

**Proposal to Establish the
Ernest & Julio Gallo School of Management
at the University of California, Merced**

Pre-proposal submitted: June 1, 2020

Revision submitted: March 1, 2022

Proposed School start date: August 16, 2023

Contact

Paul P. Maglio

Professor of Management, School of Engineering, UC Merced

Director, Division of Management and Information, UC Merced

tel: 831-588-7354; email: pmaglio@ucmerced.edu

Proposal Core Team – AY 2021-22

Rob Innes, Professor, Economics and Business Management
Andrew Johnston, Assistant Professor, Economics and Business Management
Crystal Kolden, Assistant Professor, Management of Complex System
Paul Maglio, Director, Division of Management and Information
Nathan Monroe, Professor, Political Science
David Noelle, Associate Professor, Cognitive and Information Sciences
Alex Petersen, Associate Professor, Management of Complex Systems
Michael Spivey, Professor, Cognitive and Information Sciences
Jessica Trounstone, Professor, Political Science

Proposal Core Team – AY 2020-21

Rob Innes, Professor, Economics and Business Management
Paul Maglio, Professor, Management of Complex Systems
David Noelle, Associate Professor, Cognitive and Information Sciences
Tracey Osborne, Associate professor, Management of Complex Systems
Paul Smaldino, Associate Professor, Cognitive and Information Sciences
Greg Wright, Associate Professor, Economics and Business Management

Proposal Core Team – AY 2019-20

Ramesh Balasubramaniam, Professor, Cognitive and Information Sciences
Rob Innes, Professor, Economics and Business Management
Paul Maglio, Professor, Management of Complex Systems
David Noelle, Associate Professor, Cognitive and Information Sciences
Leroy Westerling, Professor, Management of Complex Systems
Greg Wright, Assistant Professor, Economics and Business Management

Proposal Extended Team – AY 2021-22

Roger Bales, Professor, Civil and Environmental Engineering
Heather Bortfeld, Professor, Psychological Sciences
Nancy Burke, Professor, Public Health
Jeffrey Butler, Associate Professor, Economics and Business Management
Ajay Gopinathan, Professor, Physics
Sarah Kurtz, Professor, Materials Science and Engineering
Roummel Marcia, Professor, Applied Math
Shawn Newsam, Associate Professor, Computer Science and Engineering
Peggy O'Day, Professor, Life and Environmental Sciences
Josh Viers, Professor, Civil and Environmental Engineering
ShiPu Wang, Professor, Global Arts
Roland Winston, Professor, Physics and Civil and Environmental Engineering

Proposal Staff – AY 2021-22

Alvin Cha, Assistant Director, Division of Management and Information
Yolanda Kyle, Administrative Assistant, Division of Management and Information

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BRIEF SUMMARY OF THE PROPOSAL

WHAT ARE WE PROPOSING?

We propose to establish the **Ernest & Julio Gallo School of Management**, which aims to understand and improve the management of resources and institutions in nature and society. The Gallo school will promote scholarship and teaching to understand and enhance the behavior, design, and performance of complex human and natural systems. Our scholars and students will study and identify practical implications for businesses, organizations, markets, and governments by building knowledge of physical, cognitive, economic, political, and natural processes.

WHY ARE WE PROPOSING IT?

The proposed Gallo School will not be a traditional management school; rather, it will combine aspects of cognition, decision-making, economics, policy, and management with technology and engineering, with information and data science, with environmental and sustainability science, and with equity and social justice, among other areas. The goal is to develop a distinctive, unique, and valuable school focused on management of resources and institutions in nature and society in the Central Valley through both deep disciplinary and broad cross-disciplinary education and research.

HOW ARE WE DOING IT?

Starting from UC Merced's strong emphasis on interdisciplinarity, the Gallo School will combine the Departments of Cognitive and Information Sciences, Economics and Business Management, Political Science, and Management of Complex Systems. The school will offer educational and research programs focused on the management of resources and institutions in nature and society as well as data science. We plan to establish a data science and analytics degree programs to provide a valuable training environment for those seeking work in the data economy, equipping students to draw sound conclusions from data in context, using knowledge of machine learning, statistical inference, computation, geographic information systems, data management, domain knowledge, policy, and theory.

HOW MUCH WILL IT COST?

The Gallo School will rely on a diverse set of revenue sources, will increase campus enrollments through novel and high-demand new programs, and will align the mission of four established departments on globally and locally important problems. No new faculty FTEs are required, and the incremental cost of staffing the new school will be less than \$10M over the first five years, representing about 1% of the campus's state funding. Given gift and endowment resources, along with revenue-generating programs, the Gallo School will return an additional \$10M to student and faculty programs on campus over the first five years of operation.

WHEN WILL IT HAPPEN?

We are still near the beginning of a multi-year process of review and refinement, in which campus and system-wide faculty and administrators consider the proposal. The School must ultimately be approved by the UC Regents. It is planned to open in 2023.

EXECUTIVE SUMMARY

We propose to establish the **Ernest & Julio Gallo School of Management**, which aims to understand and improve the management of resources and institutions in nature and society. The Gallo school will promote scholarship and teaching to understand and enhance the behavior, design, and performance of complex human and natural systems. Our scholars and students will study and identify practical implications for businesses, organizations, markets, and governments by building knowledge of physical, cognitive, economic, political, and natural processes. We will strive to advance human well-being, diversity, and equity while promoting sustainability of natural ecosystems. The Gallo school will incorporate both academic and professional degree programs that support and promote the integrated research, teaching, and service missions of social and natural scientists, engineers, and practitioners.

Slated to open in 2023, the Gallo School will align the mission of four established departments on globally and locally important problems, will increase campus enrollments through novel and high-demand new programs, and will incorporate a diverse set of revenue sources. Four existing departments have collaboratively articulated this new shared vision and mission: Cognitive and Information Sciences (CIS), Economics and Business Management (EBM), and Political Science (POLI) from the School of Social Sciences, Humanities, and Arts (SSHA), and Management of Complex Systems (MCS) from the School of Engineering (SoE). The four groups propose collectively to meet challenges for research, teaching, and learning, filling gaps in knowledge related to

- understanding complex human behavior and decision-making in individual, interactive, organizational, institutional, technological, natural, and market settings;
- understanding complex interactions and barriers between natural processes and human-designed or human-influenced systems;
- designing complex systems in both the public and private realm that sustainably and efficiently couple people, technologies, and natural processes; and
- managing complex real-world systems to put theory into practice and improve human and natural conditions locally and globally.

These four groups approach the study of management from varied perspectives and all rely on similar methods, including observation, experimentation, conceptual models and qualitative analytics, large-scale data analytics, and computational modeling and simulation. Aligning these departments represents the seeds of an innovative integration of perspectives that focus on theories, methods, and applications related to management, information, cognition, economics, politics, and coupled human-natural systems. The novel combination of faculty and foci provides an immediate opportunity to create programs in the important area of data science and opens up many future opportunities. Incorporating both academic and professional degree programs, the Gallo School will be a non-traditional management school that is unique, valuable, forward-looking, and self-sustaining.

If approved, the E. & J. Gallo School of Management will become UC Merced's fourth school – joining the Schools of Engineering, Natural Sciences, and Social Sciences, Humanities and Arts – and will be the campus's first named school. Funded in part through a generous endowment

from the Ernest & Julio Gallo family and Winery, longtime campus friends and supporters, the Gallo School of Management will combine innovation and tradition with theory and practice to become something distinctive and worthy of the Gallo name and of the University of California.

CONVERGING DISCIPLINES, ACADEMIC STRENGTHS, INSTITUTIONAL PRIORITIES

These four departments already provide the campus with intellectual leadership in an array of academic disciplines and emerging interdisciplinary fields. The faculty provide expertise in diverse, but related, research areas, including behavioral complexity, learning and memory, communication and language, coordinated action, embodied cognition, science of science and innovation, data science, knowledge management, philosophy of mind, ethics, security and privacy, entrepreneurship, business management, behavioral economics, environmental economics, forest and natural lands management, climate change solutions, water security, service science, political behavior and cognition, political institutions and political economy, as well as international relations, among others. These areas range across social sciences, natural sciences, engineering, and management disciplines. Because each department draws on a different mix of disciplinary roots, the proposed school will feature diverse competencies and perspectives coming together around a shared vision centered upon the management of natural and human systems. The conceptual connections emerging as the result of both explicit alignment and proximity-mediated diffusion will further support campus values embracing interdisciplinarity and promoting intellectual diversity.

These same arguments highlight the potential for developing a parallel layer of convergent educational programs, ones that organically blend best methods, theory, pedagogy, and practice regarding management education. As such, this disciplinary configuration also fosters the development of a student body well-versed in the challenges and opportunities associated with a diverse educational environment that embraces team-oriented cross-pollination. A case example is the planned data science and analytics major, which would integrate curriculum in coupled systems thinking, human behavior, policy evaluation, institutional design, and causal inference with a common thread comprised of core competencies in computational methods that leverage the vast data resources increasingly available to the empirical sciences. Indeed, research and education focusing on developing a better understanding of human-centered complex systems is at the core of the goals and values identified by each department:

CIS focuses on how cognition and intelligent behaviors emerge in systems of variable size and structure, ranging from individuals to groups of individuals, including artificial agents; applied to compelling problems in social cognition, human dimensions of information technologies, artificial intelligence ethics, and individual and collective decision making under uncertainty.

EBM focuses on empirical microeconomic analysis using advanced econometric techniques to identify causal effects and economic mechanisms, with the goal of guiding effective policy design and efficient resource allocation; applied to compelling problems in health, environment, income and savings, innovation, migration and education. Regarding business management, EBM responds to the growing needs of California's business environment by focusing on analytical tools and techniques from a blend of fields in business economics, management theory and other social sciences, such as accounting, finance, marketing, business strategy, organizational theory, leadership,

innovation and entrepreneurship, in order to provide a holistic view of business management issues.

MCS focuses on how to reconcile sustainability-oriented decision making and management of complex coupled human-technological-natural systems within the constraints imposed by holistic “people, planet, and profit” values; applied to compelling problems in service system innovation, climate change, land and natural resource management, and information systems.

POLI focuses on the ways in which institutions, cognition, and behavior shape and constrain politics systems. It entails the scientific study of power, governments, public opinion, and public policy both in the United States and throughout the world; applied to compelling problems in residential segregation, war, human rights, voting behavior, judicial decision making, service provision, and political representation.

Locally, Merced and the region are burdened by hardships relating to poverty; a dominant agricultural industry that provides limited demand for a skilled technical workforce and consequently lower levels of integration within the innovation economy; and associated negative externalities manifest in the social cost of high-intensity wildfire, poor air quality, unsustainable groundwater use, degraded lands, industrial and agricultural pollution, and heat stress – among others. To address these issues, there is an unmet need for an organizational platform upon which relevant human-systems problems can be brought to the fore. The proposed school will address this need for a central repository of human, social, and intellectual capital charged with targeting the region’s very real problems.

The Gallo School will support the campus’s commitment to UC Quality Scholarship, UC Quality Academic Programs, and Diversity – the three focal points defined by the campus’ Academic Planning Working Group (APWG)²⁵ and related campus Strategic Plan.²⁶ Regarding UC Quality Scholarship, building on existing research strengths within the disciplines of economics, cognitive science, politics, and management, the school aims to continue to advance knowledge within these fields and train the next generation of scientists and practitioners through our graduate programs. Regarding UC Quality Academic Programs, the proposed School will have four Ph.D. programs offered by the four distinct groups, providing sufficient capacity to contribute to measures of doctoral conferrals. At the undergraduate level, the proposed School will be comprised of roughly 16% of campus undergraduate enrollment, with near-term growth anticipated in an undergraduate program centered around data science and analytics, further contributing to UC quality educational experience. Regarding Diversity, the proposed School will increase disciplinary diversity of educational programs and demonstrate our clear commitment to promoting sustainable growth, equity and social justice, and faculty diversity.

COMMITMENT TO EQUITY, DIVERSITY, AND INCLUSION

Creation of the proposed Gallo School of Management presents an opportunity to make equity, diversity, and inclusion (EDI) a priority for programs associated with the School. Diversity in faculty, staff, students, and research populations and a commitment to social and environmental justice are essential elements of outstanding practice and research within the departments of the proposed Gallo School. Our commitment to diversity in faculty and student recruitment is simultaneously a commitment to diversity of perspective, a greater propensity to engage in

research of benefit to underserved communities, and a commitment to excellence. The emphasis on equity and on social and environmental justice demonstrates our commitment to supporting and improving the conditions of vulnerable and marginalized populations.

With an a priori focus on ensuring a diverse faculty, staff, and student body, we will establish equity and economic, social and environmental justice as central to the mission of the School and prioritize diversity and inclusion within the School's core function. We will also establish a new Associate Dean for Equity, Justice, and Inclusive Excellence charged with monitoring, measuring, and advancing justice, equity, diversity, and inclusion among students, faculty, and staff in conjunction with appropriate department-level and school-level committees.

Administrators, faculty, and staff will work closely with UC Merced's Chief Diversity Officer and the Division of Justice, Equity, and Inclusive Excellence to support positive and productive relationships among individuals of diverse perspectives to create a culture and environment that is both open and inclusive. In addition to recruitment, we understand the importance of retention of underrepresented and underserved populations. Part of the ongoing education for all will be to deepen understanding and challenge misconceptions surrounding diversity, including addressing micro-aggressions. Gallo School leadership will be advocates for establishing diversity, inclusion and equity within the School.

The School will seek and promote a culture of diversity and inclusion within the fabric of the Gallo School, including education, support, mentoring, recruitment, retention, prioritizing diversity-related activities in faculty merit and promotion reviews, and assessing student and faculty experience related to diversity. Examples of efforts to increase diversity of students and faculty include: (a) recruitment and retention of underrepresented faculty and staff by creating an environment of inclusiveness in hiring, mentoring, and evaluation; (b) recruitment and retention of underrepresented students through mentoring, building curriculum aligned with social and environmental justice, and funding support; and (c) encouraging faculty, staff, graduate students and undergraduate majors to participate in one (or more) of the several workshops offered by the Division of Justice, Equity, and Inclusive Excellence.

DEFINING A UNIQUE PLACE AMONG MANAGEMENT SCHOOLS

The proposed Gallo School will not be a traditional management school; rather, it will combine aspects of cognition, decision-making, economics, politics, policy, and management with technology and engineering, with information and data science, with environmental and sustainability science, and with equity, ethics and social justice, among other areas. Our goal is to develop a distinctive, unique, and valuable school through cross-disciplinary education and research – and one that aligns with the forward-looking vision of management and business schools focusing on systems thinking, complex problems such as climate change, and inclusiveness.¹ In reviewing a variety of related programs, schools, and colleges in the UC system and elsewhere, we find our proposed school is exactly like none of them and partly like all of them.

Within the UC system, six of the ten campuses have schools of business or management, all AACSB-accredited; half include both undergraduate and graduate programs, and half include

¹ See <https://hbr.org/2020/03/a-bolder-vision-for-business-schools>

only graduate programs; all include traditional M.B.A. degrees, as well as focused M.B.A. programs aimed at working professionals, and almost all offer graduate degrees in finance (an M.Sc. in Finance or a Master's in Financial Engineering) and a Ph.D. in Business or Management; most also offer a Master's in Business Analytics; and there is a common core of faculty in accounting, economics, finance, marketing, and operations. Outside the UC system, several local campuses in the California State system have AACSB-accredited business schools, including Bakersfield, Fresno, Sacramento, and Stanislaus; all include undergraduate and graduate degrees; almost all have traditional M.B.A. programs; and there is a common core of faculty in accounting, economics, finance, marketing, and management or operations. The Gallo School will not be a traditional management school with an M.B.A. program and with faculty aligned with traditional management school disciplines. One consequence is that the Gallo School is not planning to seek accreditation by AACSB in the near term. By incorporating cognitive science, sustainability, economics, politics, and complex-systems science and engineering, the Gallo School will carve out a unique niche among schools with a focus on management in the UC system and in the Central Valley.

The proposed Gallo School's focus on information, data, technology, and environmental sustainability aligns with a number of related schools and programs across the UC system focused primarily on data science and on the environment and sustainability: UC Berkeley's Division of Computing, Data Science, and Society, and Rausser College of Natural Resources; UC San Diego's Halıcıoğlu Data Science Institute; and UC Santa Barbara's Bren School Environmental Science & Management. The Gallo School will incorporate aspects of data science and sustainability but will not focus solely on either of these. Schools of sustainability and environment at Stanford University, the University of Washington, and the University of Michigan highlight a common approach to siloing sustainability and environmental sciences separately from applied management and data science or information programs. The Gallo School, in contrast, aims to bring cognition, economics, complexity, data science, sustainability and management together in one institution, with cross-cutting programs in management, data science and sustainability that leverage faculty across a broad array of disciplines. Thus, the Gallo School represents a unique convergence of disciplinary and interdisciplinary faculty and students, carving out a niche, by connecting management, complexity, behavior, and institutions with technology, data, and sustainability, among other areas. The Gallo School will have a full array of graduate and undergraduate educational programs designed to harness cross-disciplinary perspectives on complex systems science to the management of critical problems in complex systems.

The proposed Gallo School of Management lies at the intersection of converging disciplines with the capacity to substantively tackle deep research problems in management, cognitive science, economics, politics, and the natural environment – problems related to the complex systems of everyday life. The capability to address such problems is not directly addressed by any other school within the UC system or the region. The proposed Gallo School of Management will advance the UC system's mission of providing research education to currently underserved populations and regions of the state of California.

EDUCATIONAL PROGRAMS FOR TODAY AND TOMORROW

The proposed Gallo School will incorporate four existing departments and associated graduate groups, including six majors, five minors, and nine graduate programs they oversee. The

Cognitive and Information Sciences (CIS) Department and Graduate Group are devoted to the interdisciplinary study of cognition, combining theories and methods from many disciplines, including artificial intelligence, linguistics, anthropology, ethics, psychology, and neuroscience. The Department of Economics, Business, and Management (EBM) and associated Graduate Group in Economics focus on the behavior and management of individuals, organizations and institutions in the economy. The Department of Management of Complex Systems (MCS) and associated Graduate Group in Management of Innovation, Sustainability, and Technology (MIST) focus on adaptive management of complex human behavior and complex coupled human-technology and human-environment systems, including for-profit and not-for-profit organizations and public and private enterprises. The Political Science Department and Graduate Group are concerned with study of governments, public policies, political processes, systems, and political behavior. The academic programs include:

Dept/Graduate Group	Undergraduate Programs	Graduate Programs
CIS/CIS	B.S./B.A./Minor in Cognitive Science	Ph.D./M.S. in Cognitive and Information Sciences
EBM/Economics	B.S./B.A./Minor in Economics B.S./Minor in Management and Business Economics	Ph.D./M.A. in Economics
MCS/MIST	Minor in Management Analytics and Decision-making	Ph.D./M.S. in Management of Complex Systems M.M., Master of Management
POLI/POLI	B.A./Minor in Political Science	Ph.D./M.A. in Political Science

The Cognitive Science programs provide training in research methods, data analysis, computational modeling, and lab-based research, preparing students for careers in technology development or a foundation from which to pursue graduate work in many fields. Cognitive Science alumni are in well-respected graduate programs at universities such as Brown, Purdue, Indiana, and Macquarie, working in industry as data scientists, user experience technicians, systems administrators, teachers, and other cognitive and information science related careers (e.g. Google, Facebook, and Dropbox). The CIS graduate program has awarded 28 Ph.D. degrees with graduates holding faculty positions in research-intensive universities, faculty positions in teaching-intensive universities, and postdoctoral positions at prestigious institutions, and many working in industry in machine learning, data science, computational modeling, robotics, learning, and analytics (e.g., Accenture, Facebook, Salesforce, Cisco, and Apple).

The Economics major provides a foundation of strong theoretical and statistical training, providing students solid grounding in microeconomic and macroeconomic theory, statistical and econometric methodology, experimental design, and applied economic analysis, emphasizing the role of incentives and institutions in shaping economic outcomes and how public policies influence economic performance and individual outcomes. The Economics PhD program has been developed with the goal of providing an excellent training in applied microeconomics to prepare students for academia, industry and policy-making. In its second year – with 10 students and on course to graduate its first M.A. in Spring 2022 – the program is already one of the most diverse in the country. The Management and Business Economics major provides rigorous analytical and quantitative training from a blend of business and economics fields, integrating key ideas and approaches from across subject areas to evaluate and understand all the dimensions

of a given business issue. Graduates from these programs have placed well in private and public sector jobs (e.g., Blackrock, Highland Consulting, Morgan Stanley, Merrill Lynch, MGM Resorts, Golden State Warriors, Lockheed, Vanguard, E&J Gallo, Facebook, Google, Amazon, and Foster Farms, among many others), and with many going on to graduate programs (e.g., law school at Duke University, and Economics programs at UC Santa Cruz, UC Davis, and Texas A&M).

Political Science programs are organized around two broad conceptual tracks: political institutions and political economy, and political cognition and behavior. The Department and Graduate Group of Political Science administers one undergraduate major – Political Science B.A. – and a corresponding minor, as well as a Ph.D. program in Political Science. The Political Science B.A. provides students with a social scientific understanding of political intuitions and political behavior. The study of political institutions includes topics such as the effect of the design of electoral systems on the quality of representation in government, the formal and informal elements of the legislative process and their implications for the making of law, and the impact of domestic political institutions on the incidence of international conflict. The Political Science major provide a strong foundation for graduate training in law, political science, or other social sciences. Students graduating with a degree in political science can also pursue a wide variety of other careers, such as public administration, campaign management or consultation, grassroots political organization, corporate governmental affairs, Foreign Service, journalism, lobbying or teaching. The Political Science Ph.D. program is designed to be small and focused on training students for successful research careers in the academy, government, and private sector. Since graduating its first students in 2016, all Ph.D. graduates have found good positions, for instance at Facebook, University of Toronto, Stanford, and more.

The Master of Management (M.M.) program provides a one-year professional degree program aimed at turning new college graduates into leaders in the Central Valley, State of California, and beyond. A unique program in the UC system, the M.M. leverages specific strengths in engineering, science, and social sciences found across schools on campus, creating an exemplary cross-functional program that addresses the need for developing managers and leaders with knowledge in their areas of expertise, combined with a sound foundation of management skills, focusing on adaptive management of complex coupled human and natural systems, including for-profit and not-for-profit organizations and public and private enterprises. The M.S./Ph.D. degree program in Management of Complex Systems is a cross-functional program of research, education, and practice, addressing the need for developing deep knowledge and leadership in areas of complex systems and analysis and management relevant to the campus, the region, and the state.

Data science is a common thread running through the three departments in the Gallo School. We plan to establish Data Science and Analytics degree programs that will provide a valuable training environment for individuals seeking work in the data economy, equipping students to draw sound conclusions from data in context, using knowledge of machine learning, statistical inference, computational processes, geographic information systems, data management strategies, domain knowledge, ethics and theory, and strategic and interactive data visualization. Specifically, we will propose a B.S. and a self-supporting graduate degree program (SSGDP), an M.S. in Data Science and Analytics, to start with the Gallo School in AY 2023-2024. Based on experience with data science programs at other UC campuses, we expect our undergraduate program to grow to 75-100 students and our master's program to grow to about 40 students over

five years. We expect demand for data scientists to grow substantially over the next few years, with demand for graduates in a range of areas, including in finance, professional services, IT and more.

FINANCIAL PLAN, REVENUE GENERATION, PHILANTHROPIC SUPPORT

The proposed Gallo School requires new resources from the campus and the state to support school operations; that is, new staff will be required to run the new school. There is no request for new faculty needed to support any of the existing or proposed programs, and there is no suggestion of moving staff from any existing school into the proposed Gallo School. Our financial plan uses a variety of funding resources, including state funds, tuition, revenues from self-supporting graduate degree programs, and an endowment that began with a generous gift from the E. & J. Gallo Winery for the purpose of establishing the E. & J. Gallo School of Management at UC Merced. The Gallo Endowment consists of the lead gift by the Gallo Winery (originally \$5M) and a set of matching gifts with restricted uses (originally \$6M), including three endowed chairs and three endowed student scholarship funds. Today the Gallo Endowment is worth more than \$24M, with an additional \$4M of accumulated payout available for current use. Building on this endowment and the potential contribution of the proposed school, we will expand our relationships with corporate partners, engage foundations, and bring together individuals whose passion for our mission will translate into philanthropic support. Building from an Advisory Council of committed individuals and engaging meaningfully with key partners in the Central Valley, we will seek to increase investment for endowed chairs, graduate fellowships, student support, and other programmatic purposes.

Over the five-year planning horizon, establishing the Gallo School will require nearly \$10M of new state general funds to support staff and operating expenses. Once established, growth in faculty, staff, and other expenses tracks student enrollment growth. Additional funding for the new school includes gifts, endowment payouts, indirect cost returns, and revenue-generating programs – all of which support student and faculty activities (such as student scholarships), some operating expenses (such as marketing and recruitment of students and faculty), and new graduate TAs (decreasing the need for centrally-funded TAs). Accounting for these potential new sources of revenue, every \$1 of new state funding invested in the Gallo School returns an additional \$1 to the campus.

BACKGROUND AND INTRODUCTION

We envision a new **Ernest & Julio Gallo School of Management** aimed at understanding and improving the management of resources and institutions in nature and society. The Gallo school will promote scholarship and teaching to understand and enhance the behavior, design, and performance of complex human and natural systems. Our scholars and students will study and identify practical implications for businesses, organizations, markets, and governments by building knowledge of physical, cognitive, economic, political, and natural processes. We will strive to advance human well-being, diversity, and equity while promoting sustainability of natural ecosystems. The Gallo school will incorporate both academic and professional degree programs² that support and promote the integrated research, teaching, and service missions of social and natural scientists, engineers, and practitioners.

A key to sustainable, vibrant, and empathic civilization lies in an integrated understanding and management of individual and collective human behavior, the natural environment, and socio-technological innovation, considering physical, cognitive, economic, and social processes, and accounting for complex interactions and dynamics in private, public, and non-governmental contexts.

The proposed Gallo School has five aspirational goals aligned with UC Merced's strategic plan:³

Establishing World-Renowned Research and Training Tomorrow's Leaders in the Study of Management of Resources and Institutions: To be world leaders in scholarship and application of knowledge in disciplinary and interdisciplinary studies of business, cognitive science, economics, ethics of technology, environmental sustainability, management, politics, public policy, and computational, empirical, quantitative, and qualitative social sciences.

Advancing Social, Behavioral, and Economic Knowledge for Human Welfare: To advance knowledge of the behavior and performance of individuals and groups in integrated social-political-economic systems and to inform the design and practices of businesses, organizations and governments in local, regional, national, and international markets and societies. Related underpinnings include studying complex physical, biological, social, and natural systems; the design and use of incentives and policy; and the functioning and failures of markets; all in view of social and economic outcomes broadly defined to include human satisfaction, diversity and equity in health, education and wealth, as well as health of natural environments and their relationship to both human progress and ecosystem function.

Educating Future Leaders and Training a Modern Workforce: To prepare the future workforce and future leadership of California to tackle grand challenges by combining traditional approaches to education with practice-based educational programs at the

² In this way, the proposed school will be like the three existing schools at UC Merced, and not a new professional school per se. According to UC's Compendium, which lays out the processes for review of academic programs, "Examples of schools that offer both academic and professional degrees include ... UCM's School of Engineering, School of Natural Sciences, and School of Social Sciences, Humanities, and Arts..." (see footnote 18 in https://www.ucop.edu/institutional-research-academic-planning/files/compendium_sept2014.pdf).

³ See <https://strategicplan.ucmerced.edu/>

undergraduate, graduate, and professional levels. Our programs aim to incorporate complex systems thinking, data analytics, technological skills, and a triple-bottom-line (people, planet, and profit) perspective throughout the curriculum, so our diverse graduates will be able to work effectively today and will be able to create what is needed to lead effectively tomorrow. Related educational priorities include the advancement of historically oppressed and marginalized groups within California and the Central Valley, and training students in politics and ethics to engender social responsibility.

Driving Prosperity and Sustainable Development in the Central Valley and

California: To drive local and regional growth and development sustainably through novel educational programs and development of knowledge, tools, and resources that promote entrepreneurship and innovation. To do this, we will focus on complex human-centered economic, technological, and environmental systems. Applicable to local and regional needs, our programs aim to enable state and local investment to multiply across existing and new social and economic opportunities in the Central Valley, creating an approach that can serve as a model for driving sustainable growth and development in historically oppressed and marginalized areas around the world.

Promoting Social Justice, Environmental Justice, and Equity Locally and Globally:

To address complex social, environmental, economic, and technological challenges, such as climate change, food insecurity, wealth inequality, wildfire, drought, artificial intelligence, workforce automation, privacy, and more. In this, we take an approach centered on complex human and natural systems as well as social and environmental justice perspectives, demonstrating a commitment to supporting and improving the conditions of vulnerable and marginalized populations locally, regionally, and globally.

OPPORTUNITY AND BENEFITS

In 2002, the Ernest & Julio Gallo family and Winery provided an endowment to UC Merced to establish the Gallo School of Management, incorporating undergraduate and professional programs in management and producing outstanding leaders. Over time, the original Gallo gift was matched with endowed funds supporting student scholarships and faculty chairs. The endowment is currently worth more than \$24M, about \$11M designated for unrestricted use by the proposed Gallo School (as of Fall 2021). By establishing the Gallo School, we aim to be good stewards of these generous gifts and establish a framework for future philanthropic support. Leveraging the existing endowment funds and other revenue sources (including revenues from self-supporting programs, indirect cost returns, and more), we can establish a world-class, innovative, and valuable new school at UC Merced at relatively low cost to the campus, the system, and the state.

In addition, we see a number of specific benefits to establishing the proposed Gallo School:

Establish thought leadership on grand challenge problems. By leveraging the convergence of distinct yet complementary management-focused disciplines, we can realize UC Merced's potential as an innovator in management research and education.

Prepare students for rewarding careers addressing socially relevant problems. By providing training and tools to manage problems in complex and dynamic nonlinear human and natural systems, and by establishing high-demand programs at undergraduate,

graduate, and professional levels, we will be in a strong position to prepare our students to address challenging societal problems in diverse issue areas, contributing to society while developing capacity to take advantage of changing opportunities in a complex and difficult to predict job market.

Promote human wellbeing in social, economic, physical, and environmental realms.

We aim to improve human welfare and environmental quality in our community through research, teaching, and practice, building knowledge and capacity for sustainably managing coupled complex systems globally.

Expand resources and opportunities campus wide. By leveraging unused gift funds for faculty, student, and campus use, we will open new opportunities for philanthropy and industry partnerships on campus and generate additional cash-flow for the campus.

SYNERGY AND ALIGNMENT

Four existing departments have collaboratively articulated this new shared vision and mission: Cognitive and Information Sciences (CIS), Economics and Business Management (EBM), and Political Science (POLI) in the School of Social Sciences, Humanities, and Arts (SSHA), and Management of Complex Systems (MCS) in the School of Engineering (SoE). The four groups propose collectively to meet challenges for research, teaching, and learning, filling gaps in knowledge related to

- understanding complex human behavior and decision-making in individual, interactive, organizational, institutional, technological, natural, and market settings;
- understanding complex interactions and barriers between natural processes and human-designed or human-influenced systems;
- designing complex systems in both the public and private realm that sustainably and efficiently couple people, technologies, and natural processes; and
- managing complex real-world systems to put theory into practice and improve human and natural conditions locally and globally.

These four groups approach the study of management from varied perspectives, but they all rely on similar methods, including observation, experimentation, conceptual models and qualitative analytics, large-scale data analytics, and computational modeling and simulation. Aligning these departments represents the seeds of an innovative integration of perspectives that focus on theories, methods, and applications related to management, information, cognition, economics, politics, and coupled human-natural systems.

CIS. The CIS faculty focus on the interdisciplinary study of human behavior and cognition. In its short history, CIS has established an international reputation as a world leader in studies at the intersection of communication, dynamics, and complex systems, as well as in the computational modeling of cognitive processes. The CIS Department currently houses 13 ladder-rank faculty members with expertise in artificial intelligence, experimental psychology, communication, and neuroscience.⁴ This group oversees five

⁴ Excluding Philosophy faculty, who are currently forming their own new department in SSHA.

educational programs: world-class Ph.D. and M.S. programs in Cognitive and Information Sciences (34 students in Fall 2021), both B.S. and B.A. programs in Cognitive Science (177 majors), an undergraduate minor in Cognitive Science (51 students). Cognitive Science majors have gone on to top graduate programs and excellent jobs at leading technology companies. CIS postdocs and Ph.D. graduates have been offered tenure-track faculty positions and prestigious postdoctoral positions, as well as positions at companies that work at the intersection of human cognition, data science, and technology.

EBM. The EBM faculty focus on the behavior and management of individuals, organizations and institutions in the economy, considering broad social objectives to advance welfare, sustainable environments and improved health. The 14 ladder-rank faculty have published in top general interest and field journals within the Economics profession, already placing the nascent department in the top 7% of world economics departments.⁵ EBM has developed two undergraduate programs. Between the two, EBM delivers the third largest undergraduate program on campus (by number of graduates), graduating roughly one-seventh of UC Merced’s undergraduates (a higher proportion than at most major universities) and serving more than 700 majors. The two undergraduate programs are Economics B.A. and B.S. (91 majors) and Management and Business Economics B.S. (714 majors), with a new accounting major under development. An Economics Ph.D. program began in Fall 2021 (10 students).

MCS. The MCS faculty focus on adaptive management of complex human behavior and complex coupled human-technological and human-natural systems, including for-profit and not-for-profit organizations and public and private enterprises and public lands. Faculty have a range of social-science, natural-science and engineering expertise, and are recognized across diverse fields. MCS is aligned with the graduate group in Management of Innovation, Sustainability, and Technology (MIST). MCS has one minor program, Management Analytics and Decision Making (MAD), and expects to have several undergraduate majors within the next five years. MIST is offering the campus’ first professional master’s program, Master of Management (M.M.). It also has two academic graduate programs, M.S. and Ph.D. in Management of Complex Systems. The MCS department has 12 ladder-rank faculty members. Arrangements of people, organizations, information, technology, and the natural world, operating together for common purposes, constitute the sort of complex adaptive systems that MCS/MIST faculty aim to understand and shape. Many MCS faculty also participate in the Environmental Systems graduate group, which also takes a cross-disciplinary approach to Earth systems sciences.

POLI. The POLI faculty study governments, public policies, political processes, political systems, and political behavior. The Department currently has 15 ladder-rank faculty (with 3 open lines). They oversee three programs: a highly regarded Political Science PhD program (ranked 63rd in the nation by the US News and World Report) with 22 students as of fall 2021, a B.A. program in Political Science (with 339 majors), and an undergraduate minor in Political Science (with 51 students). The Department is working toward establishing a new minor in Data Analytics and Policy Evaluation. Every graduate of the Political Science PhD program has gone on to a PhD level placement including

⁵ According to <https://ideas.repec.org/top/top.inst.all.html>

tenure track positions at research universities, teaching universities, and community colleges, as well as data science positions in industry.

Co-locating research on complex physical, cognitive, human, and natural processes with economic modeling and research on behavior and outcomes in firms, markets, politics and the economy at large promise unique and innovative research and educational opportunities both within and at the intersection of disciplines. Whereas some researchers focus principally on the “upstream” (fundamentals of physical, cognitive, and natural processes, including properties of brain function, communication, and natural systems), others focus principally on the “downstream” (behavior of individuals, groups, firms, and governments in economic and natural worlds). As such, a unique feature of the Gallo School vision is the combination of these perspectives in one School that promises intellectual and learning synergies for advancing knowledge at the intersection of upstream science and downstream research and practice.

Moreover, this intersectional research synergy also manifests in educational program synergy. The Gallo School directly gives rise to opportunities for developing novel undergraduate, graduate, and executive leadership programs around the same thematic research configurations. Such educational programs would be markedly more difficult to launch without the co-location of these departments in a single School, given the administrative and procedural challenges to a shared multi-school approach.

One such opportunity taking shape is an undergraduate “Data Science and Analytics” major and a graduate self-supporting masters program, both under development by representatives of the four proposed Gallo departments. These programs would provide students a valuable curriculum oriented around decision-making with data – including but not limited to the data-driven pipeline comprised of collecting, cleaning, analyzing, modeling and effectively communicating with data. The curriculum would draw on the empirical research strengths of the proposed Gallo School faculty, integrating real-world cases that confront students with powerful data-oriented tools to tackle a wide range of challenges relating to individual and group-level decision-making under the increasingly complex constraints of time, resource, risk, and uncertainty. These and other planned educational programs that leverage the intersection of management science theory and methods across the diverse proposed Gallo School departments, along with implementation via a case-based educational approach, will prepare students for a myriad of lucrative professional pathways aligned with the highly integrated techno-social future of work.⁶

To summarize, there are many synergies for advancing new paradigms and approaches to related research and teaching in areas of management and science of complex coupled human-centered systems, and behavior, management, and governance of individuals, firms, institutions, and economies. To be specific, below we highlight four prominent benefits to aligning these four departments in a new School:

Common Tools. There is a growing set of general tools for investigating complex human and natural systems, offering innovative new concepts, mathematical modeling formalisms, computational methods, and approaches to data analytics. Data science and analytics is an overarching paradigm that uses scientific methods, algorithms, and

⁶ This Data Science and Analytics major under development is being designed around principles of cutting-edge convergence in undergraduate education that blends computational and social sciences, as exemplified by the recently implemented hybrid Computer Science, Economics, and Data Science major at MIT: <https://computing.mit.edu/news/popular-new-major-blends-technical-skills-and-human-centered-applications/>.

statistics to extract insights from structured and unstructured data. Some examples relevant to the Gallo school include: (a) standardized metrics for measuring progress towards sustainable development goals (by the United Nations); (b) scalable and dispersible remote sensing capabilities producing high-resolution temporal-geospatial environmental data; (c) highly annotated metadata (e.g., patents and publications) for studying innovation at different levels of aggregation (e.g., people, teams, institutions, globe); (d) high-frequency market data to study financial systems; (e) high-frequency social and web media to study the attention economy; (f) web- and personal wearables-based data collection platforms for systematically recording human and social activity for modeling behavior and the emergence of order and disorder in socio-economic systems; (g) modeling the micro-foundations of political insurgency; and (h) analyzing local and federal policy impacts, such as the effect of electoral rules on individual voter behavior.

Understanding Multi-faceted Problems. Deep research problems lie at the intersection of management, cognitive science, economics, politics, and earth systems. As the relationships between humans and natural systems grow increasingly complex, and as ever more information about such relationships is generated, there is a need for more awareness, skills, and systems-oriented thinking to manage the coupling of data, information, people, and the Earth's resources in a sustainable and ethical manner, using for instance, incentives and appropriate institutional arrangements. This systems approach falls squarely at the nexus of CIS, EBM, MCS, and POLI.

Designing Practical and Mindful Solutions. Management, cognitive science, politics, and economics apply results of scholarship to the constrained design of practical and productive systems that leverage the strengths of human cognition and human institutions while guarding against weaknesses of the same, for instance, in the context of sustainability and the future of work and automation. Applied work can range from cognitive engineering of user experiences with computers to shaping the visual and linguistic context of risk communication to crafting of organizational structures and policies to adaptively manage natural resources or to implement incentive systems for positive human outcomes. Whereas applications benefit from experimental work and theory, management, cognitive science, economics, politics, and environmental sciences share a deep respect for case studies of real systems to guide fundamental research. This common interest in designing real-world applications leads to a common need for infrastructure to support partnerships with companies, government agencies, and other institutions. Such partnerships both facilitate research and offer valuable opportunities for education and professional training.

Shared Pedagogical Approaches. There are a variety of points of intersection in the educational curricula of management, cognitive science, economics, politics, and Earth and environmental sciences and engineering. As disciplines oriented around real-world problems, the shared pedagogical approach is tasked with integrating traditional dimensions of quantitative, qualitative, empirical, and theoretical knowledge. Increasingly, integrating these elements is achieved by way of computational and data-driven capabilities that catalyze problem solving and effective communication. At a practical level, the four Gallo departments are already primed for integrating education with diverse concepts and skills – such as the mathematics of variation, dynamics and complexity, big data analytics, econometric modeling for quasi-experimental causal

inference, stochastic computational modeling of coupled dynamical systems, and applied ethics, among other areas – that could be taught effectively in a coordinated fashion, giving rise to efficiencies in teaching and unique interdisciplinary educational experiences. For instance, management students will benefit from easy access to coursework on the scientific study of human cognition, and since many cognitive science graduates pursue careers involving leadership positions outside of the academy, management skills will likely be seen as useful augmentations to their scientific training. Related teaching priorities include the education of business and intellectual leaders with a preeminent objective to advance under-represented groups of California and the Central Valley in private and public sectors of the economy.

Given a shared vision and the many benefits of establishing close ties among the four academic groups in this proposal, we believe there is a compelling rationale to establish a new Gallo School at UC Merced to advance both the campus’ aspirations for preeminence in research and its transformational mission and identity, particularly in the intersecting domains of management, economics, cognitive science, politics, and environmental sustainability. The new Gallo School envisioned here does so by sculpting an institution that embraces the complexities of real-world interactions among people, technologies, and the natural environment.

CAMPUS CONSULTATION

This proposal to establish the Gallo School of Management has evolved over the last four years. Faculty in CIS, EBM, MCS, and POLI have collaboratively developed the shared vision, mission, and plan described here in consultation with faculty, students, and administrators across the UC Merced campus.

In Fall 2018, a core team of faculty from CIS, EBM, and MCS developed a sketch of a proposal and an extended team of faculty from across campus provided input. This sketch was published on the web for comment by campus stakeholders.⁷ A series of workshops, retreats, and meetings were held between 2018 and 2020 to discuss plans for the school and gather feedback, including meetings with campus administrators, senate committees, school executive committees, faculty groups, student groups, and alumni groups. An external Advisory Council for the future Gallo School was also convened starting in Spring 2020, including innovators and leaders from business and elsewhere in the Central Valley and Silicon Valley, and has met three times to offer advice and perspective on the evolving plans.⁸ This consultation process yielded several letters of support (Appendix K) and a positive evaluation from the CIS graduate program’s periodic review (Appendix I).

At the end of Spring 2020, faculty from CIS, EBM, and MCS commented on and voted on the initial pre-proposal for the E. & J. Gallo School of Management. There was overwhelming support for the establishment of the Gallo School as outlined in that pre-proposal, with 36 for, 4 against, 1 abstention, and 2 ballots unreturned.

⁷ See <https://mcs.ucmerced.edu/gallo-school-initiative>

⁸ See <https://gallo.ucmerced.edu/about/external-advisory-council>

The initial pre-proposal⁹ advanced through administration and Senate channels during the 2020-2021 academic year. In Spring 2021, the Provost returned the pre-proposal to the proposal team with a set of comments from the Academic Senate and campus administrators suggesting the team revise and resubmit the pre-proposal.^{10,11} At this point, the Department of Political Science approached the proposal team to ask about the possibility of joining the Gallo effort. This request was motivated by the Political Science faculty's understanding of synergies between their department and the mission and values expressed in the pre-proposal. In Fall 2021, CIS, EBM, MCS, and POLI all voted overwhelmingly in favor of POLI joining the Gallo School effort.

In Fall 2021, the philosophy faculty in the CIS Department began to prepare a proposal to form their own department, leaving CIS and remaining in SSHA; and the pre-proposal was revised with the assumption that four philosophy faculty members from CIS would not move to the Gallo School. Also in Fall 2021, the newly constituted core planning team – with representatives from CIS, EBM, POLI, and MCS – held listening meetings with Academic Senate committees, school executive committees, and campus leadership. The resulting feedback – along with the feedback received from the formal campus review – has been incorporated into this revision of the pre-proposal. It has become clear that there is much concern among faculty in SSHA about the future of SSHA if the Gallo School is established as proposed. Yet, while the formation of the Gallo School is an opportunity for a few departments from SSHA and one from SoE to envision a new and exciting future, it is also an opportunity for the rest of SSHA to envision its own new and exciting future. The remaining departments in SSHA have many strengths: strong professional reputations, distinctive academic traditions, and important educational missions that are fundamental to the larger goals of our campus. They clearly have the resources and tools necessary to innovate (as UC Merced has always done) a new vision for SSHA with a distinctive curricular shape that nonetheless draws some inspiration from other schools with similar sets of departments. There are so many new foci that they can create together. We are certain they will find the right ones for themselves.

In early Spring 2022, faculty from CIS, EBM, MCS, and POLI commented on and voted on the revised pre-proposal for the E. & J. Gallo School of Management. The result of the vote was 47 for, 2 against, 2 abstention, and 5 ballots unreturned.

CURRENT ECONOMIC CONTEXT

As the preparation of the original pre-proposal was nearing completion in Spring 2020, the coronavirus pandemic hit, changing the economic landscape for California (and the world). The pandemic had (and continues to have) substantial consequences for higher education. Nevertheless, many of the immediate financial consequences of the pandemic have passed and the state budget and overall UC budget are bouncing back. The proposed Gallo School leverages substantial philanthropic support and independent revenue generation, resulting in only a modest state funding request of just over one percent of the state's contribution to the UC Merced campus. Importantly, the state funds required for the proposed Gallo School will not be needed

⁹ Pre-proposal submitted for campus review June 1, 2020: <https://ucmerced.box.com/s/7jl5llch9c58iwd1kewajjy56s3690og>

¹⁰ Senate reviews: <https://ucmerced.box.com/s/cebfcfs0mf2e5xf0z035talszrtwu0t0>

¹¹ Administration reviews: <https://ucmerced.box.com/s/2i2aq6fe0ic1pzaoo9fkrze5eu79t8ir>

for several years, as the school proposal moves through the approval process. As an institution, the University of California must engage in long-range planning to remain vibrant and vital to the state's interests. Moreover, educational programs associated with the proposed school can be transitioned to online and hybrid instruction; for example, existing programs do not require wet labs or significant in-person instruction, and future programs in data science may be created as mostly online programs (as has been done at other UC campuses). Finally, the vision and mission of the proposed Gallo School aims squarely at multi-faceted society-scale problems, such as the coronavirus pandemic. In this way, the pandemic may provide increased opportunities for grant funding to investigate and mitigate such complex systems problems, and it may provide a natural bridge between the Gallo School effort and the medical and public health research and education efforts at UC Merced.

SUMMARY: VISION AND MISSION

The proposed Gallo School aims to be a world leader in the study of the management of institutions and resources in nature and in society. Its mission is to develop students into outstanding leaders and scientists who contribute to public, private, and non-profit organizations. Drawing broadly from a wide array of disciplines, the Gallo School will provide a well-rounded education that incorporates multiple perspectives for solving real-world problems. Reflecting the many domains in which science, design, and management skills are critical, the Gallo School will prepare students for careers in many areas of science, engineering, sustainability, and management, including business management, environmental and natural resource management, public policy, educational leadership, computational literacy, data analytics, risk analysis, communication, and more.

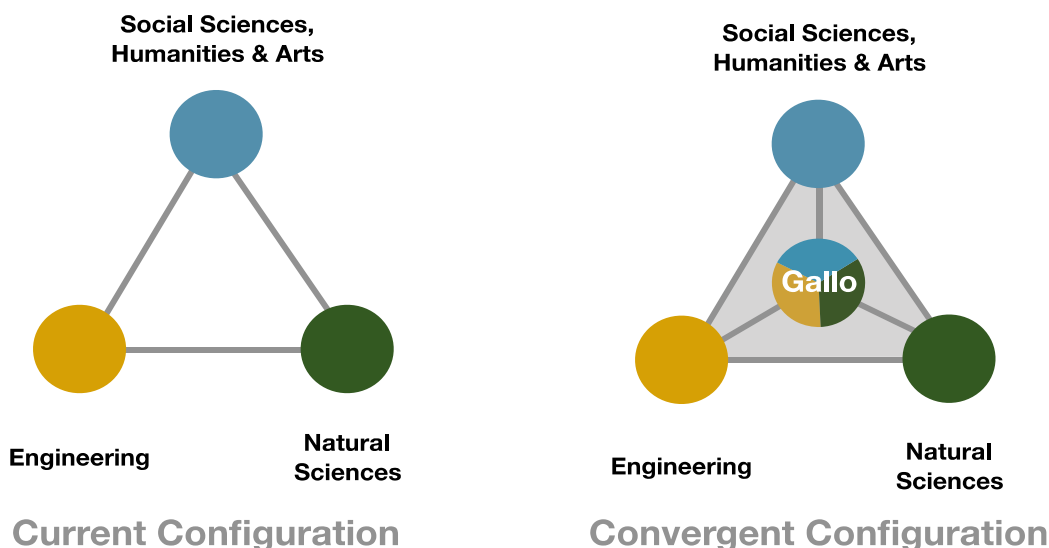


FIGURE 1. CONVERGENT CONFIGURATION.

PROPOSED CONFIGURATION OF UC MERCED SCHOOLS REINFORCES EXISTING STRENGTHS BY INTEGRATING AROUND THE PARADIGM OF DISCIPLINARY CONVERGENCE.

NEED FOR THE PROPOSED SCHOOL

University of California campuses serve the public as producers and repositories of formal, institutional, and instructional knowledge. Thus, in a manner that is central to its mission, UC Merced acts as an emerging hub within the larger knowledge economy. The organizational structure of the campus currently reflects conventional epistemological pillars (see Figure 1), with intellectual efforts divided among three schools: Social Sciences, Humanities, and Arts; Engineering; and Natural Sciences. We propose to add a fourth school dedicated to the study of Management, broadly construed.

Schools at UC Merced are an important venue for articulating a shared local mission and set of values that can help guide resource allocation and programmatic development. The four groups proposing the new Gallo School are aligned in their concern with promoting scholarship and teaching focused on the behavior, design, and performance of complex human and natural systems.

BUILDING ON ACADEMIC STRENGTHS

From an organizational perspective, convergence in research and education will be supported through strategic alignment of four existing departments to be co-located within the Gallo School, namely Cognitive and Information Sciences, Economics and Business Management, and Political Science, all from the School of Social Sciences, Humanities and Arts¹² and Management of Complex Systems from the School of Engineering. The migration of full departments into a new school, rather than sub-groups and select individuals, will maintain the organizational integrity of these departments. Consequently, it is anticipated that the reconfiguration costs at the departmental administration level will be relatively low, with minimal interruption of department-level research and educational program development.

These four departments already provide the campus with intellectual leadership in an array of academic disciplines and emerging interdisciplinary fields. The faculty provide expertise in diverse, but related, research areas, including behavioral complexity, learning and memory, communication and language, coordinated action, embodied cognition, science of science and innovation, data science, knowledge management, security and privacy, entrepreneurship, business management, behavioral economics, environmental economics, forest and natural lands management, climate change solutions, water security, service science, political behavior and cognition, political institutions, and political economy, as well as international relations among others. These areas range across social sciences, natural sciences, engineering, and management disciplines. Because each department draws on a different mix of disciplinary roots, the proposed school will, by construction, feature diverse competencies and perspectives coming together around a shared vision centered upon the management of natural and human systems. The conceptual connections emerging as the result of both explicit alignment and proximity-mediated diffusion will further support campus values embracing interdisciplinarity and promoting intellectual diversity.

¹² Although the Department of Cognitive and Information Sciences is currently associated with the social sciences on campus, this field can often be found within a School of Natural Sciences, such as at Princeton University.

Bringing these successful departments together under a shared vision and a shared organizational infrastructure will generate new intellectual pathways by training future leaders with powerful conceptual frameworks and critical thinking skills, honed for addressing so-called “wicked problems” just over the horizon.

The development of an explicitly open epistemological culture will also foster cross-disciplinary career paths across the three existing schools,¹³ thereby capitalizing on existing knowledge- and skill-based human capital on campus. In this way, by increasing the number of cross-disciplinary pathways to success, early career researchers will receive institutional support when taking advantage of opportunities for intellectual exploration and career matching, which are distinct advantages of agglomerated innovation systems.¹⁴ This will help UC Merced capitalize on the skilled workforce that it is able to develop locally and attract from elsewhere.

Moreover, these same arguments highlight the potential for developing a parallel layer of convergent educational programs, ones that organically blend best methods, theory, pedagogy and practice regarding management education. As such, this disciplinary configuration also fosters the development of a student body well-versed in the challenges and opportunities associated with a diverse educational environment that embraces team-oriented cross-pollination. A case example is the planned Data Science and Analytics major, which would integrate curriculum in coupled systems thinking, human behavior, policy evaluation, institutional design, and causal inference with a common thread comprised of core competencies in computational methods that leverage the vast data resources increasingly available to the empirical sciences.

This possibility for convergent research and collaboration also aligns with the long-term vision of U.S. research funding agencies. In particular, the National Science Foundation (NSF) supports fundamental and applied research on human behavior pertaining to grand societal challenges.¹⁵ In 2016, the NSF included “Growing Convergence Research” as one of 10 “Big Ideas” that would shape its future funding agenda.¹⁶ Two of the principal characteristics identified by the NSF for Convergence Research are “research driven by a specific and compelling problem” and “deep integration across disciplines”. Indeed, research focusing on developing a better understanding of human-centered complex systems is at the core of the goals and values identified by each department:

CIS focuses on how cognition and intelligent behaviors emerge in systems of variable size and structure, ranging from individuals to groups of individuals, including artificial agents; applied to compelling problems in social cognition, human dimensions of information technologies, artificial intelligence ethics, and individual and collective decision making under uncertainty.

EBM focuses on empirical microeconomic analysis using advanced econometric techniques to identify causal effects and economic mechanisms, with the goal of guiding effective policy design and efficient resource allocation; applied to compelling problems in health, environment, income and savings, innovation, migration, and education.

¹³ Cognitive Science as a discipline is also heavily rooted in the Natural Sciences.

¹⁴ Interview with Enrico Moretti, by David A. Price. Econ Focus, Federal Reserve Bank of Richmond, Q1 2019. https://www.richmondfed.org/publications/research/econ_focus/2019/q1/interview

¹⁵ National Academies of Sciences, Engineering, and Medicine, 2017. The value of social, behavioral, and economic sciences to national priorities: A report for the National Science Foundation. National Academies Press.

¹⁶ NSF Program: Growing Convergence Research. https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505637

Regarding business management, EBM responds to the growing needs of California's business environment by focusing on analytical tools and techniques from a blend of fields in business economics, management theory and other social sciences, such as accounting, finance, marketing, business strategy, organizational theory, leadership, innovation and entrepreneurship, in order to provide a holistic view of business management issues.

MCS focuses on how to reconcile sustainability-oriented decision making and management of complex coupled human-technological-natural systems within the constraints imposed by holistic “people, planet, and profit” values; applied to compelling problems in service system innovation, climate change, land and natural resource management, and information systems.

POLI focuses on the ways in which institutions, cognition, and behavior shape and constrain political systems. It entails the scientific study of power, governments, public opinion, and public policy both in the United States and throughout the world; applied to compelling problems in residential segregation, war, human rights, voting behavior, judicial decision making, service provision, and political representation.

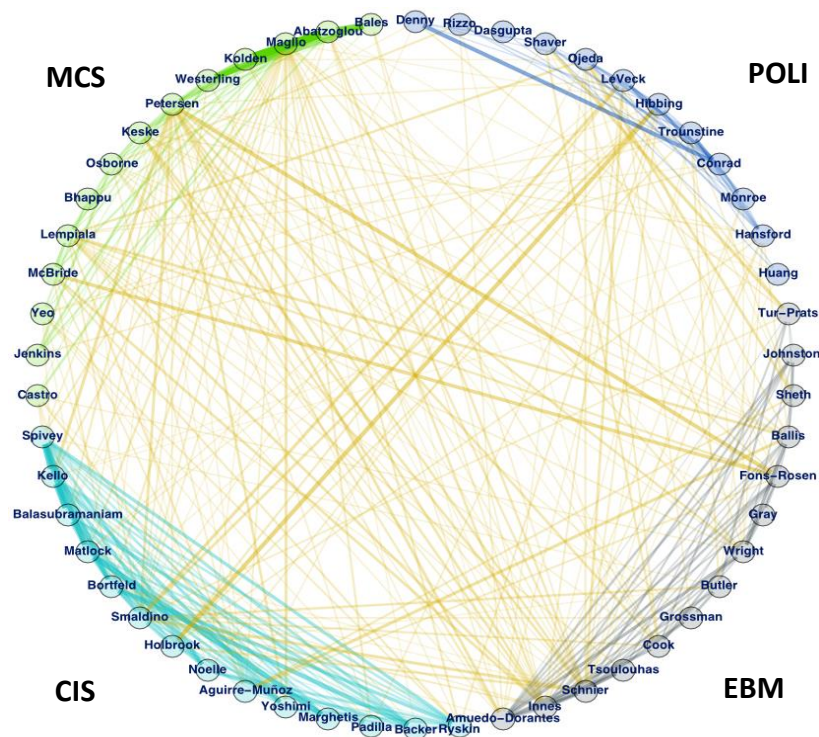


FIGURE 2. CROSS-DEPARTMENT RESEARCH SYNERGY, LEVERAGING INTRA-DEPARTMENT INTELLECTUAL LEADERSHIP.

VISUALIZATION OF FACULTY-FACULTY SIMILARITY ACROSS THE FOUR PROPOSED GALLO SCHOOL DEPARTMENTS. FACULTY ARE GROUPED IN DEPARTMENT AND SORTED ACCORDING TO TOTAL NUMBER OF WEB-OF-SCIENCE PUBLICATION RECORDS (TO REDUCE LIKELIHOOD OF THE STRONGEST LINKS OCCURRING BETWEEN DIRECT NEIGHBORS IN THE LAYOUT). THE THICKNESS OF A LINK CONNECTING EACH FACULTY PAIR IS PROPORTIONAL TO PUBLICATION KEYWORD CO-OCCURRENCE AS A MEASURE OF RESEARCH AREA SIMILARITY. LINK COLOR DISTINGUISHES INTRA- VS CROSS-DEPARTMENT LINKS, THE LATTER CROSSING THE CENTER OF THE NETWORK AND HIGHLIGHTED IN CALIFORNIA POPPY GOLD, THEREBY INDICATING EXISTING CROSS-DEPARTMENT SYNERGY.

Co-location will accelerate the development of common cross-cutting research agendas and facilitate team assembly for extramural funding opportunities with explicit multi-disciplinary criteria (see Figure 2). Creating internal fellowship or research awards from endowed funds for high-impact and cross-cutting projects may also accelerate convergence research and help build a cross-disciplinary research culture. Developing competitiveness in these prominent thematic areas, with similar initiatives likely to continue in future funding programs, will position the school for contributing to the Carnegie indices of research activity that are critical for UC Merced’s effort to achieve **Highest Research Activity (R1)** status.

TEACHING AND MENTORING

Novel undergraduate and graduate educational programs that draw on competencies in the social, natural, and engineering sciences will be possible within a single curricular and student support framework. This will support crossbreeding of disciplinary theory, methods, pedagogy, practice, and culture across students’ educational arc. And because these four departments share common goals and values centered around addressing complexity in real-world systems comprised of inextricable subsystems and interconnectivity, students of this new school will benefit from having multiple perspectives and a developmental environment that supports mixed-methods problem solving, valuable experience working in diverse teams, and the complementarity of depth and breadth-oriented skills, in particular communicating across traditional boundaries.

Notably, the proposed school will build upon existing synergy across these four departments regarding paradigmatic themes such as data analytics and sustainability, which currently are lacking formal educational programs on campus despite being focal points of recent UC Merced strategic initiatives aimed primarily at faculty hiring.¹⁷ Developing educational support for these thematic areas will be a priority for the proposed School. For example, the resources required for computation-oriented courses are relatively inexpensive, readily distributable, highly scalable, and highly re-usable, that is, open data sets and open-source software are public goods in that they are non-excludable and non-rivalrous. And for these same reasons, computational research affords many opportunities for **Research Experiences for Undergraduates (REUs)**, in particular, relating to the scalability of computational endeavors.

Moreover, such a configuration will also facilitate diverse mentor-mentee matches that span traditional disciplines. Cross-cutting interactions can help foster open-mindedness, creative exploration, and appreciation for mixed-method scientific inquiry at critical stages of students’ intellectual development. Experience in multi-disciplinary teams will also foster the development of effective communication skills, which are critical to bridging gaps and overcoming technical boundaries associated with problem solving.

SCHOLARLY COMMUNITY

For the city of Merced and the surrounding region, it is essential that the scholarly community around UC Merced continue to grow, integrate, and contribute to the identity of the region. The creation of this school will introduce new interfaces for faculty to interact and collaborate – not

¹⁷ For example, regarding faculty hiring through the 2014 Strategic Academic Focusing Initiative (SAFI), three of the six areas identified in the [AY15-16 through AY20-21 Ladder rank Faculty Recruitment Plan](#) were: Towards a Sustainable Planet; Computational Science and Data Analytics; and Entrepreneurship and Management.

necessarily just around research or teaching-oriented activities, but also relating to local community and industry. Integration of such diverse actors around common challenges will increase the reach of UC Merced’s beacon – at local, state, national, and international levels – highlighting the fundamental mission of teaching, research, and public service.

In addition to fostering convergent research, also among the “10 Big Ideas for Future NSF Investments”¹⁸ are the **INCLUDES** program (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science),¹⁹ the **Future of Work at the Human-Technology Frontier** program²⁰, and the **Harnessing the Data Revolution** program.²¹ By sidestepping traditional disciplinary barriers, the School will create an intellectual and social environment championing disciplinary inclusion. And by pursuing new educational programs that emphasize computational data analytics, geographic information systems, and service innovation, the School will also prepare students for a workforce that increasingly demands technical skills leveraging human-computer interaction.

FILLING GAPS AT UC MERCED AND IN THE CENTRAL VALLEY

The city of Merced and its region are burdened by hardships relating to poverty; a dominant agricultural industry that provides limited demand for a skilled technical workforce and consequently lower levels of integration within the innovation economy; and associated negative externalities manifest in the social cost of high-intensity wildfire, poor air quality, unsustainable groundwater use, degraded lands, industrial and agricultural pollution, and heat stress – among others. To address these issues, there is an unmet need for an organizational platform upon which relevant human-systems oriented problems can be brought to the fore. The proposed school will address this need for a central repository of human, social, and intellectual capital charged with targeting the region’s very real problems.

Building upon the successful completion of the Merced 2020 building project,²² the proposed school can thus contribute to these next phases of integration and growth. These phases will take place both internally to the campus, as well as externally, by virtue of the skilled workforce trained at UC Merced. This workforce is integral to developing the region’s lacking knowledge economy²³ that will provide greater opportunities for social and economic mobility within the Central Valley. For example, with faculty expertise in entrepreneurship, economics, organizational, and finance, the proposed school will be in a position to develop professional degree programs producing administrators with the modern skillset that is in demand broadly across IT-oriented organizations.

¹⁸ “10 Big Ideas for Future NSF Investments”: https://www.nsf.gov/about/congress/reports/nsf_big_ideas.pdf

¹⁹ NSF Program: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505289

²⁰ NSF Program: Future of Work at the Human-Technology Frontier: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505620

²¹ NSF Program: Harnessing the Data Revolution: <https://www.nsf.gov/cise/harnessingdata/>

²² Campus’s Economic Impact on State Nears \$3 Billion: <https://news.ucmerced.edu/news/2017/campus-economic-impact-state-nears-3-billion>; <https://www.universityofcalifornia.edu/news/economic-impact-uc-merced-rises-26b>

²³ For example, based on official US government data collected by the *Data USA* platform, the employment occupations that are overly represented in Merced CA relative to other similar metropolitan statistical areas are *Farming, Fishing, & Forestry*, *Personal Care & Service*, and *Material Moving* occupations: <https://datausa.io/profile/geo/merced-ca-metro-area>

Many of the Merced region’s issues are multi-faceted, requiring an integrated understanding of the underlying behavioral, institutional, technological, legal, and environmental factors. In many ways, Merced and the Central Valley will benefit from research focusing on complex systems problems: It lies at the center of California and at the center of so many challenges facing society today, from financial inequities, health disparities, and climate change, including drought and wildfire. Addressing such issues requires a systems-oriented approach based upon complementary mixed methods, that is, both qualitative and quantitative analysis. A relevant example of a graduate program addressing this type of holistic training is the Master of Management program, which provides students valuable experience working on integrative team projects centered around real-world issues. The program is designed to prepare graduates for the hard constraints encountered by sustainability-minded professionals charged with balancing people and planet bottom lines with the more traditional bottom line of financial profit. This “triple-bottom-line” paradigm requires students to understand how interacting systems give rise to challenges that lack clear solutions. One goal of the proposed school is to extend this educational framework into new undergraduate programs.

The four departments are already equipped with faculty in the relevant expertise domains needed to develop new undergraduate educational programs around the challenges of decision making in the face of uncertainty within highly constrained human-oriented systems. To further fill the void of undergraduate education centered around systems problem solving, the proposed school will develop a new major in Data Science and Analytics. This undergraduate program will be designed to provide breadth across both soft “people” skills and hard “technical” skills, both of which are increasingly moderated by technology and critical to developing the nation’s knowledge-based economy.²⁴

Considering the increasing prevalence of certificate programs, minors and majors in the competitive domain of data science education, yet the lack of terminal degree educational programs in this area at UC Merced (despite there being thematically represented across campus in various concentration and minor forms), and also a lack of representation of UC Merced in the California Alliance for Data Science Education²⁵ being led by UC Berkeley, the development of this joint-department major will fulfill a clear campus gap, and also be an established vertex of integration for Gallo faculty regarding both education and research activities.

CONTRIBUTING TO THE LARGER CAMPUS ACADEMIC PLAN

The proposed Gallo School will support the campus’s commitment to UC Quality Scholarship, UC Quality Academic Programs, and Diversity – the three focal points defined by the campus’ Academic Planning Working Group (APWG)²⁶ and related campus Strategic Plan.²⁷ Regarding UC Quality Scholarship, building on existing research strengths within the disciplines of economics, cognitive science, politics, and management, the school aims to continue to advance

²⁴ National Research Council, 2001. Building a workforce for the information economy. National Academies Press; National Academies of Sciences, Engineering, and Medicine, 2017. Building America's skilled technical workforce. National Academies Press.

²⁵ California Alliance for Data Science Education: <https://data.berkeley.edu/californiaalliance>

²⁶ See the Academic Planning Working Group (APWG) Report at <https://ucmerced.app.box.com/s/zaeicn8kmb33hzi101qsi0igua1n4r28>

²⁷ See <https://strategicplan.ucmerced.edu/>

knowledge within these fields and train the next generation of scientists and practitioners through our graduate programs. Regarding UC Quality Academic Programs, the proposed School will have four Ph.D. programs offered by the four distinct groups, providing sufficient capacity to contribute to measures of doctoral conferrals. At the undergraduate level, the proposed School will be comprised of roughly 16% of campus undergraduate enrollment, with near-term growth anticipated in an undergraduate program centered around data science and analytics, further contributing to UC quality educational experience. Regarding Diversity, the proposed School will increase disciplinary diversity of educational programs and demonstrate our clear commitment to promoting sustainable growth, equity and social justice, and faculty diversity.

Reaching Carnegie Classification **Doctoral University - Highest Research Activity (R1)** status is another relevant campus goal to which the proposed school can contribute. In addition to contributing to non-science and engineering metrics for research expenditures and doctoral conferrals, there is also considerable expertise among these departments in the broad areas of science, technology, and innovation studies. Bringing these faculty together, with common interests around data-driven models of science, could contribute to innovative research opportunities, including increased grant opportunities and attraction of promising graduate students and post-doctoral researchers.

A transdisciplinary school primed for cross-disciplinary research will not only be competitive for funding that targets transdisciplinary problems but will also contribute to bringing UC Merced to the levels of impactful cross-disciplinary research observed at peer campuses within the system, which have competitive advantages because of their size. There is substantial cross-fertilization potential for research areas across departments of the proposed Gallo School (see Appendix E for descriptions of faculty research).

COMMITMENT TO EQUITY, DIVERSITY, AND INCLUSION

Creation of the proposed Gallo School of Management presents an opportunity to make equity, diversity, and inclusion (EDI) a priority for existing and new programs and initiatives associated with the School. We adopt the University of California’s definition of diversity which includes “the variety of personal experiences, values, and worldviews that arise from differences of culture and circumstance. Such differences include race, ethnicity, gender, age, religion, language, abilities/disabilities, neurodiversity, sexual orientation, gender identity, socioeconomic status, geographic region, and more.”²⁸ Equity, diversity, and inclusion arises from the mission, professional values, ethics, and overall commitments of the School. With an a priori focus on ensuring a diverse faculty, staff, and student body, we will establish equity and economic, social, and environmental justice as central to the mission of the School and prioritize diversity and inclusion within the School’s core functioning. We will also establish a new Associate Dean for Equity, Justice, and Inclusive Excellence charged with monitoring, measuring, and advancing justice, equity, diversity, and inclusion among students, faculty, and staff in conjunction with appropriate department-level and school-level committees. Administrators, faculty, and staff will work closely with UC Merced’s Chief Diversity Officer and the Division of Justice, Equity, and Inclusive Excellence to support positive and productive relationships among individuals of

²⁸ Regents Policy 4400: Policy on University of California Diversity Statement:
<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

diverse perspectives to create a culture and environment that is both open and inclusive. In addition to recruitment, we understand the importance of retention of underrepresented and underserved populations. Part of the ongoing education for all will be to deepen understanding and challenge misconceptions surrounding diversity, including addressing micro-aggressions. Gallo School leadership will be advocates for establishing diversity, inclusion and equity within the School. As stated in the UC Merced’s diversity statement “Our commitment to diversity will foster our ability to thrive in a complex world.”²⁹

Diversity in faculty, staff, students, and research populations, and a commitment to social and environmental justice are essential elements of outstanding practice and research within the departments of the Gallo School. Our commitment to diversity in faculty and student recruitment is simultaneously a commitment to diversity of perspective, a greater propensity to engage in research of benefit to underserved communities, and a commitment to excellence. Equity and economic, social, and environmental justice are core to the mission of the proposed School, which aims to address and manage complex social, economic, environmental, and technological challenges, such as climate change, advancing economic welfare of disadvantaged populations, food insecurity, economics of migration, wildfire, and drought using systems and incentive-based approaches and equity-based perspectives. The emphasis on equity and social and environmental justice demonstrates our commitment to supporting and improving the conditions of vulnerable and marginalized populations.

Overall, we will continue to seek and promote a culture of diversity and inclusion within the fabric of the Gallo School, including education, support, mentoring, recruitment, retention, prioritizing diversity-related activities in faculty merit and promotion reviews, and assessing student and faculty experience related to diversity. Examples of efforts to increase diversity of students and faculty include: (a) recruitment and retention of underrepresented faculty and staff by creating an environment of inclusiveness in hiring, mentoring, and evaluation; (b) recruitment and retention of underrepresented students through mentoring, building curriculum aligned with social and environmental justice, and funding support; and (c) encouraging faculty, staff, graduate students and undergraduate majors to participate in workshops offered by the Office of Equity, Diversity and Inclusion.

STUDENT AND FACULTY DIVERSITY

Located in California’s Central Valley and drawing a substantial fraction of students from the Central Valley, UC Merced has a much more diverse student body than all other UC campuses. We are committed to diversity in our educational programs, curriculum, research, and faculty. Our four undergraduate major programs include many from underrepresented groups, reflecting the campus’s diversity overall (see **TABLE 1**; see also **Figure 8** and **Figure 9** in Appendix J).

²⁹ See <https://diversity.ucmerced.edu/diversity-statement>

TABLE 1. STUDENT DIVERSITY IN UNDERGRADUATE PROGRAMS (AY 2020-21)

	Gallo School	UC Merced	UC System
Women	62%	52%	53%
Latinx	62%	56%	25%
African American	4%	4%	4%
Native/Pacific Islander	0%	1%	0%

*Institutional data from UC Merced and UCOP, accessed November 2021

The school's success in creating a diverse, equitable, and inclusive environment will require addressing specific educational and economic challenges faced by our diverse student body, both at the university and in business and government job markets and workplaces. Classroom practices – including office hours and teaching methods -- reflect demands for clarity, presentation variation, and, particularly, access to support outside of the classroom that is vital to the success of our large number of first-generation college students. Additionally, emphasis on techniques of student communication relevant to job market success is a priority in upper-division courses.

Beyond the classroom, access to job market prospects is stressed in club activities and sponsored events, including events targeted to underrepresented groups. In the area of economics and business, sponsored clubs include the Business Society, Investment Club, Delta Sigma Pi, the Economics Club, Omicron Delta Epsilon, and the Entrepreneurship Club. These clubs and the EBM Department sponsor numerous events each year to promote interaction with professionals and recruiters, and to provide advice and perspective on success in the work world. Events include a “Diversity in Economics” symposium featuring women Economics faculty and Economics faculty of color, an event that is typically attended by over 150 students, and three student-faculty socials per year that attract over 100 students each. Political Science's Center for Analytic Political Engagement (CAPE) will allow dozens of students to access rigorous training and financial support in preparation for careers in public policy, nonprofit work, and government. CAPE programming and internships are attentive to a variety of barriers UCM students face including access to work appropriate attire, high debt burdens, and unfamiliarity with the benefits internships provide. CAPE reserves a variety of funding streams for students from marginalized groups and students from the Central Valley in an effort to diversify politics and policy making.

Our four graduate programs have a distribution of women and students from underrepresented groups that mirrors that of the campus and the system (see **TABLE 2**). We currently track ethnicity and gender; in the future, we will also track first-generation status at the program level.

TABLE 2. STUDENT DIVERSITY IN GRADUATE PROGRAMS (AY 2020-21)

	Gallo School	UC Merced	UC System
Women	43%	46%	55%
Hispanic	17%	20%	25%
African American	3%	2%	4%
Native/Pacific Islander	0%	0%	1%

*Institutional data from UC Merced and UCOP, accessed November 2021

In terms of faculty, we have and will be committed to recruiting and retaining a diverse faculty as exemplified by the core group of current faculty (see Table 3).

TABLE 3. FACULTY DIVERSITY (AY 2020-21)

	Gallo School	UC Merced	UC System
Women	32%	41%	39%
Hispanic	11%	14%	7%
African American	3%	2%	3%
Native/Pacific Islander	1%	1%	1%

*Institutional data from UC Merced and UCOP, accessed November 2021

For example, at the professional level, economics and business are particularly behind in advancing gender equality in the post-graduate academy. Proportions of economics faculty who are women lag far behind even STEM fields.³⁰ All four departments have more work to do in building their cohorts of faculty of color. This is an important shared goal of the School.

RESEARCH ON DIVERSITY AND EQUITY

With respect to research populations and research questions, many faculty associated with the proposed Gallo School already focus on diversity locally and globally, and on outcomes and policies that affect disadvantaged populations from economic, social, and environmental perspectives. Faculty tackle economic, social, and environmental challenges affecting vulnerable and marginalized communities using a range of methods. These methods include both disciplinary tools and collaboration with communities in defining the questions and priorities of research and ensuring the research is applied to benefit the community. To advance underprivileged individuals and communities, our faculty tackle questions of climate change; economic welfare of migrant and other local communities; cognitive, behavioral, and social foundations for learning and individual economic advancement; corporate social responsibility; access to health care and promotion of healthy behaviors; food security; water security; wildfires; technological development and change; and privacy and security issues; among many other research priorities. Our faculty are, and will be, particularly attentive to impacts on vulnerable and marginalized peoples and are committed to related research that is policy-relevant.

VISION AND FIVE-YEAR PLAN

Our vision for how the School will advance UC's goals for diversity, equity, and inclusion includes (a) recruitment and retention of underrepresented faculty – creating an environment of inclusiveness in hiring, mentoring, and evaluation; (b) recruitment and retention of underrepresented students – mentoring, building curriculum aligned with social and environmental justice, and funding support; (c) building curriculum where social and environmental justice are deeply integrated into the very fabric of the program, and (d) because diversity is not just about representation but also about influence, we will ensure faculty from

³⁰ See the Winter 2019 issue of the *Journal of Economic Perspectives*, and <https://www.nytimes.com/2018/01/10/us/politics/women-economics.html>

underrepresented groups have opportunities to assume leadership roles and are able to make decisions about the direction of the School's programs.

To achieve this vision, our five-year plan includes:

Recruitment. (a) Establish new positions that have an emphasis on social transformation, social equity, political ecology, racial disparities in education, income, wealth and environmental and climate justice – fields that recognize the often disproportionate impacts in low income communities and communities of color and have approaches to understanding and addressing these inequities. (b) Leverage the networks of our diverse faculty to recruit colleagues with diverse perspectives. (c) Send out job listings to listservs and faculty in institutions that serve diverse populations.

Advancement. (a) Support faculty tenure and promotion through workshops and mentoring. (b) Ensure equity, diversity, and inclusion are always in merit and promotion reviews (per APM 210), whether related to teaching, research, mentorship, or outreach.

Leadership. Increase the number of underrepresented faculty in leadership roles by providing mentoring and opportunities for leadership across all ranks.

Curriculum. Building curricula that reflect all viewpoints, including the values of underrepresented minority students, and recruiting and retaining faculty that reflect their backgrounds will facilitate the recruiting and retention of students from diverse backgrounds, building the foundation that will promote equity, diversity, and inclusion.

Outreach. Establish a high-profile annual lecture on management issues related to equity, diversity, and inclusion, followed by a reception that will bring together students, researchers, and faculty from across campus.

To evaluate equity, diversity, and inclusion goals, the Associate Dean for Equity, Justice, and Inclusive Excellence will track the numbers of faculty, graduate students and undergraduate majors from diverse backgrounds annually (e.g., race and ethnicity, gender, and first-generation status), track the number of underrepresented faculty in leadership roles, make diversity, equity, and inclusion part of all of our learning outcomes, and request all outgoing students complete exit surveys from which we will evaluate and incorporate feedback to constantly improve the program with regard to equity, justice, and inclusion.

RELATIONSHIP OF THE PROPOSED SCHOOL TO OTHER INSTITUTIONS

Society is increasingly characterized by complex coupled human-technological and human-natural systems. Moving forward, societal well-being and well-functioning will require a deep and integrated understanding of human behavior, management, and governance of individuals, cultures, firms, institutions, and economies in a world of rapidly evolving technologies, populations, and global environment. The proposed Gallo School provides a unique opportunity to bring together a faculty that can produce research and instruction on society's constituent parts – individuals, cultures, firms, organizations, governments, and markets – as well as the complex and overarching systems emerging from the interactions among these constituent parts. In this way, the proposed Gallo School will not be a traditional management school; rather, it will combine aspects of cognition, decision-making, economics, politics, policy, and management with technology and engineering, with information and data science, with environmental and sustainability science, and with equity, ethics, and social justice, among other areas. Our goal is to develop a distinctive, unique, and valuable school through cross-disciplinary education and research – and one that aligns with the forward-looking vision of management and business schools focusing on systems thinking, complex problems such as climate change, and inclusiveness.³¹ Here, we highlight similarities and differences of the proposed Gallo School with a variety of programs, schools, and colleges in the UC system and elsewhere. Our proposed school is exactly like none of them and partly like all of them.

MANAGEMENT AND BUSINESS SCHOOLS IN THE UC SYSTEM

Within the UC system, six of the ten campuses have schools of business or management (see Table 4). The oldest school is Berkeley's Haas School of Business (established in 1898), and the youngest is UCSD's Rady School of Management (established in 2003). All are accredited by the Association to Advance Collegiate Schools of Business (AACSB) International, a global non-profit certifying that schools have met rigorous standards of excellence in business education. Half include both undergraduate and graduate programs, and half include only graduate programs. All include traditional M.B.A. degrees, as well as a variety of more focused, often shorter, M.B.A. programs aimed at working professionals. Almost all offer graduate degrees in finance (an M.Sc. in Finance or a Master's in Financial Engineering) as well as a Ph.D. in Business or Management. Most also offer a Master's in Business Analytics. There is also a common core of faculty specialties in accounting, economics, finance, marketing, and operations; most also include faculty in organizational behavior or management of organizations.

³¹ See <https://hbr.org/2020/03/a-bolder-vision-for-business-schools>

TABLE 4. MANAGEMENT AND BUSINESS SCHOOLS IN THE UC SYSTEM

Campus	School	Senate Faculty	Undergraduate Majors	Graduate Programs
Berkeley	Haas School of Business	70	Business; Management, Entrepreneurship and Technology; Biology+Business; Global Management	MBA; Executive MBA; Master of Financial Engineering; PhD
Davis	Graduate School of Management	30		MBA; online MBA; Master of Professional Accounting; MS in Business Analytics
Irvine	Paul Merage School of Business	60	Business Administration; Business Information Management	MBA; Executive MBA; Master of Finance; Master of Innovation and Entrepreneurship; Master of Professional Accountancy; MS in Business Analytics; PhD
Los Angeles	Anderson School of Management	100		MBA; Executive MBA; Master of Financial Engineering; MS in Business Analytics; PhD
Riverside	School of Business	40	Business	MBA; Professional MBA; Master of Finance; Master of Accountancy; PhD
San Diego	Rady School of Management	40		MBA; Master of Professional Accountancy; Master of Finance; MS in Business Analytics; PhD

The missions of each of the schools, as described in the mission statements, are also quite similar to one another, typically centering on leadership. For example, the UC Davis Graduate School of Management “... is focused on preparing the next generation of inspired, innovative and collaborative leaders who are committed to making a positive impact”; the UCLA Anderson School of Management “... prepare[s] future leaders for evolving careers in ever-changing organizations and markets – and for lives of significance”; the UCI Paul Merage School of Business “... develops and equips leaders with critical business and leadership skills”; and the UCSD Rady School of Management “... develops ethical and entrepreneurial leaders who make a positive impact in the world”

As described, the mission of the proposed Gallo School is similar but broader: “Reflecting the many domains in which science, design, data, and management skills are critical, the Gallo School prepares students for careers in many areas of science, engineering, sustainability, and management, including business management, environmental and natural resource management, public policy, educational leadership, data analytics, and more” (see Appendix B). Along these same lines, the Gallo School will not be a traditional management school with an M.B.A. program and with faculty aligned with traditional management disciplines. One consequence is that we are not planning to seek AACSB accreditation for the School’s programs: doing so would constrain hiring to a much narrower set of disciplines for the foreseeable future, given the expected number of faculty lines available. By incorporating cognitive science, politics, sustainability, economics, and complex systems science and engineering, the proposed Gallo School will carve out a unique niche among schools with a focus on management in the UC system.

BUSINESS SCHOOLS LOCATED REGIONALLY IN THE CENTRAL VALLEY

Outside the UC system, several local campuses in the California State system have AACSB-accredited business schools, including Bakersfield, Fresno, Sacramento, and Stanislaus; and in addition to state schools, the University of the Pacific in Stockton houses the Eberhardt School of Business (see Table 5). All include undergraduate and graduate degrees. Almost all have traditional M.B.A. programs. There is also a common core of faculty specialties in accounting, economics, finance, marketing, and management or operations.

TABLE 5. BUSINESS SCHOOLS LOCATED REGIONALLY IN THE CENTRAL VALLEY

University	School	Undergraduate Majors	Graduate Programs
CSU Bakersfield	School of Business and Public Administration	Agricultural Business; Applied Studies; Business Administration; Economics; Environmental Resource Management; Public Policy and Administration	MBA; Masters in Public Administration; Masters in Health Care Administration
CSU Fresno	Craig School of Business	Business Administration; Economics; Fashion Merchandising	MBA; Executive MBA
CSU Sacramento	College of Business Administration	Business Administration	MBA; Executive MBA; MS in Accountancy
CSU Stanislaus	College of Business Administration	Business Administration	MBA, Executive MBA
University of the Pacific	Eberhardt School of Business	Business Administration; Accounting	Masters in Accounting

The missions of these schools are locally focused. For instance, the mission statement of Bakersfield’s School of Business and Public Administration says: “We offer a wide range of programs to meet the needs of Bakersfield, Kern County, and the Antelope Valley’s future leaders in business, public administration, and non-profit management. Our graduates are well-prepared to address the challenging issues facing businesses and organizations in our region”; and the mission statement of Stanislaus’s College of Business Administration says: “We strive to offer our students a highly valuable professional business education that is accessible, affordable, and empowers people of all ages and backgrounds to transform their lives and realize their potential. We offer well-respected programs that add value primarily to the Central Valley. ... To our regional community we represent a recognized talent pool of faculty and student resources.”

Though not conceived as a traditional management or business school, the proposed Gallo School shares a key aspect of the missions of these local schools, namely serving the Central Valley and the underserved and underrepresented communities that characterize the Central Valley. Nevertheless, the proposed Gallo School will not compete locally in the region with these traditional management and business schools and programs: With an innovative, cross-functional, multidisciplinary focus rather than concentrating on traditional management and business disciplines, and without an M.B.A. program, the Gallo School will carve out a unique and valuable niche in the Central Valley.

OTHER RELATED SCHOOLS AND PROGRAMS IN THE UC SYSTEM

The proposed Gallo School’s focus on information, data, technology, and environmental sustainability aligns with a number of schools and programs in the UC system (see Table 6).

TABLE 6. RELATED SCHOOLS AND PROGRAMS IN THE UC SYSTEM

Campus	Division/School/Program	Undergraduate Majors*	Graduate Programs*
Berkeley	Division of Computing, Data Science, and Society	Data Science	Master of Information and Data Science; Master of Engineering; Master of Science; MS/PhD in EECS
	Rausser College of Natural Resources	Conservation and Resource Studies; Environmental Sciences; Ecosystem Management and Forestry; Environmental Economics and Policy; Society and Environment	Master of Forestry; Master of Development Practice; MS in Range Management; PhD in Environmental Science, Policy and Management; MS/PhD in Energy and Resources; PhD in Agricultural and Resource Economics
San Diego	Halıcıoğlu Data Science Institute	Data Science	
Santa Barbara	Bren School Environmental Science & Management		Master of Environmental Science and Management; PhD in Environmental Science and Management
	Technology Management Program		Master of Technology Management; PhD in Technology Management

* Relevant programs listed

The number of entities in the UC system focused primarily on data science and on the environment and sustainability has increased in the last few years. The proposed Gallo School incorporates aspects of data science and sustainability but does not focus solely on either of these. Thus, it represents a unique convergence of disciplinary and interdisciplinary faculty and students, carving out a unique niche in the UC system by connecting management, complexity, behavior, and institutions with technology, data, and sustainability, among other areas.

OTHER RELATED SCHOOLS AND PROGRAMS OUTSIDE THE UC SYSTEM

Though we cannot provide a comprehensive analysis of all potentially related schools and programs outside of the UC system, we review a sample of related programs at three comparable universities (see Table 7). In addition, the Santa Fe Institute, which is not a degree-granting educational institution, has a research mission that is closely aligned to that of the Gallo School.

TABLE 7. RELATED SCHOOLS AND PROGRAMS OUTSIDE OF THE UNIVERSITY OF CALIFORNIA SYSTEM

Institution	School/Program	Undergraduate Majors*	Graduate Programs*
Stanford University	Management Science and Engineering Department	Management Science and Engineering	MS/PhD in Management Science and Engineering
	School of Earth, Energy, and Environmental Sciences		MA/MS in Sustainability Science and Practice; MS/PhD in Environment and Resources
University of Washington	College of the Environment	Environmental Science and Terrestrial Resource Management; Environmental Studies	MS/PhD Quantitative Ecology and Resource Management; Master of Forest Resources
	Information School	Informatics	MS in Information Management; PhD in Information Science
University of Michigan	School for Environment and Sustainability		MS in Environmental Science and Sustainability; PhD in Natural Resources and Environment
	School of Information	Information	MS/PhD in Information; Master of Applied Data Science

* Relevant programs listed

Programs at Stanford University, the University of Washington, and the University of Michigan highlight a common approach to siloing sustainability and environmental sciences separately from applied management and data science or information programs. The Gallo School, in contrast, seeks to bring cognition, economics, complexity, data science, sustainability and management together in one institution, with cross-cutting programs in management, data science and sustainability that leverage faculty across a broad array of disciplines.

The closest analogue for the confluence of disciplines around complex systems science that we have identified is the Santa Fe Institute in New Mexico. From the Santa Fe Institute Mission Statement:

Our researchers endeavor to understand and unify the underlying, shared patterns in complex physical, biological, social, cultural, technological, and even possible astrobiological worlds. Our global research network of scholars spans borders, departments, and disciplines, unifying curious minds steeped in rigorous logical, mathematical, and computational reasoning. As we reveal the unseen mechanisms and processes that shape these evolving worlds, we seek to use this understanding to promote the well-being of humankind and of life on earth.³²

Unlike the Santa Fe Institute, the Gallo School specifically sees science-informed management as the link between understanding complex systems and promoting the well-being of humankind and life on Earth. The Gallo School will have a full array of graduate and undergraduate educational programs designed to harness cross-disciplinary perspectives on complex systems science to the management of critical problems in complex systems.

³² Santa Fe Institute Mission Statement: <https://www.santafe.edu/about>

PROSPECTS FOR THE PROPOSED GALLO SCHOOL

The proposed Gallo School of Management lies at the intersection of converging disciplines with the capacity to substantively tackle deep research problems in management, cognitive science, economics, politics, and the natural environment – problems related to the complex systems of everyday life. The capability to address such problems is not directly addressed by any other school within the UC system or the region. Moreover, the Central Valley currently lacks a world-class research-focused school of management. Though several schools in the region offer M.B.A. degrees, no school in the region offers a Ph.D. in business, management or related areas. In filling this gap and offering several distinct Ph.D. programs at its outset, the proposed Gallo School of Management will advance the UC system’s mission of providing research education to currently underserved populations and regions of the state of California.

The Gallo School of Management will develop into a well-known school providing a UC quality education and producing UC quality research by co-locating four nationally and internationally acclaimed faculties to focus on fundamental questions pertaining to the management of complexity that are not being addressed by any one school in the UC system or in the region. By combining scholarship and teaching in science and engineering that addresses deep and complex processes of individual human and natural systems with scholarship and teaching in understanding behavior, design, and performance of integrated political-economic systems and implications for practices of businesses, groups, and governments, in markets and society, the proposed Gallo School of Management will build upon underpinning knowledge of complex physical, cognitive, and natural systems, the design and use of incentives, and the functioning and failures of markets, all in view of economic outcomes broadly defined to include human satisfaction, culture, identity, diversity, and equality in health and wealth, health of natural environments, and their relationship to both human progress and ecosystem function.

At its inception, the Gallo School of Management will offer four PhD programs – one in Economics, one in Management of Complex Systems, one in Cognitive and Information Sciences, and one in Political Science.

The CIS PhD program has an international reputation as a world leader in studies at the intersection of communication, dynamics, and complex systems, as well as in the computational modeling of cognitive processes. It features interdisciplinary training with an emphasis on computation, technology, and applications. This emphasis distinguishes it from other cognitive science graduate programs and reflects a view of intelligent behaviors emerging not solely from neural processes, but from interactions between brain, body, and environment. In this view, intelligent behaviors may emerge from group and social interactions situated in their economic and technological milieu. The word “information” in CIS denotes the program's multiscale perspective on cognition and emphasizes on computational approaches and applications towards developing technologies that foster, and even aspire to emulate, intelligent behavior.

The POLI PhD program has rapidly risen to a ranking of 63rd in the nation by the US News and World Report. The program offers innovative Ph.D. training that emphasizes a rigorous, theoretical, and quantitative approach to the study of politics. The program has a unique approach to graduate training, focused on Political Institutions & Political Economy (PIPE) and Political Cognition & Behavior (CAB), guaranteeing that students will have a comprehensive and creative understanding of politics, rather than the siloed approach of many programs. The program pushes students to cross disciplinary boundaries and locate new research frontiers by

encouraging work with faculty from disciplines such as cognitive science, psychology, economics, and philosophy. Graduates of the program have gone on to careers as professors at research and teaching universities, as well as high profile positions in the private sector.

The other two Ph.D. programs are in their first years but are being built with internationally renowned faculty. They promise to quickly become top programs in their respective niches. The Ph.D. in Management of Complex Systems is designed to educate a new generation of management scholars with depth in analytical methods and a focus on complexity as the driving force behind issues in management of human-technology and human-environment systems. The Ph.D. in Economics is designed to take advantage of the latest methodological advances in statistical, econometric, and experimental methodologies as well as a broadening of economic theory to incorporate insights from multiple disciplines and perspectives.

In addition to these existing programs, the proposed Gallo School provides the opportunity to exploit overlap in faculty research interests in new and innovative ways. Integrating research on complex physical, cognitive, human, and natural processes with economics modeling and research on behavior and outcomes in firms, markets, cultures, and the economy at large promises unique research opportunities both within and across disciplines. In this way, the Gallo School promotes the research, teaching, and service missions of social and natural scientists, engineers, and practitioners in areas of management and science of complex coupled human-technological and human-environmental systems and of behavior, management, and governance of individuals, firms, institutions, and economies.

Overall, building the Gallo School on two existing internationally renowned Ph.D. programs (CIS and POLI) and two nascent programs with the potential to rapidly gain recognition in their well-defined niches (MCS and Economics), coupled with the potential to create new programs and to tackle important societal issues from the considerable potential research overlap across the constituent faculty, should place the proposed Gallo School of Management on a trajectory to rapidly achieve a reputation for producing UC quality research and education.

ACADEMIC RIGOR OF THE PROPOSED SCHOOL

CURRENT ACADEMIC PROGRAMS

As described, the proposed Gallo School includes four existing departments (CIS, EBM, POLI, and MCS) and associated graduate groups (CIS, Economics, MIST, POLI respectively), incorporating the educational programs that these already offer or that have already been approved. In total, seven majors, six minors, and nine graduate programs will shift operations to the proposed Gallo School (see Table 8; see also Figure 5, Figure 6, Figure 7 in Appendix J).³³

TABLE 8. CURRENT ACADEMIC PROGRAMS

Department/Graduate Group	Undergraduate Programs	Graduate Programs
CIS/CIS	B.S./B.A./Minor in Cognitive Science	Ph.D./M.S. in Cognitive and Information Sciences
EBM/Economics	B.S./B.A./Minor in Economics B.S./Minor in Management and Business Economics	Ph.D./M.A. in Economics
MCS/MIST	Minor in Management Analytics and Decision-making	Ph.D./M.S. in Management of Complex Systems M.M., Master of Management
POLI/POLI	B.A./Minor in Political Science	Ph.D./M.A. in Political Science

At the undergraduate level, there will be little impact on General Education of shifting the courses associated with these programs to the Gallo School. For instance, 10% of the Approaches to Knowledge courses in Science and Engineering and 15% the Approaches to Knowledge courses in Social Sciences, Humanities, and Arts will shift to the Gallo School, mirroring the overall shift in faculty and students; and the distribution of Intellectual Experience Badges illustrates the proposed Gallo School's educational focus on scientific methods, analytical methods, practice and application of knowledge, ethics, sustainability, and leadership, among other areas (see Figure 3).

COGNITIVE AND INFORMATION SCIENCES

The Cognitive and Information Sciences (CIS) Department and Graduate Group is devoted to the interdisciplinary study of cognition. The field of cognitive science combines theories and methods from many disciplines, including artificial intelligence, linguistics, philosophy, anthropology, psychology, and neuroscience. The general aim is to understand how cognitive processes and intelligent behaviors emerge in individuals, in groups of biological organisms, and in artificial systems. A variety of methods are used by cognitive scientists, including neurobiological and behavioral experiments, computational and robotic modeling, and linguistic, philosophical, and statistical analyses.

³³ Per Standing Order of the Regents 110.1, currently undergraduate degrees at UC Merced are conferred by the three schools and graduate degrees are conferred by the Graduate Division (see also <https://regents.universityofcalifornia.edu/documents/pdf/110.pdf>). As proposed, the Gallo School will follow the same approach, offering both academic (undergraduate and graduate) and professional (graduate) degree programs, in the same manner as the three existing schools on the campus (see also the Compendium, https://www.ucop.edu/institutional-research-academic-planning/files/compendium_sept2014.pdf).

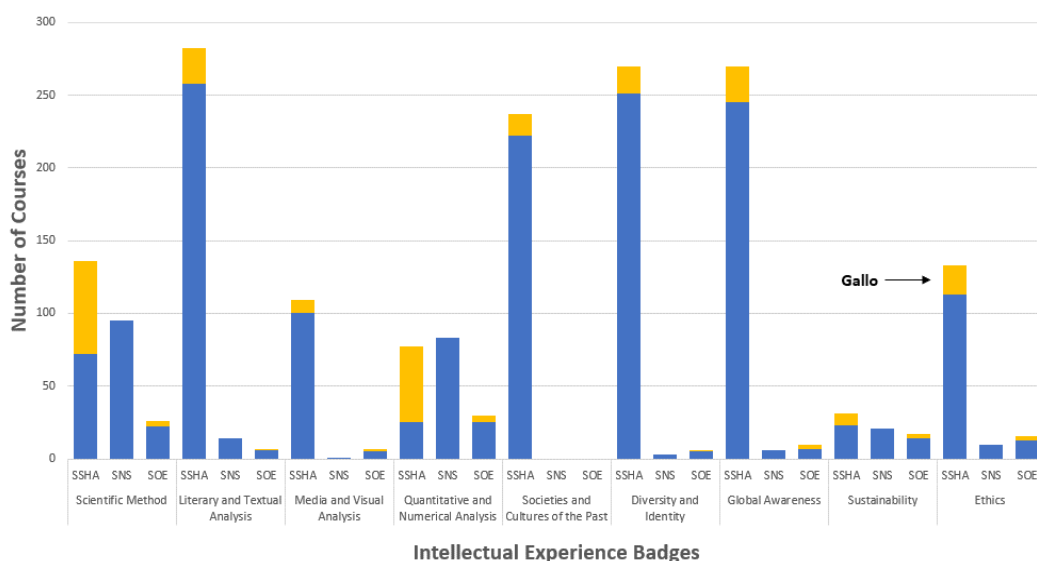


FIGURE 3. IMPACT OF THE GALLO SCHOOL ON SOME GENERAL EDUCATION COURSES.

NUMBER OF GENERAL EDUCATION COURSES WITH SPECIFIC EXPERIENCE BADGES BY SCHOOL SHOWN IN BLUE; COURSES THAT WILL MOVE TO THE GALLO SCHOOL SHOWN IN YELLOW.

The CIS Department and Graduate Group oversee five educational programs: both B.S. and B.A. programs in Cognitive Science, an undergraduate minor in Cognitive Science, as well as a new M.S. and a world-class Ph.D. program in Cognitive and Information Sciences (not including Philosophy programs). See Appendix D for details on curricula and courses.

UNDERGRADUATE PROGRAMS

COGNITIVE SCIENCE B.A. AND B.S.

Cognitive Science is the interdisciplinary study of human thought and behavior. The Cognitive Science major program provides students with broad knowledge of cognitive science, including language and communication, reasoning, learning, memory, concept formation and use, cognitive modeling, perception and action, philosophical foundations, artificial intelligence, cognitive engineering, and cognitive science applications for business.

Compared to the B.A. program, the B.S. degree requires three additional lower division courses, one each in math, science, and computing. Students in the B.S. program are also encouraged to pursue upper division courses in biology or computer science and engineering. Students may work with faculty to tailor individual programs of study, emphasizing one or two specific areas within cognitive science, such as behavioral experimentation, cognitive neuroscience, computational modeling, decision sciences, linguistics, and philosophy of cognitive science.

COGNITIVE SCIENCE MINOR

The Cognitive Science minor offers knowledge concerning the nature of the mind and how it is studied from various perspectives. The minor also supports the development of critical skills in

scientific research and in areas of formal analysis, such as computer science and mathematics. Students are required to complete five Cognitive Science courses, and they are also encouraged to become involved in faculty research activities. The Cognitive Science Minor has been available to students since the opening of the campus in 2005. In Fall 2019, there were 64 minors.

RELATIONSHIP TO OTHER PROGRAMS

CIS programs are interdisciplinary. Cognitive Science incorporates courses and materials from a variety of areas, including Biology, Applied Math, Computer Science and Engineering, Psychology, and more. In addition, a number of Cognitive Science courses are cross-listed with courses in Management, Computer Science and Engineering, and other majors.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

The B.A. and B.S. programs in Cognitive Science have been available to students since the opening of the campus in 2005; in Fall 2021, there were 177 majors, with most pursuing the B.S. degree. A degree in Cognitive Science provides training in research methods, data analysis, computational modeling, and lab-based research. It also prepares students for careers in technology development. The programs provide a foundation from which students may pursue graduate work in such fields as cognitive science, business, communications, computer science and engineering, education, information sciences, law, linguistics, management, medicine, neuroscience, and psychology.

According to the recent survey results from Cognitive Science Major Alumni, the alumni report successfully using their cognitive science education in general, in the service of their careers, and in the experience of their everyday lives. About 70% of the respondents reported that they use their cognitive science education at least once a week in the service of their careers. Several of these alumni are in well-respected graduate programs at universities such as Brown, Purdue, Indiana, and Macquarie. In addition, many of our cognitive science graduates are working in industry as data scientists, user experience technicians, systems administrators, teachers, and other cognitive and information science related careers. Many of these alumni have jobs at technology companies such as Google, Facebook, Dropbox, and JSTOR.

GRADUATE PROGRAMS

COGNITIVE AND INFORMATION SCIENCES M.S.

The M.S. program in Cognitive and Information Sciences trains students in experimental, analytical, and computational methods and theories concerning human perception, cognition, behavior, and interaction. The program allows students to concentrate their studies on basic research in preparation for continued study at the doctoral level, or students may concentrate on applied methods and skills useful to careers in cognitive data science, careers at the interface of humans and technology, and other non-academic career paths that stem from cognitive science training. Cognitive science is a growing interdisciplinary field that combines knowledge and techniques from the social, natural, and computational sciences, as well as philosophy, to address problems related to mind, brain, and behavior. Due to this intrinsic interdisciplinarity, researchers

often need training in multiple disciplines for advanced study, beyond what is typically covered in most undergraduate degree programs.

Students may choose either a thesis track or a capstone track, with both tracks designed so that coursework may be completed in two full-load semesters. The capstone or thesis may then be completed by end of the subsequent Summer.

COGNITIVE AND INFORMATION SCIENCES PH.D.

The Cognitive and Information Sciences faculty conduct vibrant research programs that investigate cognition in many forms and at many scales: from brain cells to consciousness to culture, from milliseconds of sensorimotor coordination to years of technology-mediated communication to eons of biological evolution. A major unifying perspective is that of dynamical and complex systems — a perspective that offers many concepts, models, and methods applicable to the study of emergent cognitive phenomena at any spatial and temporal scale. The complex systems framework provides a shared approach to the exploration of mind, brain, and computation. In addition to conducting basic research, the group aims to expand the public understanding of the science of cognition and the socially responsible application of scientific findings to technology, policy, and practice. In its short history, the CIS group has established an international reputation as a world leader in the study of cognition from the perspectives of complex systems, dynamics, language, embodiment, philosophical methods, cognitive engineering, behavioral methods, and the computational modeling of cognitive processes.

The Ph.D. program in Cognitive and Information Sciences pursues the dual goals of producing highly interdisciplinary academic cognitive scientists and expanding the responsible use of cognitive science in a broad array of other commercial and public service domains. The curriculum is grounded in experiences conducting innovative original research, and it focuses on multi-disciplinary and cross-disciplinary skills, including advanced computational and data analysis methods. Program requirements include six graduate-level courses, regular participation in a weekly graduate seminar, research projects in the first and second years, the production of two integrative review papers, a teaching requirement, a research presentation requirement, and a candidacy examination. Most importantly, students must successfully complete a written doctoral dissertation containing an original contribution to scientific knowledge in some domain within the cognitive and information sciences.

RELATIONSHIP TO OTHER PROGRAMS

As an interdisciplinary graduate program, the M.S./Ph.D. in Cognitive and Information Sciences, incorporates courses in statistics, data analytics, computational modeling, and more. Electives may be taken across a wide range of areas.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

While graduate students began working with CIS faculty as early as 2006, the Ph.D. program was approved in 2011, and 2011 was also the year of the first Ph.D. degree awarded by the program. The program has steadily grown to a maximum enrollment of 30 in 2016, with enrollments temporarily reduced to 34 M.S./Ph.D. students in Fall 2021. The Cognitive and Information

Sciences M.S. program was approved during the Spring 2020 semester, and though students have yet to be enrolled in this program, some existing Ph.D. students may have already fulfilled the requirements of the new M.S. degree.

The CIS graduate program has successfully awarded 36 Ph.D. degrees (18 female, 1 URM) with four former students holding faculty positions in research-intensive (R1) universities, two former students holding faculty positions in teaching-intensive universities, four students acting as postdoctoral scholars at very prestigious institutions, and about 16 students working in industry in the areas of AI/machine learning, data science, computational modeling, robotics, learning, and analytics. The companies that have hired CIS Ph.D. students include Accenture, Facebook, Salesforce, Cisco, and Apple. This is an excellent placement record for a Ph.D. program that is only 10 years old. CIS Ph.D. students are already known for cross-cutting empirical and theoretical work, conducted with an eye toward applications in industry, education, government, and management.

ECONOMICS AND BUSINESS MANAGEMENT

The Department of Economics, Business, and Management and associate Graduate Group in Economics focus on the behavior and management of individuals, organizations, and institutions in the economy. EBM currently administers two undergraduate majors – Economics B.A. and Management and Business Economics (MBE) B.S. – and two corresponding minors – Economics and MBE. The Economics Ph.D. program admitted its first cohort in Fall 2020. See Appendix C for details on curricula and courses.

UNDERGRADUATE PROGRAMS

The Economics B.A. provides a well-rounded liberal arts education with a strong emphasis on economic analysis, and the MBE B.S. prepares students for employment in management, particularly in finance-related roles. A new Economics B.S. degree has been approved and will start admitting students in Fall 2020; this major is intended to provide students with quantitative skills, both to expand their options in private and public sector employment, as well as to prepare students for graduate study in economics and quantitative analysis.

With two major programs, EBM was responsible for 237 of the 1889 total undergraduate degrees awarded by UC Merced in AY 2020-21, approximately 12.5% of the total. In AY 2020-2021, there were 82 declared majors in Economics and 728 in Management and Business Economics, approximately 9.6% of current total undergraduate enrollment at UC Merced.

MANAGEMENT AND BUSINESS ECONOMICS (MBE), B.S.

The MBE major responds to the growing demands and needs of the modern business world. The major provides rigorous analytical and quantitative training from a blend of business and economics fields. Today's managers tackle issues that involve a number of management functions and do not always fit neatly into subject areas. The UC Merced approach is to integrate key ideas and approaches from across subject areas to evaluate and understand all the dimensions of a given issue. Creativity, innovation and entrepreneurship are emphasized, preparing majors for a broad range of management-related careers. The major particularly reflects the demands of private- and public-sector organizations for employees who are trained in analytical and

quantitative decision-making, who work effectively in teams and on projects, who are comfortable in various cultures, who are "well rounded" in sciences and humanities, and who have become self-directed learners.

The MBE curriculum provides a strong foundation in analysis and problem solving across a spectrum of management activities and promotes reasoning skills and critical analysis required in a modern, volatile business environment. The theoretical underpinning for the undergraduate program comes from business economics and management disciplines that use tools and techniques based on applied mathematics and statistics to solve problems in virtually all areas of business operations. The typical undergraduate student develops skills to build quantitative models of complex operations in competitive and in imperfect markets and will be able to use these models to facilitate decision-making.

The MBE major involves a suite of core courses in micro and macro-economic principles, accounting, finance, marketing, and quantitative methods (both statistics and econometrics), as well as electives from a large menu of business and economics classes, including Investments, Economics of Regulation, Industrial Organization, Organizational Strategy, Intermediate and Advanced Accounting, Business Law, International Finance, Entrepreneurship, and Global Markets. In addition, in response to student requests and trends, a new track in Accounting is under development. This optional track would provide students the opportunity to take additional accounting courses to enable them to sit for the Certified Public Accountant (CPA) exam upon fulfillment of the degree.

MINOR PROGRAM IN MANAGEMENT AND BUSINESS ECONOMICS (MBE)

The MBE minor at UC Merced provides an opportunity for students who are majoring in another field, such as the sciences or engineering, to learn the fundamental analytical and quantitative tools necessary for management decision-making. Students receive analytical and quantitative training from a blend of fields, including accounting, economics, finance, marketing, and strategy. In Fall 2021, the MBE minor enrolled 66 students.

ECONOMICS B.A.

Since the inception of UC Merced, the Economics group has offered a B.A. in Economics. The degree involves a mix of rigorous core classes, including both economic theory and quantitative methods, and a large suite of upper division economics and related classes.

The Economics major is built on a foundation of strong theoretical and statistical training. Economists study how scarce resources are allocated so that the well-being of individuals is maximized. Whether the resource being allocated is income, time, or a precious commodity, there is always some tradeoff associated with allocating the resource for one use and not another. Individuals, businesses, and governments face these tradeoffs in countless ways every day. The most important thing students learn from studying economics is how to identify, measure, and understand the essential elements of this tradeoff. To do this, the Economics major provides students solid grounding in microeconomic and macroeconomic theory, statistical and econometric methodology and applied economic analysis. It emphasizes the role of incentives and institutions in shaping economic outcomes and how public policies influence economic performance and individual outcomes, with special emphases on development economics, economic growth, economic history, empirical methods, environmental economics, health

economics, international trade, labor economics, law and economics, political economy, and public economics. In addition to having a solid understanding of economic theory, the Economics B.A. program has a special emphasis on empirical research methods. All students engage in research (with faculty members, in teams and independently) that involves analyzing data and answering well-formulated questions related to public policies. With these research experiences, our students are competitive for research internships, fellowships, and pre-graduate summer programs while still in school.

Because students with economics degrees develop strong analytical and quantitative skills and the ability to solve complex problems effectively, studying economics is excellent preparation for many careers in business, law, management consulting, education, or public service. Businesses of all types and sizes, financial institutions, consulting firms, government agencies, non-governmental organizations, as well as graduate business and law schools actively seek graduates with bachelor's degrees in economics. In addition, many of our students go on to do graduate study in economics, law, public policy, or business.

ECONOMICS B.S.

Starting in Fall of 2020, the EBM department will offer a B.S. in Economics targeted to students who demand more comprehensive quantitative training in the field. The Economics B.S. is designed to give students more options in private and public sector employment, and to prepare students for graduate study in economics and business. The degree offers students two alternate emphases within the major, one in Economic Analysis and Policy (EAP), targeted toward private and public sector employment, and the other in Quantitative Economics, which will provide a particularly strong level of mathematics preparation, essential for admission to and success in, Economics Ph.D. programs. Compared to the Economics B.A., the B.S. offers deeper training in mathematics and computer science and additional upper division training in quantitative methods. The Quantitative option requires more mathematics and quantitative training; the EAP option takes a deeper dive into upper division economic policy electives.

MINOR PROGRAM IN ECONOMICS

The Economics minor provides students with an overview of how incentives and institutions shape society. Students in the Economics minor have opportunities for strong theoretical and statistical training in areas of development economics, economics growth, economic history, empirical methods, environmental economics, health economics, international trade, labor economics, law and economics, political economy, and public economics. The minor provides a nice complement to many other major fields of emphasis, including for example political science, engineering, psychology, and public health, in all of which economics principles can be useful for both conceptual understanding and career paths. In Fall 2021, the Economics minor enrolled 15 students.

RELATIONSHIP TO OTHER PROGRAMS AT UC MERCED

EBM's undergraduate programs uniquely focus on economics and business management principles and application. While focusing distinctly on economics principals and practice, the EBM programs draw on our sister social sciences for breadth in understanding the social, political, and psychological contexts in which economic actors function. For example, both the

B.A. and B.S. in Economics require a lower division breadth course from another social science. In addition, several EBM courses are cross-listed with other programs, including Computer Science and Engineering, Political Science, and Cognitive Science.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

Demand for EBM's undergraduate programs is documented by consistent high enrollments and growth over the history of the campus.³⁴ The programs are responsible for nearly 10 percent of the overall undergraduate population, a number consistent with many campuses and universities for Economics and Business studies. We anticipate that the B.S. in Economics will increase the share of students marginally by attracting a small cohort of quantitatively astute students both from our current degree programs but also from other potential major choices.

Graduates from EBM's undergraduate programs have placed extraordinarily well in responsible private and public sector jobs. They have also established their own business ventures in a number of cases, reflecting the entrepreneurial spirit of both our student body and the programs themselves. Salaries and employment prospects for our graduates exceed those of most other programs at UC Merced. For example, students in both EBM programs have recently placed into prestigious internships at the Pepsi Statistical Analysis Section and the Farm Credit Administration; been admitted to law school at Duke University, and to Economics Masters programs at UC Santa Cruz, UC Davis and Texas A&M; and obtained jobs at Blackrock, Highland Consulting, Morgan Stanley, Merrill Lynch, MGM Resorts, Golden State Warriors, Mayor's Office in Washington DC, Lockheed, Vanguard, E&J Gallo, Facebook, Google, Amazon, and Foster Farms, among many others. On salaries, the 2018 UC Merced alumni survey reports average salaries for graduates of the Economics B.A. program of \$51,324 and average salaries of \$51,886 for graduates of the MBE B.S. program. Both of these are well above the average for the Social Science, Humanities and Arts (SSHA) School of \$42,144. MBE B.S. students comprise half of SSHA students that report making in excess of \$100,000. The 2011-2012 Economics B.A. cohort reported average salaries of \$67,000 five years after graduation (in 2017) and for MBE graduates in that cohort, average salaries were \$63,000, with several enrolled in graduate degree programs. This exceeds the overall averages for all UC Merced graduates in that cohort of \$55,100.

GRADUATE PROGRAMS

The Economics Ph.D. program is designed to be small and focused on training students for successful research careers in the academy, government, and private sector. The program consists of two degrees: An M.A. degree (one year) and a Ph.D. (anticipated to take five years). The M.A. is awarded with successful completion of the first year of the Ph.D. program.

ECONOMICS PH.D.

The Ph.D. program in Economics at UC Merced prepares students to answer real-world questions, using frontier economic methods and insights from multiple disciplines. We emphasize rigorous quantitative training, novel data sources and an expansive view of economic

³⁴ See <https://visualizedata.ucop.edu/#/site/UCMerced/views/EnrollmentStatistics/EnrollmentFacts>

theory. These emphases are embodied by a vibrant faculty actively conducting research in a variety of applied microeconomics areas, including development, migration, labor, innovation, health, environment, international trade, culture, and experimental economics. The program stresses applied microeconomic studies broadly, using tools of an Economics discipline occupied with the study of human behavior, markets, and the allocation of scarce resources. It will focus precisely on the applied economics fields that reflect the research priorities of department faculty, taking advantage of our unique interdisciplinary opportunities to advance training and research in high demand fields in economics, business, and government. The program stresses state of the art quantitative methods used to address contemporary economic phenomena affecting individuals, groups, and governments. The program is designed to prepare students for research careers in both the academic and non-academic labor markets.

Our goal is to establish a premier graduate program in Economics focused on a modern approach to economic science. Paul Krugman, an Economics Nobel Laureate, writes that old world Economics exalted “mathematical prowess...and...turned a blind eye to the limitations of human rationality...to the problems of institutions that run amok; to the imperfections of markets...and to the dangers created when regulators don’t believe in regulation.”³⁵ A modern approach to the study of economics means facing the challenges posed by Krugman and applying the tools of economics to address real world problems. Operationalizing this theme requires researchers to use economic theory and modeling to address observed problems that advance our understanding of human behavior, processes that drive economic outcomes in families, schools, the workplace, markets, and the social fabric, and in doing so, address the role of organization design and public policy.

To achieve our goal of developing a world-class graduate program focused on real world economics we focus on fields of study in applied micro-economics reflective of both our faculty research priorities and strengths and their interaction with strengths in other fields of study at UC Merced. The former notably include the economics of labor markets, migration, international trade and development, health, environment, innovation, education, the behavior of individuals and groups generally, and the appropriate design and role of policy, all with emphasis on quantitative rigor and methods, both statistical and experimental. These foci both leverage existing faculty resources and strengths; differentiate our program from others; provide our graduates with the necessary theoretical and quantitative skills to excel in the study of contemporary economic issues and policy. All these design choices will ultimately enable us to achieve national and international prominence in our chosen focus areas.

The Ph.D. coursework includes a core program with a two-semester sequence in microeconomic theory; a three-semester sequence in statistics, econometrics, and applied econometrics; economic history and macroeconomics breadth courses; and a research methods and preparation course. After the first year, students are required to pass a comprehensive written Preliminary exam on quantitative methods. The second year of the program is primarily occupied by a four-course field requirement fulfilled primarily by advanced economics field courses offered by the department’s faculty, including courses on international trade and migration, economic development, experimental economics, environmental economics, and labor economics, among

³⁵ Krugman, Paul “How Did Economists Get It So Wrong?” New York Times, September 2 2009, http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html?_r=0

others. Field classes will be combined to achieve tailored areas of concentration for Ph.D. students, and will in some cases include integrated fields that are delivered in combination with courses in other social science disciplines at UC Merced.

While students will be spurred to research from day one in the program, including research paper requirements in each Ph.D. year and research emphasis in field courses, the ultimate required research product is the dissertation, which represents the student's original contribution to the economics literature and will typically contain three distinct publishable-quality papers. Our overriding goal in the Ph.D. program, as reflected in relatively small enrollment targets, is to emphasize in-depth research involvement and close mentoring by faculty to promote excellence in preparation for the academic workplace.

ECONOMICS M.A.

The M.A. in Economics is not intended as a stand-alone degree, but rather as an option for students admitted to the Ph.D. program. The optional M.A. serves as recognition of advancement in the degree program, though it is not a prerequisite for advancement. Ph.D. students will have the option to obtain the M.A. degree, either in route to a Ph.D. degree (non-terminal), or in lieu of a Ph.D. degree (terminal) if a student exits the graduate program prior to fulfilling the Ph.D. requirements. The recipient of an M.A. degree is understood to possess knowledge of a broad field of learning that extends well beyond that attained at the undergraduate level, but is not expected to have made a significant original and novel contribution to knowledge in Economics or to be able to use sophisticated methodological tools to conduct independent research. This structure is typical for Economics Ph.D. programs around the country. We anticipate that terminal M.A. graduates will be well prepared for quantitative careers in government and the private sector, where demand for the quantitative skills and training delivered is large.

RELATIONSHIP TO OTHER PROGRAMS AT UC MERCED

Our applied microeconomic and “modern economics” emphases complement the existing graduate programs at UC Merced in Cognitive and Information Sciences, Management of Complex Systems, Environmental Systems, Political Science, Psychological Sciences, Sociology, Biology, and Ecology. In addition, the program enables and stresses interdisciplinary opportunities in construction of field concentrations. With approval of the graduate advisor, Ph.D. students can combine economics Ph.D. field courses with suitable graduate courses in the other disciplines. For example, students with interests in political economy can combine economics policy related fields with Political Science graduate course(s) in political behavior, political institutions, political economy, and other related topics. Students with interests in social movements, group behavior and economic disparities can combine economics fields in labor, economic behavior, and policy with Sociology courses on race and ethnicity, public policy, gender, and health. Students with interests in behavioral and experimental economics can take advanced courses in Psychology and Cognitive Science on psychological and cognitive foundations for behavior. In sum, we expect our Ph.D. program to be distinguished not only by its applied focus on individuals, markets and policy, but also by UC Merced's unique opportunities for inter-disciplinary learning and study on important individual and social phenomena that inform the study of economic behavior and performance.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

Our new Ph.D. program secured 30 applicants in its first year; 11 students were admitted, and 7 students enrolled. Beyond these promising initial numbers, indirect evidence of student demand can be seen in the large number of applicants to Economics Ph.D. programs in the U.S. and at UC. The American Economic Association recently surveyed 77 graduate programs in the United States to collect information on applicants, acceptance rates, and salaries.³⁶ The survey indicated that there were 22,805 applicants to Economics Ph.D. programs. Of these applicants 3,486 (15.3%) were offered admission, resulting in 1,118 (4.9%) new students enrolled in Ph.D. programs in the U.S. Within the UC System there is substantial demand for Economics Ph.D. programs: A survey of other Economics graduate programs within the UC System indicates the number of applicants range from 800 (UC Berkeley) to approximately 135 (UC Riverside), with enrollment ranging from 12 to 30. The large number of applicants to Economics Ph.D. programs and the corresponding low acceptance and enrollment rates indicates excellent prospects for applications and enrollments in the Economics Ph.D. at UC Merced.

The American Economic Association survey cited above reports the earnings of recently granted Ph.D. students. Among the institutions surveyed, the average salary for a newly appointed Economics Ph.D. was \$115,240 at Ph.D. granting institutions, \$86,829 at M.A. granting institutions and \$76,825 at B.A. granting institutions. To investigate placement rates, we surveyed related graduate programs in the UC System: All indicated that their students were successful in finding employment upon completing their Ph.D. program with a very small percentage not being able to find immediate employment (largest was 2%). The most common form of employment included academic placements, post-doctoral fellowships, government agency, and private sector consulting. The academic placement rate within the UC System was approximately 50% for a majority of the graduate programs.

MANAGEMENT OF COMPLEX SYSTEMS

The Department of Management of Complex systems and associated Graduate Group in Management of Innovation, Sustainability, and Technology (MIST) focus on adaptive management of complex human behavior and complex coupled human-technology and human-environment systems, including for-profit and not-for-profit organizations and public and private enterprises. MCS oversees one minor program, Management Analytics and Decision Making (MAD), and MIST offers the campus' first professional master's program, Master of Management (M.M.) and two new academic graduate programs (M.S. and Ph.D. in Management of Complex Systems). See Appendix D for details on curricula and courses.

UNDERGRADUATE PROGRAMS

MANAGEMENT ANALYTICS AND DECISION-MAKING (MAD) MINOR

Data analytics has become ubiquitous. Consumers supply information – whether deliberately or inadvertently – to multiple databases and analytical programs. Personal devices allow users to

³⁶ American Economic Association Universal Academic Questionnaire Summary Statistics. *American Economic Review*. 2014. 104(5): 603-607.

generate analytics about themselves and their digital communities. Though there has been much talk about privacy, security, and ethics of widespread data collection and analysis, unforeseen uses, contexts, and practices will certainly emerge. Practical issues surrounding data management will multiply, as physical and social constructs grow increasingly complex. Information gained through the collection of large datasets may facilitate improved technical and economic efficiency, entrepreneurship, creativity, and inclusion – all potentially leading to improved prosperity and well-being. Of course, human dimensions, and the coupling of humans with natural and built environments influence the design and implementation of analytical programs and the use of data analytics. At this point, it is difficult to anticipate the future domains of knowledge that may potentially contribute to data management, analytical programs, and human interactions with coupled natural-human systems, particularly in light of the rapid evolution of technology and the complexity of social relationships.

Given this context, the MAD Minor immerses students in interdisciplinary courses that foster analytical skills, communication skills, and critical thinking about managing data and analytics in complex environments. It teaches skills that will help graduates succeed in interdisciplinary environments, solve problems, and manage resources mindful of risk, uncertainty, human dimensions, and sustainability. It cultivates skills for managing people, data, and the natural world – the interface of all three helps students explore sustainable growth in human and built environments. The MAD Minor provides the tools to collect, analyze, manage, visualize and communicate data for diverse management challenges focusing on *People, Planet, and Profit*.

Courses in the MAD Minor rely on case studies and applied projects to exemplify the diverse challenges encountered when simultaneously seeking profitability, social justice, and environmental sustainability. Data governance and ethical considerations underlie decision-making and resource management. Students are introduced to the fundamentals of entrepreneurial decision-making, ethics of data use and custodianship, and communication. Case studies and project materials are drawn from real management problems from the Central Valley, Sierra Nevada, and Bay Area. Students engage in hands-on, practical experiences with data-driven analytics, professional communication, and entrepreneurship to acquire knowledge needed to understand and manage complex systems, including Critical Thinking and Analytics for Management of Complex Systems; Communication of Quantitative Analysis, Results, and Implications; Leadership and Teamwork in Practice; and Ethics and Sustainability.

RELATIONSHIP TO OTHER PROGRAMS

In connecting analytics to work of other areas, the MAD Minor incorporates elective courses from a large number of disciplines, including Cognitive Science, Computer Science and Engineering, Economics, Mathematics, Psychology, and more.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

Currently, the MAD Minor has 13 students enrolled in Fall 2021. The proposal for the MAD minor included a survey of campus undergraduates that indicated substantial interest.

GRADUATE PROGRAMS

PROFESSIONAL DEGREE PROGRAM: MASTER OF MANAGEMENT (MM)

A unique program in the UC system, the Master of Management (M.M.) offered by the Graduate Group in Management of Innovation, Sustainability, and Technology (MIST) is a one-year professional degree program aimed at turning new college graduates into leaders in the Central Valley, California, and beyond. The M.M. program leverages specific strengths in engineering, science, and social sciences found across schools on campus, creating an exemplary cross-functional program that addresses the need for developing managers and leaders with knowledge in their areas of expertise, combined with a sound foundation of management skills, focusing on adaptive management of complex coupled human and natural systems, including for-profit and not-for-profit organizations and public and private enterprises.

The M.M. program has several unique features. As a professional degree that is intended primarily for students interested in non-academic careers, the program has a stronger focus on practical training than on theory. Admissions focuses on high achieving students with undergraduate or graduate degrees from science, engineering, or social sciences who are seeking to become leaders and managers. The program serves recent graduates from any undergraduate major, with admissions the first few years focusing on recent graduates of UC Merced's undergraduate programs, with a goal of turning existing students into a new generation of leaders in the Central Valley and beyond. The curriculum comprehensively addresses the basic skills of management with special emphasis on innovation, sustainability, and technology, aiming to enhance students' transition to successful careers in their fields of specialty. The program includes coursework and teamwork in areas such as organizational behavior, finance, data analytics, spatial analysis, service management, operations management, innovation, and policy. It also includes a capstone activity working independently on a personal project or professional internship.

According to data from the Bureau of Labor Statistics (BLS), the unemployment rate of college graduates is about half of that of the population in general.³⁷ However, according to a report by Georgetown University's Center on Education and the Workforce,³⁸ the unemployment rates for *new* college graduates is 2 to 4 times the unemployment rate of *all* college graduates. In addition, many new graduates are also under-employed, or working in jobs where their education is not a requirement. Thus, new graduates are struggling to obtain appropriate employment. The M.M. program is targeted at this population: recent college graduates who can benefit from management education to supplement their domain expertise and make them more valuable in the workforce.

Recently, the BLS suggested that natural resource managers will see employment growth of 3% between 2014-2024.³⁹ Natural resources managers work with teams of scientists, engineers,

³⁷ Bureau of Labor Statistics, Unemployment by age, sex, and education, October 2013.

http://www.bls.gov/opub/ted/2013/ted_20131113.htm

³⁸ Hard Times: College Majors, Unemployment and Earnings. <http://cew.georgetown.edu/unemployment2013/>

³⁹ Bureau of Labor Statistics, *Occupational Outlook Handbook*, 2016-17 Edition. <http://www.bls.gov/ooh/management/natural-sciences-managers.htm>.

planners, and technicians to educate companies and public agencies about sustainable resource management strategies and environmental policy frameworks. Job skills for natural resource managers must include analytical and systems thinking, interpersonal skills, leadership, and problem solving. They participate in sustainability research, from carbon reduction plans to waste reduction strategies, train staff in environmental issues and responsibilities, negotiate agreements on environmental services amid multiple stakeholder groups, and write environmental reports from corporate sustainability plans to environmental impact statements.

M.M. graduates have marketable skills that will put them at a competitive advantage in a number of ways: For example, the curriculum provides well-rounded exposure to the fundamental disciplines generally involved in the management of businesses, agencies, non-profits, and organizational units such as finance, accounting, organization, and analytics. Moreover, M.M. curriculum is taught using an innovative cohort model in which students seeking careers in for-profit, not-for-profit, and public agencies will go through the program together – in a setting in which values that guide corporate profitability are blended with values that stress resource stewardship. The objective is to develop alumni that come from an academic experience that stresses the importance of people, planet, and business sustainability as compatible ideals rather than as adversarial positions. In addition, course content and the capstone experience will stress components that are often missing in students completing only a four-year degree. Examples include first-hand exposure to working in teams; opportunities for leadership and outcome accountability; competency in professional writing; finely tuned public speaking ability; and development of network contacts in industry, agencies, and partnership organizations.

MANAGEMENT OF COMPLEX SYSTEMS M.S. AND PH.D.

The M.S./Ph.D. degree program in Management of Complex Systems (MCS), offered by the MIST Graduate Group is a cross-functional program of research and education, addressing the need for developing deep knowledge and leadership in areas of complex system analysis and management relevant to the campus, the region, and the state. Its target applicants includes engineers and natural and social scientists with educational backgrounds in disciplines that concern themselves with the measurement, monitoring, analysis, modeling, and management of complex systems, including engineering, computer science, economics, management, cognitive science, political science, sociology, philosophy, geography, ecology, biology, climatology, hydrology, chemistry, physics, geophysics, applied math, or other appropriate field.

MIST faculty focus on adaptive management of complex coupled human and natural systems, including for-profit and not-for-profit organizations and public and private enterprises. Broadly speaking, arrangements of people, organizations, information, technology, and the natural world operating together for a common purpose constitute the sort of complex adaptive systems that we aim to understand and shape through doctoral research and training. In particular, modern business management deals with challenges emerging from the complex interdependencies of multiple stakeholders working together in service relationships to accomplish complementary goals. Likewise, lands and resource management must address challenges arising from changing global earth systems and governance that impact land use, conservation, ecosystem services and climate adaptation. By focusing on technology-enabled service management and natural resource management in the context of data analytics and innovation for public and private enterprises, the faculty aims to build a world-class research and education program that is novel in its multi-disciplinary approach to addressing critical issues and skills that cut across disciplines.

The MCS M.S./Ph.D. program emphasizes cross-functional problem-solving skills in analytics and modeling that integrate cross-disciplinary expertise. The programs deliver a distinctive educational experience that flexibly integrates graduate course offerings by MIST faculty with opportunities to incorporate courses from existing and developing graduate programs on campus. By combining faculty and graduate students with diverse disciplinary backgrounds, this cross-cutting approach provides graduate students unique interdisciplinary research and education opportunities at the intersection of management, innovation, sustainability, and technology. In particular, the program provides training in qualitative and quantitative analytical management skills tailored for the *wicked problems* (problems of indeterminate scale and scope requiring interdisciplinary collaboration) often encountered in complex adaptive systems.

RELATIONSHIP TO OTHER PROGRAMS

Graduate programs offered by the MIST Graduate Group cross disciplinary boundaries, connecting to a variety of other areas. Though the M.M. program, as a standalone program with professional degree supplemental tuition, does not incorporate courses from other areas, its curriculum reflects many related disciplines, including public policy, organizational behavior, data analytics, information technology, and more. The M.S./Ph.D. program in Management of Complex Systems is research-based program that incorporates electives and methods from a variety of related areas, including for example, courses in Environmental Systems.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

In its first year, the M.M. program enrolled and graduated 10 students (AY 2018-19), in its second year, 16 (AY 2019-20), in its third year, 13 (AY 20-21), and in its fourth year 7 (AY 21-22) – with the decrease in year four attributed to fallout from the COVID-19 pandemic. Students have come from a variety of undergraduate majors (including management, psychology, mechanical engineering, political science, and many others). Steady state for the program is projected to be around 30-35 students, which we expect to achieve by year seven.

The one-year professional M.M. is not intended to be a substitute for an M.B.A., which is usually sought by mid-career professionals moving into management. Rather, the M.M. provides early exposure to management concepts and practice that rounds off an undergraduate degree with a comprehensive fluency in management thinking that enhances student readiness to fit into an outside organization. It prepares graduates to be more coachable by supervisors early in their careers because they understand where the coaching is coming from, thus accelerating their mobility in the organization. Graduates are also better set up to direct their own course of continuous learning – including possibly a mid-career M.B.A. – because they have a management baseline against which to compare their progress, identify gaps, and find ways to address those gaps. M.M. graduates will have a year where development of a network is stressed from the beginning, including by faculty, mentors, and external organizational contacts; this network will provide a marketability advantage in resume building, references, and personally propagated career leads that four-year students will likely not have. Given two candidates with bachelor's degrees in science or engineering who are being considered for an entry-level position and who are more-or-less identical except one has an M.M., it is likely that the candidate with the M.M. will be viewed as both a lower risk and a better prepared addition to an organization. Because team dynamics, interdisciplinary experience, business acumen, and communication

skills are viewed as increasingly important (as we move from a goods-dominated economy to service-oriented environment), the candidate with the background offered in the one-year master's degree has the competitive advantage. Graduates of the first class have gone on to positions in consulting, information technology, construction management, among other areas.

The MCS Ph.D. program aims to place graduates in a research career, whether in academia or in industry. In the first year of operation, AY 2019-20, six students were admitted to the PhD program in Fall and two more in Spring. In its first year, the MCS Ph.D. program had 13 applications for admission, and in its second year, it had 27. As of Fall 2021, there are a total of 15 students enrolled in the Ph.D. program.

The flexible MCS Ph.D. program design allows for these students to be placed in a variety of careers, in areas where we see high demand currently. Such areas include business analytics, statistical analysis and modeling, geospatial analytics, technology and innovation management, and natural resource management, to name a few. In academia, the demand for our Ph.D. students will be driven by both teaching and research universities hiring faculty in management, engineering, data science, and sustainability. In industry, the demand for our students may come from the business analytics and data science fields. For instance, McKinsey estimates very strong growth for jobs requiring strong analytical skills: 440,000 to 490,000 jobs will require deep analytical skills by 2018.⁴⁰ The Bureau of Labor Statistics (BLS) estimates the growth in business occupations to be about 10% and management occupations to be 8.5% from 2016 to 2026.⁴¹ BLS estimates the growth in computer and mathematical occupations to be 14% in the same period, showing strong growth in the areas related to our program. According to an IBM report examining the demand for data scientists, 39% of job postings for data scientists or advanced analysts require an advanced degree.⁴² Based on salary data collected by the NSF, industry demand for doctorate recipients in Physical and Earth Sciences in general (and Geosciences, atmospheric, and ocean sciences in particular) is high and these individuals are very well paid.⁴³ Recipients of business doctorates are highly paid, according to the same survey.

POLITICAL SCIENCE

Political Science is a social science discipline concerned with study of governments, public policies, political processes, systems, and political behavior. The Department and Graduate Group of Political Science (POLI) currently administers one undergraduate major – Political Science B.A. – and a corresponding minor, as well as a Ph.D. program in Political Science. See Appendix C for details on curricula and courses.

In the decade prior to the founding of the UC Merced Political Science major, the discipline of political science was plagued by internal divisions largely over methodological approaches to the study of politics. Many departments faced hiring stalemates, an inability to effectively train

⁴⁰ McKinsey, 2011. "Big data: The next frontier for innovation, competition and productivity," McKinsey Global Institute. http://www.mckinsey.com/~media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_exec_summary.ashx.

⁴¹ Bureau of Labor Statistics, 2017. Employment Projections: 2016-2026. https://www.bls.gov/emp/ep_table_101.htm

⁴² IBM, Burning Glass Technologies, and Business-Higher Education Forum, 2017. "The Quant Crunch. How the demand for data science skills is disrupting the market." <https://www.ibm.com/analytics/us/en/technology/data-science/quant-crunch.html>

⁴³ NSF, 2017. Doctorate Recipients from US Universities, <https://www.nsf.gov/statistics/2017/nsf17306/static/report/nsf17306.pdf>

graduate students, and animosity among colleagues. With an eye toward preventing such factional divisions, building on the emerging strengths in other social science disciplines on campus, and encouraging research innovation, political science faculty made two significant structural choices. The first was to abolish traditional subfields for graduate training and faculty recruitment in favor of cross-cutting themes. To serve these ends, the UC Merced Political Science unit is organized around two broad conceptual tracks: political institutions & political economy, and political cognition & behavior. This is as opposed to traditional subfields that include American politics, comparative politics, international relations, political theory, and methodology. The second important structural choice was to build a community of scholars and degree programs that emphasize theoretically driven, quantitative approaches. As a result, the Political Science unit is a highly consensual group with a shared vision of producing high quality research and delivering rigorous training for both graduate and undergraduate students.

UNDERGRADUATE PROGRAMS

The Political Science B.A. provides students with a social scientific understanding of political institutions and political behavior. The study of political institutions includes topics such as the effect of the design of electoral systems on the quality of representation in government, the formal and informal elements of the legislative process and their implications for the making of law, and the impact of domestic political institutions on the incidence of international conflict. Under the rubric of political behavior, political scientists study how and why people choose to participate in politics, the determinants of vote choice, and the nature and origins of public opinion. Students studying Political Science at UC Merced develop a strong substantive understanding of both political institutions and behavior. Students also learn the theories that help us better understand the political world and the methods by which these theories are tested and refined.

Political Science majors choose courses from four subfields of the discipline: American Politics, Comparative Politics, International Relations, and Law and Policy. The study of institutions and behavior is central to all four of these subfields, although the substantive emphasis differs. Courses in American Politics focus on domestic politics in the U.S., while courses in Comparative Politics examine government and politics in other nations. International Relations classes address issues in foreign policy, international conflict, and the institutions intended to govern the interactions between nations. Law and Policy classes involve legal institutions, the behavior of legal actors, and public policy. Students choose two subfields on which to focus.

The program is distinctive in its positive (non-normative approach) to political science and emphasis on quantitative skills and research. Students also have the unique opportunity to enhance their education by volunteering in the PS Lab, a state of the art experimental laboratory where scholars conduct research on political attitudes and behavior. Students are also encouraged to take advantage of internship and research opportunities through POLI's Center for Analytic Political Engagement.

The POLI minor at UC Merced provides an opportunity for students who are majoring in another field, such as the sciences or engineering, to learn about political institutions and political behavior.

RELATIONSHIP TO OTHER PROGRAMS AT UC MERCED

All Political Science courses meet General Education requirements at UC Merced. POLI 10 satisfies the University's Quantitative Reasoning requirement. Additionally, Political Science courses fulfill the Social Science and Outside Emphasis General Education requirements for non-Political Science majors in the School of Social Sciences, Humanities and Arts. Political Science courses also fulfill the Social Science General Education requirements in the School of Engineering and the School of Natural Sciences.

Many non-majors take political science courses. None of the lower division courses have prerequisites. While most upper division political science courses require one of the introductory lower division courses as a prerequisite (the specific prerequisite varies depending on the upper division course in question), many non-majors will likely have taken one of the introductory political science courses (or an acceptable substitute) out of interest or to satisfy a general education requirement.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

The knowledge and skills acquired with the Political Science major provide a strong foundation for graduate training in law, political science, or other social sciences. Students graduating with a degree in political science can also pursue a wide variety of other careers, such as public administration, campaign management or consultation, grassroots political organization, corporate governmental affairs, Foreign Service, journalism, lobbying or teaching. There is also an additional benefit to the study of political science in terms of citizenship. By developing a better understanding of how government works, students can be better informed participants in our democracy.

As of Fall 2021, the POLI major enrolled 339 students and the POLI minor enrolled 51 students.

GRADUATE PROGRAM

The Political Science Ph.D. program is designed to be small and focused on training students for successful research careers in the academy, government, and private sector. The program consists of two degrees: An M.A. degree (two year) and a Ph.D. (anticipated to take five years). The M.A. is awarded with successful completion of the first two years of the Ph.D. program.

Our quantitatively focused program trains students in two broad areas: Political Cognition & Behavior (CAB) and Political Institutions & Political Economy (PIPE). The Ph.D. Program in Political Science is intended to prepare students for research careers. It is research intensive, innovative, and tailored to students' individual interest within the field of Political Science. The M.A. degree is offered, along the way, as an option for students admitted to the Ph.D. program.

The Ph.D. program offers a unique graduate experience. First, graduate training is grounded on a student's access to and engagement with faculty. The small size of the program guarantees that seminar classes are small and students have unparalleled one-on-one faculty mentoring with respect to research, training and professional development. Second, early graduate education is not limited to the traditional classroom setting. After the first year, students begin to apply and sharpen research skills by directly working with faculty and their projects in a required research practicum. Third, by eliminating traditional subfield boundaries, our program allows students to ask and answer cutting-edge questions that are stifled by traditional subfield divisions.

RELATIONSHIP TO OTHER PROGRAMS AT UC MERCED

The lack of subfield barriers in the POLI Ph.D. program encourages interdisciplinary research and allows students to interact with a mix of scholars from other fields during their training. Our program is a particularly good fit for students with research interests that span traditional disciplinary boundaries, such as political cognition or political economy. Students may take classes in cognate disciplines for credit toward their degree.

PROGRAM DEMAND AND STUDENT EMPLOYMENT OPPORTUNITIES

The POLI Ph.D. program is structured to prepare students for work in the academy at teaching and research focused institutions as well as for work as data scientists in the public or private sector. Since graduating our first students in 2016, 100% of our graduates have found positions commensurate with their degree.

- Kathryn Herzog, 2021, Ph.D., Facebook
- Melissa Baker, 2021, Ph.D. Postdoctoral Scholar at the University of Toronto
- Ae sil Woo, 2020, Ph.D., Assistant Professor of Political Science, Gettysburg College
- Kayla Canelo, 2019, Ph.D., Assistant Professor of Political Science, University of Texas, Arlington
- Chelsea Coe, 2019, Ph.D., Market Research Project Manager/Analyst, NetPop Research, LLC
- Stephanie Nail, 2019, Ph.D., Postdoctoral Scholar, Stanford University
- Josue Franco, 2018, Ph.D., Assistant Professor of Political Science, Cuyamaca Community College
- Chanita Intawan, 2018, Ph.D., Social Scientist at a private firm
- Tessa Provins, 2018, Ph.D., Assistant Professor of Political Science, University of Pittsburgh
- Raman Deol, 2016, Ph.D., Associate Professor of Communication Studies, Delta College
- Kau Vue, 2016, MA, Assistant Professor of Political Science, Fresno City College

As of Fall 2021, the Ph.D. program enrolled 22 students.

PROPOSED ACADEMIC PROGRAMS

DATA SCIENCE AND ANALYTICS

It is clear that the world is in the midst of a “big data” revolution – and the demand for highly trained computational and data scientists is growing at an astounding rate. This transformation is not limited to only professions developing technical or “hard” data- and computation-oriented capabilities at the innovation frontier (e.g. AI, algorithm design, massive cloud-data warehousing), but also encompasses a wide range of professions increasingly calling for expertise in the “soft” skillset of data-driven analysis, real-time assessment or “now-casting”, inference, and communication.

Accordingly, to fully realize the promise of “big data” to foster innovation – that improves management of critical challenges in environmental sustainability, human health, living standards, national security and much more – it is not enough to just increase computing power, algorithms, and data storage capacities. We must also equip our students with skills related to data, information, decision making, and their application to management. As data increase in complexity in addition to sheer size, the data analyst requires more adept intuition regarding the data generation processes – and possible biases and ethical issues – underlying the production of data that capture multi-dimensional coupled systems, in addition to advanced computational know-how. Relationships among variables are often nonlinear and context-dependent, and useful information must be culled from virtually limitless sources of data. Given the high-stakes and high-rewards conditions of management, decisions often must be made under conditions of time pressure and uncertainty, and systems must constantly adapt to new data, changing data-generation conditions and management objectives.

Responding to the dual needs of hard and soft skills calls for an innovative hybrid approach to management education. The Gallo faculty propose to address this need by designing a Data Science and Analytics major tailored to our students and the cross-cutting environmental, social, and technological issues of the Central Valley. This major will train students in the fundamentals of data science, equipping them with knowledge of quasi-experimental methods of causal inference using cutting-edge algorithms and computing software, against the backdrop of real-world problem examples, to thereby bridge the gap between data and computation on the one hand, and information and decisions on the other. In addition to a primer in “hard skills”, the program will draw on Gallo faculty expertise who specialize in the soft skills associated with data wrangling (collecting, cleaning, and integrating data from diverse sources), analysis, human and societal ethics, causal inference, visualization, and communication – thereby leveraging the “big data” revolution as it relates to transformative capabilities in socio-economic and environmental decision-making. Graduates of this program will be well-suited for the increasing number of job opportunities in many STEM-oriented domains traditionally drawing on computer science and math graduates, where the Bureau of Labor Statistics projects employment of computer and information scientists will grow 16% from 2018-2028, more than three times faster the national growth rate for all occupations.⁴⁴ But the impact of the data science revolution and the opportunities it creates will also be realized in careers not only tangential, but also far afield from computer and information sciences, where the demand and opportunity for data-oriented decision-making and communication is vast.

COMPLEX SYSTEMS

Recent research and technological advances are changing how we conceptualize and interact with data and the scientific opportunities for high-resolution measurement, modeling, and inference that big data represents. From viruses and amoebae to swarms and human brains, scientists are making rapid advances into the data sciences that allow us to uncover the mechanisms and principles that underlie an increasingly remarkable range of natural phenomena. At the same time, data science is becoming just as pervasive in driving technological change. From devices and software that anticipate consumer behaviors, to robots and algorithms that autonomously seek out information in real and virtual spaces, data science is fast becoming an

⁴⁴ See <https://www.bls.gov/ooh/computer-and-information-technology/computer-and-information-research-scientists.htm#tab-1>

integral part of modern life. And data science is increasingly used by social scientists to understand the statistical and causal regularities that drive emergent phenomena in economic and social systems, leading to new insights into the impacts of policies and events.

Researchers from various disciplines have begun to address these fundamental questions, including mathematicians, physicists, biologists, environmental scientists, geographers, computer scientists, economists, philosophers, and behavioral and cognitive scientists. Common to the studies of all these scientists are basic principles of *complex systems* – including, but not limited to, systems featuring multiple time or spatial scales; historical memory and acute sensitivity to initial conditions; and tipping points and other nonlinear phenomena occurring around critical states. While these features represent challenges to modeling, prediction, and control on the one hand, they also represent the conditions for profound understanding and innovation on the other. In particular, intelligent function always emerges from interactions among many system components that can adapt in ways that give rise to many different patterns of behavior depending on conditions. Intelligence is often enhanced, even optimized, when component interactions are balanced between extremes, e.g., order versus disorder, independence versus dependence, excitation versus inhibition, and so on. Intelligent functioning is learned and shaped on the basis of relatively small, incremental changes to individual components, yet learning can be swift and based on very sparse information.

APPLICATION AREAS

Both theoretical and practical advances are likely to emerge from academia and will complement important technological advances in data science that arise from industry. Indeed, the big data revolution, along with the imminent age of robotics, is likely to drive major technological innovations and advances. Many such advances will be peripheral to this proposal, e.g. in software and hardware needed to process vast amounts of data and allow robots to operate robustly for extended periods and in various environments. However, advances also will be needed to build systems that can collect, manage, and act upon information to manage complex systems for beneficial goals, and stimulating these advances will be a core objective of our data science programs. For instance, companies will need systems that adapt to and predict the needs and specifications of users and clients, or that can intelligently filter and highlight data that are autonomously identified as high priority. Other companies will need systems that interact with the physical world in semi- or fully autonomous modes to manage transport or sensor systems, for example, or search large environments that are too dangerous or expensive for humans or manage processes that are hazardous to humans. In the policy realm, the analysis of large datasets will allow policymakers to harness new methods of causal inference to understand the key determinants and scalar dependencies of policy outcomes. These examples demonstrate the need for applied scientists with broad perspectives who can perceive opportunities and problems, and formulate strategies and solutions, that require synthetic knowledge of data science.

TOWARD PROGRAM PROPOSALS

The application of powerful data science methods to facilitate data-driven analysis and modeling of social, economic and environmental systems is a common thread integrating the four departments of the proposed Gallo School. Accordingly, we plan to establish both undergraduate and graduate Data Science and Analytics degree programs in the proposed Gallo School that equip graduates with computational “hard-skill” know-how, coupled with a multi-disciplinary

applied education in the soft-skills comprised of data-driven analysis, inference and communication. Together these programs, along with the existing one-year professional Master of Management program, represent an integrated pipeline for training computationally and data-adept analysts, managers, and interdisciplinary scholars. These programs will be designed for both local and international students seeking opportunities to enter this lucrative and growing workforce, who can take advantage of Merced’s affordable cost-of-living and proximity to Silicon Valley as well as the Sierra Nevada, which together with the Central Valley are host to a host of real-world problems facilitating experiential data-driven education. As such, these programs will provide a valuable training environment for individuals seeking work in the data economy.

More specifically, either by way of a four-year bachelors or a one-year masters education, students will be equipped to draw sound conclusions from data in context, using knowledge of machine learning, statistical inference, computational processes, geographic information systems, data management strategies, domain knowledge, ethics, and theory. Students will learn to carry out analyses of data through the full cycle of investigative processes in scientific and managerial contexts. They will gain a deep appreciation of the human, social, and institutional structures and practices that shape technical work around computing and data, as well as an understanding of how data, data analytics, machine learning, artificial intelligence, and computing permeate and shape our individual and social lives. Accordingly, we expect both the undergraduate and professional masters programs in Data Science and Analytics to start with the proposed Gallo School in AY 2023-2024. These programs are currently being proposed through established processes of existing departments, groups, and schools, and they will move to the proposed Gallo School when it opens. Note that the proposed Gallo School faculty have agreed that these new programs should be established and incorporated into the new school.

DATA SCIENCE AND ANALYTICS B.S.

The proposed Data Science and Analytics (DSA) bachelor’s degree follows the innovative UC Berkeley model for delivering a multi-disciplinary undergraduate data science major designed around the various methodological, research, and pedagogical strengths of the faculty⁴⁵. In particular, the proposed Gallo DSA major integrates three distinct skillset domains – foundations in quantitative and computational sciences; applications of core data science methods; and fundamentals of data analytics for data wrangling, modeling, ethics, visualization, communication, and decision-making. Students will develop data-oriented skills and contextual intuition by selecting electives from three overlapping application domains: *Understanding and Modeling People*; *Environment and Sustainability*; *Policy and Decision Making*. In this way the program will prepare students for a range of complex real-world problems through the lens of People, Planet and Profit (PPP) sustainability perspectives⁴⁶, which is also the core pedagogical framework delivered in the 1-year professional Masters of Management (M.M.) program delivered by the MIST graduate group. As such, the proposed Gallo DSA major is designed to integrate opportunities in undergraduate and masters education by providing a 5-year pathway at

⁴⁵ UC Berkeley Division of Computing, Data Science & Society <https://data.berkeley.edu/>; Multi-thematic undergraduate Data Science Major oriented around 29 different domain emphases: <https://data.berkeley.edu/academics/data-science-undergraduate-studies/data-science-major/requirements-domain-emphases-1>

⁴⁶ Savitz, A. (2013). The triple bottom line: how today's best-run companies are achieving economic, social and environmental success-and how you can too. John Wiley & Sons.

UC Merced to specialize in this increasingly important and data-oriented PPP nexus, which further supports the campus’ mission and vision oriented around thought leadership, research, education and practice as a leading sustainability-oriented institution.

Delivery of the major will provide a focal point for integrating teaching and governance across all four Gallo departments, for example by drawing on lower division and upper division courses from CIS, MCS, EBM, and POLI. By construction, this DSA major complements the more technically rigorous and methodologically-focused approaches to data science offered by the Applied Math and Computer Science and Engineering majors, requiring only four lower division courses from these departments: MATH 011/012 (Calculus I/II) and CSE015 (Discrete Math) CSE019 (Intro to Computing). In this way, we believe our program can serve as a demand shunt to relieve the over-burdened CSE major by providing a more soft-skill-focused pathway to education at the intersection of applied data science and management analytics. Launching the program will require no additional faculty and just six new courses, including Foundations of Data Science and Analytics (DSA 001) which could provide general education in data literacy broadly across campus. In addition to this course, several other new courses may serve multiple existing majors (including those managed by CIS, EBM and POLI) and some may provide new teaching opportunities for MCS faculty. Other distinct features of this DSA major are required courses in Data Ethics, and also Entrepreneurship in order to educate students in ethical and just practices of translating opportunities and methods into real-world practice. Another feature is a senior-year capstone course providing data analytics services to regional, city and campus entities (e.g. the Library or Facilities Management) who would propose a research problem and advise a year-long student-led project aimed at developing analysis-based assessment and decision-support by way of interactive web-based tools.

MASTER OF DATA SCIENCE AND ANALYTICS

The proposed Master in Data Science and Analytics (MDSA) is envisioned to be a one-year (two semesters plus one summer) self-supporting graduate degree program. Student tuition will be set around \$45,000, at the low end of comparable self-supporting programs at UC, including Berkeley (\$70,000), Irvine (\$46,000), and UCSD (\$50,000).⁴⁷ While there are a myriad of other online program tailored for autodidactic self-education and certification in this domain, our proposed masters program would target the niche of students seeking cost-aware in-person education and interactive guidance via team- and project-oriented coursework, in the same practical fundamentals and application areas as the proposed undergraduate major in DSA. Coursework will include an introduction to data science and data science methods courses, as well as courses in statistics and computational modeling, with electives possibly drawn from other graduate programs, including Electrical Engineering and Computer Science, Applied Math, CIS, Economics, MIST, and more. The program will also include a capstone activity in the summer, either as an internship or a research practicum.

Similar to the envisioned 5-year pathway in which an undergraduate bachelors in DSA leads into the professional M. M. program, we also designed the Masters of DSA as an option for UC Merced students to complement their undergraduate degree in a traditional STEM, social science, or engineering discipline by capping it with a 1-year applications-oriented Masters in

⁴⁷ Data available at https://www.ucop.edu/institutional-research-academic-planning/content-analysis/academic-planning/attachment_a_description_and_summary_table-51619.pdf

DSA. This cost-effective pathway will facilitate the development of adept Central Valley professionals equipped with a T-shaped skillset in data-driven decision-making, one that will be competitive in the modern data economy.

DEMAND FOR DATA SCIENTISTS

A 2017 IBM/Burning-glass report ⁴⁸ identified DSA as one of the most rapidly expanding pathways leading to careers in finance, professional services, IT, and other sectors, one that is projected to grow more than 28% over several years, continuing the exponential growth in this lucrative workforce domain⁴⁹.

More recently, LinkedIn's 2020 Emerging Jobs Report indicates that DSA jobs have been growing at roughly 37% annually and are part of the fastest three growing jobs categories, including behavioral health professionals and engineers. Yet even more broadly, it is commonly appreciated that rapidly growing, high-paying opportunities are available to data science graduates in business intelligence, information architecture, market research, and much more.⁵⁰ Data scientists earn an average of \$121,189 annually. Interestingly, three of the five cities with the highest average pay for data scientists are all in California, with the nearby Bay Area leading the salary ranking:

1. San Francisco average DSA salary, \$170k, adjusted for cost of living, \$128k
2. Boston average DSA salary, \$135k, adjusted for cost of living, \$120k
3. San Diego average DSA salary, \$142k, adjusted for cost of living, \$119k
4. Chicago average DSA salary, \$116k, adjusted for cost of living, \$107k
5. Los Angeles average DSA salary, \$129k, adjusted for cost of living, \$106k

More recently, a LinkedIn report from 2018 identified 151,000 unfilled data science jobs.⁵¹ While about 40% of these jobs would require an advanced degree, such as a master's in data science and analytics, the remainder could be filled by graduates with a bachelor's degree in DSA. In addition to strong historical demand featuring competitive starting salaries, DSA-oriented industries are also anticipated to be resilient to present economic and labor market challenges.⁵²

RELATIONSHIP TO OTHER PROGRAMS

The most closely related programs on campus are degrees in Applied Mathematics and in Computer Science and Engineering. In particular, the B.S. in Applied Mathematics with emphasis in Computational and Data Sciences adds courses in differential equations, linear algebra, optimization, statistics, and modeling stochastic processes to the core foundation of a major in mathematics; and the B.S. in Computer Science and Engineering may incorporate electives in database systems, machine learning, and more. In addition, other programs have

⁴⁸ [The Quant Crunch: How the demand for data science skills is disrupting the job market](https://www.ibm.com/downloads/cas/3RL3VXGA), Burning Glass Technologies, 2017. See <https://www.ibm.com/downloads/cas/3RL3VXGA>

⁴⁹ Gilpress (Nov 8, 2015). Top skills and backgrounds of data scientists on LinkedIn. <https://whatsthebigdata.com/2015/11/08/top-skills-and-backgrounds-of-data-scientists-on-linkedin/> Retrieved from URL.

⁵⁰ See, for example, <https://www.onetonline.org/link/summary/15-1199.08>, <https://www.onetonline.org/link/summary/15-1199.02>, <https://www.onetonline.org/link/summary/13-1161.00>, and <https://www.onetonline.org/link/summary/15-1111.00>

⁵¹ [LinkedIn Workforce Report | United States | August 2018](#). Retrieved from URL.

⁵² [Say goodbye to six-figure starting salaries – with these exceptions](#), CNBC, 2020.

courses related to data science – particularly statistical methods applied to specific application domains – including Biology, Environmental Engineering, Public Health, Political Science, Psychology, and others. As mentioned, at the undergraduate level, we will aim to incorporate courses from across the campus, particularly from Applied Math (e.g., probability and statistics) and Computer Science and Engineering (e.g., data structures and programming), and possibly applications from other areas. Our aim is to make use of existing faculty resources wherever possible and practical, and to incentivize other programs appropriately, for instance, providing increased enrollments and resources to help improve course offerings. We note that the teams developing the Data Science and Analytics proposals have recently helped to establish a cross-campus group interested in promoting data science research and education, aiming to maintain open communication among all those with an interest in this area and to develop coordinated and mutually supportive data science programs and activities on campus.

ENROLLMENT PROJECTIONS

Over several years, data science programs at UC have grown quickly (see Table 9). Based on these data and on our capacity, we expect our undergraduate program in Data Science and Analytics to grow to 74 students over five years, and we expect our masters program in Data Science and Analytics to grow to about 40 students in that same period (see Table 10).

TABLE 9. DATA SCIENCE ENROLLMENTS AT THE UNIVERSITY OF CALIFORNIA

	2015	2016	2017	2018	2019	2020
UC Irvine						
Data Science, B.S.	4	29	111	106	113	157
Data Science, M.S.*						
UC San Diego						
Data Science, B.S.		16	131	517	609	759
Data Science and Engineering, M.S.	43	57	69	63	67	59
UC Berkeley						
Data Science, B.A.				171	739	1007
Information and Data Science, M.S.	98	109	171	218	260	275

* UC Irvine's Data Science M.S. is expected to begin in AY 2021.

** UC San Diego's Data Science program enrollment was capped at 90 students

*** UC Berkeley's program (MIDS) is entirely online.

TABLE 10. PROJECTED DATA SCIENCE AND ANALYTICS ENROLLMENTS AT UC MERCED

Program	AY 2023	AY 2024	AY 2025	AY 2026	AY 2027
B.S. in Data Science and Analytics	10	25	45	70	74
Master of Data Science and Analytics.	10	15	20	30	40

RESOURCE NEEDS

Because our B.S. in Data Science and Analytics program will take advantage of existing courses within the proposed Gallo School as well as existing courses from other programs across the campus, we do not expect substantial new resource needs to deliver the undergraduate program. As a self-supporting graduate degree program, our Master's in Data Science and Analytics will pay for itself and generate income to support some operations of the proposed Gallo School, as well as committing substantial resources in return to aid to support a diverse student body and enhanced opportunities for California students. Nevertheless, given a shortage of computer teaching labs on campus – with existing labs used more than 95% of the time today – we expect increased demand from data science students may require increased teaching lab capacity over time, which will be defrayed by support from the SSGDP in Data Science and Analytics. This resource need could also be reduced given that students will be encouraged to develop and deploy their data analytics software (much of which is open-source) on their personal laptop, which further reinforces key aspects of open language/data/code culture in data science. Alternatively, although it is not our initial intent, it may be possible to deliver substantial portions of the data science curriculum virtually, limiting the need for additional on-campus resources. Specific financial implications are described below in the Financial and Resource Planning section, and these and potential resource needs will be further detailed in degree program proposals that will be submitted to campus and systemwide committees, as appropriate.

FUTURE ACADEMIC PROGRAMS

We see opportunities to create a number of additional academic and professional degree programs in the Gallo school over the next 10 years. For example, we may combine our faculty's interests in complex systems, sustainability, and management to create an undergraduate minor and bachelor's degree in this area, and we may create a number of possible self-supporting programs at the master's level as well, depending on future resources and other conditions. Note that none of these programs are in our immediate plan and may be considered formally by the Gallo School faculty at a later time.

UNDERGRADUATE PROGRAMS

MINOR IN SUSTAINABILITY AND SOCIETY

A minor program in Sustainability and Society would incorporate courses related to natural resource management, climate solutions, parks and protected areas management, as well policy and related areas. This program would draw primarily on courses and faculty in MCS and would also include courses and faculty from CIS and EBM, for instance, with elective courses on ethics and resource economics. The minor would be available to students from all majors and

preliminary analysis of undergraduate program emphases and campus learning community themes suggests this would be both a highly relevant and sought-after minor with complimentary curriculum to that of established majors.

B.S. IN SYSTEMS, SUSTAINABILITY, AND MANAGEMENT

A major program in Systems, Sustainability, and Management would incorporate courses from the existing MAD minor and future Data Science and Analytics major and future Systems and Sustainability minor, applying “systems thinking” to human-environment concerns and human-technology concerns, particularly in the context of sustainability in complex real-world systems. The program will also leverage resources already available on campus, such as project support with access to geographic information systems analysis and visualization tools at the Spatial Analysis and Research Center (SpARC). Graduates would be good candidates for jobs in many areas, including sustainability officers, environmental consultants, systems analysts, and managers which are high-demand, high-paying jobs,⁵³ and they would also be good candidates for graduate school in human factors, environmental systems, management, and more.

GRADUATE PROGRAMS

MASTER OF PROFESSIONAL ACCOUNTANCY (SELF SUPPORTING)

Demand for accountants remain strong.⁵⁴ Locally, California State University campuses in the Central Valley incorporate accounting as tracks in their M.B.A. programs. CSU Sacramento along with UC campuses at Davis, Irvine, Riverside, and San Diego have implemented standalone masters programs in accounting, which provide required training for individuals seeking to pass the CPA exam. We will explore approaches to providing professional training in accounting through a self-supporting professional master’s program in the Gallo School.

MASTER OF PARKS AND LANDS MANAGEMENT (SELF SUPPORTING)

Building on the success of our *National Parks Institute Executive Leadership Seminar*,⁵⁵ we will explore the opportunity to create a professional masters degree program in the area of parks and lands management, serving public sector and private sector demand in this area.⁵⁶ Existing connections that will contribute to the curriculum delivery and program learning outcomes for students including the proximity of Yosemite National Park and Sequoia and Kings Canyon National Parks to the UC Merced campus as natural learning laboratories to learn from practitioners about the complexities of parks management, such as, wildland fire response, visitor use and transportation planning, and park financial administration. Furthermore, an ongoing collaboration between the University Library and each park’s archives has led to the digitization of archival resources related to lands management that will enable virtual (remote) learning on applied topics, such as, superintendent reports, fire records, organizational charts, annual budgets, and engineering and infrastructure plans.

⁵³ See for example, <https://www.bls.gov/ooh/business-and-financial/management-analysts.htm>

⁵⁴ See <https://www.bls.gov/ooh/business-and-financial/accountants-and-auditors.htm>

⁵⁵ For more on the National Parks Institute, see the next section and <https://parkleadership.ucmerced.edu/>

⁵⁶ See for example, <https://www.bls.gov/ooh/life-physical-and-social-science/urban-and-regional-planners.htm>

MASTER OF ENGINEERING MANAGEMENT (SELF SUPPORTING)

Given steady demand for engineering management skills across a range of engineering disciplines, including Mechanical, Environmental, Materials, and Bio Engineering,⁵⁷ we envision creating a practical core of management education with emphases aligned with several specific engineering disciplines. For example, a Master of Engineering Management with emphasis in Environmental Engineering would augment environmental engineering skills with practical management skills, putting graduates in a perfect position for jobs in the design or supervision of the design of systems, processes, assessment, or equipment for control, management, or remediation of natural resources, or work with environmental scientists, planners, engineers, or other specialists to address environmental problems, in-demand, high-paying jobs.⁵⁸ Such a program would cater to students with specific engineering backgrounds, combining management courses (offered through the proposed Gallo School) with engineering courses (offered through the School of Engineering) in a one-year self-supporting program.

OTHER PROGRAMS

EXECUTIVE EDUCATION

THE NATIONAL PARKS INSTITUTE

The National Parks Institute (NPI) hosts an annual eleven-day *Executive Leadership Seminar*. The NPI invites managers of parks and protected areas from around the world to learn strategic approaches to problem-solving and advanced management, from a combination of UC and partner university faculty, as well as expert practitioners and through experience-building exercises in the field. The seminar is taught in a sequence of three phases and venues, beginning at Golden Gate National Park in San Francisco, moving to the UC Merced campus, and ending in Yosemite National Park. With a class size between 20 and 28 participants, we seek a balance between domestic and international attendees, including emerging managers, who are in the second third of a career and interested in moving to the most senior positions in their organizations. “Protected areas” includes national parks, wildlife refuges and preserves, marine sanctuaries, state parks and similar areas, set aside to protect wilderness, wildlife, ecosystems, watersheds and natural resources. It also includes places of historical, cultural, anthropological and archaeological significance, including tribal lands and places sacred to indigenous peoples.

The seminar was developed in response to recognition of a complete absence of opportunities for deep executive education for emerging park leaders worldwide: education that would be the equivalent of a demanding M.B.A. program for a corporate candidate, or a war college experience for military executives. This absence was recognized to be global – with no university at the time, international or domestic, providing the educational tools necessary for tackling the most demanding problems facing people in these challenging positions: climate change and species effects, regional economic impacts and tourism, the international movement of zoonotic disease and potential extinctions, effective strategies for the protection for migratory species between countries, and catastrophic fire to name a few.

⁵⁷ See <https://www.bls.gov/ooh/management/architectural-and-engineering-managers.htm>

⁵⁸ See <https://www.onetonline.org/link/summary/17-2081.00>

NPI is designed as a short, impactful seminar that delivers both strategic and tactical tools for: understanding and leading change; recognizing and integrating stakeholder values in decision-making; practical methods for guiding organizational culture as adaptation is required, harnessing the power of emerging technologies; and developing a confident and survivable management capacity. Based on an approach that fuses an understanding of law, the best available science, and fair policy development as the foundational elements of decision making given political pressure, media criticism, and litigation – all in a world of natural and cultural resource protection where resource extractors are increasingly competitive, influential and savvy in their develop of methods that threaten protected lands and waters.

In all, UC Merced has hosted four NPI seminars, with 103 graduates from 35 nations. Many graduates have gone on to become senior managers in their agencies. We plan to hold the NPI annually and are developing a financing strategy that recognizes both the need to be sustainable and the reality that few, if any, park systems in the world are well-enough funded to sponsor executive education at normal corporate levels. To that end, the program is endeavoring to build a sponsorship base that will partially off-set tuition rates.

RELATED CENTERS AND INSTITUTES

CENTER FOR ANALYTIC POLITICAL ENGAGEMENT

The Center for Analytic Political Engagement (CAPE) is a focal point for scholars, students and community leaders in California’s Central Valley, founded by the Political Science faculty at the University of California, Merced. It aims to enhance a healthy democratic society by advancing responsible civic participation and elevating the voices of the under-represented. CAPE seeks to 1) Provide students the scholarly and pragmatic skills to participate in politics and policy creation and to navigate the realities of electoral politics and partisanship; 2) Support research which incorporates sound social science and data analysis of citizen action and the processes by which governments make, enact, and adjudicate policy; 3) Engage the community – especially the Central Valley region – to amplify its voice and enrich its public-minded pursuits.

CENTER FOR CLIMATE JUSTICE

The Center for Climate Justice is a University of California system-wide initiative to address climate change as a social justice and equity issue. Climate justice recognizes the disproportionate impacts of climate change on low-income communities and BIPOC communities around the world, the people and places least responsible for the problem. The UC Center for Climate Justice seeks solutions that address the root causes of climate change and in doing so, simultaneously address a broad range of social, racial, and environmental injustices. The Center’s mission is to leverage and harness the power of the university to support, strengthen, and build an emergent climate justice ecosystem and social movement that solves the climate crisis through science, systems thinking, and social-ecological justice. Through innovative broader-impact research, transformative education, and public engagement, the Center for Climate Justice, works toward a world where extractive systems and economies have been transformed into ones that are regenerative, equitable, and support the sustained wellbeing of all life.

FINANCIAL AND RESOURCE PLANNING

The proposed Gallo School requires new resources from the campus and the state to support school operations; that is, new staff will be required to run the new school. There is no request for new faculty needed to support any of the existing or proposed programs, and there is no suggestion of moving staff from any existing school into the proposed Gallo School. Our financial plan uses a variety funding resources, including state funds, tuition, revenues from self-supporting professional graduate degree programs, and an endowment that began with a generous gift from the E. & J. Gallo Winery for the purpose of establishing the E. & J. Gallo School of Management at UC Merced. The Gallo Endowment consists of the lead gift by the Gallo Winery (originally \$5M) and a set of matching gifts with restricted uses (originally \$6M), including three endowed chairs and three endowed student scholarship funds. Today the Gallo Endowment is worth more than \$24M, with an additional \$4M of accumulated payout available for current use.

OPERATING BUDGET PLAN

The proposed budget projects revenues and expenses over a six-year period, including a pre-opening year and five years of operation of the school (see Table 11). Our plan relies mainly on state general funds, tuition, self-supporting program revenues, and endowments. The budget reflects a pre-opening year of the school during FY23 (AY 2022-23) and the opening and initial growth phase from FY24 – FY28 (AY 2023-28). Faculty expenses include faculty salaries, benefits, and incidentals. Staff expenses include core administrative staff needed for business and administrative operations and student support and career services. No contracts and grants or sales and service agreements are projected in the operating budget.

PRE-OPENING PHASE

The pre-opening year assumes twelve months of support for endowed chairs and student scholarships, a small administrative staff, and minor operational expenses, all supported by existing endowment reserve funds. In addition, the pre-opening year begins staffing the proposed school by adding advising staff in SSHA to support proposed Gallo School programs (including Cognitive Science, Economics, Management and Business Economics, and Political Science) at the start of the year and adding operations staff in the Division of Management and Information (including finance and personnel services) mid-way through the year. All other operations, revenues, and expenses of the departments will continue to be handled by their existing schools during this year (CIS, EBM, and POLI by SSHA, and MCS by SOE), and all new staff added in the pre-opening year will transfer to the Gallo School when it is established. Building the initial staff complement over several years provides time for training and learning, and for creation of new school processes and practices before they are needed. It also begins to improve the staff ratios in SSHA before the Gallo School is established. Thus, the request for new State General Funds includes the salaries and benefits of these staff in the pre-opening year. To mitigate the short-term effects of this request on the campus budget, the Gallo School financial model (shown in Table 11) incorporates a payment from endowment reserve funds to the central campus to offset these staff expenses in the pre-opening year.

OPENING AND GROWTH PHASE

Upon opening of the proposed Gallo School, all faculty from the Departments of Cognitive and Information Sciences, Economics and Business Management, Management of Complex Systems, and Political Science, along with associated operations, revenues, and expenses will transfer from the School of Social Sciences, Humanities and Arts and the School of Engineering to the new School. Specifically, State General Funds (SGF) supporting faculty salaries, benefits, and incidental expenses will transfer to the new school, along with Temporary Academic Support (TAS) supporting teaching assistant tuition, salaries, and benefits and lecturer salaries and benefits (per the campus's TAS funding formula based on student-credit-hours taught by faculty in the new school). New SGF will be needed to support new staff salaries and benefits, including the Dean and Associate Deans (see Table 12).

TABLE 11. PROPOSED OPERATING BUDGET FOR THE GALLO SCHOOL

	School Operating Budget					
	PreOpening 2022-23	FY24 2023-24	FY25 2024-25	FY26 2025-26	FY27 2026-27	FY28 2027-28
Revenues						
State General Funds	\$ 423,078	\$ 13,764,290	\$ 14,603,122	\$ 15,564,626	\$ 16,562,962	\$ 17,887,845
Tuition Revenues	\$ -	\$ 3,792,960	\$ 4,020,547	\$ 4,261,753	\$ 4,517,458	\$ 4,788,541
Summer Session Revenues	\$ -	\$ 93,892	\$ 99,525	\$ 105,497	\$ 111,826	\$ 118,536
Indirect Cost Return	\$ -	\$ 15,000	\$ 15,750	\$ 16,538	\$ 17,364	\$ 18,233
Revenue-generating Programs	\$ (134,167)	\$ (20,377)	\$ (14,965)	\$ 26,334	\$ 262,906	\$ 211,310
Endowment Reserve and Other Gifts	\$ 400,000	\$ 400,000	\$ 500,000	\$ 500,000	\$ 400,000	\$ 400,000
Endowments	\$ 1,032,328	\$ 1,055,377	\$ 1,078,941	\$ 1,103,031	\$ 1,127,659	\$ 1,152,837
Total Revenues	\$ 1,721,239	\$ 19,101,142	\$ 20,302,920	\$ 21,577,778	\$ 23,000,176	\$ 24,577,301
Expenditures						
Personnel Expenses						
Senate Faculty	\$ -	\$ 11,547,685	\$ 12,299,854	\$ 13,078,349	\$ 13,884,092	\$ 14,892,035
Temp. Academic Staff (Lect/TAs)	\$ -	\$ 3,792,960	\$ 4,020,547	\$ 4,261,753	\$ 4,517,458	\$ 4,788,541
Dean's Office	\$ 309,652	\$ 730,310	\$ 755,871	\$ 782,326	\$ 809,708	\$ 838,048
School Staff	\$ 408,078	\$ 979,935	\$ 1,014,233	\$ 1,141,291	\$ 1,276,001	\$ 1,524,429
Total Salaries & Benefits	\$ 717,730	\$ 17,050,891	\$ 18,090,505	\$ 19,263,720	\$ 20,487,258	\$ 22,043,052
Non-Personnel Expenses						
Non-Salary Operating Expenses & Supplies	\$ 25,000	\$ 341,360	\$ 362,164	\$ 385,659	\$ 410,162	\$ 441,334
Faculty Incidentals	\$ -	\$ 165,000	\$ 171,000	\$ 177,000	\$ 183,000	\$ 192,000
Faculty Recruitment	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 60,000
Department Support Expenses	\$ -	\$ 40,000	\$ 42,000	\$ 44,100	\$ 46,305	\$ 48,620
Marketing and Student Recruitment	\$ 100,000	\$ 379,296	\$ 402,055	\$ 426,175	\$ 451,746	\$ 478,854
Endowed Chair & Student Support (Existing)	\$ 447,530	\$ 457,522	\$ 467,738	\$ 478,181	\$ 488,858	\$ 499,773
Endowed Faculty & Student Support (New)	\$ -	\$ 200,000	\$ 300,000	\$ 400,000	\$ 500,000	\$ 600,000
Transition Support for SSHA	\$ -	\$ 379,296	\$ 321,644	\$ 255,705	\$ 180,698	\$ 95,771
Offset Payment for Central Campus	\$ 423,078	\$ -	\$ -	\$ -	\$ -	\$ -
Total Non-Personnel Expenses	\$ 995,608	\$ 2,002,474	\$ 2,106,600	\$ 2,206,821	\$ 2,300,769	\$ 2,416,351
Total Expenditures	\$ 1,713,338	\$ 19,053,365	\$ 20,197,105	\$ 21,470,541	\$ 22,788,028	\$ 24,459,404
Annual Operating Balances	\$ 7,901	\$ 47,777	\$ 105,815	\$ 107,238	\$ 212,148	\$ 117,897
Cumulative Balances	\$ 7,901	\$ 55,678	\$ 161,493	\$ 268,731	\$ 480,879	\$ 598,776

Initial staffing of 13 (excluding the Dean and Associate Deans) covers basic needs for undergraduate student support, graduate student support, and faculty support (see Table 12). To determine appropriate staffing, we considered the staff levels across existing schools on campus for undergraduate student support, graduate student support, and faculty support (see Table 14). As our plan does not require shifting staff resources from SSHA or SoE, when faculty and students shift to the proposed Gallo School, relative staff support in SSHA (and to a lesser extent SoE) improves significantly, bringing student-to-staff ratios of the three existing schools much closer together. As future staff growth depends on enrollment growth, we will aim to keep the undergraduate-student-to-staff ratio in the range, 450-550, the graduate-student-to-staff ratio in the range 75-85, and the faculty-to-staff ratio in the range 5-7 (see also Table 18).

TABLE 12. NEW STATE GENERAL FUNDS

	PreOpening 2022-23	FY24 2023-24	FY25 2024-25	FY26 2025-26	FY27 2026-27	FY28 2027-28
Dean's Office	\$ -	\$ 730,310	\$ 755,871	\$ 782,326	\$ 809,708	\$ 838,048
School Staff	\$ 408,078	\$ 979,935	\$ 1,014,233	\$ 1,141,291	\$ 1,276,001	\$ 1,524,429
Offset	\$ 408,078	\$ -	\$ -	\$ -	\$ -	\$ -
Total New Funds	\$ -	\$ 1,710,245	\$ 1,770,104	\$ 1,923,617	\$ 2,085,708	\$ 2,362,476

TABLE 13. INITIAL STAFF OF THE PROPOSED GALLO SCHOOL

Dean's Office	Dean
	Associate Dean for Education and Research
	Associate Dean for Equity, Justice, and Inclusive Excellence
	Assistant Dean
	Executive Assistant
Undergraduate Staff	Undergraduate Services (x 3)
Graduate Staff	Graduate Services
Other Staff	Finance/Business (x 2)
	Personnel - AP/HR (x 2)
	Department Specialist (x 2)
	Curriculum/Class Scheduler

TABLE 14. STAFFING LEVELS BEFORE AND AFTER FACULTY AND STUDENTS SHIFT TO PROPOSED GALLO SCHOOL

STAFFING BY SCHOOL, AY 2021-22				STAFFING AFTER SHIFT TO PROPOSED GALLO SCHOOL, AY 2021-22				
	SNS	SSHA	SOE		SNS	SSHA	SOE	Gallo
Undergraduate Majors	2020	3659	2324	Undergraduate Majors	2020	2338	2324	1321
Undergraduate Staff	7	6	5	Undergraduate Staff	7	6	5	3
<i>Undergraduate-to-Staff Ratio</i>	289	610	465	<i>Undergraduate-to-Staff Ratio</i>	289	390	465	440
Graduate Students	350	227	195	Graduate Students	350	161	173	88
Graduate Staff	3	3	3	Graduate Staff	3	3	3	1
<i>Graduate-to-Staff Ratio</i>	117	76	65	<i>Graduate-to-Staff Ratio</i>	117	54	58	88
Faculty	91	144	75	Faculty	91	98	62	50
Other Staff	29	19	23	Other Staff	29	19	23	9
<i>Faculty-to-Staff Ratio</i>	4	8	4	<i>Faculty-to-Staff Ratio</i>	4	6	3	6
Total Staff	39	28	31	Total Staff	39	28	31	13

ENROLLMENT AND FTE GROWTH

Projected future faculty and staff FTE growth depend entirely on student enrollment growth. Thus, the proposed Gallo School financial plan requires a number of assumptions regarding enrollment growth, faculty FTE growth, and staff FTE growth. Student enrollment growth across the proposed school's existing undergraduate programs averaged 4% over the last five years (Fall 2016-2021), including the year of COVID-19, and averaged 6% over the prior five years (Fall 2015-2020), not including the year of COVID-19.⁵⁹ For planning, we assumed average (non-COVID) undergraduate enrollment growth of 6%, but can easily adjust given different rates.⁶⁰ Graduate student enrollment growth is projected by graduate group estimates. Student enrollment growth for new programs is estimated based on experience at other campuses for similar programs and on capacity (see separate program proposals for more details on projected enrollment in these programs).

TABLE 15. STUDENT ENROLLMENT AND RELATED PROJECTIONS

	FY24	FY25	FY26	FY27	FY28
BS, Management and Business Economics	802	850	901	955	1012
BS, Political Science	381	404	428	454	481
BA/BS, Cognitive & Information Sciences	199	211	224	237	251
BA/BS, Economics	102	108	114	121	128
BS, Data Science and Analytics	10	25	45	70	74
TOTAL UNDERGRADUATE	1494	1598	1712	1837	1947

⁵⁹ See <https://cie.ucmerced.edu/analytics-hub/student-statistics>

⁶⁰ Campus enrollment growth is expected to average 6% or more through 2030.

PhD, Management of Complex Systems	20	20	22	22	24
MM, Master of Management	25	30	35	40	40
PhD, Cognitive & Information Sciences	30	30	30	30	35
MS, Cognitive & Information Sciences	10	12	12	15	15
PhD, Economics	14	16	16	18	18
PhD, Political Science	24	26	26	26	30
MS, Data Science and Analytics	10	15	20	30	40
TOTAL GRADUATE	133	149	161	181	202
TOTAL STUDENTS	1627	1747	1873	2018	2149

We anticipate 54 faculty will join the new Gallo School of Management, including 50 faculty in the four departments in AY 21-22 (excluding Philosophy faculty but including four vacant lines, two in EBM and two in POLI). Additional faculty will be recruited as programs grow (see Table 16, and Appendix B for a list of faculty). Faculty growth tracks student growth, with roughly one faculty member for every 28-30 undergraduate student majors in the school (in AY 21-22, the student-to-faculty ratio in SNS was 23, in SSHA, 26, and SOE, 31). Nevertheless, the proposed Gallo School will need to establish appropriate and agreed-upon methods for resource distribution, including for example, approaches to setting faculty salaries and approaches for strategically and tactically distributing faculty FTE and other resources. To start to establish effective practices and norms for resource distribution once the school is formed, we will create an *ad hoc* faculty-administration committee charged with developing methods for resource distribution that align with school needs and priorities.

TABLE 16. FACULTY GROWTH PROJECTION

	FY24	FY25	FY26	FY27	FY28
Undergraduate Majors	1494	1598	1712	1837	1947
<i>Student-to-Faculty Ratio</i>	27	28	29	30	30
Faculty FTE	55	57	59	61	64

Temporary instructional staff – Unit 18 Lecturers and Teaching Assistants (TAs) – grow in line with programmatic needs for undergraduate instruction. Following the campus’s proposed plan for allocating temporary academic support based on student-credit hours taught at the school-level, we have projected future growth based on average enrollment growth of 6% (see Table 17). We understand that the temporary instructional budget for SSHA will undergo an initial strain during the first few years of CIS, EBM, and POLI moving to the Gallo school. Rather than several large majors distributing the burden of financially supporting lower-enrollment majors, there will be fewer large majors now carrying that burden alone. To assist in the transition of SSHA developing an instructional funding model that does not unduly disadvantage large majors, the Gallo School has planned to return some instructional funds to SSHA during the first five years of operation. Specifically, the plan is to return 10% of the Gallo School’s TAS allocation to SSHA in the first year, decreasing by each year over the five years of the plan, and totaling more than \$1.2M in that time (see Table 11).

TABLE 17. TEMPORARY ACADEMIC SUPPORT – GROWTH PROJECTIONS

	FY24	FY25	FY26	FY27	FY28
Projected student-credit hours taught	34,532	36,604	38,800	41,128	43,596
Projected temporary academic support	\$3,792,960	\$4,020,547	\$4,261,753	\$4,517,458	\$4,788,541

A total of thirteen staff will join the new Gallo School during its opening year (see Table 13 and Table 14), with the projected growth over the next five years tied to student enrollment growth as described previously (see Table 18). Student-related staff grow in proportion to students at undergraduate and graduate levels, and other staff grow in proportion to faculty. We anticipate the campus will continue to establish central, shared services over the next few years to fill the roles of staff in several additional categories, including research administration, travel, and procurement.

TABLE 18. SCHOOL STAFF GROWTH PROJECTIONS

	FY24	FY25	FY26	FY27	FY28
Undergraduate Staff	3	3	3	4	4
<i>Undergraduate-to-Staff Ratio</i>	<i>498</i>	<i>533</i>	<i>571</i>	<i>459</i>	<i>487</i>
Graduate Staff	1	1	2	2	2
<i>Graduate-to-staff Ratio</i>	<i>123</i>	<i>134</i>	<i>71</i>	<i>76</i>	<i>79</i>
Other Staff (including Dean's Staff)*	9	9	10	10	11
<i>Faculty-to-Staff Ratio</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>
Total Staff	13	13	15	16	16

*excluding Dean and Associate Deans

NON-PERSONNEL EXPENSES

We account for seven types of non-personnel operating expenses in our financial plan:

Non-salary Operating Expenses include supplies, computers, equipment, infrastructure, travel and entertainment, publications, marketing, and facilities and administrative fees associated with the operations of the school.

Faculty Incidental Funds of \$3,000 annually is provided to each faculty member to support teaching and public service efforts.

Faculty Recruitment Expenses of \$20,000 per each expected faculty search and recruitment effort.

Department Support Expenses include \$10,000 per department each year to support its teaching and research activities.

Marketing and Student Recruitment Expenses estimated at 10% of instructional costs to support increasing enrollment in school programs, targeting under-represented students, transfer students, and local students.

Endowed Faculty and Student Support include existing endowed chair and scholarship support plus funding for new programs, such as a speaker series on cross-cutting topics, seed funding for cross-cutting research, venture funding for student and faculty projects, and student scholarship and fellowship programs focused on underrepresented students.

Transition Support for SSHA returns some temporary instructional funds to SSHA over five years, as described previously.

Offset Payment for Central Campus returns some endowment reserve funds to the central campus in the year before opening to offset the request for SGF in that year.

REVENUE SOURCES

As shown in Table 11, we anticipate a diverse set of revenue sources supporting the School:

State General Funds will be required to support existing faculty FTEs, new staff FTEs, and associated non-salary operating costs. No new faculty FTEs are requested from the state in our financial plan (beyond faculty FTE growth aligned with student enrollment growth).

Tuition and Fees generated by the academic programs within the Gallo School will directly support the salaries, benefits, and fee remissions for temporary instructional staff, following the campus’s planned method of allocating the temporary academic support proportional to student-credit-hours taught.

Summer Session Revenues generated by academic programs within the Gallo School are projected based on past enrollments (assuming 6% annual growth) using the “Distribution of Summer Session Revenue” worksheet provided by the Division of Undergraduate Education (see TABLE 19).

TABLE 19. SUMMER SESSION ENROLLMENT AND REVENUE PROJECTIONS

	FY24	FY25	FY26	FY27	FY28
ECON Enrollment	466	494	523	555	588
Revenue	\$38,897	\$41,231	\$43,705	\$46,327	\$49,107
COGS Enrollment	176	187	198	210	223
Revenue	\$24,097	\$25,543	\$27,076	\$28,701	\$30,423
POLI Enrollment	223	236	250	265	281
Revenue	\$23,315	\$24,714	\$26,197	\$27,769	\$29,435
MGMT Enrollment	36	38	40	43	45
Revenue	\$3,123	\$3,310	\$3,508	\$3,719	\$3,942
MIST Enrollment	31	33	35	37	39
Revenue	\$4,459	\$4,727	\$5,010	\$5,311	\$5,630
TOTAL	\$93,892	\$99,525	\$105,497	\$111,826	\$118,536

Data Science and Analytics SSGPDP Revenues project a small loss during the first three years, with income applied to School operations beginning in FY26.

Indirect Cost Recovery estimates are derived from the existing and growing research portfolio of faculty in the three Gallo School departments using UC Merced’s current model of 5% return to the School.

Gallo Endowment contributions consist of estimated annual payouts from the existing endowments of more than \$24M (see Table 20), and Gallo payout reserve (noted as

“Endowment Reserve and Other Gifts” in Table 11, estimated to be about \$4M in FY22) disbursed over 6 years (totaling \$2.6M).

TABLE 20. GALLO ENDOWMENT SUMMARY

	Original Gift	Market Value*
Lead Gallo School Gift	\$5,000,000	\$13,500,000
Scholarships and Fellowships		\$7,500,000
Merced Mall: Scholarships for Outstanding San Joaquin Valley Students in Management	\$196,000	
Bank of America Foundation: Distinguished Management Scholar's Program	\$1,000,000	
Charles Perry Ellis Fund: Scholarships and Fellowships in Economics and Business	\$3,448,000	
Endowed Chairs		\$3,000,000
County Bank Chair in Economics (Innes)	\$500,000	
McClatchy Chair in Communications (Matlock)	\$500,000	
Ruiz Family Chair in Entrepreneurship (<i>vacant</i>)	\$500,000	

*Approximate market value of Gallo Endowment funds as of June 2021, totaling about \$24M.

RETURN ON INVESTMENT

Over the five-year planning horizon, establishing the Gallo School will require nearly \$10M of new SGF to support staff and operating expenses (see Table 12). Once established, growth in faculty, staff, and other expenses tracks student enrollment growth. In addition to SGF and TAS, funding for the new school includes gifts, endowment payouts, indirect cost returns, and revenue-generating programs – all of which support student and faculty activities (such as student scholarships), some operating expenses (such as marketing and recruitment of students and faculty), and new graduate TAs (decreasing the need for centrally-funded TAs). Accounting for these potential new sources of revenue, every \$1 of new state funding invested in the Gallo School returns an additional \$1.02 to the campus; and if we assume no additional revenue is generated by self-supporting programs, every \$1 of new state funding invested in the Gallo School returns an additional \$0.93 to the campus (see Table 21 and Table 22).

TABLE 21. RETURN ON INVESTMENT ANALYSIS

	Pre-Opening	FY24	FY25	FY26	FY27	FY28
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
New SGF	\$ 408,078	\$ 1,710,245	\$ 1,770,104	\$ 1,923,617	\$ 2,085,708	\$ 2,362,476
Offset	\$ 408,078					
Cumulative		\$ 1,710,245	\$ 3,480,349	\$ 5,403,966	\$ 7,489,674	\$ 9,852,151
New Revenue (All)	\$ 1,298,161	\$ 1,435,000	\$ 1,563,976	\$ 1,629,365	\$ 1,790,565	\$ 1,764,146
Cumulative	\$ 1,298,161	\$ 2,733,161	\$ 4,297,137	\$ 5,926,503	\$ 7,717,067	\$ 9,481,214
New Revenue (Gifts/Endowments)	\$ 1,432,328	\$ 1,455,377	\$ 1,578,941	\$ 1,603,031	\$ 1,527,659	\$ 1,552,837
Cumulative	\$ 1,432,328	\$ 2,887,705	\$ 4,466,646	\$ 6,069,677	\$ 7,597,335	\$ 9,150,172
New Undergraduate Enrollment		94	104	114	125	110
Cumulative		94	198	312	437	547
New Graduate Enrollment		14	11	7	10	6
Cumulative		14	25	32	42	48
New Fully Supported 50% TAships		2.5	4	5	5.5	9
Cumulative		2.5	6.5	11.5	17	26

TABLE 22. RETURN ON INVESTMENT SUMMARY

Total return (all revenues plus new TAships)	\$ 10,053,214
Return per state dollar	1.02
Total return (without new program revenues/TAships)	\$ 9,150,172
Return per state dollar without new programs	0.93

CONTINGENCY PLANNING

The financial and resource plan described here incorporates several pessimistic assumptions, including limiting returns on endowed funds over several years (given expected financial market conditions). It is also a very lean plan in terms of staff, anticipating the effect of continued position control policies. Nevertheless, the financial and resource plan makes projections about the rate of student FTE growth across programs. Slower student FTE growth in existing programs would not have any impact on the plan, as faculty and staff growth are tied specifically to student enrollment growth, and the incremental costs, which are based on staffing and enrollment at the time of opening, would not change. Slower growth in student enrollment for the self-supporting graduate program in Data Science and Analytics would have an impact on the plan, as revenues from this program accrue starting in Year 3 (see Table 11). If enrollment in this program lags projections, program costs will be scaled back, supporting fewer staff, fewer TAships, and less return-to-student-aid.

The financial plan shown in Table 11 relies on payout reserves from the Gallo Endowment (\$2.6M over the six years of the plan, leaving about \$1.4M of payout reserve at the end of FY28). If we continue to draw down the reserve at about the same rate after FY28, the reserve would be depleted by the end of FY31. Though we expect substantial new resources will be developed (whether through new programs or philanthropy or both), it is conceivable that no new resources appear by this time. Of course, the payout reserve can be drawn down at a slower rate without substantially affecting the plan; as shown in TABLE 11, the proposed School accumulates a substantial balance (\$0.6M by the end of FY28), suggesting a slower draw down of the payout reserve would enable these funds to last about two more years (through FY33). Further, by minimizing some expenses over time, for instance, limiting new endowed faculty and student programs (currently costing \$2M through FY28), the payout reserve could last up to five additional years (through FY38) if we choose to eliminate these programs. Thus, using the payout reserve to support school operations and programs at the proposed rate may be helpful, but is not strictly necessary; the current reserve can be conserved to last fifteen years (rather than the proposed nine), by which time we expect many additional revenue sources will be available to support school operations and programs. We note that we plan to reassess our overall need for State General Funds and the use of any accumulated balances by Year 5 and adjust accordingly.

LIBRARY PLAN

The UC Merced Library will be a key partner of the proposed Gallo School. It is already an effective partner in the management and processing of data for faculty and student research; for example, the Library provides Research Data Curation services⁶¹ and tools and expertise in the Spatial Analysis and Research Center (SpARC).⁶² And it provides the campus with resources and workshops for learning Data Carpentry,⁶³ teaching methods and tools for data analytics, which aligns with our plans for programs in data science. In addition, the Library already provides access to extensive online collections, journals, and other publications relevant to management, economics, cognition, complexity, politics, and other relevant areas.

As the proposed Gallo School is mainly a shift in faculty, programs, and students from existing schools into the new school, it will leverage existing Library resources. Any incremental needs resulting from the to-be-proposed programs in Data Science and Analytics (or others) will be incorporated into those program proposals; for example, there may be need for additional library resources to obtain and host large data sets, supplement data carpentry offerings, expand collections relevant to data science, and increase tools and staffing for spatial analytics, among others. Increased resource needs may be offset by incorporating SpARC and Data Curation as partners in relevant grant applications. It will be important for the Library to have a sustainable funding model that is tied to growth in education and research on the campus.

⁶¹ Research Data Curation: <http://library.ucmerced.edu/research-data-curation>

⁶² Spatial Analysis and Research Center (SpARC): <http://library.ucmerced.edu/sparc>

⁶³ Data Carpentry: <http://library.ucmerced.edu/digital-curation-and-scholarship/data-carpentry>

DEVELOPMENT PLAN

To ensure the success of the Gallo School, we will expand our relationships with corporate partners, engage foundations, and bring together individuals whose passion for our mission will translate into philanthropic support. We have a strategy to raise \$15M in new gift or endowment funds over the next 10 years. Development plans start with a core group of dedicated donors and leverages those relationships to build a sustainable donor base, as we build up numbers of alumni and increase brand awareness. Building from an Advisory Council of committed individuals and engaging meaningfully with key partners in the Central Valley, we will seek to increase investment for endowed chairs, graduate fellowships, student support, and other programmatic purposes. Our fundraising plan, developed jointly with the campus's Department of Philanthropy and Strategic Partnerships, is outlined in Appendix H.⁶⁴

SPACE PLAN

The campus intends to dedicate the Social Science and Management (SSM) Building to the proposed Gallo School of Management by Fall 2025 (see letter from the EVC/Provost in Appendix L). At approximately 92,000 gross usable square feet, SSM will fully accommodate the existing and proposed new educational programs, faculty, staff, and researchers associated with the new Gallo School. With office space for more than 100 faculty and staff and research lab space for over 35 researchers, the SSM building will have ample room for cohort-based teaching labs, student resource and support spaces, graduate student seating, conference rooms, and a Dean's suite. Until the space is ready in 2025 or later, Gallo School programs will grow within existing space dedicated to CIS and MCS primarily on the 2nd and 3rd floor of SSM, within space dedicated to EBM on the 3rd floor of the Classroom and Office Building (COB), and within space dedicated to POLI on the 3rd floor of Classroom and Office Building 2 (COB2), per the campus's 2020 space plan. Specifically, the Gallo School will be able to grow into some space vacated in SSM in 2022, augmented with interim space in COB and COB2. We expect interim space will be sufficient for several years in the event that completion of the new building is delayed. When the new Health, Behavioral Sciences, and Medical Education building is completed and operational, all other departments will vacate SSM, leaving the four departments and administrative staff of the Gallo School to occupy the building. SSM will be re-modeled in phases to accommodate the needs of the proposed school. We note that the Health and Behavioral Sciences building will also create three new state-of-the-art computer labs for use by all academic programs, including future Data Science and Analytics programs.

⁶⁴ Note: An updated development plan is pending approval by External Relations and will be included in the final pre-proposal.

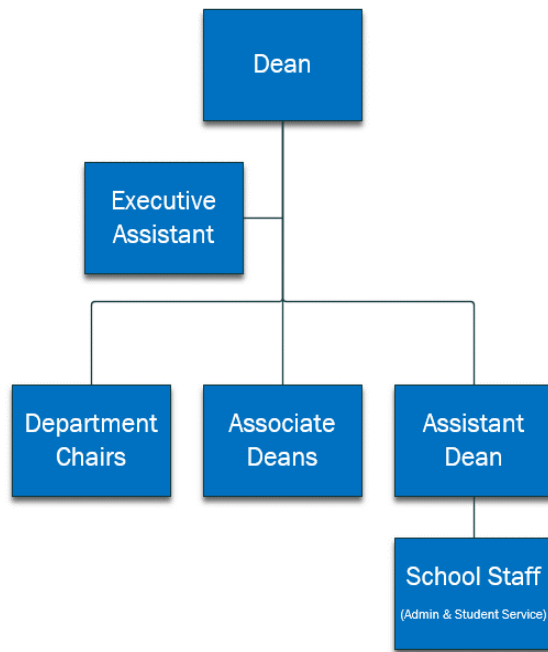


Figure 4. Organizational Structure of the Proposed Gallo School of Management

SCHOOL GOVERNANCE

The organizational structure of the proposed Gallo School is shown in Figure 4. Appendix F contains the proposed bylaws for the School.

APPENDICES

APPENDIX A: ACKNOWLEDGMENTS

For support and help with the Gallo School Initiative, we thank:

UC Merced Administrators, Faculty, and Staff

Chris Abrescy, Creative Director, Marketing and Public Relations
De Acker, Director of Program Development, Office of Legal Affairs
Hans Bjornsson, former Acting Dean, School of Social Sciences, Humanities and Arts
Nathan Brostrom, former Interim Chancellor
Paul Brown, Professor of Health Economics and Public Health
Jeff Butler, Associate Professor, Economics and Business Management
Sharon Butler, former Assistant Executive Vice Chancellor and Provost for Finance and Administration
Gregg Camfield, Executive Vice Chancellor and Provost
Lisa Pollard Carlson, Associate Vice Chancellor, Philanthropy and Strategic Partnerships
Ehsan Choudhry, Faculty Liaison, Office of the Executive Vice Chancellor and Provost
Betsy Dumont, Dean School of Natural Sciences
Sarah Frey, Vice Provost and Dean, Division of Undergraduate Education
Jeff Gilger, Dean School of Social Sciences, Humanities and Arts
Sang Han, former Associate Vice Chancellor and Chief Development Officer
Joseph Hefta, Regional Director of Development, Philanthropy & Strategic Partnerships
Thelma Hurd, Director of Medical Education
Romi Kaur, former Assistant Vice Chancellor, Financial Planning and Analysis
Bianca Khanona, Assistant Vice Chancellor, Financial Planning and Analysis
Ed Klotzbier, Vice Chancellor for External Relations
Ann Kovalchick, Associate Vice Provost for Information Technology and CIO
Dorothy Leland, Chancellor Emerita
Haipeng Li, University Librarian
Mark Matsumoto, Dean School of Engineering
Charles Nies, Vice Chancellor for Student Affairs
Tracey Osborne, Associate Professor, Management of Complex Systems
Alex Petersen, Assistant Professor, Management of Complex Systems
Tom Peterson, former Executive Vice Chancellor and Provost
Mike Riley, former Interim Vice Chancellor for Finance and Business Administration
Juan Sánchez Muñoz, Chancellor
Maggie Saunders, Executive Director of Space Planning and Analysis
Kurt Schnier, Interim Chief Financial Officer and Associate Executive Vice Chancellor and Provost for Academic Planning and Budget
Steve Shackelton, Executive Director, E. & J Gallo Management Program
Molly Sims, former Executive Director, Major and Institutional Giving
Maria Tinoco, Director of Academic Budget and Policy, Financial Planning and Analysis
Sam Traina, former Vice Chancellor for Research and Economic Development
Marjorie Zatz, Interim Vice Chancellor for Research and Economic Development
James Zimmerman, Senior Associate Dean and Vice Provost, Division of Undergraduate Education

UC Merced Student Organizations

UC Merced Graduate Student Association: Brandon Batzloff and Ritwika

Vallomparambath Panikkassery Sugasree, Co-Presidents

CIS Graduate Student Association: Ayme Tomson, Chair

MIST Graduate Students: Taylor Fugere, Lead

Other Organizations

UC Merced Alumni Association: Brandon Ruscoe

Future Gallo School Advisory Council: Eric G. Chu, Luke Cooper, Robert Glushko,

James Hall, Ty Jagerson, Sandesh Mouli, Courtney Nicholas, Mark A. Riley, Mike

Roland, Dilawar Syed, Lawrence Trosen, Denise Watkins, Rani Yadav-Ranjan

Philanthropic Support

Lead Gift of the Gallo Endowment: Robert and Marie Gallo, Joseph E. Gallo, and the
E. & J. Gallo Winery

Endowed Chairs: McClatchy Newspapers, County Bank, Fred and Mitzi Ruiz and
Family

Endowed Scholarships: Merced Mall (Coddling Enterprises), Bank of America
Foundation, Charles Perry Ellis Trust, Ernest & Julio Gallo School of Management
Advisory Council Scholarship

Endowed Prizes: Robert J. Glushko Prize for Distinguished Undergraduate Cognitive
Science Research Endowment

Mackenzie Scott and Dan Jewett Gift: Mackenzie Scott and Dan Jewett

APPENDIX B: LIST OF FACULTY IN THE PROPOSED GALLO SCHOOL

Last	First	Title	Department
Aguirre-Munoz	Zenaida	Professor	Cognitive and Information Sciences
Backer	Kristina	Asst Professor	Cognitive and Information Sciences
Balasubramaniam	Ramesh	Professor	Cognitive and Information Sciences
Bortfeld**	Heather	Professor	Cognitive and Information Sciences
Holbrook	Colin	Assoc Professor	Cognitive and Information Sciences
Kello*	Christopher	Professor	Cognitive and Information Sciences
Marghetis	Tyler	Asst Professor	Cognitive and Information Sciences
Maglio**	Paul	Professor	Cognitive and Information Sciences
Matlock*	Teenie	Professor	Cognitive and Information Sciences
Noelle	David	Assoc Professor	Cognitive and Information Sciences
Padilla	Lace	Asst Professor	Cognitive and Information Sciences
Ryskin	Rachel	Asst Professor	Cognitive and Information Sciences
Smaldino	Paul	Assoc Professor	Cognitive and Information Sciences
Spivey	Michael	Professor	Cognitive and Information Sciences
Yoshimi	Jeff	Assoc Professor	Cognitive and Information Sciences
Amuedo-Dorantes	Catalina	Professor	Economics and Business Management
Ballis	Briana	Asst Professor	Economics and Business Management
Cook	Justin	Asst Professor	Economics and Business Management
Fons-Rosen	Christian	Assoc Professor	Economics and Business Management
Gray	Rowena	Assoc Professor	Economics and Business Management
Grossman	Zachary	Assoc Professor	Economics and Business Management
Hicks	Justin	Assoc Teaching Professor	Economics and Business Management
Innes	Robert	Professor	Economics and Business Management
Johnston	Andrew	Asst Professor	Economics and Business Management
Lee	Jason	Assoc Teaching Professor	Economics and Business Management
Sandoval-Hernandez	Jesus	Assoc Teaching Professor	Economics and Business Management
Schnier*	Kurt	Professor	Economics and Business Management
Sheth	Ketki	Asst Professor	Economics and Business Management
Tsoulouhas	Theofanis	Professor	Economics and Business Management
Tur-Prats	Ana	Asst Professor	Economics and Business Management
Wright	Greg	Assoc Professor	Economics and Business Management
Abatzoglou	John	Assoc Professor	Management of Complex Systems
Bales**	Roger	Professor	Management of Complex Systems
Bhappu	Anita	Assoc Professor	Management of Complex Systems
Castro	Spencer	Asst Professor	Management of Complex Systems
Jenkins	Jeffrey	Asst Professor	Management of Complex Systems
Keske	Catherine	Professor	Management of Complex Systems
Kolden	Crystal	Asst Professor	Management of Complex Systems

Lempiala	Tea	Asst Professor	Management of Complex Systems
Maglio*	Paul	Professor	Management of Complex Systems
McBride	Russell	Asst Professor	Management of Complex Systems
Osborne	Tracey	Assoc Professor	Management of Complex Systems
Petersen	Alexander	Assoc Professor	Management of Complex Systems
Westerling	LeRoy	Professor	Management of Complex Systems
Yeo	Lisa	Asst Professor	Management of Complex Systems
Conrad	Courtenay	Associate Professor	Political Science
Dasgupta	Adi	Assistant Professor	Political Science
Denny	Elaine	Assistant Professor	Political Science
Hansford	Thomas	Professor	Political Science
Hibbing	Matthew	Associate Professor	Political Science
Huang	Haifeng	Associate Professor	Political Science
LeVeck	Brad	Associate Professor	Political Science
Monroe	Nathan	Professor	Political Science
Ojeda	Christopher	Assistant Professor	Political Science
Rizzo	Tesalia	Assistant Professor	Political Science
Shaver	Andrew	Assistant Professor	Political Science
Trounstine	Jessica	Professor	Political Science

* Full or partial administrative appointment

** Zero-percent appointment

APPENDIX C: CURRENT ACADEMIC PROGRAMS

UNDERGRADUATE MAJOR REQUIREMENTS

COGNITIVE SCIENCE, B.A.

LOWER DIVISION MAJOR REQUIREMENTS [24-25 UNITS]

INTRODUCTION TO COGNITIVE SCIENCE REQUIREMENTS [4 UNITS]

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

QUANTITATIVE REASONING REQUIREMENT [4 UNITS]

- **CSE 015: Discrete Mathematics [4 Units]**

Explores basic concepts of discrete mathematics used in computer science and other disciplines that involve formal reasoning. Topics include logic, proof, counting, discrete probability, relations, graphs, trees, and Boolean algebra.

- **MATH 011: Calculus I [4 Units]**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

- **PHIL 005: Introduction to Logic [4 Units]**

Introduction to the techniques of deductive reasoning. Topics include the translation between English and symbolic language, rules of inference, deductive vs. inductive reasoning, validity and soundness, truth tables, and proof techniques in statement and predicate logic.

STATISTICAL METHODS REQUIREMENT [4 UNITS]

- **BIO 018: Data Science for Life Sciences [4 Units]**

Analytical and computational methods for statistical analysis of data. Descriptive statistics, graphical representations of data, correlation, regression, experiment design, introductory probability, random variables, sampling distributions, inference, and significance.

- **ECON 010: Statistical Inference [4 Units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and

inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

- **PSY 010: Analysis of Psychological Data [5 Units]**

Design and analysis of psychological research including experimental design, correlational research, and descriptive and inferential statistics.

INTRODUCTORY COURSE REQUIREMENT [8 UNITS] - TWO COURSES CHOSEN FROM THE FOLLOWING:

- **ANTH 001: Introduction to Sociocultural Anthropology [4 Units]**

Introduction to human culture and cultural diversity, including the methods by which anthropology—via the study of social institutions, shared practices, and collective meanings—seeks to understand how people adapt to, make sense of, and transform their worlds.

- **ANTH 005: Introduction to Biological Anthropology [4 Units]**

Introduction to evolution and how natural selection has shaped modern human variation. Examination of non-human primate behavior and how analogous it might be to that of early humans. Discussion of culture, the fossil evidence, genetics, and inheritance.

- **BIO 001: Contemporary Biology [4 Units]**

Introduces the major concepts in biology including origin of life, evolution, DNA, genes and genomes. Principles and patterns of inheritance, biotechnology, biodiversity, earth systems, environments and disease relationships in addition to ecosystem structures, function, nutrient cycles, pollution, and genotypes to phenotypes.

- **COGS 005: Introduction to Language and Linguistics [4 Units]**

An introduction to the scientific study of language. Topics include phonology, phonetics, syntax, semantics, pragmatics, sociolinguistics, psycholinguistics, historical linguistics, language acquisition, and natural discourse.

- **ECON 001: Introduction to Economics [4 Units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **PHIL 001: Introduction to Philosophy [4 Units]**

An introduction to the main areas of philosophy using classic and contemporary sources. Consideration of central and enduring problems in philosophy, such as skepticism about the external world, the mind-body problem and the nature of morality.

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **PSY 001: Introduction to Psychology [4 Units]**

Introduction to psychology as a science of behavior, including history, research methods, biological bases of behavior, cognition, personality, social behavior, psychological disorders, techniques of therapy and applied science.

- **SOC 001: Introduction to Sociology [4 Units]**

The study of groups, culture, collective behavior, classes and caste, community and ecology, role, status, and personality.

COMPUTING REQUIREMENT [4 UNITS] – ONE COMPUTING COURSE FROM THE FOLLOWING:

- **BIOE 021: Introduction to Computing with Python**

Provides an introduction to scientific and engineering computer programming using Python as the language. Covers programming fundamentals using specific engineering applications with examples drawn from various engineering and related disciplines including Bioengineering, Chemical Engineering, Economics, Biology, Bioinformatics. Being laboratory-based, focuses equally on programming concepts and on actual coding and implementation.

- **CSE 005: Introduction to Computer Applications [4 Units]**

This project-based experience presents the use of computers to control information flow: data collection, management, analysis, and presentation. Basic programming skills, selection of appropriate computer-based tools and languages, and data security are covered. Emphasis is placed on computer knowledge necessary for non-CSE majors to successfully use and manage data and information.

- **CSE 019: Introduction to Computing [4 Units]**

Presents the basics of programming to a student with no prior experience. Concepts of Input/Output, Data Types, Variables and Arrays will be introduced in the context of solving problems. Elementary programming skills such as conditional and loops execution will be emphasized. Object-oriented Programming, recursion and data manipulation will also be introduced. Students are expected to solve problems using different programming paradigms.

UPPER DIVISION MAJOR REQUIREMENTS [28 UNITS]

UPPER DIVISION MAJOR CORE REQUIREMENT [8 UNITS]

- **COGS 101: Mind, Brain, and Computation [4 Units]**

Further explores the issues covered in COGS 001, but with greater emphasis on computation, brain structure, neurological deficits, and the connection between mind and brain.

- **COGS 105: Research Methods for Cognitive Scientists [4 Units]**

Methods used for conducting interdisciplinary research in cognitive science. Topics range from identifying interesting problems, applying methods and theory to everyday cognitive

tasks, designing projects, collecting data, analyzing and interpreting data, modeling data, and writing up results. Lab work and group projects are included.

Additional Upper Division Cognitive Science Requirement [16 Units]: at least 4 additional upper division courses in Cognitive Science required.

Additional Upper Division Elective Requirement [4 Units]: complete one additional upper division course in Cognitive Science, Philosophy, Political Science, Psychology, Arts, Management, Economics, Biology, or Computer Science and Engineering.

COGNITIVE SCIENCE, B.S.

LOWER DIVISION MAJOR REQUIREMENTS [32-33 UNITS]

INTRODUCTION TO COGNITIVE SCIENCE REQUIREMENT [4 UNITS]

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

QUANTITATIVE REASONING REQUIREMENT [8 UNITS]

- **MATH 011: Calculus I [4 Units] Required**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

- **CSE 015: Discrete Mathematics [4 Units]**

Explores basic concepts of discrete mathematics used in computer science and other disciplines that involve formal reasoning. Topics include logic, proof, counting, discrete probability, relations, graphs, trees, and Boolean algebra.

- **MATH 012: Calculus II [4 Units]**

Continuation of MATH 011. Introduction to integral calculus of functions of one variable and differential equations, emphasizing conceptual understanding and applying mathematical concepts to real-world problem.

- **PHIL 005: Introduction to Logic [4 Units]**

Introduction to the techniques of deductive reasoning. Topics include the translation between English and symbolic language, rules of inference, deductive vs. inductive reasoning, validity and soundness, truth tables, and proof techniques in statement and predicate logic.

STATISTICAL METHODS REQUIREMENT [4 UNITS]

- **BIO 018: Data Science for Life Sciences [4 Units]**

Analytical and computational methods for statistical analysis of data. Descriptive statistics, graphical representations of data, correlation, regression, experiment design, introductory probability, random variables, sampling distributions, inference, and significance.

- **ECON 010: Statistical Inference [4 Units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

- **PSY 010: Analysis of Psychological Data [5 Units]**

Design and analysis of psychological research including experimental design, correlational research, and descriptive and inferential statistics.

INTRODUCTORY COURSE REQUIREMENT [8 UNITS]

- **ANTH 001: Introduction to Sociocultural Anthropology [4 Units]**

Introduction to human culture and cultural diversity, including the methods by which anthropology—via the study of social institutions, shared practices, and collective meanings—seeks to understand how people adapt to, make sense of, and transform their worlds.

- **ANTH 005: Introduction to Biological Anthropology [4 Units]**

Introduction to evolution and how natural selection has shaped modern human variation. Examination of non-human primate behavior and how analogous it might be to that of early humans. Discussion of culture, the fossil evidence, genetics, and inheritance.

- **BIO 001: Contemporary Biology [4 Units]**

Introduces the major concepts in biology including origin of life, evolution, DNA, genes and genomes. Principles and patterns of inheritance, biotechnology, biodiversity, earth systems, environments and disease relationships in addition to ecosystem structures, function, nutrient cycles, pollution, and genotypes to phenotypes.

- **COGS 005: Introduction to Language and Linguistics [4 Units]**

An introduction to the scientific study of language. Topics include phonology, phonetics, syntax, semantics, pragmatics, sociolinguistics, psycholinguistics, historical linguistics, language acquisition, and natural discourse.

- **ECON 001: Introduction to Economics [4 Units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **PHIL 001: Introduction to Philosophy [4 Units]**

An introduction to the main areas of philosophy using classic and contemporary sources. Consideration of central and enduring problems in philosophy, such as skepticism about the external world, the mind-body problem and the nature of morality.

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **PSY 001: Introduction to Psychology [4 Units]**

Introduction to psychology as a science of behavior, including history, research methods, biological bases of behavior, cognition, personality, social behavior, psychological disorders, techniques of therapy and applied science.

- **SOC 001: Introduction to Sociology [4 Units]**

The study of groups, culture, collective behavior, classes and caste, community and ecology, role, status, and personality.

COMPUTING REQUIREMENT [4 UNITS] – ONE COMPUTING COURSE FROM THE FOLLOWING:

- **BIOE 021: Introduction to Computing with Python**

Provides an introduction to scientific and engineering computer programming using Python as the language. Covers programming fundamentals using specific engineering applications with examples drawn from various engineering and related disciplines including Bioengineering, Chemical Engineering, Economics, Biology, Bioinformatics. Being laboratory-based, focuses equally on programming concepts and on actual coding and implementation.

- **CSE 019: Introduction to Computing [4 Units]**

Presents the basics of programming to a student with no prior experience. Concepts of Input/Output, Data Types, Variables and Arrays will be introduced in the context of solving problems. Elementary programming skills such as conditional and loops execution will be emphasized. Object-oriented Programming, recursion and data manipulation will also be introduced. Students are expected to solve problems using different programming paradigms.

SCIENCE INTRODUCTORY REQUIREMENT [4 UNITS] – COMPLETE ONE INTRODUCTORY COURSE FROM THE FOLLOWING:

- **BIO 001: Contemporary Biology [4 Units]**

Introduces the major concepts in biology including origin of life, evolution, DNA, genes and genomes. Principles and patterns of inheritance, biotechnology, biodiversity, earth systems, environments and disease relationships in addition to ecosystem structures, function, nutrient cycles, pollution, and genotypes to phenotypes. Taken with BIO 001L [1 unit].

- **CHEM 002: General Chemistry I [4 Units]**

First semester of a two-semester general chemistry sequence. Stoichiometric calculations, types of chemical reactions, properties of gases, thermochemistry, introduction to chemical equilibrium, basic atomic structure and atomic orbital theory, periodic properties, and chemical bonding. The concepts and quantitative skills introduced in lecture are reinforced by a discussion and laboratory section.

- **CHEM 008: Principles of Organic Chemistry [3 Units]**

Molecular shapes and charge distributions; resonance; electron delocalization; organic structures, nomenclature and isomerism, stereochemistry; optical activity; organic reactions; IR spectroscopy; intermolecular forces. Rational approaches to organic mechanism are emphasized.

- **CHEM 008L: Principles of Organic Chemistry Lab [1 Unit]**

Molecular shapes and charge distributions; resonance; electron delocalization; organic structures, nomenclature and isomerism, stereochemistry; optical activity; organic reactions; IR spectroscopy; intermolecular forces. Rational approaches to organic mechanism are emphasized.

- **PHYS 008: Introductory Physics I for Physical Sciences [4 Units]**

Introduction to classical and contemporary physics. Intended for students with preparation in calculus and algebra. Topics include introduction to forces, kinetics, equilibria, fluids, waves, and heat. Experiments and computer exercises are integrated into the course content.

- **PHYS 009: Introductory Physics II for Physical Sciences [4 Units]**

Continuation of introduction to classical and contemporary physics. Topics include introduction to electricity, magnetism, electromagnetic waves, optics, and modern physics. Experiments and computer exercises are integrated into the course content.

- **PHYS 018: Introductory Physics I for Biological Sciences [4 Units]**

First introductory physics course for biological science majors. Topics include vectors, kinematics, Newton's Laws, Work, Energy and Conservation, Torque and rotation, Fluids and Elasticity, Oscillations and Waves all with an emphasis on biological applications.

- **PHYS 019: Introductory Physics II for Biological Sciences [4 Units]**

The physical principles of electromagnetism and thermodynamics are introduced, examined, and discussed in the context of biological applications.

UPPER DIVISION MAJOR REQUIREMENTS [28 UNITS]

UPPER DIVISION MAJOR CORE REQUIREMENT [8 UNITS]

- **COGS 101: Mind, Brain, and Computation [4 Units]**

Further explores the issues covered in COGS 001, but with greater emphasis on computation, brain structure, neurological deficits, and the connection between mind and brain.

- **COGS 105: Research Methods for Cognitive Scientists [4 Units]**

Methods used for conducting interdisciplinary research in cognitive science. Topics range from identifying interesting problems, applying methods and theory to everyday cognitive tasks, designing projects, collecting data, analyzing and interpreting data, modeling data, and writing up results. Lab work and group projects are included.

Additional Upper Division Cognitive Science Requirement [16 Units]: complete at least 4 additional upper division courses in Cognitive Science. One upper division course in Biology, Computer Science and Engineering, or Philosophy may be substituted.

Additional Upper Division Elective Requirement [4 Units]: complete at least 1 additional upper division course in Cognitive Science, Philosophy, Political Science, Psychology, Arts, Management, Economics, Biology, or Computer Science and Engineering.

ECONOMICS, B.A.

LOWER DIVISION MAJOR REQUIREMENTS [16 UNITS]

LOWER DIVISION CORE REQUIREMENTS [8 UNITS]:

- **ECON 001: Introduction to Economics [4 units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **ECON 010: Statistical Inference [4 units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

MATHEMATICS REQUIREMENT [4 UNITS]

- **MATH 011: Calculus [4 units]**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

INTRODUCTORY COURSE REQUIREMENTS [4 UNITS]: ONE INTRODUCTORY COURSE CHOSEN FROM THE FOLLOWING:

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

- **PSY 001: Introduction to Psychology [4 Units]**

Introduction to psychology as a science of behavior, including history, research methods, biological bases of behavior, cognition, personality, social behavior, psychological disorders, techniques of therapy and applied science.

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **SOC 001: Introduction to Sociology [4 Units]**

The study of groups, culture, collective behavior, classes and caste, community and ecology, role, status, and personality.

UPPER DIVISION MAJOR REQUIREMENTS [32 UNITS]

UPPER DIVISION MAJOR CORE REQUIREMENTS [12 UNITS]

- **ECON 100: Intermediate Microeconomic Theory [4 Units]**

Price determination and resource distribution theory under conditions of perfect and imperfect competition. General equilibrium and welfare economics.

- **ECON 101: Intermediate Macroeconomic Theory [4 Units]**

Analysis of output, employment, interest rates, and the price level. The effects of these on changes in monetary and fiscal variables.

- **ECON 110: Econometrics [4 Units]**

Introduction of problems of observation, estimation and hypotheses testing in economics through the study of the theory and application of linear regression models, critical evaluation of selected examples of empirical research and exercises in applied economics.

ADDITIONAL UPPER DIVISION ECONOMICS REQUIREMENT [20 UNITS]: At least 5 additional upper division courses in Economics must be completed.

ECONOMICS, ECONOMIC ANALYSIS AND POLICY EMPHASIS, B.S.

LOWER DIVISION MAJOR REQUIREMENTS [28 UNITS]

LOWER DIVISION CORE REQUIREMENTS [8 UNITS]:

- **ECON 001: Introduction to Economics [4 units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **ECON 010: Statistical Inference [4 units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

MATHEMATICS REQUIREMENT [8 UNITS]

- **MATH 011: Calculus [4 units]**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

- **MATH 012: Calculus II [4 Units]**

Continuation of MATH 011. Introduction to integral calculus of functions of one variable and differential equations, emphasizing conceptual understanding and applying mathematical concepts to real-world problem.

COMPUTER SCIENCE REQUIREMENT [4 UNITS] – ONE COMPUTING COURSE FROM THE FOLLOWING:

- **BIOE 021: Introduction to Computing with Python**

Provides an introduction to scientific and engineering computer programming using Python as the language. Covers programming fundamentals using specific engineering applications with examples drawn from various engineering and related disciplines including Bioengineering, Chemical Engineering, Economics, Biology, Bioinformatics. Being laboratory-based, focuses equally on programming concepts and on actual coding and implementation.

- **CSE 019: Introduction to Computing [4 Units]**

Presents the basics of programming to a student with no prior experience. Concepts of Input/Output, Data Types, Variables and Arrays will be introduced in the context of solving problems. Elementary programming skills such as conditional and loops execution will be emphasized. Object-oriented Programming, recursion and data manipulation will also be introduced. Students are expected to solve problems using different programming paradigms.

INTRODUCTORY SOCIAL SCIENCE REQUIREMENTS [4 UNITS]: ONE INTRODUCTORY COURSE CHOSEN FROM THE FOLLOWING:

- **ANTH 001: Introduction to Sociocultural Anthropology [4 Units]**

Introduction to human culture and cultural diversity, including the methods by which anthropology—via the study of social institutions, shared practices, and collective meanings—seeks to understand how people adapt to, make sense of, and transform their worlds.

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

- **PH 001: Introduction to Public Health [4 Units]**

An introduction to Public Health, including i) scientific tools, ii) biomedical basis, iii) societal determinants of health, iv) environmental health, iv) role of the medical care system, v) population level interventions, vi) health communication and promotion, and vii) challenges facing public health.

- **PH 005: Global and International Public Health [4 Units]**

An overview of the dynamic factors that produce global health challenges, including demographic changes, conflict, human rights abuses, migration, travel, food production and distribution, water resources, and market forces and economic factors. We will also examine their responsibilities towards global health as global citizens.

- **PSY 001: Introduction to Psychology [4 Units]**

Introduction to psychology as a science of behavior, including history, research methods, biological bases of behavior, cognition, personality, social behavior, psychological disorders, techniques of therapy and applied science.

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **SOC 001: Introduction to Sociology [4 Units]**

The study of groups, culture, collective behavior, classes and caste, community and ecology, role, status, and personality.

INTRODUCTORY NATURAL SCIENCE REQUIREMENT [4 UNITS]: ONE INTRODUCTORY COURSE CHOSEN FROM THE FOLLOWING:

- **ANTH 005: Introduction to Biological Anthropology [4 Units]**

Introduction to evolution and how natural selection has shaped modern human variation. Examination of non-human primate behavior and how analogous it might be to that of early humans. Discussion of culture, the fossil evidence, genetics, and inheritance.

- **BIO 003: To Know Ourselves: Molecular Basis of Health Disease [4 Units]**

Introduces the molecular basis of a number of human diseases and molecular-based therapies for disease treatment.

- **BIO 005: Concepts and Issues in Biology Today [4 Units]**

Fundamental biological concepts in the areas of genetics, evolution and ecology are explored in the context of current issues enabling students to understand the relevance of biology to their lives both as individuals and as voting citizens.

- **BIO 050: Human Development [4 Units]**

Male and female reproductive systems, hormonal control of egg-sperm interactions, fertilization, venereal disease, embryonic development, fetal physiology.

- **BIO 051: Cancer and Aging [4 Units]**

Introduction to the biology of cancer and aging, including discussions of the biological and molecular basis of aging and cancer, novel and conventional cancer treatments, cancer prevention, and prospects for new approaches to increase longevity and health.

- **BIO 060: Nutrition [4 Units]**

Introduction to nutrition science that integrates basic concepts of nutrients, human physiology, microbiology, biochemistry, and the psychology of wellness.

- **CHEM 001: Preparatory Chemistry [4 Units]**

Preparation for general chemistry. Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept; acids and bases; stoichiometry; properties of the states of matter; gas laws; solutions, concentrations. NOTE: Chemistry 1 satisfies no requirements other than contribution to the 120 units required for graduation. Designed for students who need additional help prior to enrollment in General Chemistry.

- **ESS 001: Introduction to Earth Systems Science [4 Units]**

Introduction to basic principles of earth systems for non-science majors and prospective majors. A multidisciplinary approach that draws from geology, chemistry, physics, and biology to understand how the Earth functions as a complex system, and the role and impact of human beings on Earth systems.

- **ESS 002: Sustainability Science [4 Units]**

Explores the scientific basis for a rigorous definition of the concept of sustainability and its implementation in society. Using “back-of-the-envelope” style calculations it explains major magnitudes and trends of environmental impacts and sustainable activities. It will also

employ assignments and discussions that encourage communication across disciplinary barriers.

- **ESS 010: Earth Resources and Society [4 Units]**

We are users and changers of our planet. This course discusses the materials and resources our planet supplies to societies, and the environmental consequences that result from consumption. We will examine the origin and use of food, water, energy, and mineral resources, and consider challenges to management and sustainability.

- **ESS 015: Weather, Climate, and the Environment [4 Units]**

Introduces the Earth's weather and climate, and environmental issues associated with the Earth's atmosphere. Topics include weather measurements, maps, forecasts, and extreme weather events, and environmental topics such as air pollution, the ozone hole, and climate change.

- **ESS 020: Fundamentals of Geology [4 Units]**

Introduction to geology with emphasis on physical and chemical processes that have shaped the Earth through time. Topics include Earth history, plate tectonics, mineral and rock formation, mountain building and landscape evolution, and interior and surface geologic processes.

- **ESS 043: Biodiversity and Conservation [4 Units]**

Introduction to the study of biodiversity and conservation. Patterns, origin, and importance of biodiversity are discussed. An introduction to the major biological groups and the conservation efforts used to preserve contemporary biodiversity.

- **ESS 047: Astrobiology [4 Units]**

Astrobiology refers to the study of the origin and evolution of life in the cosmos: What is life, how did it form, and where is it? It is an integrative, multidisciplinary field that includes areas of astronomy, biology, (bio)chemistry, geology, and physics.

- **ESS 050: Ecosystems of California [4 Units]**

An introduction to ecological principles and processes through the examination of California's varied ecosystems; discussion of native and invasive species, land use, human impacts, and biodiversity; two Saturday field trips to a variety of California habitats.

- **ESS 065: Natural History of Dinosaurs [4 Units]**

Provides an introduction to the history of life, emphasizing the radiation of dinosaur species throughout the Mesozoic Era, and ecological roles filled by different dinosaur groups. Connections will be made between the ecological, and environmental events shaping the Mesozoic and those experienced throughout the Anthropocene.

UPPER DIVISION MAJOR REQUIREMENTS [32 UNITS]

UPPER DIVISION MAJOR CORE REQUIREMENTS [12 UNITS]

- **ECON 100: Intermediate Microeconomic Theory [4 Units]**

Price determination and resource distribution theory under conditions of perfect and imperfect competition. General equilibrium and welfare economics.

- **ECON 101: Intermediate Macroeconomic Theory [4 Units]**

Analysis of output, employment, interest rates, and the price level. The effects of these on changes in monetary and fiscal variables.

- **ECON 110: Econometrics [4 Units]**

Introduction of problems of observation, estimation and hypotheses testing in economics through the study of the theory and application of linear regression models, critical evaluation of selected examples of empirical research and exercises in applied economics.

QUANTITATIVE REQUIREMENTS [4 UNITS] – COMPLETE ONE OF THE FOLLOWING:

- **ECON 170: Game Theory [4 Units]**

Consideration of non-cooperative games in the strategic and extensive form as well as applications of game theory to issues in social science and philosophy. Topics may include: solution concepts for non-cooperative games; epistemic foundations for solution concepts; indefinitely repeated games; theories of equilibrium selection; experimental game theory.

- **ECON 171: Advanced Econometrics [4 Units]**

Develops techniques that are commonly used in empirical research beyond that of OLS. Students will learn how to analyze data, make informed conclusions, and critique the limitations and assumptions of empirical analysis. Emphasizes the application of econometrics through the use of cutting edge statistical software packages.

- **POLI 170: Theoretical Models of Politics [4 Units]**

The development, utility, and limitations of theoretical models of the political world. May include rational choice theory, game theory, and psychological theories of politics.

APPLIED ECONOMIC ANALYSIS REQUIREMENTS [4 UNITS] – COMPLETE ONE OF THE FOLLOWING:

- **ECON 115: Economics of Industrial Organization [4 Units]**

Examination of firm behavior in various competitive environments. Extends the theory of the firm and introduces real-world complications, such as contract enforcement, property rights, and limited information. Analyzes the determinants of market power by firms, strategic interactions among firms, and the role of government regulation.

- **ECON 140: Labor Economics [4 Units]**

Analysis of the economic forces that shape labor markets, institutions, and performance in the United States and other countries, with special attention to the determinants of labor supply and demand, human capital investment, and government policy.

- **ECON 145: Health Economics [4 Units]**

An economic analysis of policies and institutions in the U.S. health care sector: supply and demand for health services, conceptual and policy issues relating to health insurance, and economic analysis of efficient regulatory policies toward the health care sector.

- **ECON 150: Economic Development [4 Units]**

Problems of underdevelopment and poverty, policy issues, and development strategy.

- **ECON 151: The Economics of Government and Business [4 Units]**

The influence of governmental revenue and expenditure decisions on economic performance. Examines such issues as public goods and externalities, as well as specific expenditure and taxation programs.

- **ECON 161: International Finance and Trade [4 Units]**

Examines the determination of exchange rates, managing exchange rate risk, and the international macroeconomy. Topics may include the balance of payments mechanism, international banking and credit risk, the economics of foreign direct investment, international financial crises, and policy issues in international finance such as fixed versus floating exchange rates.

ADDITIONAL UPPER DIVISION ECONOMICS REQUIREMENT [20 UNITS]: 5 additional upper division elective Economics courses, of which at least three should be selected from economic analysis and policy-oriented classes.

ECONOMICS, QUANTITATIVE ECONOMICS EMPHASIS, B.S.

LOWER DIVISION MAJOR REQUIREMENTS [36 UNITS]

LOWER DIVISION CORE REQUIREMENTS [8 UNITS]:

- **ECON 001: Introduction to Economics [4 units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **ECON 010: Statistical Inference [4 units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

MATHEMATICS REQUIREMENT [16 UNITS]

- **MATH 011: Calculus [4 units]**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

- **MATH 012: Calculus II [4 Units]**

Continuation of MATH 011. Introduction to integral calculus of functions of one variable and differential equations, emphasizing conceptual understanding and applying mathematical concepts to real-world problem.

- **MATH 023: Vector Calculus [4 Units]**

Calculus of several variables. Topics include parametric equations and polar coordinates, algebra and geometry of vectors and matrices, partial derivatives, multiple integrals, and introduction to the theorems of Green, Gauss, and Stokes.

- **MATH 024: Linear Algebra and Differential Equations [4 Units]**

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations and linear systems of differential equations.

COMPUTER SCIENCE REQUIREMENT [4 UNITS] – ONE COMPUTING COURSE FROM THE FOLLOWING:

- **BIOE 021: Introduction to Computing with Python**

Provides an introduction to scientific and engineering computer programming using Python as the language. Covers programming fundamentals using specific engineering applications with examples drawn from various engineering and related disciplines including Bioengineering, Chemical Engineering, Economics, Biology, Bioinformatics. Being laboratory-based, focuses equally on programming concepts and on actual coding and implementation.

- **CSE 019: Introduction to Computing [4 Units]**

Presents the basics of programming to a student with no prior experience. Concepts of Input/Output, Data Types, Variables and Arrays will be introduced in the context of solving problems. Elementary programming skills such as conditional and loops execution will be emphasized. Object-oriented Programming, recursion and data manipulation will also be introduced. Students are expected to solve problems using different programming paradigms.

INTRODUCTORY SOCIAL SCIENCE REQUIREMENTS [4 UNITS]: ONE INTRODUCTORY COURSE CHOSEN FROM THE FOLLOWING:

- **ANTH 001: Introduction to Sociocultural Anthropology [4 Units]**

Introduction to human culture and cultural diversity, including the methods by which anthropology—via the study of social institutions, shared practices, and collective meanings—seeks to understand how people adapt to, make sense of, and transform their worlds.

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

- **PH 001: Introduction to Public Health [4 Units]**

An introduction to Public Health, including i) scientific tools, ii) biomedical basis, iii) societal determinants of health, iv) environmental health, iv) role of the medical care system, v) population level interventions, vi) health communication and promotion, and vii) challenges facing public health.

- **PH 005: Global and International Public Health [4 Units]**

An overview of the dynamic factors that produce global health challenges, including demographic changes, conflict, human rights abuses, migration, travel, food production and distribution, water resources, and market forces and economic factors. We will also examine their responsibilities towards global health as global citizens.

- **PSY 001: Introduction to Psychology [4 Units]**

Introduction to psychology as a science of behavior, including history, research methods, biological bases of behavior, cognition, personality, social behavior, psychological disorders, techniques of therapy and applied science.

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **SOC 001: Introduction to Sociology [4 Units]**

The study of groups, culture, collective behavior, classes and caste, community and ecology, role, status, and personality.

INTRODUCTORY NATURAL SCIENCE REQUIREMENT [4 UNITS]: ONE INTRODUCTORY COURSE CHOSEN FROM THE FOLLOWING:

- **ANTH 005: Introduction to Biological Anthropology [4 Units]**

Introduction to evolution and how natural selection has shaped modern human variation. Examination of non-human primate behavior and how analogous it might be to that of early humans. Discussion of culture, the fossil evidence, genetics, and inheritance.

- **BIO 003: To Know Ourselves: Molecular Basis of Health Disease [4 Units]**

Introduces the molecular basis of a number of human diseases and molecular-based therapies for disease treatment.

- **BIO 005: Concepts and Issues in Biology Today [4 Units]**

Fundamental biological concepts in the areas of genetics, evolution and ecology are explored in the context of current issues enabling students to understand the relevance of biology to their lives both as individuals and as voting citizens.

- **BIO 050: Human Development [4 Units]**

Male and female reproductive systems, hormonal control of egg-sperm interactions, fertilization, venereal disease, embryonic development, fetal physiology.

- **BIO 051: Cancer and Aging [4 Units]**

Introduction to the biology of cancer and aging, including discussions of the biological and molecular basis of aging and cancer, novel and conventional cancer treatments, cancer prevention, and prospects for new approaches to increase longevity and health.

- **BIO 060: Nutrition [4 Units]**

Introduction to nutrition science that integrates basic concepts of nutrients, human physiology, microbiology, biochemistry, and the psychology of wellness.

- **CHEM 001: Preparatory Chemistry [4 Units]**

Preparation for general chemistry. Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept; acids and bases; stoichiometry; properties of the states of matter; gas laws; solutions, concentrations. NOTE: Chemistry 1 satisfies no requirements other than contribution to the 120 units required for graduation. Designed for students who need additional help prior to enrollment in General Chemistry.

- **ESS 001: Introduction to Earth Systems Science [4 Units]**

Introduction to basic principles of earth systems for non-science majors and prospective majors. A multidisciplinary approach that draws from geology, chemistry, physics, and biology to understand how the Earth functions as a complex system, and the role and impact of human beings on Earth systems.

- **ESS 002: Sustainability Science [4 Units]**

Explores the scientific basis for a rigorous definition of the concept of sustainability and its implementation in society. Using “back-of-the-envelope” style calculations it explains major magnitudes and trends of environmental impacts and sustainable activities. It will also employ assignments and discussions that encourage communication across disciplinary barriers.

- **ESS 010: Earth Resources and Society [4 Units]**

We are users and changers of our planet. This course discusses the materials and resources our planet supplies to societies, and the environmental consequences that result from consumption. We will examine the origin and use of food, water, energy, and mineral resources, and consider challenges to management and sustainability.

- **ESS 015: Weather, Climate, and the Environment [4 Units]**

Introduces the Earth's weather and climate, and environmental issues associated with the Earth's atmosphere. Topics include weather measurements, maps, forecasts, and extreme weather events, and environmental topics such as air pollution, the ozone hole, and climate change.

- **ESS 020: Fundamentals of Geology [4 Units]**

Introduction to geology with emphasis on physical and chemical processes that have shaped the Earth through time. Topics include Earth history, plate tectonics, mineral and rock formation, mountain building and landscape evolution, and interior and surface geologic processes.

- **ESS 043: Biodiversity and Conservation [4 Units]**

Introduction to the study of biodiversity and conservation. Patterns, origin, and importance of biodiversity are discussed. An introduction to the major biological groups and the conservation efforts used to preserve contemporary biodiversity.

- **ESS 047: Astrobiology [4 Units]**

Astrobiology refers to the study of the origin and evolution of life in the cosmos: What is life, how did it form, and where is it? It is an integrative, multidisciplinary field that includes areas of astronomy, biology, (bio)chemistry, geology, and physics.

- **ESS 050: Ecosystems of California [4 Units]**

An introduction to ecological principles and processes through the examination of California's varied ecosystems; discussion of native and invasive species, land use, human impacts, and biodiversity; two Saturday field trips to a variety of California habitats.

- **ESS 065: Natural History of Dinosaurs [4 Units]**

Provides an introduction to the history of life, emphasizing the radiation of dinosaur species throughout the Mesozoic Era, and ecological roles filled by different dinosaur groups. Connections will be made between the ecological, and environmental events shaping the Mesozoic and those experienced throughout the Anthropocene.

UPPER DIVISION MAJOR REQUIREMENTS [32 UNITS]

UPPER DIVISION MAJOR CORE REQUIREMENTS [12 UNITS]

- **ECON 100: Intermediate Microeconomic Theory [4 Units]**

Price determination and resource distribution theory under conditions of perfect and imperfect competition. General equilibrium and welfare economics.

- **ECON 101: Intermediate Macroeconomic Theory [4 Units]**

Analysis of output, employment, interest rates, and the price level. The effects of these on changes in monetary and fiscal variables.

- **ECON 110: Econometrics [4 Units]**

Introduction of problems of observation, estimation and hypotheses testing in economics through the study of the theory and application of linear regression models, critical evaluation of selected examples of empirical research and exercises in applied economics.

QUANTITATIVE REQUIREMENTS [8 UNITS] – COMPLETE TWO OF THE FOLLOWING:

- **ECON 170: Game Theory [4 Units]**

Consideration of non-cooperative games in the strategic and extensive form as well as applications of game theory to issues in social science and philosophy. Topics may include: solution concepts for non-cooperative games; epistemic foundations for solution concepts; indefinitely repeated games; theories of equilibrium selection; experimental game theory.

- **ECON 171: Advanced Econometrics [4 Units]**

Develops techniques that are commonly used in empirical research beyond that of OLS. Students will learn how to analyze data, make informed conclusions, and critique the limitations and assumptions of empirical analysis. Emphasizes the application of econometrics through the use of cutting edge statistical software packages.

- **MATH 101: Real Analysis [4 Units]**

Introduction to rigorous mathematical proofs and concepts pertaining to real numbers. The class will cover the structure of real numbers, sequences, series and functions of real numbers, and, time permitting, concepts of abstract algebra.

- **POLI 170: Theoretical Models of Politics [4 Units]**

The development, utility, and limitations of theoretical models of the political world. May include rational choice theory, game theory, and psychological theories of politics.

ADDITIONAL UPPER DIVISION ECONOMICS REQUIREMENT [12 UNITS]: 3 additional upper division elective Economics courses.

MANAGEMENT AND BUSINESS ECONOMICS, B.S.

LOWER DIVISION MAJOR REQUIREMENTS [28 UNITS]

INTRODUCTORY ECONOMICS REQUIREMENT [8 UNITS]

- **ECON 001: Introduction to Economics [4 Units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **ECON 005: Introduction to Business and Finance [4 Units]**

Provides an introduction to the modern business enterprise. It covers the role of the business enterprise in the global economy; financial tools, including the time value of money and capital budgeting; product pricing and marketing; and personal financial management.

ACCOUNTING REQUIREMENT [8 UNITS]

- **ECON 006A: Financial Accounting [4 Units]**

A broad introduction to accounting. Students draw up and interpret accounts and are introduced to some key ideas of auditing. Covers the fundamental accounting concepts and how to apply them; record accounting entries, prepare accounts for different business entities and understand the differences between them, the basic principles of auditing.

And then complete either:

- **ECON 006B: Financial Accounting II [4 Units]**

Covers tools of financial accounting, including accounting for revenues and costs in the income statement; cash flows; and assets, liabilities, and equity in the balance sheet. There will be in-depth coverage of accounting for cash, receivables, inventories, property, plant and equipment, depreciation, and intangible assets.

- **ECON 007: Managerial Accounting [4 Units]**

Learn what financial information is needed within an organization; where to obtain this information; and how managers can use this information. Topics include cost behavior and forecasting, capital budgeting, activity-based costing and management, costs of quality and productivity improvement programs, cost-volume analysis, tactical decision making and transfer pricing.

ADDITIONAL LOWER DIVISION REQUIREMENT [12 UNITS]

- **CSE 005: Introduction to Computer Applications [4 Units]**

This project-based experience presents the use of computers to control information flow: data collection, management, analysis, and presentation. Basic programming skills, selection of appropriate computer-based tools and languages, and data security are covered. Emphasis is placed on computer knowledge necessary for non-CSE majors to successfully use and manage data and information.

- **ECON 010: Statistical Inference [4 Units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

- **MATH 011: Calculus I [4 Units]**

Introduction to differential and integral calculus of functions of one variable, including exponential, logarithmic and trigonometric functions, emphasizing conceptual understanding and applying mathematical concepts to real-world problems (approximation, optimization).

UPPER DIVISION MAJOR REQUIREMENTS [32 UNITS]

UPPER DIVISION ECONOMICS REQUIREMENT [20 UNITS]

- **ECON 100: Intermediate Microeconomic Theory [4 Units]**

Price determination and resource distribution theory under conditions of perfect and imperfect competition. General equilibrium and welfare economics.

- **ECON 101: Intermediate Macroeconomic Theory [4 Units]**

Analysis of output, employment, interest rates, and the price level. The effects of these on changes in monetary and fiscal variables.

- **ECON 105: Corporate Finance [4 Units]**

Explores corporate decision making in allocating investment funds to capital projects and alternative methods of raising capital from financial markets. Related topics include asset pricing, capital budgeting, capital structure, dividend policy, valuation of bonds, stocks, and options. Particular attention is paid to how managers maximize shareholder wealth.

- **ECON 108: Marketing and Consumer Behavior [4 Units]**

Outlines the foundations of marketing and its relationship with consumer behavior. Emphasis on the fundamental concepts underlying modern marketing practices including consumer preferences, product value, pricing strategies, retail markets, brand loyalty, advertising, product development and marketing ethics.

- **ECON 110: Econometrics [4 Units]**

Introduction of problems of observation, estimation and hypotheses testing in economics through the study of the theory and application of linear regression models, critical evaluation of selected examples of empirical research and exercises in applied economics.

ADDITIONAL UPPER DIVISION REQUIREMENTS [12 UNITS]: three additional courses in ECON or MGMT required.

POLITICAL SCIENCE, B.A.

LOWER DIVISION MAJOR REQUIREMENTS [16 UNITS]

LOWER DIVISION MAJOR CORE REQUIREMENT [8 UNITS]

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **POLI 010: Understanding Political Controversies [4 Units]**

Overview of the application of social scientific methods to the study of politics. Covers research design, hypothesis testing, measurement, and a variety of methodological approaches (e.g. experiments, descriptive and inferential statistics, qualitative analysis) to answering political questions.

ADDITIONAL LOWER DIVISION POLITICAL SCIENCE REQUIREMENT [8 UNITS]

- **POLI 002: Controversies in American Politics [4 Units]**

Examination of select problems in contemporary American politics. Possible subjects include campaign finance, culture wars and party polarization, barriers to third party success, and media coverage of politics.

- **POLI 003: Introduction to Comparative Politics [4 Units]**

Introduction to the cross-national study of political institutions and behavior. Formal and informal aspects of politics in selected countries are covered, as are comparative research methods.

- **POLI 005: Introduction to International Relations [4 Units]**

Introduction to the study of the politics of conflict and war, diplomacy, international cooperation, and international institutions.

- **POLI 006: Global Issues [4 Units]**

Examination of select problems in international relations and foreign policy. Possible topics include terrorism, proliferation of nuclear weapons, and conflict in the Middle East.

- **POLI 009: Community Mobilization and Politics [4 Units]**

Examination of political and social mobilization at the local level, including strategies for organization and advocacy.

UPPER DIVISION MAJOR REQUIREMENTS [36 UNITS]

Subfield Requirement [24 Units] – Complete three courses per subfield for two of the following subfields for a total of six courses.

- **American Politics: POLI 100 - POLI 127**
- **Comparative Politics: POLI 130 – POLI 142**
- **International Relations: POLI 150 – POLI 165**
- **Law and Policy: (POLI 100, POLI 102, POLI 106, POLI 107, POLI 108, POLI 110, POLI 111, POLI 112, POLI 138, POLI 165, POLI 192/POLI 092)**

ADDITIONAL ELECTIVE REQUIREMENTS [12 UNITS]: three additional upper division courses in Political Science

UNDERGRADUATE MINOR REQUIREMENTS

COGNITIVE SCIENCE MINOR

LOWER DIVISION MINOR REQUIREMENTS [4 UNITS]

- **COGS 001: Introduction to Cognitive Science [4 Units]**

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

UPPER DIVISION MINOR REQUIREMENTS [16 UNITS]

- **COGS 101: Mind, Brain, and Computation [4 Units]**

Further explores the issues covered in COGS 001, but with greater emphasis on computation, brain structure, neurological deficits, and the connection between mind and brain.

Three additional upper division courses in Cognitive Science

ECONOMICS MINOR

LOWER DIVISION MINOR REQUIREMENTS [8 UNITS]

- **ECON 001: Introduction to Economics [4 units]**

Introduction to economics principles and methods, including microeconomics (operation of the economy at the individual and firm level) and macroeconomics (nature and functions of the national economy in a global context).

- **ECON 010: Statistical Inference [4 units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

UPPER DIVISION MINOR REQUIREMENTS [16 UNITS]

A minimum of 4 upper division ECON courses are required.

MANAGEMENT AND BUSINESS ECONOMICS MINOR

LOWER DIVISION MINOR REQUIREMENTS [8 UNITS]

- **ECON 006A: Financial Accounting [4 Units]**

A broad introduction to accounting. Students draw up and interpret accounts and are introduced to some key ideas of auditing. Covers the fundamental accounting concepts and how to apply them; record accounting entries, prepare accounts for different business entities and understand the differences between them, the basic principles of auditing.

- **ECON 010: Statistical Inference [4 Units]**

Introduction to the application of social scientific methods to the study of economics, politics, and management. Covers research design, random sampling, descriptive and inferential statistics, hypothesis testing, and the linear regression model with an emphasis on applications.

UPPER DIVISION MINOR REQUIREMENTS [16 UNITS]

A minimum of 4 upper division ECON or MGMT courses are required.

MANAGEMENT ANALYTICS AND DECISION-MAKING MINOR

FUNDAMENTAL REQUIREMENT [4 UNITS]

- **MIST 050: Introduction to Entrepreneurship [4 Units]**

Provides hands-on training in the practice of entrepreneurship where students learn to make actual money in challenging exercises in “the real world” (or measurably improve a social good if students choose a social entrepreneurship project).

CORE AREAS REQUIREMENT [12 UNITS]

Complete three courses from the following:

- **MIST 130: Statistical Data Analysis and Optimization in R for Decision Support [4 Units]**

Introduces statistical analysis and optimization for decision support using the R programming environment. Analyze and visualize data and model relationships using graphing techniques, correlation and regression analysis, scenario development and analysis, sensitivity analysis, simulations, and optimization. Emphasizes applied work using real data from resource management and service management examples to support decision making. Case driven and team-focused, emphasizes best practices and professional ethics for analyzing, modeling and communicating empirical data and model results.

- **MIST 131: Data Governance for Analytics Projects [4 Units]**

Introduces skills and technologies to appropriately collect, manage, and safely dispose of data; known as “Data Governance” in industry. Explores the analytics research process from translating business problems into research questions that can be addressed through analytics. Develops the ability to frame a business problem, map alternative solutions, and identify sources for relevant data. Investigates threats to collection, storage, and protection of relevant data, and creating a plan to protect the important data assets.

- **MIST 132: Geographic Information Systems Analysis in Management [4 Units]**

Introduces geographic information systems (GIS) for sustainability management as the technology of processing spatial data, including input, storage and retrieval; manipulation and analysis; reporting and interpretation. Emphasizes GIS as a decision support tool for problem solving in natural resource management, forestry, conservation, water, wildfire, agriculture, and other sustainability fields.

- **MIST 133: Service Innovation [4 Units]**

Focuses on service innovation, generation of new successful service ventures. Helps students gain the skills necessary to be successful in three main aspects of service production and delivery systems: the back office, the front office, and service design.

- **MIST 134: Methods of Data and Network Science [4 Units]**

Explores methods to efficiently manage and analyze large complex datasets. The computer lab will introduce the Mathematica programming language with a focus on extracting data from websites, exploring, and inquiry-oriented analyses and visualizations. Introduction to network science theory useful in understanding and managing complex socio-technological systems.

- **MIST 135: Technical Communication and Visualization Skills [4 Units]**

Theory of effective communication in quantitative contexts drawing on various presentation modes – written, oral, graphical, PowerPoint, poster. Seminars on theory and best-practices combined with individual and team project presentations. Opportunity to improve inquiry-oriented communication skills, to give and receive constructive feedback, and to learn graphical methods for developing striking visualizations.

- **MIST 136: Retailing Management [4 Units]**

Provides students with a panoramic view of the changing nature of retailing and the many complex management issues facing retailers today using a social scientific approach. Emphasis is placed on the analysis of retail business models and operational strategies to market goods and services in two or more channels. Students learn about evolving consumer behavior and omnichannel supply chain management, as well as the social, environmental and economic impacts of retailing.

- **MIST 137: Managing Teamwork [4 Units]**

Provides students with a comprehensive understanding of how individuals respond to doing complex work in small groups using a social scientific approach. Students learn about important interpersonal processes and how to make them more effective, both individually

and collectively. Emphasis is placed on managing and leading high-performing diverse teams to maximize positive individual and collective outcomes in a variety of organizational contexts.

- **MIST 164: Energy Policy [4 Units]**

Introduces students to contemporary energy policy and presents fundamental tools for modeling firm and market behavior in the energy sector.

- **MIST 175: Information Systems for Management [4 Units]**

Introduces organizational use of information systems and information technology, and discusses how these create value for organizations.

- **MIST 190: Special Topics [4 Units]**

Provides lectures on special topics within Management, Innovation, Sustainability, and Technology that are not covered in the regularly scheduled courses. Each class will have a specific focus which will be defined by the instructor of the course on a semester-by-semester basis.

ELECTIVE REQUIREMENT [4 UNIT]

Complete 1 upper division course related to Management Analytics and Decision-Making in Cognitive Science, Computing Science and Engineering, Economics, Mathematics, Psychology, or other disciplines.

POLITICAL SCIENCE MINOR

LOWER DIVISION MINOR REQUIREMENTS [4 UNITS] – COMPLETE ONE OF THE FOLLOWING

- **POLI 001: Introduction to American Politics [4 Units]**

A general introduction to political institutions and political behavior in the United States. Specific topics include the U.S. Constitution, Congress, the presidency, the federal judiciary, political parties, interest groups, mass public opinion, elections, and voting behavior.

- **POLI 003: Introduction to Comparative Politics [4 Units]**

Introduction to the cross-national study of political institutions and behavior. Formal and informal aspects of politics in selected countries are covered, as are comparative research methods.

- **POLI 005: Introduction to International Relations [4 Units]**

Introduction to the study of the politics of conflict and war, diplomacy, international cooperation, and international institutions.

UPPER DIVISION MINOR REQUIREMENTS [16 UNITS]

Complete a minimum of four upper-division Political Science courses.

GRADUATE DEGREES

COGNITIVE AND INFORMATION SCIENCES, M.S. AND PH.D.

The Cognitive and Information Sciences Ph.D. program offers its students interdisciplinary training in cognitive science with an emphasis on computation, technology and applications. This emphasis distinguishes us from other Cognitive Science graduate programs. We view intelligent behaviors not just as emerging solely from neural processes, but from interactions between brain, body, and environment. Thus intelligent behaviors may also emerge from group and social interactions situated in their economic and technological milieu. The word “information” in CIS denotes our multi-scale perspective on cognition, and our emphases on computational approaches and applications towards developing technologies that foster, and even aspire to emulate, intelligent behavior.

Our award-winning faculty specialize in a variety of areas that intersect at this nexus, including computational modeling, complex systems theory, distributed cognition, categorization, psycholinguistics, cognitive linguistics, visual perception, cognitive engineering, service science, artificial intelligence, reasoning, computer vision, philosophy of mind, cognitive neuroscience, and bioinformatics. With computational, technological, and application oriented skills in these areas, students who graduate from this Ph.D. program will have career opportunities in both academia and industry.

ECONOMICS, M.A. AND PH.D.

The economics Ph.D. program focuses on utilizing economic theory and modeling to address real world problems that advance our understanding of human behavior and facilitates efficient public policy. The Ph.D. program focuses on two concentrations highly relevant to the advancement of modern economics: (1) Economic Geography and International Development; and (2) Environmental and Resource Economics. Our program concentrates on conducting applied economic research with a strong foundation in econometric analysis.

MANAGEMENT OF COMPLEX SYSTEMS, M.S. AND PH.D.

The Management of Complex Systems (MCS) program is designed to educate a new generation of management scholars with depth in analytical methods and a focus on complexity as the driving force behind issues in management of human-technology systems and in management of coupled human-natural systems. The program draws upon the multidisciplinary composition of MIST faculty and the interdisciplinary spirit of UC Merced to deliver a distinctive educational experience – one that provides students the flexibility to cross-breed coursework and mentorship with other domains of engineering, science, and social science. Likewise, the program does not require prospective students to have any particular undergraduate degree.

Courses are directly taught by MIST core faculty who have expertise in various facets of adaptive management of complex coupled human and natural systems, including for-profit and not-for-profit organizations and public and private enterprises. As such, coursework and thesis projects are aimed at developing management skills tailored for ‘wicked problems’—those of indeterminate scale and scope requiring interdisciplinary collaboration—that that are so often

encountered in complex adaptive systems. Both the sources and solutions to the grand challenges of the 21st century are at the intersection of people, organizations, information, technology, and the natural world. By focusing on this nexus, this program will prepare our students with a valuable skillset for working with other scholars, practitioners, and policy makers in order to address challenges of monitoring, analysis, modeling, entrepreneurship, adaptive management and change leadership that managers and leaders are faced with across a diverse array of public and private organizations.

Prospective applicants must hold the equivalent of a bachelor's degree from a four-year accredited college or university.

MANAGEMENT OF INNOVATION, SUSTAINABILITY, AND TECHNOLOGY, M.M.

The Master of Management (M.M) 12-month program offered by MIST faculty provides students with fluency in managerial thinking and practice, enhancing their readiness to fit and succeed in an organization within the private or public sector. The M.M. curriculum is designed for recent graduates looking to complement their undergraduate degree with real-world management knowledge and skills and draws on concepts from business, engineering, natural and social sciences, computing, and data analytics. Particular focus is paid to management problems associated with the Central Valley. In consultation with regional employers, this program is designed around relevant case studies and integrative team projects that foster valuable discussion, oral presentation, professional writing, and leadership skills for solving complex problems about sustaining our environment, society, and economy. Along these lines, the curriculum highlights the challenges of finding solutions that simultaneously balance corporate profitability and stewardship of natural resources.

Prospective applicants must hold the equivalent of a bachelor's degree from a four-year accredited college or university.

POLITICAL SCIENCE, M.A. AND PH.D.

The Political Science program offers quantitatively focused training in two broad areas: Political Cognition & Behavior (CAB) and Political Institutions & Political Economy (PIPE). The program is research intensive, innovative, and tailored to students' individual interest within the field of Political Science. Students are admitted to the Political Science Program to work toward a Ph.D. degree.

The M.A. degree is offered only as an option for students admitted to the Ph.D. program.

The program offers a unique graduate experience. First, graduate training is grounded on a student's access to and engagement with faculty. The small size of the program guarantees that seminar classes will be small and students will have unparalleled one-on-one faculty mentoring with respect to research, training and professional development. Second, early graduate education will not be limited to the traditional classroom setting. After the first year, students begin to apply and sharpen research skills by directly working with faculty in a required research practicum. Third, by eliminating traditional subfield boundaries, the program allows students to ask and answer cutting-edge questions that would be stifled by traditional subfield divisions. The

lack of subfield barriers also encourages interdisciplinary research and allows students to interact with a mix of cognitive scientists, economists, psychologists, philosophers, and sociologists during their training. Our program is a particularly good fit for students with research interests that span traditional disciplinary boundaries, such as political psychology or political economy.

APPENDIX D: FACULTY RESEARCH INTERESTS

COGNITIVE AND INFORMATION SCIENCES

Zenaida Aguirre-Muñoz, Professor. Zenaida Aguirre-Muñoz’s research integrates cognitive science, language, learning sciences, and assessment applied to the following research interests: (a) STEM education; (b) model-based assessment and instruction of dual language learners; (c) the impact of opportunity to learn on learning and achievement; and (d) content-area literacy development for dual language learners. Her research projects have been funded by organizations such as NSF, NIH, Department of Energy, and the US Department of Education.

Kristina Backer, Assistant Professor. Kristina Backer’s research lies at the intersection of cognitive and auditory neuroscience. Real-world listening environments are often noisy. In these acoustically-adverse listening situations, perceptual and cognitive processes dynamically interact, thereby enabling successful speech comprehension. Thus, one line of research aims to elucidate the neural mechanisms underlying these dynamic perceptual-cognitive interactions in young adults with normal hearing. Age-related changes in auditory perception and certain cognitive processes, such as selective attention, can exacerbate the effort required for speech comprehension in noise. Therefore, a second research aim is to understand how aging and hearing loss affect the perceptual and cognitive processes that are engaged during listening. Finally, a third research goal is to characterize how language experience and language context modulate perceptual and cognitive processing during listening, throughout the lifespan. Methods used in the laboratory include behavioral paradigms and electroencephalography (EEG) recordings.

Ramesh Balasubramaniam, Professor. Ramesh Balasubramaniam’s research focuses on cognitive, neurophysiological and dynamical systems approaches to coordinated human action, using the human motor system as a vehicle to understand the embodied nature of cognition. In particular, Balasubramaniam’s work looks at several functions of the motor system including planning, prediction, anticipation, and simulation to understand sensory and cognitive functions of the brain. Methods include 3-D motion capture, eye tracking, robotic exoskeletons, TMS, EEG and other electrophysiological recordings to study the brain and behavior. Particular problems relate to (1) sensorimotor timing (2) visual and auditory guidance of action (3) posture, balance and the control of unstable objects (4) music and synchronization and (5) human interaction with robotic systems and agents. Much of this research borrows from principles of complex systems, where the behavior of a system of many components is significantly different, yet simpler than the behavior of the components themselves. This research is supported by several grants from the National Science Foundation and other sources. Balasubramaniam also directs the NSF-NRT graduate interdisciplinary training program in intelligent adaptive systems, which provides students with a learning environment that combines elements of computation and data science.

Heather Bortfeld, Professor. Heather Bortfeld’s research follows two converging lines, one in typical and one in atypical language learning and use, specifically under adverse listening conditions. The first line looks at things like: how typically developing infants come to recognize words in fluent speech and the extent to which the perceptual abilities underlying this learning process are specific to language. The second line looks at the influence of perceptual, cognitive,

and social factors on language development in deaf children who learn language through a cochlear implant. The acoustic signal these children hear through their implant is substantially degraded relative to the original source. Some do better using this signal than others. Bortfeld examines possible sources of variability in this learning process and how language outcomes can be maximized for this population. She also studies how postlingually deafened adults who opt for a cochlear implant learn to process the input. Bortfeld’s approach is best characterized as integrating (1) multiple methods, (2) different levels of analysis, and (3) a broad theoretical perspective. The findings from this research underscore the central role of experience, both perceptual and social, in language learning and language processing throughout the lifespan.

Colin Holbrook, Associate Professor. Colin Holbrook is an Asst Professor of Cognitive and Information Sciences at the University of California, Merced. His program of research explores decision-making under contexts of threat, with particular focus on aggression, coalitional psychology, morality, and the representation of mental states. Holbrook’s doctoral work explored processes by which threat cues heighten reactivity to emotional stimuli, particularly when individuals are unaware of having entered a state of threat-vigilance, precipitating a number of judgment biases including heightened group prejudice. At the level of proximate neurobiological mechanisms relevant to such context-sensitive shifts, Holbrook employs transcranial magnetic stimulation to explore the role of the posterior medial frontal cortex region in modulating empathic and prosocial responses contingent on perceived group membership. In complementary research, Holbrook’s research has examined the psychological mechanisms by which individual differences in threat-sensitivity related to political orientation or religious belief predict group prejudice and tendencies to aggress. Most recently, Holbrook has extended his work on group bias to human-robot interaction with anthropomorphic agents, systematically manipulating characteristics such as the apparent gender and ethnicity of a robot to assess potential effects on conformity with the robot’s recommendations, and perceptions of the robot as possessing mental attributes such as emotion and intelligence.

Chris Kello, Professor, Interim Vice Provost and Dean for Graduate Education. Professor Kello studies how people coordinate their speech and movements to work together in pairs and groups. His lab and collaborators use analysis methods from complex systems research to study how human behavior is timed and structured, and how this temporal structure reflects underlying thought processes. The types of coordination he studies include verbal and non-verbal interactions, and individual and group search processes. Kello also works on energy-efficient methods for machine learning that may be applied to edge computing applications such as smart remote sensing and signal analysis.

Tyler Marghetis, Assistant Professor. Tyler Marghetis studies cognition and communications as they occur within interconnected, multiscale, complex systems – brains, bodies, small groups and large sociocultural systems. A major focus is investigating how thought and behavior can get stuck in stable patters (‘regimes’) but also change suddenly (‘ruptures’). Examples include “aha!” moments in mathematics, paradigm shifts in science, romantic breakups, cultural revolutions, creative breakthroughs in the arts, and improvisation by musicians.

Teenie Matlock, Professor, Vice Provost for Academic Personnel. Teenie Matlock is the Vice Provost for the Faculty, McClatchy Chair in Communications, and a Professor of Cognitive Science. Her research focuses on communication. Much of her work focuses on non-literal language, for instance, metaphors used in the expression of time, numbers and math, social

distance, spatial configurations, and internet use. Matlock's recent work on metaphor examines its use in public discourse, for instance, in discourse about political campaigns, wildfires, climate change, and disease. Some of her work examines how people interpret grammatical information, for instance, tense and aspectual markers as well as evidentials. Other research has focused on how people produce and interpret manual gestures, for instance, in describing quantity. Some of Matlock's early work examined communication in the domain of human-centered computing.

David Noelle, Associate Professor. David Noelle's research largely involves the fabrication, analysis, and testing of computational models of the cognitive processes and neural mechanisms that give rise to controlled behavior and explicit learning. Recent work has focused on the role of prefrontal cortex, and Associated brain areas, in working memory, cognitive control, and category learning. These models have been used to explain cognitive flexibility, the behavioral effects of frontal damage, aspects of instructed learning, and behavioral differences in people with autism spectrum disorders. In addition to his computational neuroscience work, Noelle conducts laboratory experiments on human learning and research on brain-inspired machine learning methods.

Lace Padilla, Assistant Professor. Lace Padilla's empirical research examines the underlying cognitive mechanisms used in decision-making with visualizations, particularly during hazard events such as hurricanes and flash floods. This research focuses on evaluating the impact of basic cognitive processes (e.g., perception, attention, working memory, and knowledge) to create visualizations of data that are easier for people to use during high-risk events with uncertainty (e.g., evacuating before a hurricane strike). She works collaboratively with computer scientists, climate scientists, and anthropologists. Additionally, she is a Disaster Risk Management and Behavioral Science Consultant for the World Bank, where she applies her empirical research to support disaster risk managers in countries such as Haiti and Bangladesh.

Rachel Ryskin, Assistant Professor. Rachel Ryskin's research is focused on how humans communicate so effortlessly despite the imperfect nature of language input (e.g., due to speech errors, ambiguities) and the complexity of inferences involved in decoding its meaning (e.g., the speaker's knowledge state)? She studies how individuals achieve impressively efficient language processing in the face of ambiguity, variability, and noise. Ryskin combines insights from eye-tracking, EEG, computational approaches, fieldwork, and neuropsychology to understand how people use various sources of information (visuo-spatial perspective, theory of mind, language statistics, etc.) to generate and constrain their linguistic predictions, as well as the learning and memory processes that underpin these representations.

Paul Smaldino, Associate Professor. Paul Smaldino is Asst Professor of Cognitive and Information Sciences. His work employs mathematical and computational modeling to answer questions about social behavior and cultural evolution of humans and other animals. His is also known for his work modeling the population dynamics of scientific communities.

Michael Spivey, Professor. Michael J. Spivey earned his B.A. in Psychology at UC Santa Cruz, and then his Ph.D. in Brain and Cognitive Sciences at the University of Rochester. After being a professor of psychology at Cornell University for 12 years, he came back to the UC system to help build the Cognitive & Information Sciences Department at UC Merced. By recording eye movements and reaching movements in natural tasks, and modeling the results with neural network simulations, his work shows that visual perception and language comprehension continuously interact with each other, and also with motor movement and situational context.

Rather than treating cognition as separate computational modules devoted to vision, or language, or action, the dynamical system approach suggests that the mind is a richly interactive process, inseparable from the activity of the body in its environment. Spivey's research program has published its findings in *Science*, *Current Biology*, *PNAS*, *Trends in Cognitive Sciences*, and many other top-tier journals. In 2010, Spivey received the William Procter Prize for Scientific Achievement from the Sigma Xi Society for Research. This research is described in his 2007 book, *The Continuity of Mind* (Oxford U. Press), and in his 2020 book, *Who You Are* (MIT Press).

Jeff Yoshimi, Associate Professor. Jeff Yoshimi specializes in philosophy of mind and cognitive science, phenomenology (especially Husserl), neural networks, dynamical systems theory, and visualization of complex processes.

ECONOMICS AND BUSINESS MANAGEMENT

Catalina Amuedo-Dorantes, Professor. Catalina Amuedo-Dorantes research areas include labor economics, international migration and remittances. She has published on contingent work contracts, the informal work sector, international remittances, as well as on immigrant savings, health care and labor market outcomes. Her current research broadly focuses on immigration policy and its consequences. She examines the impact that state and local level immigration policy is having on the employment, education, fertility and human rights of undocumented immigrants, as well as on the effect of immigration policy geared towards high-skilled immigrants.

Briana Ballis, Assistant Professor. Briana Ballis areas of interest include labor economics, public economics, and the economics of education. Her research has focused on special education, the spillover effects of DACA, and the long-run impacts of the social safety net. Her work has been funded by the National Science Foundation (NSF), the American Educational Research Association (AERA), and the Social Security Administration (via Mathematica).

Justin Cook, Associate Professor. Justin Cook's work is divided into two strains. The first focuses on the relationship between historic economic environments and natural selection since the initiation of agriculture. The adoption and widespread usage of agriculture represented a monumental shift in the environment, so it is natural to assume that there must have been some type of selection to this new environment. This implies that genetic differences may have arisen differentially to cope with certain aspects of the new agricultural environment; two primary examples being lactase persistence and infectious disease resistance. The second strain of Cook's work is tied to the moderating, or amplifying, effects certain genetic variants may have in response to environmental stimuli, or gene-environment interactions. In particular, the moderating (or amplifying) influence of genetic variants can potentially explain heterogeneity in the effects of early childhood conditions on later life cognitive development, economic productivity, and health conditions. These two strains of research, while seemingly unrelated—e.g., historic country-level growth vs. individual cognitive development, share the same basic principle that initial conditions, whether agricultural or in utero, have long-run economic consequences.

Christian Fons-Rosen, Associate Professor. Christian Fons-Rosen's research mainly focuses on two branches: (1) economics of science; (2) firms and innovation. In (1), Fons-Rosen uses

large datasets and statistical techniques including text analysis to track the evolution of science over time, to evaluate the effort of lower communication costs on scientific progress, and on the relative merits of doing science in universities versus corporations. Future work includes evaluating the impact of McCarthyism on the direction of science and also analyzing the effort of an aging scientific cohort on the renovation of ideas. In (2), Fons-Rosen looks at the intensity of knowledge flows across firms and the role of geographical and institutional boundaries in the intensity of idea dissemination. This again implies using large datasets on the population of firms in many European countries matched to all their patent stock and, for example, tracking inventors over time and space.

Rowena Gray, Associate Professor. Rowena Gray is an economic historian specializing in nineteenth and twentieth century United States. She investigates the effect of technological change on labor markets during the second Industrial Revolution which introduced electricity and related general purpose technologies. She also considers the first global era, assessing the impact of immigrants on crime rates, the housing market and innovation. She has published in top economic history outlets and is currently PI on a Russell Sage Foundation grant and co-PI on a NSF grant which will create new measures of housing prices and living standards over the long run in the urban United States. She enjoys incorporating undergraduates in her research and promoting her results in outlets such as the Conversation.

Zack Grossman, Associate Professor. Zack Grossman is a microeconomist who primarily studies the impact of social and psychological motivations, as well as cognitive phenomena, on economic decisions. His approach is behavioral, reflecting an openness to how insights from psychology can help us understand economic behavior and he uses both experimental and theoretical methods, often complementarily.

Justin Hicks, Associate Teaching Professor. Justin Hicks is an applied macroeconomist working with patent and publication data to identify the unintended spillovers of collaboration across international borders. Hicks loves teaching and being in the classroom and looks forward to continuing his own learning experience both in the classroom and in his research as he develops his career at UC Merced.

Rob Innes, Professor. Rob Innes holds the County Bank Chair in Economics. He conducts research in experimental economics with a focus on moral preferences; environmental economics with a focus on efficient regulation of pollution; theories of market structure, particularly in food markets and how different types of market competition affect prices and performance; and the law and economics of property rights, liability, and nuisance regulation.

Andrew Johnston, Assistant Professor. Andrew C. Johnston is an economist who specializes in public economics and labor. He studies the influence of social insurance and taxation on firm and worker behavior using natural experiments. For example, he studied the effect of extended unemployment benefits on search and job finding among unemployed workers. Motivated to identify policies to promote economic mobility, he has begun a research agenda in human-capital formation. Since teachers are the central input in public schooling, he has focused on studying the labor market for teachers, including the causes of teacher shortages, how to attract and retain excellent teachers, the role of compensating differentials in promoting equal opportunity, and how compensation and working conditions shape the quality distribution of teachers. His work has been published in the Journal of Political Economy and the American Economic Review:

P&P. In 2016, He earned his PhD in economics from the University of Pennsylvania and his wife and children are his greatest joy.

Jason Lee, Associate Teaching Professor. Jason Lee's research has focused on financial markets and economic history.

Jesus Sandoval-Hernandez, Associate Teaching Professor. Jesus Sandoval-Hernandez is an Asst Teaching Professor (LPSOE) of Economics at the University of California Merced. He earned a PhD in International Economics from the University of California, Santa Cruz. Sandoval-Hernandez's teaching experience include Econometrics, Corporate Finance, Introduction to Business and Finance, The Economics of Emerging Markets, Statistical Inference, International Macroeconomics/Finance, Introductory Finance, Economic Development, International Microeconomics, Intermediate Macroeconomics, Latin American Economies, The Economics of Globalization, Economics and Management of Technology and Innovation, Personal Finance, and Introductory courses in Micro and Macroeconomics.

Kurt Schnier, Professor, Interim Vice Chancellor and Chief Financial Officer. Kurt Schnier studies policy analysis in the fields of health and resource economics. His research includes a focus on the response of physicians and hospitals to current and impending regulations that impact the provision of health care as well a focus on facilitating the development of efficient marine resource policy.

Ketki Sheth, Assistant Professor. Ketki Sheth is an applied development economist. Her research focuses on improving gender equality and the delivery of services, such as financial access, education, and health care, in low-income countries. Her recent scholarship includes identifying gender discrimination in responsiveness to leadership and access to credit, and covers a broad geographical spread, including India, Sri Lanka, Ethiopia, Rwanda, Tanzania and Madagascar. She earned her Bachelor degrees in Economics and Psychology from UC Berkeley, and received her Ph.D. in Economics from UC San Diego.

Theofanis Tsoulouhas, Professor. Fanis Tsoulouhas' research focuses on applied theory, particularly contract theory and the economics of information. Most of his research deals with the implications of asymmetric information and moral hazard problems (which arise when agents undertake unobservable actions with stochastic effects). His earlier work considered, first, the limitations imposed by limited liability, bankruptcy and commitment problems on financial and labor contracts in order to show the optimality of debt as opposed to equity contracts and, second, the strategic role of information gathering and transmission. His later work has focused on organizational design and on applications of absolute or relative performance evaluation (i.e., tournaments and contests) in areas such as executive promotion and contracts under moral hazard, limited liability for the principal or liquidity constraints for the agents and/or heterogeneity of agents. His latest published papers deal with performance pay incentives and offshoring, and with the optimality of tournaments under adverse selection (which arise when some parties have private information when contracts are signed). His latest working paper examines why countries in financial distress strategically delay seeking help. He is also working on entrepreneurship, effort and top incomes in a small open economy, and on business commonality, standardization and offshoring.

Ana Tur-Prats, Assistant Professor. Ana Tur-Prats is an applied economist, with broad research interests in Culture, Gender and Economic History. Tur-Prats' research mainly focuses

in two branches: (1) violence against women; (2) social capital. In (1), Tur-Prats has analyzed the long-term determinants of intimate-partner violence by focusing on the historical family structure that was prevalent in the past. She has also looked at how individuals' responses to changes in the gender gap in unemployment in terms of intimate-partner violence are shaped by their underlying cultural norms about the appropriate role of men and women in society. In current work Tur-Prats is analyzing how cultural norms can explain the prevalence and intensity of conflict-related sexual violence. In (2), Tur-Prats looks at the historical determinants and long-term persistence of social capital, by focusing on the legacy of the commons; and also analyzes how social capital has a positive impact on local economic development today. On a separate project, Tur-Prats looks at how conflict can actually destroy social capital, by examining the long-term consequences of the Spanish Civil War on generalized trust and other outcomes.

Greg Wright, Associate Professor. Greg Wright has a PhD from the University of California, Davis and studies international trade, immigration and technological change, primarily focusing on the labor market impacts of each. His current projects explore the long-run consequences of international trade shocks and the role of patents in mediating global trade flows. His work has appeared in top Economics journals such as the American Economic Review, the American Economic Journal: Applied Economics, the American Economic Journal: Economic Policy, and the Journal of International Economics.

MANAGEMENT OF COMPLEX SYSTEMS

John Abatzoglou, Associate Professor. John Abatzoglou is interested in climate science and climate impacts in the American West. His lab's work spans many topics - from advancing scientific knowledge on climate variability, to understanding climate impacts on impacts on systems including water resources, wildfire, and agriculture, to developing climate datasets and tools.

Roger Bales, Professor. Roger Bales focuses on the scientific research of mountain hydrology and biogeochemistry, polar snow and ice, climate impacts and water resources. He applies his research to real world problems and engages with decision makers to improve information and investments in California's water resources systems.

Anita Bhappu, Associate Professor. Anita Bhappu has published research on team collaboration, workplace diversity, service delivery and digital technology. She is currently studying platforms in the sharing economy. Her research examines technology affordances and the nature of service interactions on ridesharing and shared lodging platforms, particular from the provider perspective. She is also investigating employee trust and engagement related to coworker collaborative consumption in a field study of an organization-sponsored sharing platform.

Spencer Castro, Assistant Professor. Spencer Castro is interested in the capacity of attention under cognitive workload, particularly in the context of technology and multitasking. He focuses on the validity of reaction time and accuracy as measures of different aspects of workload, as well as quantifying the risk of adverse outcomes due to these workload metrics in driving. He employs advanced cognitive modeling techniques to examine the mechanisms of attentional capacity, multitasking, and performance.

Jeff Jenkins, Assistant Professor. Jeff Jenkins' research aims to answer questions such as, What is the visitor carrying capacity of our national parks? How are social equity and ecological conditions valued and negotiated through public process? What features contribute to visual buy-in for climate adaptation? How do political-legal, economic, aesthetic, and historic land use considerations shape multiple use landscapes? Are the current and future trajectories of forest management bound by original mandates or can new paradigms emerge amid socio-ecological complexity? Jenkins works with partners at the National Park Service, U.S. Forest Service, and other public lands to inform management decisions through research, teaching, and public facing data collection methods. Technologies including geovisualization and geographic information systems allow for information to be geospatially communicated in much of this work. This research is built upon theoretical traditions of critical resource geography, socio-ecological systems, political ecology, regional planning, and public lands management.

Catherine Keske, Professor. Catherine Keske is an agricultural and resource economist who conducts interdisciplinary coupled natural human systems research at the food-water-energy nexus. Keske's projects often involve disadvantaged communities in mountainous, semi-arctic, or arid ecosystems seeking economically viable, sustainable environmental management. Several of my popular studies involve food security and food sovereignty; sense of place; conservation easements; the economic value of Colorado Fourteeners; and, food, energy, and biochar co-production. Keske publishes in a variety of literatures, including economics, engineering, sociology, law, public planning, and sustainability science. Keske uses a continuum of quantitative and qualitative research methods and enjoy working on international projects. Presently, Keske is working on two multi-investigator projects funded by California's Strategic Growth Council to mitigate climate change. One project aims to reduce methane emissions by developing an economic viable system for biochar production and manure management at Central Valley dairies. A second project aims to improve ecosystem service valuation of California's forests for their carbon storage and water conservation benefits. Keske is also leading a project to establish an Engineering Research Center at UC-Merced for precision agriculture and agricultural technology, and another project to develop a sustainability index that will promulgate sustainable dairy management practices in the semi-arid U.S. West.

Crystal Kolden, Assistant Professor. Crystal Kolden's research focuses on characterizing and understanding wildfire intersections with the human-environment system through geospatial, temporal, and mixed-methods approaches.

Tea Lempiälä, Assistant Professor. Tea Lempiälä is an Asst Professor of Management at the Department of Management of Complex Systems. Her research interests include innovation practice and management, sustainable energy and paradoxical tensions of organizational life. Her research aims to create better understanding of innovation as a social and collaborative process, and through this discover better means for supporting it. Dr. Lempiälä is passionate about various aspects of equity, especially in the context of creating more inclusive innovation cultures. She has conducted qualitative research in technology companies and non-profit organizations in the United States, India and Europe.

Paul Maglio, Professor, Director of the Division of Management and Information. Paul Maglio is a Professor of Management and Cognitive Science at the University of California, Merced. He holds a bachelor's degree in computer science and engineering from MIT and a Ph.D. in cognitive science from the University of California, San Diego. One of the founders of

the field of service science, Dr Maglio is the Editor-in-Chief of INFORMS Service Science, and is lead editor of the Handbook of Service Science. He has published more than 125 papers in computer science, cognitive science, and service science.

Russ McBride, Assistant Professor. Russ McBride did his Masters at Stanford and his PhD from UC Berkeley in philosophy and cognitive science. He then spent four years as a Research Professor at the University of Utah David Eccles Business School working on entrepreneurship and social theory, and working as the Director for The Foundry Entrepreneurship Incubator whose companies generated over \$200M in revenue. His central research goal is to advance our understanding of social reality as it applies to firms, organizations, and entrepreneurship. Since, for social entities, what counts as a “real” social entity (like a firm, an academic department, or a government) depends upon what individuals believe is real (unlike physical objects which are real regardless of what we think), such research ultimately requires an exploration of aspects of human beliefs and cognition. He is the Director of the Social Reality & Cognition Research Group (SORAC: <http://sorac.info>). He has run the social ontology workshop at the Academy of Management Conference for the last 7 years. He has also spent many years doing research on artificial intelligence, running a software consulting company, and working on problems in cognitive science. Current works in progress include a book, “The Complexity of Human Behavior”.

Tracey Osborne, Associate Professor, Tracey Osborne is an Assoc Professor and Presidential Chair in Management of Complex Systems in the Department of Management of Complex Systems at the University of California, Merced. Her research focuses on the social and political economic dimensions of climate change mitigation in tropical forests and the role of Indigenous Peoples, the politics of climate finance (with particular emphasis on carbon markets), global environmental governance, and climate equity and justice. She has worked on these issues globally with extensive field experience in Mexico and the Amazon (Peru, Ecuador and Guyana). She also leads the Climate Alliance Mapping Project. This is a collaborative effort between academics, environmental non-governmental organizations, and Indigenous organizations working for a socially-just response to climate change through research, maps and digital stories. The mapping project is an initiative of the Public Political Ecology Lab, which Tracey founded and directs to support engaged scholarship by communicating environmental research to broader publics. Her work has been published in high-impact geography and social science journals, and she has been invited to share her research internationally in academic and non-academic venues such as Conference of the Parties climate change meetings. She received her PhD from the Energy and Resources Group at the University of California, Berkeley.

Alex Petersen, Associate Professor. Alex Petersen’s research models the evolution of large multiscale socio-economic systems by applying concepts and methods from complex systems, statistical physics, management and innovation science. By way of example, recent empirical work analyzes two types of researcher mobility — cross-border and cross-disciplinary — by applying econometric and network science methods to measure career dynamics mediated by these relatively common career events. Other data-driven work addresses the growth of scientific production and its implications for collective attention, research evaluation, and mega-journal management.

LeRoy Westerling, Professor. LeRoy Westerling is Professor of Management of Complex Systems and Chair of the Graduate Council of the Academic Senate at UC Merced. Prior to

coming to Merced in 2006, he was a postgraduate research meteorologist and project scientist at Scripps Institution of Oceanography. He holds a BA from UCLA in International Economics and Chinese Area Studies, and a joint PhD in Economics and International Affairs from UCSD. Research interests include drivers of extreme fire events, wildfire climatology, and modeling and scenario analysis for wildfire and impacts affecting vegetation, carbon, water, air pollution and public health, habitat, insurance, and infrastructure.

Lisa Yeo, Assistant Professor. Lisa Yeo's research interests lie in examining the economics of information systems, security and privacy, as well as the organizational behaviors that lead to decisions that deviate from the rational behavior expected in typical models. Yeo finds applications in the areas of collaboration, decision support, and behavioral operations, as well as information security and privacy, to be of interest. Yeo has focused on the topics of economics of information security and collaborative knowledge management. Yeo's industry experience as an information security professional demonstrated that there is still a need for better decision-making tools when it comes to information security investment. Believing information security can add value for an organization, Yeo is interested in research that can lead to better business and policy decisions regarding the protection of information. Yeo's methods typically include stochastic modelling, mathematical programming, and statistical analysis. Yeo's future research goals are designed to build on this foundation by introducing ideas and tools from behavioral operations into the decisions regarding information security, risk management, and even collaborative knowledge production. Yeo's work will help design information systems that enable users to easily behave secure, privacy-protecting ways.

POLITICAL SCIENCE

Courtenay Conrad, Associate Professor. Courtenay Conrad's research interests fall at the intersection of international relations and comparative politics. She is primarily interested in how domestic and international institutions affect political violence, including government repression and opposition dissent. The majority of her work to date focuses on how executives make decisions regarding human rights in the face of institutional constraints. Conrad's work has been published in the American Political Science Review, the American Journal of Political Science, the Journal of Politics, International Studies Quarterly, the Journal of Conflict Resolution, and the Journal of Peace Research, among others.

Aditya Dasgupta, Assistant Professor. Aditya Dasgupta works on three main topics: (i) democratization; (ii) technological change; (iii) and state capacity. Much of his work is on rural India, including his book project on the political consequences of technological change, but he also works comparatively. He is building a lab on the Political Economy of Agriculture and Rural Societies (PEARS).

Elaine Denny, Assistant Professor. Elaine Denny studies how financial insecurity changes how people make decisions, with downstream effects on political preferences and behavior. Her research links financial stress to disparities in political participation, and she shows how (and why) financial insecurity changes one's likelihood of taking political action. Denny combines survey, lab, and field studies to both identify mediating psychological factors that affect behavior, and to test the efficacy of interventions that leverage these findings in actual policy settings. Additional interests include developing methods for measuring social norms change, and using cutting-edge causal inference to evaluate the efficacy of poverty alleviation efforts.

Thomas Hansford, Professor. Thomas Hansford studies American politics, with a focus on judicial politics. His research addresses interest group involvement in the courts, interactions between the U.S. Supreme Court and Congress, the selection of judges, the interpretation of precedent at the Supreme Court and the evolution of judicial institutions. He also has an interest in campaigns, elections and voter turnout. Hansford's publications include "The Politics of Precedent at the U.S. Supreme Court" (Princeton University Press) and numerous articles in journals such as American Political Science Review, American Journal of Political Science, Journal of Politics, Political Research Quarterly, and Law & Society Review.

Matthew Hibbing, Associate Professor. Matthew Hibbing studies American politics with a focus on political behavior, political psychology and the influence of biology on mass politics. His research centers on individual level predispositions that shape political attitudes and behaviors, including personality and physiological traits. He is currently writing a book about qualities we seek from good citizens. Hibbing's work has been published in Science, the American Political Science Review, the British Journal of Political Science, the Journal of Politics, Legislative Studies Quarterly, Political Behavior, and Political Psychology.

Haifeng Huang, Associate Professor. Haifeng Huang studies comparative politics, political economy, and political behavior with focuses on authoritarianism, media and information flow, public opinion, and China, using surveys, experiments, and/or formal modeling. His work has been published in the American Political Science Review, Journal of Politics, British Journal of Political Science, Comparative Politics, Comparative Political Studies, Journal of Theoretical Politics, Political Behavior, Political Research Quarterly, and Political Science Research and Methods, among other journals.

Brad LeVeck, Associate Professor. Brad LeVeck uses game theoretic models and experiments to study the psychology of strategic decision-making. This research examines how people reason and learn in situations where the outcome of their own decision also depends on the decisions made by other individuals. His work has been published in the American Political Science Review, Journal of Politics, International Organization, and the Proceedings of the National Academy of Sciences.

Nathan Monroe, Professor. Nathan Monroe is the Tony Coelho Chair of Public Policy and the Director of the Center for Analytic Political Engagement (CAPE). He studies legislative politics—especially the U.S. Congress—as well as the decision-making processes in international organizations and authoritarian legislatures. A main focus of his most influential research reconsiders the conventional non-partisan view of the U.S. Senate. He is co-editor of Why Not Parties? Party Effects in the United States Senate (2008, University of Chicago Press) and co-author of Agenda Setting in the U.S. Senate: Costly Consideration and Majority Party Advantage (2011, Cambridge University Press). His research has also been published in the American Journal of Political Science, Journal of Politics, Legislative Studies Quarterly, Political Research Quarterly, and State Politics and Policy Quarterly.

Christopher Ojeda, Assistant Professor. Christopher Ojeda studies the social and economic roots of political inequality, with an emphasis on how poverty and poor mental health shape the political engagement of citizens are in turn shaped by political processes. He is currently working on a book project that explores how contemporary democratic politics makes citizens feel depressed. His research has been funded by the Russell Sage Foundation and published in the American Political Science Review, American Journal of Political Science, American

Sociological Review, and other journals. Ojeda won the Seymour Sudman award in 2012 from the American Association of Public Opinion Research and was the receipt of the Distinguished Junior Scholar Award in 2015 from the political psychology section of the American Political Science Association.

Tesalia Rizzo, Assistant Professor. Tesalia Rizzo studies topics in comparative political behavior and political economy using a variety of techniques such as field experiments, surveys, interviews, and observational data. Her research interest includes political behavior, political economy of development, intermediaries, clien-telism, accountability, survey and experimental methodology.

Andrew Shaver, Assistant Professor. Andrew Shaver is a scholar of sub-state conflict and the founding director of the Political Violence Lab. His research focuses broadly on contemporary sub-state conflict and appears in the American Political Science Review, American Economic Review, Annual Review of Sociology, and Journal of Politics, amongst other outlets. More specific areas of focus include the informational, territorial, and climatic underpinning of political violence; the causes and consequences of forcible displacement; and media reporting processes and biases related to international affairs.

Jessica Trounstine, Professor. Jessica Trounstine is the UC Merced Foundation Board of Trustees Presidential Chair, and studies American politics with a focus on sub-national politics, primarily concentrating on large cities. Her work studies the process and quality of representation. She is particularly interested in how political institutions enhance or limit the ability of residents to achieve responsive government. Trounstine takes a mixed method approach to her scholarship including using historical analysis, qualitative data and quantitative methods.

APPENDIX E: DEPARTMENT AND PROGRAM BROCHURES



UNIVERSITY
OF
CALIFORNIA
MERCED

FACULTY

KRISTINA BACKER, *Assistant Professor*
Cognitive neuroscience, attention, memory, auditory perception, aging, hearing loss

RAMESH BALASUBRAMANIAM, *Professor*
Cognitive, neurophysiological, and dynamical systems approaches to action

HEATHER BORTFELD, *Professor*
Cognitive neuroscience, typical and atypical speech and language development, language learning under adverse listening conditions

HANNA GUNN, *Assistant Professor*
Social epistemology, virtue & vice epistemology, feminist philosophy of language, ethics & epistemology of the Internet and new media

DANIEL HICKS, *Assistant Professor*
Philosophy of science, social / political philosophy, public scientific controversies, science policy, data science and data ethics

COLIN HOLBROOK, *Assistant Professor*
Threat-detection, group bias, social neuroscience, morality, theory of mind, evolutionary psychology

CAROLYN DICEY JENNINGS, *Associate Professor*
Philosophy of mind, philosophy of cognitive science, attention, perception, action, consciousness

DAVID JENNINGS, *Assistant Teaching Professor*
Ancient philosophy, normative and applied ethics, bioethics, history of philosophy

ROLF JOHANSSON, *Continuing Lecturer*
Logic, philosophy of language, philosophy of religion systems, philosophy of science

CHRIS KELLO, *Professor*
Neural networks, complex systems, speech, language, search

DOROTHY LELAND, *Professor*
Continental and humanistic philosophy

PAUL MAGLIO, *Professor*
Human-computer interaction, distributed cognition, service science

TEENIE MATLOCK, *Professor*
Cognitive linguistics, experimental semantics, human-computer interaction, political language

TOBY NAPOLETANO, *Lecturer*
Philosophy of language and linguistics, philosophical methodology, philosophy of education, political philosophy

DAVID NOELLE, *Associate Professor*
Computational cognitive neuroscience, learning and memory, cognitive control, machine learning, artificial intelligence

LACE PADILLA, *Assistant Professor*
Visual cognition, decision-making and risk, data visualization, spatial cognition, cognitive biases, working memory, cognition for the global good

PAUL SMALDINO, *Assistant Professor*
Social organization, evolutionary dynamics, mathematical and computational modeling of complex systems

MICHAEL SPIVEY, *Professor*
Language processing, eye movements, embodied cognition, dynamical systems

JEFFREY YOSHIMI, *Associate Professor*
Philosophy of cognitive science, dynamical systems theory, neural networks, phenomenology

DID YOU KNOW?

- › Opening in 2005 as the newest campus of the University of California, UC Merced is building the future in the heart of California by carrying out the university's mission of teaching, research and public service.
- › With nearly 8,900 students and more than 400 faculty members and lecturers, UC Merced offers the best of both worlds: an affordable research-based education with a private college atmosphere.
- › Small classes mean personalized attention and easy access to professors who are acclaimed scholars and teachers in their fields.
- › All of UC Merced's building projects are certified through the U.S. Green Building Council's Leadership in Energy and Environmental Design. That includes 17 LEED certifications for new construction and two for operations and maintenance, with more certification for new construction on the way.
- › We offer students brand-new facilities and the latest technology – such as our digital library that offers access to the largest research/academic library in the world.
- › Our pioneering students are making history – year after year – as they lay the foundation for the university's future by creating policy and making decisions that will have a lasting legacy.

COGNITIVE SCIENCE



CONTACT INFORMATION

The Cognitive Science Program at UC Merced
School of Social Sciences, Humanities and Arts
TEL: 209-228-7742 | **WEB:** cogsci.ucmerced.edu

PHYSICAL LOCATION:
Classroom and Office Building, dean's suite, second floor
5200 N. Lake Road | Merced, CA 95343

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MERCED

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MAJOR REQUIREMENTS

LOWER DIVISION MAJOR REQUIREMENTS:

- › Introduction to Cognitive Science
- › Introductory courses in language and linguistics, biology, economics, philosophy, psychology, and related fields
- › Quantitative courses in computer science, statistics, and calculus

UPPER DIVISION MAJOR REQUIREMENTS:

- › Mind, Brain, and Computation
- › Research Methods for Cognitive Scientists
- › Elective courses in cognitive science, as well as in arts, biology, computer science, management, philosophy, political science, and psychology

SAMPLE COGNITIVE SCIENCE ELECTIVES:

- › Introduction to Neural Networks in Cognitive Science
- › Cognitive Neuroscience
- › Perception and Action
- › Language Acquisition
- › Metaphor and Thought
- › Cognitive Science of the Emotions
- › Introduction to Artificial Intelligence

PROGRAM LEARNING OUTCOMES

UPON GRADUATION, STUDENTS MAJORING IN COGNITIVE SCIENCE WILL BE ABLE TO:

- › Explain and apply knowledge of landmark findings and theories in cognitive science.
- › Design, interpret, and evaluate simple behavioral and neuroscientific experiments.
- › Interpret and appreciate formal and computational approaches in cognitive science.
- › Argue for or against theoretical positions in cognitive science.
- › Use a cognitive science education outside of the undergraduate classroom, particularly in the service of careers.



WHAT IS COGNITIVE SCIENCE?

Cognitive Science is the interdisciplinary study of human thought and behavior. It combines methods, theories, and applications from many disciplines, including philosophy, psychology, linguistics, computer science, neuroscience, and biology. The Cognitive Science majors, B.A. and B.S., provide broad knowledge of cognitive science, including language and communication, reasoning, memory, categorization, cognitive modeling, perception and action, philosophical foundations, artificial intelligence, cognitive engineering, and cognitive science applications for business.

A degree in Cognitive Science provides in depth training in research methods, data analysis, modeling, and lab-based research. It also prepares students for jobs in high-tech companies. It is ideal for students who want to pursue graduate work in cognitive science, business, communications, computer science and engineering, education, information sciences and information management, law, linguistics, management, medicine, neuroscience, and psychology. Students can work with Cognitive Science faculty to tailor their own program of study to

emphasize one or two specific areas within cognitive science. Example specializations include behavioral experimentation, cognitive neuroscience, computational modeling, decision sciences, linguistics, and philosophy of cognitive science.

CAREERS

WHAT CAN I DO WITH A DEGREE IN COGNITIVE SCIENCE?

Upon graduation, students with a degree in Cognitive Science will find themselves prepared for a number of career possibilities, including:

- | | |
|-------------------------------|--------------------------------------|
| › Attorney | › Human-Robot Interaction Researcher |
| › Business Professional | › Media Consultant |
| › Computational Linguist | › Medical/Health Professional |
| › Computer Interface Designer | › Neuroscientist |
| › Computer Programmer | › Social Worker |
| › Data Scientist | › Speech Pathologist |
| › Educator/Administrator | |



UNIVERSITY
OF
CALIFORNIA
MERCED

ECONOMICS

FACULTY

CATALINA AMEUDO-DORANTES, *Professor*
Labor, migration, remittances, immigration policy

JEFFREY BUTLER, *Associate Professor*
Culture, identity, ethics, trust and beliefs formation

JUSTIN COOK, *Assistant Professor*
Economic growth, macroeconomics, health economics

CHRISTIAN FONS-ROSEN, *Assistant Professor*
Innovation, foreign direct investment, and economics of science

GLYNIS GAWN, *Assistant Professor of Teaching*
Experimental economics, labor economics, public economics

ROWENA GRAY, *Assistant Professor*
Economic history, immigration, crime and housing markets

JUSTIN HICKS, *Assistant Professor of Teaching*
Applied microeconomics, economics of innovation

ROBERT INNES, *Professor*
Experimental economics, industrial organization, environmental economics, law and economics, agricultural policy and markets

ANDREW JOHNSTON, *Assistant Professor*
Public policy, labor and personnel economics

JASON LEE, *Associate Professor of Teaching*
Economic history, economic growth and financial economics

GABRIELA RUBIO, *Assistant Professor*
Development economics and labor economics

JESUSSANDOVAL-HERNANDEZ, *Associate Professor of Teaching*
Applied econometrics, international finance, economic development, Latin American economies, corporate finance, macroeconomics

KURT SCHNIER, *Professor*
Econometrics, environmental economics, experimental economics, health economics and resource economics

KETKI SHETH, *Assistant Professor*
Development economics, labor economics, health economics, economics of education

ANA TUR-PRATS, *Assistant Professor*
Culture and institutions, economic history, political economy, gender economics, and health economics

THEOFANIS TSOULOUHAS, *Professor*
Corporate finance, tournament theory, contract theory, economics of information

GREG WRIGHT, *Assistant Professor*
International trade and immigration

DID YOU KNOW?

- › Opening in 2005 as the newest campus of the University of California, UC Merced is building the future in the heart of California by carrying out the university's mission of teaching, research and public service.
- › With nearly 8,900 students and more than 400 faculty members and lecturers, UC Merced offers the best of both worlds: an affordable research-based education with a private college atmosphere.
- › Small classes mean personalized attention and easy access to professors who are acclaimed scholars and teachers in their fields.
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CONTACT INFORMATION

The Economics Program at UC Merced
School of Social Sciences, Humanities and Arts
TEL: 209-228-7742 | **WEB:** economics.ucmerced.edu

PHYSICAL LOCATION:
Classroom and Office Building, dean's suite, second floor
5200 N. Lake Road | Merced, CA 95343

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MAJOR REQUIREMENTS

LOWER DIVISION MAJOR REQUIREMENTS:

- › Introduction to Economics
- › Quantitative courses in statistics and calculus
- › Introductory courses in cognitive science, psychology, political science, and/or sociology

UPPER DIVISION MAJOR REQUIREMENTS:

- › Intermediate Macroeconomic and Microeconomic Theory
- › Econometrics
- › Additional elective courses in Economics

SAMPLE ECONOMICS ELECTIVES:

- › The Economics of Gender and Poverty
- › Intro to Economic Growth
- › Experimental Economics
- › Economic Development
- › Economics of the Environment and Public Policy
- › Labor Economics
- › Health Economics
- › Students can also gain units for research, working directly with a faculty member.

PROGRAM LEARNING OUTCOMES

UPON GRADUATION, STUDENTS MAJORING IN ECONOMICS WILL BE ABLE TO:

- › Describe the underlying economic incentives and tradeoffs associated with the decisions made by individuals, firms, organizations, institutions and governments.
- › Apply economic concepts in analyzing policy debates and evaluating policy outcomes.
- › Design and conduct research that can inform managerial and economic policy making, by collecting, analyzing and interpreting data using relevant software.
- › Demonstrate critical, evidence-based, thinking about economic phenomena, whether encountered in coursework or in media reports, so that students can evaluate the accuracy of hypotheses presented.
- › Communicate clearly and cogently in written and oral form in academic and professional environments.



WHAT IS ECONOMICS?

Economists study how scarce resources are allocated so the well-being of individuals is maximized. Whether the resource allocated is income, time or a precious commodity, there is always some tradeoff associated with allocating the resource for one use and not another. Individuals, businesses, and governments face these tradeoffs in countless ways every day. The most important thing students learn from studying economics is how to identify, measure and understand the essential elements of these tradeoffs in society.

The major provides students solid grounding in microeconomic and macroeconomic theory, statistical and econometric methodology, as well as applied economic, social and policy analysis. The economics major emphasizes the role of incentives and institutions in shaping economic outcomes and explaining human behavior. It further analyzes how public policies influence economic performance and individual outcomes. Special emphases in the program include development economics, economic growth and innovation, economic history, environmental economics, health economics, international trade, labor and public economics, empirical methods and data analysis, behavioral economics and the economics of race and discrimination.

CAREERS

WHAT CAN I DO WITH A DEGREE IN ECONOMICS?

Each student graduating with an economics major will be well prepared for advanced study in economics, management, law, public policy, urban and regional planning or medicine. Career paths include business management, consulting, finance, federal, state and local government service, nongovernmental organization and nonprofit agency service or community development.

RECENT ALUMNI SUCCESS

2013 data from payscale.com showed that the mid-career salary for individuals with Economics degrees was \$100,000 on average across the U.S. Recent MBE and ECON graduates have had great success in securing graduate level jobs and internships. They are working in finance, sales, management consulting and data analysis:

- › Vanguard
- › Merrill Lynch
- › Foster Farms
- › Gallo
- › Lockheed
- › Kiva
- › Blackrock
- › Highlands Consulting Group
- › Omnicom Group Media Communications
- › Golden State Warriors
- › MGM Resorts
- › Wells Fargo
- › McKinsey & Co.
- › UC Merced graduates have been admitted to graduate programs in Economics at institutions such as UC Santa Cruz and Texas A&M and Law School at Duke University

Our department is developing an alumni network on LinkedIn and Facebook to ease the transition to the labor market for future graduates. What sets UC Merced apart is a more personalized approach from our small faculty and a more direct relationship between students and research faculty.





FACULTY

CATALINA AMEUDO-DORANTES, *Professor*
Labor, migration, remittances, immigration policy

JEFFREY BUTLER, *Assistant Professor*
Culture, identity, ethics, trust and beliefs formation

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Economic growth, macroeconomics, health economics

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Innovation, foreign direct investment, economics of science

GLYNIS GAWN, *Assistant Professor of Teaching*
Experimental economics, labor economics, public economics

ROWENA GRAY, *Assistant Professor*
Economic history, immigration, crime and housing markets

MARK HARRIS, *Continuing Lecturer*
Business law, finance, trade policy

JUSTIN HICKS, *Assistant Professor of Teaching*
Applied microeconomics, economics of innovation

ROBERT INNES, *Professor*
Experimental economics, industrial organization, environmental economics, law and economics, agricultural policy and markets

ANDREW JOHNSTON, *Assistant Professor*
Public policy, labor and personnel economics

JASON LEE, *Associate Professor of Teaching*
Economic history, economic growth and financial economics

GABRIELA RUBIO, *Assistant Professor*
Development economics and labor economics

JESUS SANDOVAL-HERNANDEZ, *Associate Professor of Teaching*
Applied econometrics, international finance, economic development, Latin American economics, corporate finance, macroeconomics

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Econometrics, environmental economics, experimental economics, health economics and resource economics

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Development economics, labor economics, health economics, economics of education

THEOFANIS TSOULOUHAS, *Professor*
Corporate finance, tournament theory, contract theory, economics of information and economic history

ANA TUR-PRATS, *Assistant Professor*
Culture and institutions, economic history, political economy, gender economics, and health economics

GREG WRIGHT, *Assistant Professor*
International trade and immigration

CRAIG VILHAUER, *Continuing Lecturer*
Financial accounting, managerial accounting

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CONTACT INFORMATION

**The Management and Business Economics Program
at UC Merced | School of Social Sciences, Humanities
and Arts**

TEL: 209-228-7742 | **WEB:** economics.ucmerced.edu

PHYSICAL LOCATION:
Classroom and Office Building, dean's suite, second floor
5200 N. Lake Road | Merced, CA 95343



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MAJOR REQUIREMENTS

LOWER DIVISION MAJOR REQUIREMENTS:

- › Introduction to Economics
- › Quantitative courses in computer science, statistics and calculus
- › Introductory courses in business, finance and accounting

UPPER DIVISION MAJOR REQUIREMENTS:

- › Intermediate Macroeconomic and Microeconomic Theory
- › Econometrics
- › Marketing and Consumer Behavior
- › Corporate Finance
- › Additional elective courses in Management and Business Economics

SAMPLE MANAGEMENT AND BUSINESS ECONOMICS ELECTIVES:

- › Entrepreneurship Theory and Practice
- › Economics of Innovation, and Entrepreneurship
- › Business Law
- › Economics of Sports
- › Organizational Strategy
- › Economics of Money, Banking, and Financial Institutions
- › International Finance and Trade
- › Economics of Investments, Futures, and Options
- › Students can also gain units for research, working directly with a faculty member

PROGRAM LEARNING OUTCOMES

UPON GRADUATION, STUDENTS MAJORING IN MANAGEMENT AND BUSINESS ECONOMICS WILL:

- › Describe the underlying economic incentives and tradeoffs associated with the decisions made by individuals, firms, organizations, institutions and governments.
- › Apply theories and concepts from disciplines in Management and Business Economics (e.g. accounting, economics, statistics, finance, and marketing) to business management situations.
- › Communicate clearly and cogently in written and oral form within professional and academic environments.
- › Design and conduct research that can inform managerial and economic policymaking, in part by collecting, analyzing and interpreting data using relevant software.
- › Describe and evaluate the relevant ethical and social issues associated with different economic and business ventures.



WHAT IS MANAGEMENT AND BUSINESS ECONOMICS?

UC Merced's Management and Business Economics major responds to the growing demands and needs of the modern business world. The major provides rigorous analytical and quantitative training from a blend of fields including accounting, economics, finance, management, marketing, and strategy. Today's managers tackle issues that involve a number of management functions and do not always fit neatly into subject areas. The UC Merced approach is to integrate key ideas and approaches from across subject areas to evaluate and understand all the dimensions of a given issue. Creativity, innovation, and entrepreneurship are emphasized.

The major reflects the demands of private and public sector organizations for employees who are trained in analytical and quantitative decision-making, who work effectively in teams and on projects, who are comfortable in various cultures, who are "well rounded" in sciences and humanities, and who have learned the art of self-directed learning.

CAREERS

WHAT CAN I DO WITH A DEGREE IN MANAGEMENT AND BUSINESS ECONOMICS?

Students will learn the analytical tools that are needed to succeed in a modern, volatile business environment. The typical undergraduate student develops skills to build quantitative models of complex operations in competitive and imperfect markets, and is able to use these models to facilitate

decision-making. The Management and Business Economics major prepares students for a broad range of careers, including:

- | | |
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| › Market research analyst | › Accounting and audit clerk |
| › Operations research analyst | › Marketing manager |
| › Accountant | › Financial manager |
| › Financial advisor | › Meeting and event planner |
| › Business operations manager | › Data Analyst |
| › Consulting | |
| › Compliance officer | |

ALUMNI SUCCESS

2013 data from payscale.com showed that the mid-career salary for individuals with Business Economics degrees was \$87,500 on average across the U.S. Recent UC Merced MBE and ECON graduates have secured jobs at firms such as Vanguard, Merrill Lynch, Foster Farms, Gallo, Lockheed, Kiva, Blackrock, Golden State Warriors, MGM Resorts, McKinsey & Co. and Wells Fargo. Others have been accepted to graduate programs at institutions such as UC Santa Cruz, Texas A&M and Duke.

Our department is developing an alumni network on LinkedIn and Facebook to ease the transition to the labor market for future graduates.

NAVIGATING THE COMPLEXITIES OF THE REAL WORLD

A unique educational experience awaits future leaders at the University of California, Merced. By combining faculty and disciplines in ways that are not traditionally done in other management programs, our Master of Management (MM) program trains you to tackle the challenges facing industry and society today and in the future.

Offered by our interdisciplinary **Management of Innovation, Sustainability, and Technology (MIST)** group, this 12-month professional-degree program is unlike any other.

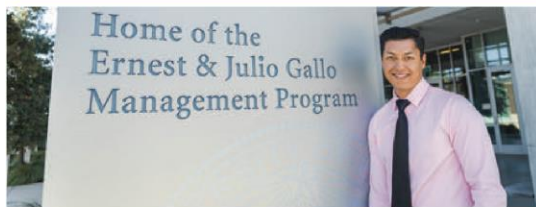
MM students learn regional and global interdisciplinary perspectives from a wide array of world-class experts in management, cognitive science, information systems, engineering, physics, economics, philosophy and environmental studies to **become T-shaped professionals — leaders with both depth and breadth.**

Carefully crafted courses draw on concepts from business, engineering, natural and social sciences, computing, and data analytics. Projects and case studies provide practical experience and applied learning.

Students from all social and educational backgrounds can develop the knowledge and skills to navigate the challenges of aligning people, organizations, information, technology and the natural world.

These diverse skills and experiences are exactly the training companies, agencies and nonprofits are looking for.

If you're looking to complement your undergraduate degree with real-world management knowledge and skills and a visionary approach to leadership, we encourage you to apply!



UNIVERSITY OF CALIFORNIA
MERCED
5200 N. LAKE ROAD
MERCED, CA 95343



WHAT YOU'LL LEARN

Foundations of Management
Traditional concepts and theories, including marketing, management, operations, strategy, accounting and finance

Critical Thinking for Management
Identify and use appropriate analytical, quantitative and data-oriented techniques for strategic planning and decision-making

Communication for Managers
Communicating effectively with experts and non-experts in business, community, and government settings; persuasive and professional presentations

INNOVATION • SUSTAINABILITY • TECHNOLOGY



WHAT YOU'LL LEARN

Leadership and Teamwork in Practice
Principles and practices of effective conflict, diversity and change management

Business Ethics & Social Context
Ethical and legal requirements for global management in complex organizational situations, including policy and risk management

Innovation, Sustainability and Technology
Synthesizing theory and practice to design innovative solutions to strategic, organizational and technical challenges

“ We're not interested in stripping away everything that makes management hard — we want students to understand how people, technology and nature operate together, and how we can better engineer these systems. ”

Professor Leroy Westerling

MASTER OF MANAGEMENT CURRICULUM

- Leadership, Organizations and Communication
- Managerial Finance and Accounting
- Quantitative Tools for Management
- Spatial Analytics
- Technology-enabled Service
- Entrepreneurship and Innovation
- Project, Program and Operations Management
- Law, Policy and Risk Management
- Case Studies in Sustainability
- Integrative Capstone Project

“ The MM focuses on management strategies that balance social justice, environmental resources and economic welfare for long-term sustainability of people, planet and profit. ”

Professor Anita Bhappu



ADMISSION INFORMATION

APPLICATIONS OPEN: October 2018 – April 2019

PRIORITY DEADLINE: February 2019

PREREQUISITE DEGREES: B.S., B.A., B.E. or equivalent

LANGUAGE: Demonstrated proficiency in English

Financial aid and fellowships available

CONTACT INFORMATION

MASTER OF MANAGEMENT PROGRAM CHAIR
Professor Anita Bhappu

EMAIL
mist@ucmerced.edu

WEB
mist.ucmerced.edu

MORE INFORMATION AND APPLICATION AT: mist.ucmerced.edu/mm-program-info



UNIVERSITY OF CALIFORNIA
MERCED

**MANAGEMENT OF INNOVATION,
SUSTAINABILITY, AND TECHNOLOGY (MIST)**

GRADUATE PROGRAM IN MANAGEMENT OF COMPLEX SYSTEMS (MCS)

Degrees Offered: Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)
University of California, Merced

The graduate program in **Management of Complex Systems** addresses cross-disciplinary challenges of understanding, modeling, designing, and managing complex systems, focusing on adaptive management of complex coupled human and natural systems and complex coupled human and technology systems, including for-profit and not-for-profit organizations and public and private enterprises.

ADMISSION INFORMATION

Applications open: Nov 2019 – Feb 2020

Financial aid and fellowships available

Requirements: Bachelors degree, GMAT or GRE

More information: mist.ucmerced.edu/phd-program-info

mist@ucmerced.edu

**Multidisciplinary doctoral training
at the nexus of complex systems and management science**

FOUNDATIONS OF MANAGEMENT

Apply disciplinary concepts and theories for framing and defining research questions and plans from business, management, economics, sociology, psychology, cognitive science, environmental science and engineering

RESEARCH METHODS FOR MANAGEMENT

Apply contemporary data analytics, complex systems, management and organizational science methods needed to conduct rigorous research in your area of specialization.

COMMUNICATION FOR MANAGERS

Communicate effectively to experts and non-experts, in professional (scientific and management) and community settings, preparing and delivering oral and written presentations using appropriate technologies.

RESEARCH INDEPENDENCE

Initiate and conduct independent research that makes an original contribution to knowledge, and which may be published in a peer-reviewed outlet.

RESEARCH ETHICS AND SOCIETAL CONTEXT

Demonstrate familiarity with all aspects of research ethics and their societal context.



MANAGEMENT OF INNOVATION, SUSTAINABILITY, AND TECHNOLOGY

Multidisciplinary faculty aligned around a common interest in better understanding how arrangements of people, organizations, information, technology and the natural world give rise to complex adaptive phenomena that pose grand decision-making challenges to society

Roger Bales PhD, Environmental Engineering Science, California Institute of Technology
hydrology, glaciology, paleoclimate, atmospheric chemistry, environmental engineering

Anita Bhappu PhD, Management, University of Arizona
organizational behavior, diversity, teams, conflict and negotiation, service delivery, digital retailing and the sharing economy

Jeffrey Jenkins PhD, Environmental Studies, University of California, Santa Cruz
political ecology, public lands and protected areas, community planning and adaptive management

Catherine Keske PhD, Agriculture and Resource Economics, Colorado State University
environmental studies, applied economics at food-water-energy nexus, land and resource management in fragile ecosystems

Tea Lempialä PhD, Organizations and Management, Aalto University
innovation studies, organization theory, technological innovation processes and collaboration

Paul Maglio PhD, Cognitive Science, University of California, San Diego
service science, human-computer interaction, distributed cognition

Russell McBride PhD, Philosophy and Cognitive Science, University of California, Berkeley
entrepreneurship, strategy, cognitive science, and the structure of social reality.

Alexander Petersen PhD, Physics, Boston University
evolution of large multiscale socio-economic systems, applying methods from complex systems, statistical physics, management and innovation science

Fanis Tsouhoulas PhD, Economics, University of Illinois Urbana-Champaign
corporate finance (corporate governance) and entrepreneurship, applied tournament theory, contract theory and the economics of information

Josh Viers PhD, Environmental Sciences, University of California, Davis
watershed management, environmental decision making, environmental and hydro informatics, geospatial analysis

Leroy Westerling PhD, Economics and International Affairs, University of California, San Diego
applied climatology, wildfire, simulation and scenario analysis, climate change impact assessment, resource management policy

Lisa Yeo PhD, Operations and Information Systems, University of Alberta
economics of information systems, security and privacy, organizational behavior

CONTACT mist@ucmerced.edu



2/9
About the Program | MCS

LA UNIVERSITY OF CALIFORNIA
MERCED
GRADUATE DIVISION

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ABOUT MANAGEMENT OF COMPLEX SYSTEMS M.S. | PH.D.

The graduate program in Management of Complex Systems addresses cross-disciplinary challenges of understanding, modeling, designing, and managing complex systems, focusing on adaptive management of complex coupled human and natural systems and complex coupled human and technology systems, including for-profit and not-for-profit organizations and public and private enterprises.

MULTIDISCIPLINARY TRAINING

FOUNDATIONS OF MANAGEMENT
Apply disciplinary concepts and theories for framing and defining research questions and plans from business, management, economics, sociology, psychology, cognitive science, environmental science and engineering.

RESEARCH METHODS FOR MANAGEMENT
Apply contemporary data analytics, complex systems, management and organizational science methods needed to conduct rigorous research in your area of specialization.

COMMUNICATION FOR MANAGERS
Communicate effectively to experts and non-experts, in professional (scientific and management) and community settings, preparing and delivering oral and written presentations using appropriate technologies.

RESEARCH INDEPENDENCE
Initiate and conduct independent research that makes an original contribution to knowledge, and which may be published in a peer-reviewed outlet.

RESEARCH ETHICS AND SOCIETAL CONTEXT
Demonstrate familiarity with all aspects of research ethics and their societal context.

MANAGEMENT OF COMPLEX SYSTEMS AT UC MERCED

The Ph.D. in Management of Complex Systems (MCS) is designed to educate a new generation of management scholars with depth in analytical methods and a focus on complexity as the driving force behind issues in management of human-technology systems and in management of coupled human-natural systems.

The program draws upon the multidisciplinary composition of Management of Innovation, Sustainability and Technology (MIST) faculty and the interdisciplinary spirit of UC Merced to deliver a distinctive educational experience – one that provides students the flexibility to cross-breed coursework and mentorship with other domains of engineering, science, and social science. Likewise, the program does not require prospective students to have any particular undergraduate degree.

Courses are directly taught by MIST core faculty who have expertise in various facets of adaptive management of complex coupled human and natural systems, including for-profit and not-for-profit organizations and public and private enterprises. As such, coursework and thesis projects are aimed at developing management skills tailored for 'wicked problems' – those of indeterminate scale and scope requiring interdisciplinary collaboration – that are so often encountered in complex adaptive systems.

Both the sources and solutions to the grand challenges of the 21st century are at the intersection of people, organizations, information, technology, and the natural world. By focusing on this nexus, this program will prepare our students with a valuable skillset for working with other scholars, practitioners, and policy makers in order to address challenges of monitoring, analysis, modeling, entrepreneurship, adaptive management and change leadership that managers and leaders are faced with across a diverse array of public and private organizations.

VISIT OUR WEBSITE

UC Merced Graduate Studies – Management of Complex Systems

Watch later
Share

Watch on YouTube

LA UNIVERSITY OF CALIFORNIA
MERCED
GRADUATE DIVISION

REQUEST MORE INFORMATION

GRADUATE STUDIES | MANAGEMENT OF COMPLEX SYSTEMS

WEBSITE

CONTACT

APPLY TODAY



REQUEST MORE INFORMATION

GRADUATE STUDIES | MANAGEMENT OF COMPLEX SYSTEMS

2/9
Research Areas | POLITICAL SCIENCE

UNIVERSITY OF CALIFORNIA
MERCED
GRADUATE DIVISION

f in t i e

ABOUT POLITICAL SCIENCE PH.D.

The Political Science Graduate Group at UC Merced offers innovative Ph.D. training that emphasizes a rigorous, theoretical, and quantitative approach to the study of politics.

We use a unique approach to graduate training, focused on Political Institutions & Political Economy (PIPE) and Political Cognition & Behavior (CAB), guaranteeing that students will have a comprehensive and creative understanding of politics.

We believe in interdisciplinary research, crossing boundaries and finding new frontiers, so students are also encouraged to work with faculty from other disciplines such as cognitive science, psychology, economics, sociology and philosophy to enrich their education.

[VISIT OUR WEBSITE](#)

RESEARCH AREAS

POLITICAL INSTITUTIONS AND POLITICAL ECONOMY

- Legislatures
- International institutions
- Human rights and government repression
- Electoral institutions and representation
- Authoritarian politics
- Courts
- Local government

POLITICAL COGNITION AND BEHAVIOR

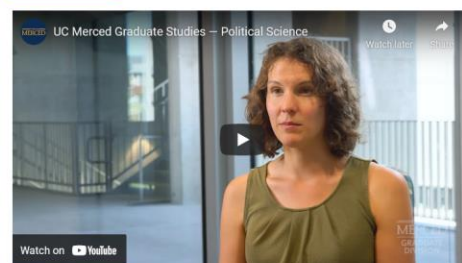
- Public opinion
- Political psychology
- Voting behavior
- Biology and politics
- Experimental methods
- Political participation

POLITICAL SCIENCE AT UC MERCED

Graduate training hinges on a student's access to and engagement with faculty. The small size of our program guarantees that seminar classes are small and students have unparalleled one-on-one faculty mentoring with respect to research, training, and professional development. The success of a graduate program also depends upon the quality of the faculty. A recent study of political science in the University of California system found that UC Merced's political science faculty have the highest average rate of research productivity in the entire UC system. Our faculty regularly publish their cutting-edge research in the very best journals and book presses in the discipline.

Graduates of our program have gone onto careers as professors at research and teaching universities, as well as high profile positions in the private sector.

We are currently accepting applications for Fall 2022 admission. Our application deadline is January 15, 2022.

[APPLY TODAY](#)


FUNDING SUPPORT

Our graduate students are offered funding in the form of teaching or research assistantships. The low cost of living in Merced means that funding stretches further than at many other campuses. We also offer annual research grants to our students to assist with their ability to acquire skills, conduct research, and present work at professional conferences.

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 › Political economy of development, democratization, political organizations
 Email: adasgupta3@ucmerced.edu

[WEBSITE](#)

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 › Voting behavior, developing democracies, Southern Africa
 Email: ddekadt@ucmerced.edu

[WEBSITE](#)

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[WEBSITE](#)

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 Email: mhibbing@ucmerced.edu

[WEBSITE](#)

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 › Authoritarian politics, news media, public opinion and game theory
 Email: hhuang24@ucmerced.edu

[WEBSITE](#)

BRAD LEVECK

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 › Strategic choice and development of collective wisdom in democracies
 Email: bleveck@ucmerced.edu

[WEBSITE](#)

NATHAN MONROE

American politics
 › Legislative institutions and Congress
 Email: nmonroe@ucmerced.edu

[WEBSITE](#)

TESALIA RIZZO

› Political behavior, citizen-state relations, social policy, bureaucracy and machine politics in Latin America
 Email: trizzo@ucmerced.edu

[WEBSITE](#)

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American politics
 › Political behavior, inequality, field experiments, geo-spatial analysis
 Email: msands2@ucmerced.edu

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 › Civil war, insurgency, terrorism, and forcible displacement
 Email: ashaver@ucmerced.edu

[WEBSITE](#)

JESSICA TROUNSTINE

American politics
 › Local politics and political representation
 Email: jttrounstine@ucmerced.edu

[WEBSITE](#)

CONTACT

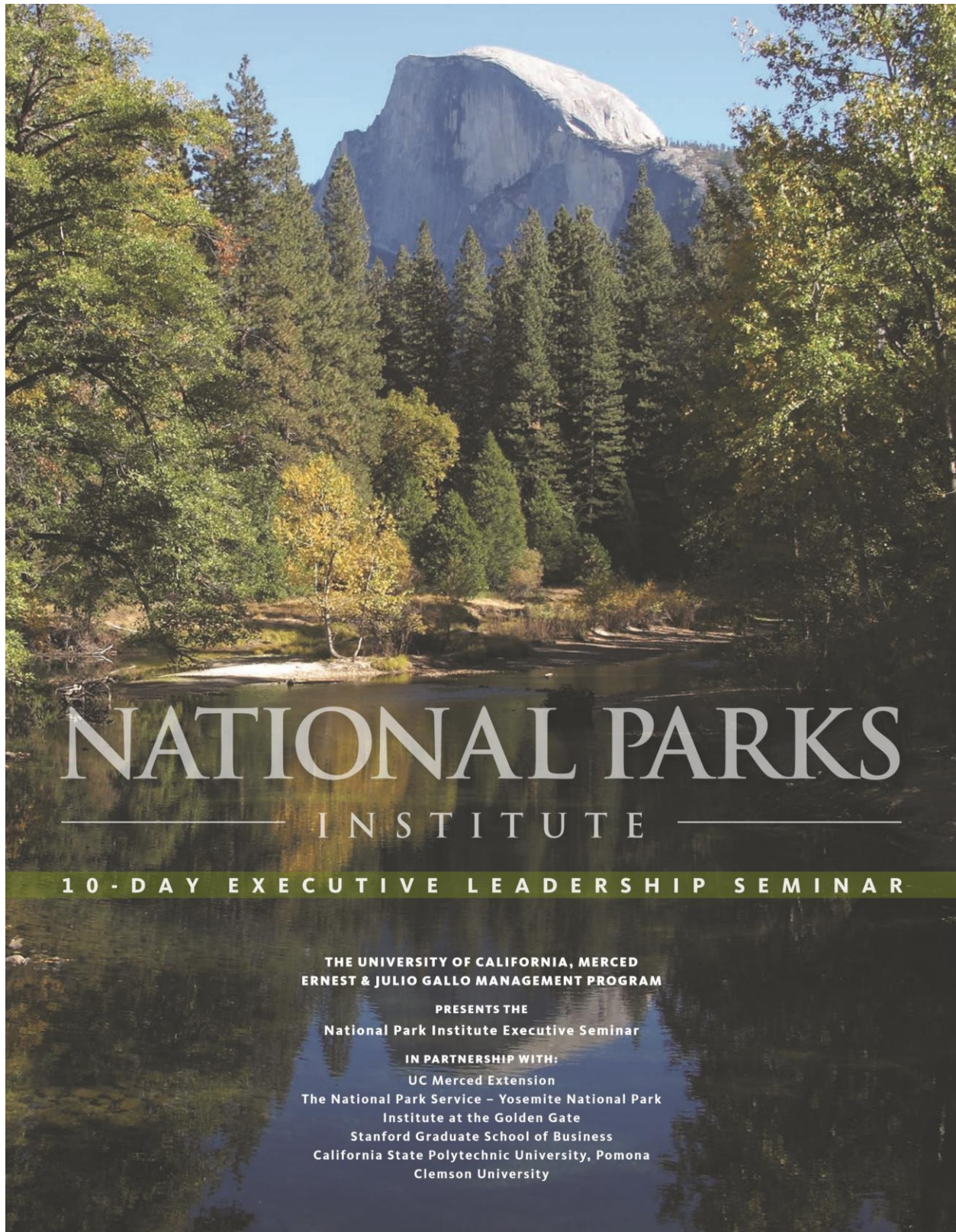
BRAD LEVECK
 Political Science Graduate Program Chair
 Email: bleveck@ucmerced.edu
 Website: polisci.ucmerced.edu
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GRADUATE STUDIES | POLITICAL SCIENCE





CHANGE, ENERGY AND INNOVATION

FROM CALIFORNIA'S SIERRA FOOTHILLS TO KENYA'S SAVANNAH PLAINS, THE CHALLENGES FACING THE WORLD'S NATIONAL PARKS AND RESERVED LANDS ARE IMMENSE AND REQUIRE A NEW WAY OF THINKING.

Park leaders are faced with rapidly escalating issues such as climate change, habitat loss, encroachment into parks and protected lands, budget constraints and frequent changes in leadership — all of which make management a sometimes overwhelming challenge. That's where the University of California, Merced, and its National Parks Institute Executive Leadership Seminar step in.

- The seminar — a partnership between UC Merced, the Institute at the Golden Gate, California State Polytechnic University, Pomona and the Stanford Graduate School of Business — provides the opportunity for 30 park leaders from around the world to share knowledge, learn from world-renowned experts on topics that affect the future of natural lands, and learn how to anticipate and lead strategic change, reinvigorate their organizations and incorporate innovative thinking into their management repertoires.
- Each year, during the seminar's intensive 10-day program, park leaders use the lens of business management strategy to build a framework for future management action.
- The framework is based on the foundational concepts of an ambidextrous, responsive, triple bottom line thinking organization and three underlying pillars of support: science, law and policy. Within this framework, students learn how to lead change and facilitate organizational renewal.
- Interactive discussions are lead by premier researchers, naturalists, innovators and park leaders and are supplemented by field excursions, course work, small-group problem-solving sessions and case-challenge learning.

EDUCATIONAL SETTINGS



SAN FRANCISCO

The journey participants take during the program is a key element of the seminar's design. This exploration begins at historic Fort Baker and the Golden Gate National Recreation Area, where the key foundational concepts for the course are set by Stanford Graduate School of Business Professor Charles O'Reilly. At this location, the seminar delves into the innovative partnerships and management approaches pioneered by Golden Gate National Recreation Area and the Institute at the Golden Gate in an urban interface protected area.



UNIVERSITY OF CALIFORNIA, MERCED

The second section of the seminar is hosted by the University of California's newest campus, in Merced. Located in the heart of the San Joaquin Valley, near Yosemite National Park, the university's world-class researchers meld research, technology, innovation and leadership to scrutinize resource challenges and provide management recommendations. The unique relationship between UC Merced and the National Park Service, demonstrated through the collaboration on the National Parks Institute, highlights the value of engagement and partnership between protected-area managers and academic research institutions.



YOSEMITE NATIONAL PARK

The seminar culminates in breathtaking Yosemite National Park, in the Sierra Nevada mountains. At Yosemite, participants integrate the knowledge and tools learned during previous sessions through interaction with on-the-ground application of protected-area management. As a large, flagship protected area with significant natural and cultural resources, high visitation and world-wide visibility, Yosemite provides the perfect case study for stewardship.

CASE-CHALLENGE APPROACH

MANAGEMENT, CONSERVATION AND PROTECTION ISSUES ARE APPROACHED FROM A REAL-WORLD CASE PERSPECTIVE. THIS APPROACH, TEACHES HOW TO APPLY A PRACTICAL FRAMEWORK TO ISSUES AND WORK THROUGH CHALLENGING SITUATIONS TO ARRIVE AT A STRATEGIC, INNOVATIVE, WELL-INFORMED PATH FORWARD.

THE CASE PERSPECTIVE IS ALSO TAKEN ONE STEP FURTHER:

- Each participant brings a local park management challenge.
- With feedback from their instructors and peers, each participant develops an implementable action plan for their challenge to take home at the conclusion of the course.

LEADERS AID LEARNING

SEMINAR PARTICIPANTS ALSO LEARN FROM THE WORLD'S LEADERS AND INNOVATIVE THINKERS. AFTER A PUBLIC, PLENARY ADDRESS HOSTED BY UC MERCED, KEYNOTE SPEAKERS RETREAT WITH PARTICIPANTS FOR AN INTIMATE, CLASS-ONLY DISCUSSION.

PREVIOUS KEYNOTE SPEAKERS INCLUDE:

Former U.S. President Jimmy Carter, former National Park Service Director Robert G. Stanton and Harvard Professor E.O. Wilson.



PRESIDENT JIMMY CARTER



ROBERT G. STANTON



E.O. WILSON

“ The opportunity for partnership between the two — and in the greater scale between an institution of the high quality and probity of the National Park System and the University of California system — is quite extraordinary for the advancement of both research and teaching.



PHOTO CAPTION:

AT LEFT, PULITZER PRIZE WINNING ECOLOGIST AND AUTHOR E.O. WILSON WITH FORMER NPS DIRECTOR JON JARVIS DISCUSSING THE VALUE OF THE RESEARCH RELATIONSHIP BETWEEN UC MERCED AND NATIONAL PARKS WITH COURSE PARTICIPANTS.



CURRICULUM AND FORMAT

THIS SEMINAR IS DESIGNED SPECIFICALLY FOR LEADERS IN PARK AND PROTECTED AREA MANAGEMENT. PARTICIPANTS WILL LEARN TO LEAD STRATEGIC CHANGE BY ANTICIPATING CHANGE, REINVIGORATING THEIR ORGANIZATIONS, AND INCORPORATING INNOVATIVE THINKING INTO THEIR MANAGEMENT.

A practical framework will be applied to real-world case studies and take-home action plans.

FOUR MODULES WILL FOCUS ON:

- Leading Change and Organizational Renewal
- Context Matters: Trends and Critical Issues in Public Land Management
- Innovation in the Field
- Generating Motivation and Commitment

LEADING CHANGE AND ORGANIZATIONAL RENEWAL

Learn a universally-adaptable framework and create a usable action plan for strategic leadership that includes:

- Setting a forward-thinking strategic direction with measurable objectives
- Analyzing performance gaps and opportunity gaps and their root causes
- Defining, diagnosing, and shaping desired culture change to execute strategy
- Managing for short-term solutions while building capacity for long-term strategic visioning and innovation
- Overcoming resistance to change



CONTEXT MATTERS: TRENDS AND CRITICAL ISSUES IN PUBLIC LAND MANAGEMENT

- Managers need to understand the context in which they work in order to articulate a clear vision and set a strategic direction.
- The context surrounding today's parks and protected areas are rapidly changing. They are linked to the economic welfare of nearby communities and to the global welfare at large.
- Boundary-crossing issues of global concern such as climate change, watershed protection, and an increase in the severity of wildfires have arisen. Partnerships and fundraising have become central to park operations, and parks are increasingly struggling with relevancy due to demographic changes and cultural shifts.

INNOVATION IN THE FIELD

- This module will focus on expanding the opportunities and mindset of public land managers in imagining possibilities through contact with innovators and best on-the-ground practices in a variety of disciplines.
- Participants will learn how emerging technologies and creative communicating may allow for more effective operations. Besides hearing from leading innovators, participants will become a think tank of ideas through the creation of a global cohort network of park and protected area leaders.

GENERATING MOTIVATION AND COMMITMENT

- One of the most challenging tasks for a leader is to generate the motivation and commitment necessary to implement change efforts.
- Managers need to analyze the current culture's ability to execute the desired strategy, and, if necessary, shape the culture. In doing so, they create satisfied employees who understand the goals they are working toward.
- Highly engaged employees tend to be more resilient to, and supportive of, organizational change initiatives, and can lead to better company performance overall.
- Strong leaders help shape culture by building clear and consistent communication across the organization, empowering employees, and creating systems for rewards and incentives.

GLOBAL SCOPE

THE NATIONAL PARKS INSTITUTE EXECUTIVE LEADERSHIP SEMINAR INTENTIONALLY DRAWS NATIONAL PARK AND PROTECTED AREA LEADERS FROM THE UNITED STATES AND AROUND THE WORLD.

By involving multinational park leaders, the seminar gives participants many opportunities to explore how different nations manage park resources under different systems. Each cohort of participants is specially chosen to represent a diversity of perspectives: geographic, political, ecosystem, gender, age, organization type, management level and knowledge area.



THE FUTURE

Knowledge exchange and relationship development across political boundaries and widely varying backgrounds is critical for the future sustainability of effective and appropriate protected-area management. The personal and professional relationships developed in the seminar serve as an anchor for the professional network and global alumni community of NPI leaders and provide avenues for collective knowledge exchange and continued innovation.



ABOUT THE NATIONAL PARKS INSTITUTE

THE NATIONAL PARKS INSTITUTE (NPI) IS THE CULMINATION OF MORE THAN 15 YEARS OF DIALOG AND COLLABORATION BETWEEN YOSEMITE NATIONAL PARK, THE UNIVERSITY OF CALIFORNIA, MERCED, AND THE NATIONAL PARK SERVICE.

- The vision for NPI is to have a sustained academic-agency partnership with a physical center on the UC Merced campus.
- The multidisciplinary institute is devoted to addressing and providing innovative solutions to the challenges that face domestic and international national park and protected-area management.

PRESENTED BY UC MERCED'S ERNEST & JULIO GALLO MANAGEMENT PROGRAM:

- The Executive Leadership Seminar
- The Yosemite Leadership Program
- The Wilderness Education Center
- California Center for Parks and Protected Areas Leadership



NPI IS MATURING TOWARD ITS GOAL OF FOCUSING ON:

- Scientific research and scholarly thought
- Technological innovation
- Non-traditional audience outreach and education
- International cooperation
- Academic workforce preparation and management development for current and future national and international park managers and staff
- Collaboration between academics, researchers, nonprofit organizations, government agencies and private industry

AREAS OF SPECIAL EMPHASIS WILL INCLUDE:

- Multidisciplinary scientific research
- Collaborative relationships among national laboratories, state and federal agencies, cooperating universities and within the 10-campus UC system
- Establishment of a multidisciplinary parks issues think tank for long term problem-solving
- Research facilities on campus including a center for strategic fire studies and geographic information system (GIS) technology laboratory
- Forum for discussions on large-scale global issues that challenge protected-area management
- Curriculum tracks that lead to four-year degrees, advanced degrees and certificate programs in specific areas of land management and leadership
- Lifelong learning for leadership in environmental and cultural-resource management
- Development of sustainable technologies for use in public-land-management arenas

FOR MORE INFORMATION:

✉ sshackelton@ucmerced.edu

🌐 parkleadership.ucmerced.edu



UNIVERSITY OF CALIFORNIA MERCED
**ERNEST & JULIO
GALLO**
MANAGEMENT PROGRAM

APPENDIX F: PROPOSED GALLO SCHOOL BYLAWS

1. FUNCTIONS

The Faculty of the Gallo School shall conduct the government of the Gallo School, subject to the following limitations:

- a. The Faculty is a Committee of the Merced Division of the Academic Senate, is responsible to the Division, and may from time to time be instructed by the Division.
- b. Graduate study and higher degrees are subject to the rules and coordinating powers of the Graduate Council.
- c. The Faculty is not responsible for student discipline.

2. MEMBERSHIP

The Faculty of the Gallo School shall consist of those members of the Academic Senate designated in Merced Division Bylaws, Part III.2.

3. COMMITTEES

- a. There shall be two standing committees of the Gallo School: The Executive Committee (described in Section 4) and the Undergraduate Curriculum Committee (described in Section 5).
- b. Additional *ad hoc* committees may be established by the Executive Committee as required.

4. OFFICERS

- a. The Chair is a voting member of the committee, and will serve for one year, with a term beginning on the first day of Fall semester. The Chair's duties include:
 - i. Serving as the Chair of the Executive Committee.
 - ii. Calling and presiding over all meetings of the Faculty of the Gallo School, as well as meetings of the Executive Committee.
 - iii. Representing the Faculty in all appropriate aspects of the School, in written and verbal communication.
 - iv. Advising the appointed administrative officer(s) in the administration of the School.
 - v. Establishing and maintaining liaison with other Faculties of the Merced Division through their elected school officers.

- vi. Facilitating communication with Gallo School faculty regarding Executive Committee and Senate business, including electronic communication.
 - vii. Assuring that Senate rules are followed, such as annual voting on rules governed by Bylaw 55 and elections of officers.
 - viii. Any other such duties as the Faculty shall direct.
 - ix. The Chair shall not serve for more than two consecutive terms.
- b. The Vice Chair/Secretary will serve for one year and is elected by the Executive Committee from among the Executive Committee members (described in Section 5-a) at the start of the Fall semester. The Vice Chair/Secretary's duties include:
- i. Serving as the Vice Chair/Secretary of the Executive Committee.
 - ii. Presiding in the absence of the Chair at meetings of the Executive Committee and the Faculty.
 - iii. Directing the transcription and distribution of minutes for meetings of the Executive Committee and the Faculty, the distribution of all calls to meetings, and the maintenance of a current roster of members of the Faculty.
- c. Elections
- i. Elections for the Chair shall normally take place during the Spring Semester.
 - ii. The Chair shall be elected annually from voting members of the Faculty.
 - iii. Not fewer than four weeks prior to elections, the Executive Committee shall distribute a call for nominations to the Faculty. Nominations for Chair shall be submitted to the Executive Committee. A nominating petition must be signed by three voting members of the Faculty. The nominee must certify willingness to serve if elected.
 - iv. At least a week before the Election, the Executive Committee shall provide to each voter, either by mail or electronically, a list of all nominees and a ballot listing the nominees in alphabetical order. The voting system must verify each voter's identity and maintain security.
 - v. The Chair position shall be filled by the candidate receiving the most "Yes" votes. In the case of a tie between two candidates, a coin flip shall determine the winner; in the case of a tie among more than two candidates, there will be a second round of voting that includes only the tied candidates. Any additional ties will be settled via a sequence of coin flips among the tied candidates."
 - vi. In the case that there is only one candidate nominated for the position of Chair at the conclusion of the nomination period, the election by ballot shall be omitted and the sole candidate shall be declared elected.

- vii. The voting members of the Executive Committee shall choose the Vice Chair/Secretary of the Gallo School faculty from their ranks.

d. Replacements

- i. If the Chair is unable to complete his or her term of office, the Vice Chair/Secretary shall assume the position of Chair, unless a special election is called.
- ii. If the Vice Chair/Secretary is unable to complete his or her term of office, either by assuming the office of Chair or for another reason, the Executive Committee shall appoint a replacement to serve the unexpired part of the term. In filling the vacancy, the Executive Committee is instructed to give consideration to nominees not elected but receiving the highest vote in the immediately preceding election.

5. EXECUTIVE COMMITTEE

a. Membership. The Committee shall consist of:

- i. One representative from each of the departments in the School, directly elected or appointed following each department's approved procedure.
- ii. The Chair of the Faculty.
- iii. An Assistant Professor representative elected by and from Assistant Professors appointed in the School. The Assistant Professor representative and the Chair of the Faculty shall not be from the same department.
- iv. One additional at-large representative from each department not represented by the Chair of the Faculty or the Assistant Professor representative (described in Section 4-a-iii). Each at-large representative will be directly elected or appointed following each department's approved procedure.
- v. The Dean of the School shall serve as an *ex officio* member, non-voting.

b. Officers

- i. The Chair of the Faculty shall serve as Chair of the Committee.
- ii. One member of the Executive Committee will serve as the Vice Chair/Secretary of the Faculty and Vice Chair/Secretary of the Committee.

a. Duties

- i. Represent the Faculty in all aspects of the Gallo School (except as described in Section 6).
- ii. Provide general oversight of the academic programs in the School and bring before the Faculty of the School any recommendations the Faculty Executive Committee may deem advisable.

- iii. Serve as an advisory body on matters concerning the welfare of students in the School.
 - iv. Review and propose faculty votes for changes to School regulations.
 - v. Serve as the primary point of contact between the Gallo School and the Merced Division Senate Assembly.
 - vi. Except as otherwise specified in these by-laws or unless otherwise assigned by the Dean, the Senate, or the Department, appoint members to all committees either within the School or on behalf of the School
 - vii. Facilitate communication with School faculty regarding Executive Committee and Senate business.
 - viii. Confer with and advise the Dean or Dean's designee and other administrative agencies regarding academic planning, budget and resource allocations.
- d. Meetings
- i. The Chair may call Executive Committee meetings as necessary, but not less than once per academic term, including meetings via electronic means. Normally, the Executive Committee will meet once per month during the academic year. Upon written request of two Executive Committee members, a meeting must be called by the Chair or, in his or her absence or disability, by the Vice Chair/Secretary. Votes and discussions may be conducted by email.
 - ii. A majority (greater than 50%) of the Executive Committee membership shall constitute a quorum.
 - iii. Normally votes will be decided by a simple majority (greater than 50%) of the committee membership. However, approval of school-level strategic plans (including faculty line allocations and budget priorities) requires both approval by a majority of members and approval by at least one member from each department.
- e. Elections and Terms
- i. Elections for department representatives shall be held during the final four weeks of the Spring Semester.
 - Department representatives shall serve for one year. Individuals that serve for three consecutive terms, whether wholly or in part, are ineligible to serve as department representatives for at least one year.

Terms of office begin on the first day of the Fall semester.

6. UNDERGRADUATE CURRICULUM COMMITTEE

a. Membership.

- i. The Committee shall consist of one representative from each department in the Gallo School. Each representative will be directly elected or appointed following each department's approved procedure.
 - ii. The Dean of the School shall serve as an *ex officio* member, non-voting.
- b Officers
 - i. The committee will elect a Chair at the beginning of each academic year from among the members of the Committee.
- c Duties
 - i. Approve undergraduate course request forms (CRFs) and make recommendations to Undergraduate Council.
 - ii. Manage the process of establishing new major and minor programs or modifying existing major and minor programs by
 - 1. Reviewing proposed changes to undergraduate programs to ensure proposed new or modified programs complement rather than duplicate or compete with existing offerings.
 - 2. Making recommendations to School faculty for final approval of new or modified programs that must be approved by Undergraduate Council.
- d. Meetings
 - i. The Curriculum Committee shall meet as necessary, but not less than once per academic term, including meetings via electronic means. Normally, the Curriculum Committee will meet once per month during the academic year to discuss and approve CRFs. Votes and discussions may be conducted by email. Decisions will be made by simple majority (greater than 50%) vote of the committee membership.
 - ii. A majority (50% or greater) of the Curriculum Committee membership shall constitute a quorum.
- e. Elections and Terms
 - i. Department representatives shall be determined by the end of the Spring Semester.

Department representatives shall serve for one year. Terms of office begin on the first day of the Fall semester

7. MEETINGS

- a. The Faculty shall meet at such times as it may determine or at the call of the Chair or the Vice Chair/Secretary. Upon the written request of six voting members, a special meeting must be called by the Chair or, in his or her absence or disability,

by the Vice Chair/Secretary. The call to all meetings must be sent to all members of the School faculty at least five business days prior to the meeting.

- b. The Chair of the Faculty is authorized to call informal meetings of the Faculty for the purpose of presentation or discussion of matters of interest to the Faculty or a large group thereof.

8. QUORUM

- a. Fifty percent of the voting members of the Faculty of the Gallo School shall constitute a quorum for matters voted on by the Faculty as a whole (including those participating via electronic means).
- b. Fifty percent of the voting members of each department of the Gallo School shall constitute a quorum for matters voted on separately by each department (including those participating via electronic means).
- c. There shall be no votes by proxy.

9. VOTING REQUIREMENTS

- a. *Voter Eligibility.* All Senate Faculty with a primary (50% or greater) appointment in the School are eligible to vote.
- b. *Method of Voting.* Any eligible voter may request any vote be done by anonymous electronic ballot.
- c. *Major and Minor Program Votes.* For new or modified major and minor undergraduate programs to be offered by the School, approval requires a simple majority of votes cast (not including abstentions) in each and every department of the School.
- d. *Bylaw Amendment Votes.* For bylaw amendments, including the addition of any new department to the Gallo School, approval requires a simple majority of votes cast (not including abstentions) in each and every department of the School.
- e. *Other Votes.* For all other matters requiring a vote of the Senate Faculty of the School, approval requires a simple majority of all votes cast (not including abstentions).

10. THE DEPARTMENTS

- a. The Gallo School consists of the following Departments:

Economics and Business Management
Cognitive and Information Sciences
Management of Complex Systems
Political Science

- b. Each Department shall be responsible for the following matters:

- i. The recruitment, supervision, and evaluation of departmental academic ladder personnel.

- ii. The development of the departmental curriculum and the administration of its degree programs.
- iii. The admission and matriculation of departmental students.
- iv. The proper functioning of a grievance procedure for both Department personnel and students.
- v. The election of representatives to the Executive Committee and Curriculum Committee.

In addition to responsibilities outlined in APM-245, each Department Chair will be responsible for the following departmental matters:

- i. The proper administration of the budget according to the allocations and categories decided by the Dean in consultation with the Chair.
- ii. Ensuring that departmental bylaws are updated and reviewed periodically.
- iii. The staffing and supervision of the departmental curriculum.
- iv. The recruitment, supervision, and evaluation of non-academic personnel assigned to the Department.
- v. The recruitment, supervision, and evaluation of non-ladder academic personnel.

11. THE DEAN

- a. *Appointment.* The Dean will be appointed by the Chancellor or his/her designee, in consultation with the faculty in all Departments, through an open search process.
- b. *Duties.* The Dean is responsible for the overall administration of the school, including (but not limited to) the following duties:
 - i. Allocation of resources to the departments.
 - ii. Managing and accounting to the departments and Faculty for all School endowments and restricted funds.
 - iii. Administration of applicable system-wide and local rules and regulations.
 - iv. Seeing that the admission and matriculation of students in the departments are in accordance with University rules and regulations.
 - v. Maintaining proper grievance procedures for students and staff.
 - vi. Appointing new department chairs after consultation with department faculty and consistent with department by-laws.
 - vii. Developing and maintaining a strategic plan for the School in consultation with the School Executive Committee and Dean's Cabinet.
 - viii. Serving as the School liaison to the University administration

- c. *Cabinet.* The Dean of the School shall convene and be advised by Cabinet comprising the Chair of each department (the Vice Chair or other departmental officer may represent the department if the Chair cannot attend.).
 - i. The Dean's Cabinet will meet at the request of the Dean, or of two departmental Chairs, or in any case at least once per semester. Agendas for Cabinet meetings will be circulated at least 5 working days before the meeting is scheduled.
 - ii. The Cabinet shall coordinate interdepartmental activities and advise the Dean on space allocation, departmental budgets, graduate student funding priorities, and new academic initiatives, as well as longer-term priorities for development and outreach.
 - iii. Cabinet meetings may include staff members, heads of Centers, or other guests as deemed necessary by the Dean

12. AMENDMENTS TO THE BYLAWS

- a. Any amendments to these bylaws, including the addition of any new department to the Gallo School, must be approved by a majority of the faculty in each and every department in the Gallo School.

APPENDIX G: DEVELOPMENT PLAN

The Ernest & Julio Gallo School of Management Proposed Fundraising Plan Spring 2022

The Ernest & Julio Gallo School of Management is preparing to launch with an innovative alliance of academic disciplines and a robust range of high-demand programs. While budgeted revenue sources are sufficient to fund the School's core operations, the School and those it serves would benefit significantly from additional sources of support. Robust philanthropic support in particular has the potential not only to accelerate the achievement of the goals outlined in this proposal but also to expand its operational scope, and to improve its ability to serve its students, attract and retain top faculty and staff, and advance its research endeavors.

Part of the proposal for a new school on a new campus with an alumni base in the earliest stages of developing its culture of philanthropy, this Development Plan necessarily focuses on long-term efforts to build sustainable and transformational support. We will expand our relationships with corporate partners, foundations, and individuals whose passion for our mission will bridge the School's need for external support while the alumni base—the chief source of such funds for established peer institutions—grows and matures in its ability to support the School.

The following is our proposed strategy to build both current-use and endowed funds:

1. Build Gallo School Advisory Council
 - a. Comprised of 10-15 committed individuals and partners, the Council will begin with engaging members in the School's launch, ultimately encouraging members to make philanthropic commitments to the School at the \$5,000 level annually.
 - i. FY23: recruit 50% of members (achieved FY21)
 - ii. FY24: recruit remaining members (achieved FY22)
 - b. Council members will also introduce individuals and organizations in their networks for partnership and philanthropic investment, thereby expanding the donor pool.
2. Engage and cultivate current donors toward comprehensive, multi-year commitments of current use and endowed funds.
3. Raise brand awareness to attract new donors for major, repeatable, and sustainable investments.
 - a. Collaborate with Advisory Council, members of the Gallo family, Gallo School alumni, and organizational and institutional partners to identify prospective new donors.
 - b. Leverage achievements of Gallo School to build awareness and investment.
4. Integrate the School's fundraising goals into a campus-wide fundraising campaign in support of UC Merced's Strategic Plan.
 - a. Ensure that any early-phase campaign initiatives include outreach to and involvement of members of the Advisory Council and all other established or promising Gallo School prospects.

- b. Use the findings from that outreach to set ambitious yet achievable fundraising targets for the School.
- c. Develop a gift table to illustrate how the fundraising targets can be achieved in the context of a comprehensive, campus-wide campaign.
- d. Create a table of giving opportunities (with attractive and ambitious gift minimums) for named scholarships, fellowships, spaces, faculty chairs, and programs.
- e. Map the giving opportunities to the gift table to create targets for numbers of each of these kinds of opportunities required to achieve the campaign targets.

The sample Table of Gifts and Table of Giving Opportunities below illustrate the number and kinds of gifts that would allow the School to build a new \$15 million endowment as it follows the Development Plan above over the course of a multi-year campaign.

Example Table of Gifts

Phase	Gift Level	# Gifts Needed	# Prospects Needed	Providing	Cumulative	% Raised by Gift Level	% Raised by Phase
Principal Gifts	\$5,000,000+	1	3	\$5,000,000	\$5,000,000	33%	63%
	\$2,500,000	1	4	\$2,500,000	\$7,500,000	17%	
	\$1,000,000	2	6	\$2,000,000	\$9,500,000	13%	
Major Gifts	\$500,000	4	12	\$2,000,000	\$11,500,000	13%	28%
	\$250,000	6	18	\$1,500,000	\$13,000,000	10%	
	\$100,000	8	24	\$800,000	\$13,800,000	5%	
Major Gifts	\$50,000	14	42	\$700,000	\$14,500,000	1%	3%
	\$25,000	20	60	\$500,000	\$15,000,000	1%	
TOTALS		56	169	\$15,000,000			94%

APPENDIX H: DRAFT BUDGET FOR SSPGDP IN DATA SCIENCE AND ANALYTICS

The draft budget for the self-supporting professional graduate degree program, Master of Data Science and Analytics, sets the program fee for students at \$45,000, returns 20% to student aid, and returns a 30% assessment to the campus.⁶⁵

<i>Master of Data Science and Analytics</i>						
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
FTEs:	Pre-opening					
MS Student Enrollment		10	15	20	30	40
Teaching Faculty (# Courses)		8	8	8	8	8
25% TA/Year		0	3	4	5	10
Staff FTE	0.25	0.5	0.5	1	1	1
Operating Revenues:						
Annual Total Student Fees		50,168	52,625	55,203	57,907	60,744
Program Fee		45,000	47,250	49,613	52,093	54,698
Campus Fee		1,580	1,643	1,709	1,777	1,848
Health Insurance		3,589	3,732	3,881	4,037	4,198
Total Operating Revenues		450,000	708,750	992,250	1,562,794	2,187,911
Operating Expenses:						
Instructional S&B						
Faculty Teaching varies		97,500	150,850	177,545	218,923	264,039
Addtl faculty	-	-	-	-	-	168,000
TA Salaries 11,275	-	-	34,839	47,845	61,601	126,898
TA Benefits 5%	-	-	1,742	2,392	3,080	6,345
TA Tuition 8,619	-	-	28,254	38,802	49,958	102,914
Total Instructional S&B	-	97,500	215,685	266,584	333,562	668,195
Non-Instructional S&B						
Director Stipend 30,000	15,000	30,900	31,827	32,782	33,765	34,778
Director Benefits 5%	750	1,545	1,591	1,639	1,688	1,739
Staff Salaries 65,000	15,000	32,500	33,475	68,959	71,027	73,158
Staff Benefits 49.7%	7,455	16,153	16,637	34,272	35,301	36,360
Total Non-Inst S&B	38,205	81,098	83,530	137,652	141,781	146,035
Non-Personnel Expenses						
Infrastructure	-	10,000	10,300	10,609	10,927	11,255
Supplies/Administrative	5,000	20,000	20,600	21,218	21,855	22,510
Supplies/Instructional	10,000	20,000	22,000	24,200	26,620	29,282
Workshop/Orientation	-	10,000	10,500	11,025	11,576	12,155
Marketing/Advertising 15.0%	50,000	54,000	85,050	119,070	187,535	262,549
Faculty Research Support	-	-	-	-	10,000	10,000
Graduate Group Support 1.0%	-	-	-	-	15,628	21,879
Student Aid (IDC exempt) 20.0%	-	90,000	141,750	198,450	312,559	437,582
Total Non-Personnel Costs	65,000	204,000	290,200	384,572	596,700	807,213
Indirect Costs						
Campus Assessment Fees 30.0%	30,962	87,779	134,300	177,107	227,845	355,158
Total Indirect Costs	30,962	87,779	134,300	177,107	227,845	355,158
Total Operating Expenses	134,167	470,377	723,715	965,916	1,299,888	1,976,601
Annual Costs Per Student						
Program Direct Costs	-	29,260	29,844	29,518	25,316	29,597
Return to Aid		9,000	9,450	9,923	10,419	10,940
Indirect Cost		8,778	8,953	8,855	7,595	8,879
Total Costs Per Student		47,038	48,248	48,296	43,330	49,415
Profit (Loss) Per Student	-	(2,038)	(998)	1,317	8,764	5,283
Program Surplus (Deficit)	(134,167)	(20,377)	(14,965)	26,334	262,906	211,310
Program Cumulative Balances	(134,167)	(154,543)	(169,508)	(143,174)	119,732	331,042

⁶⁵ Worked with campus administration to set campus assessment rate, as this would be the first SSPGDP on campus.

APPENDIX I: EXCERPTS FROM CIS GRADUATE PROGRAM REVIEW, 2020

Excerpts from the “Report of the Review Team for the Program Review of Cognitive and Information Sciences, University of California, Merced”, submitted on March 30, 2020.

2.2 Faculty and Leadership

... Faculty recruiting has basically been very successful, but salaries for new faculty can be quite divergent. For example, scholars doing philosophical work are paid considerably less than those doing artificial intelligence. These sorts of inequities across members of the same department can lead to division and discontent, and should be addressed as soon as possible. The planned move to the Gallo School might provide an opportunity to move the entire faculty to the engineering pay scale....

A number of faculty noted that the Health Science Research Institute has excellent grant support staff, and that many faculty run their grants through there. Unfortunately, they, too, are becoming overstretched. **A more permanent solution might be to ask managers from this institute to help set up a new office for grant support in the Gallo School.** Although the primary beneficiaries of grant support are the faculty, graduate students also benefit from well-funded labs as this can result in GSR funding over the summer and during the academic year. To get to R1 status, both faculty and researchers who are living on their soft funding need to have adequate staff support for grants....

3.6 Move to Gallo School

CIS recently held a retreat to discuss a move from the Social Sciences Humanities and Arts (SSHA) division to the Gallo School of Management. As a result, faculty feel well included in the planning for the development of the new school and have a very positive attitude about the move. **While initially skeptical, the review committee is also positive about the planned move.** Rather than a traditional management or business school, the emphasis of the Gallo School will be on the complexity of real world problems and systems, data science, and the behavior and management of individuals, firms, and institutions. The school's emphasis on complexity and the reliance on sophisticated computational techniques is a great fit with UCM's distinctive brand of cognitive science. The plan for a data science and analytics program for undergraduates and an equivalent track for graduate students will fit well with what CIS already emphasizes in research involving big data. As approximately half of CIS graduates work in industry, the ready availability of training in the use of data science for complex, real world problems will make these students even more marketable.

The move to the Gallo School should have other positive consequences. First, the locus of CIS in SSHA has meant that CIS students and faculty often don't hear about funding opportunities aimed at STEM fields. This will no longer be the case in the Gallo School where the presence of science and technology will be more apparent. Second, the new school should be able to provide lab space and startup packages more in line with those offered in other STEM fields. Finally, the move to Gallo will involve the creation of administrative staff that places a high priority on supporting faculty efforts to bring in extramural grant support. As STEM funding models differ from those of humanities and social sciences, the hope is that staff in the planned Gallo School will better align with the needs of CIS faculty.

APPENDIX J: CAMPUS IMPACT OF THE PROPOSED GALLO SCHOOL

Here we summarize the shift in students, faculty, and other resources to the proposed Gallo School in a series of graphs showing some of what would move from existing schools to the proposed school based on data for AY 2020-21.

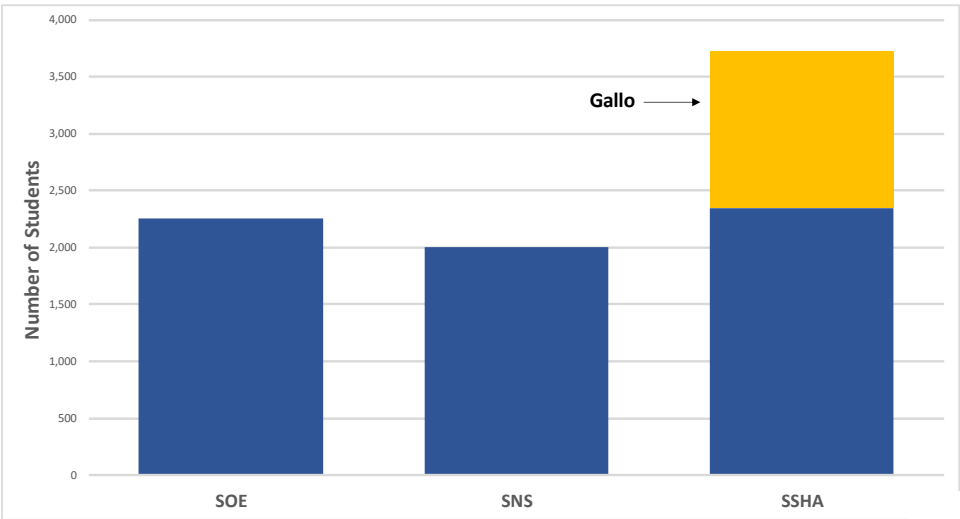


FIGURE 5. UNDERGRADUATES (AY 2020-21)
SLIGHTLY OVER A THOUSAND UNDERGRADUATE MAJORS WILL SHIFT FROM SSHA TO THE PROPOSED GALLO SCHOOL (SHOWN IN YELLOW). SSHA WILL STILL REMAIN THE LARGEST SCHOOL IN NUMBER OF UNDERGRADUATES.

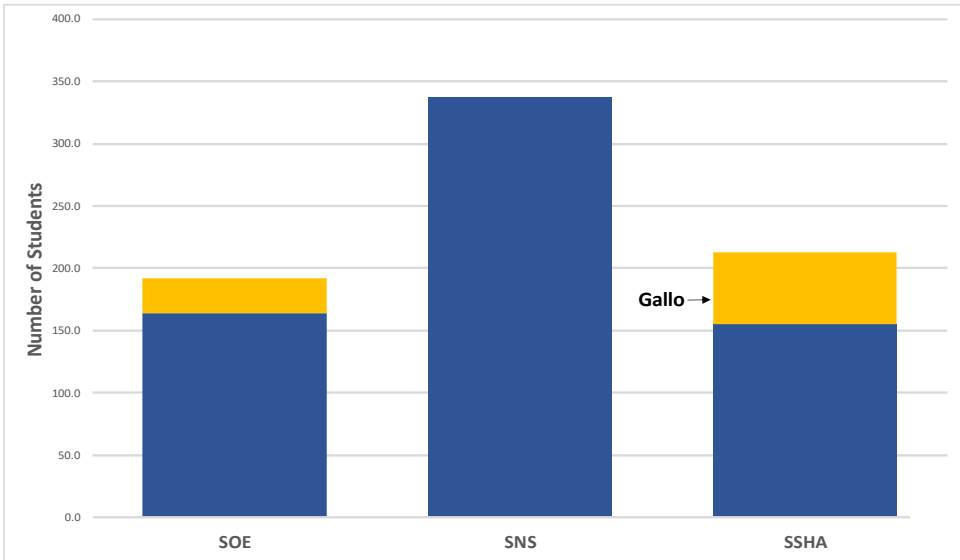


FIGURE 6. GRADUATE STUDENTS (AY 2020-21)
ABOUT 86 GRADUATE STUDENTS WILL SHIFT FROM SOE AND SSHA TO THE PROPOSED GALLO SCHOOL (SHOWN IN YELLOW).

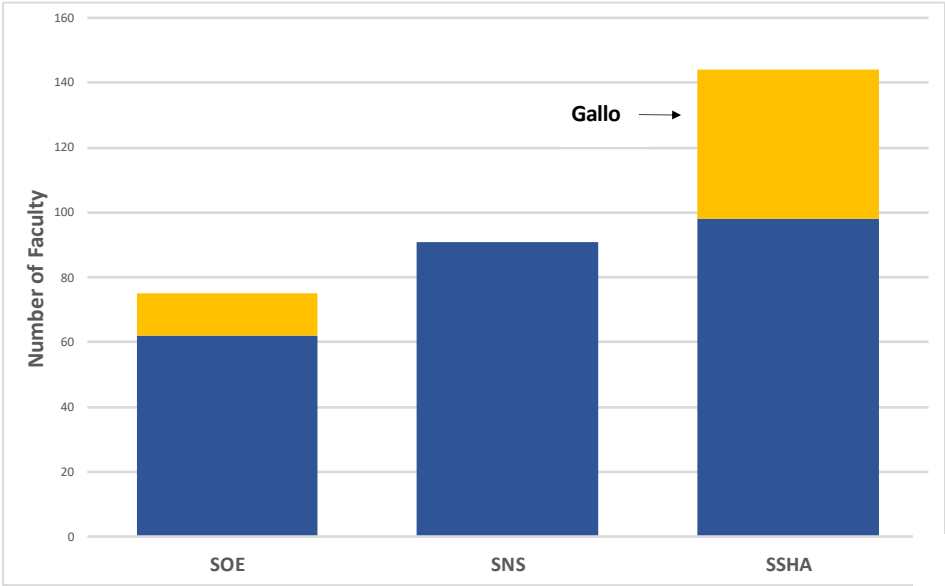


FIGURE 7. FACULTY (AY 2020-21)
ABOUT 32% OF THE FACULTY IN SSHA AND ABOUT 17% OF THE FACULTY IN SoE WILL SHIFT TO THE PROPOSED GALLO SCHOOL (SHOWN IN YELLOW).

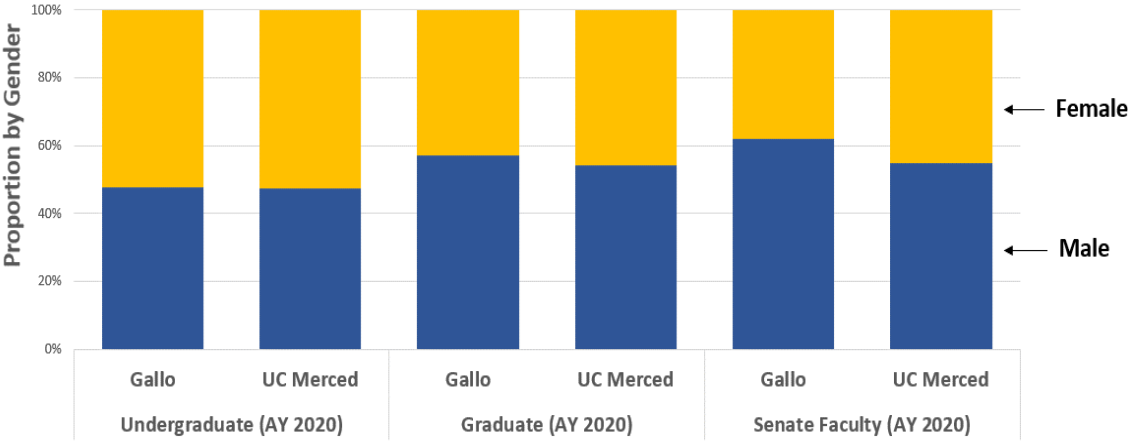


FIGURE 8. DIVERSITY (GENDER)
THE PROPOSED GALLO SCHOOL WILL REFLECT THE GENDER DIVERSITY OF THE CAMPUS FOR STUDENTS AND FACULTY (BASED ON AY 2020-21 NUMBERS).

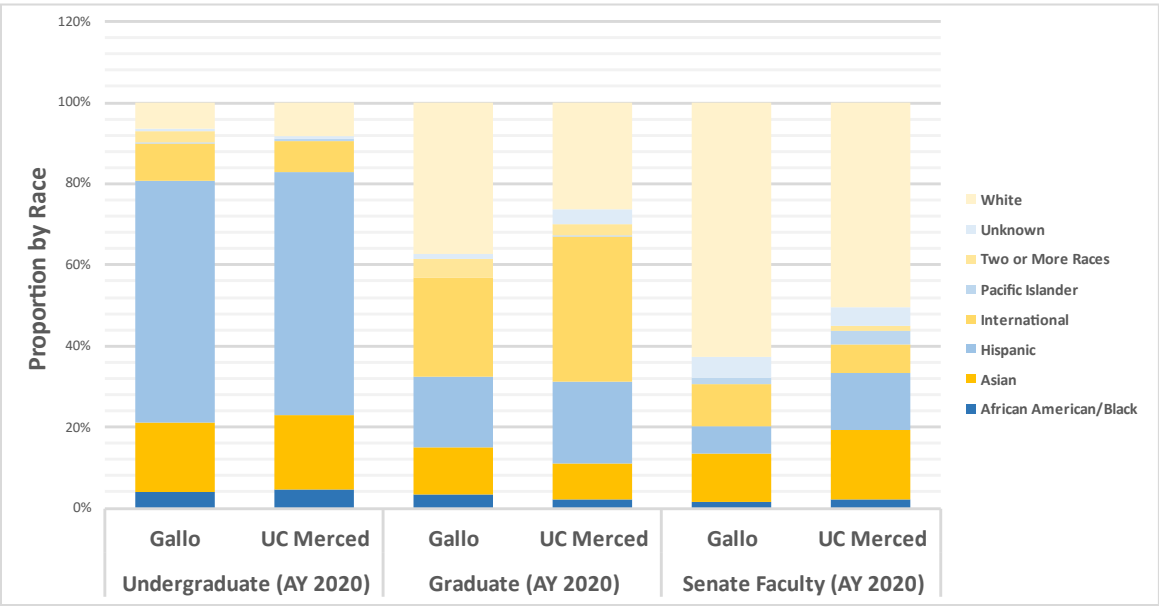


FIGURE 9. DIVERSITY (RACE)
THE PROPOSED GALLO SCHOOL WILL REFLECT THE RACIAL AND ETHNIC DIVERSITY OF THE CAMPUS FOR STUDENTS AND FACULTY (BASED ON AY 2020-21 NUMBERS).

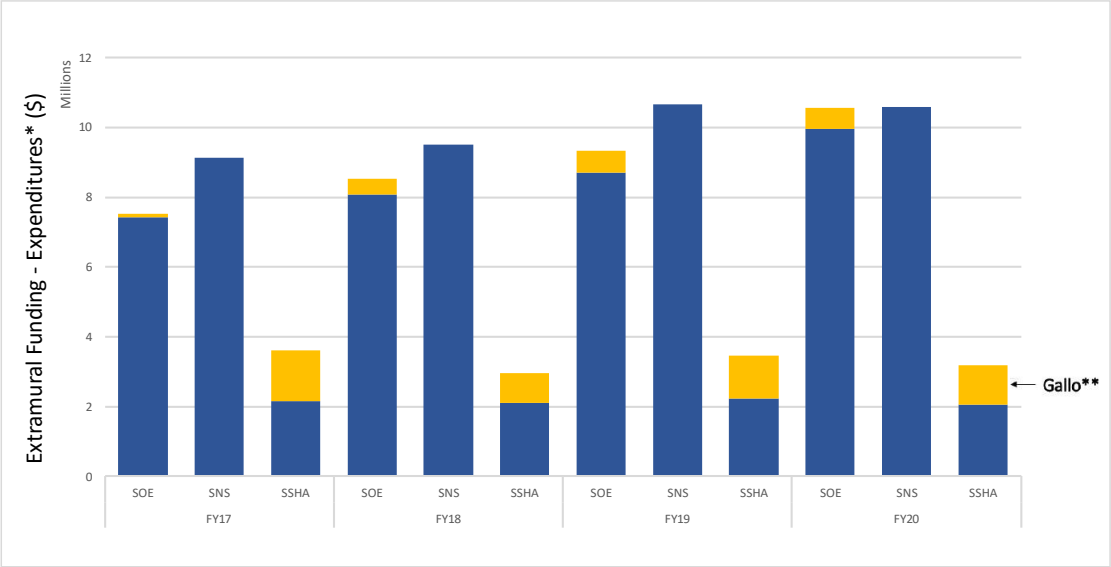


FIGURE 10. Research Expenditures (FY 2017-20)
EXPENDITURES ON EXTRAMURAL GRANTS WILL SHIFT FROM SSHA AND SoE TO THE PROPOSED GALLO SCHOOL (SHOWN IN YELLOW). * RESEARCH EXPENDITURES BY DEPARTMENT IN THE SCHOOLS. ** RESEARCH EXPENDITURES BY DEPARTMENTS ASSOCIATED WITH THE PROPOSED GALLO SCHOOL. (FY21 DATA IS NOT REPRESENTED AT THIS TIME DUE TO CHANGES IN FINANCIAL REPORTING SYSTEMS)

APPENDIX K: LETTERS OF SUPPORT

Gregg Camfield, UC Merced EVC/Provost – Space Plan

Haipeng Li, UC Merced University Librarian

UC Merced Alumni Association

UC Merced Graduate Student Association

UC Merced CIS Graduate Students

UC Merced MIST Graduate Students

UC Merced Foundation Board of Trustees

H. Rao Unnava, Dean, Graduate School of Management, UC Davis

Vish Krishnan, Professor, Rady School of Management, UC San Diego

Rajesh Gupta, Director, Halicioğlu Data Science Institute, UC San Diego

Rich Lyons, Former Dean, Haas School of Business, UC Berkeley

Julie Olson-Buchanan, Dean, Craig School of Business, CSU Fresno

Jennifer Dunne, VP for Science, Santa Fe Institute

Art Markman, Executive Director, IC² Institute, University of Texas, Austin

Jeff Welser, Vice President, IBM Research and IBM University Partnerships

David Gadsden, Director Conservation Solutions, Esri

João Falcão e Cunha, Dean, Faculty of Engineering, University of Porto

Mike Reynolds, Regional Director, National Park Service

Noah Goldstein, Director, Guidehouse Consulting

D. Roderick Kiewiet, Professor of Political Science, California Institute of Technology

Keith Krehbiel, Edward B Rust Professor of Political Science, Stanford University Graduate School of Business

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OFFICE OF THE EXECUTIVE VICE CHANCELLOR AND PROVOST

5200 N. LAKE ROAD
MERCED, CA 95343
(209) 228-4439

April 28, 2020

Paul Maglio
Director, Division of Management and Information
University of California, Merced
5200 N Lake Rd
Merced CA 95343

Dear Paul,

I am writing to affirm my support of the statement of interim and long-term space plans for the proposed School of Management at UC Merced. The campus is committed to dedicating the physical space resources necessary for the development and maturation of a School of Management that includes a Bachelors and Masters of Data Science and Analytics and a standalone Masters in Management Program. As the abstract states the long-term plan is unlikely to reach fruition until AY 25/26, however, there is a clear interim space plan to ensure that the School has adequate space to hire new faculty to launch the new programs and maintain the standalone Masters in Management program.

Thank you for all of your efforts on behalf of the proposed School of Management.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gregg Camfield'.

Gregg Camfield
Executive Vice Chancellor and Provost



UNIVERSITY OF CALIFORNIA, MERCED LIBRARY • 5200 N. LAKE ROAD • MERCED, CA 95343

Date: May 20, 2020

On behalf of the UC Merced Library, I am pleased to write this letter in support of the Ernest & Julio Gallo School of Management proposal at UC Merced. The proposal is visionary in addressing critical societal issues in innovative and futuristic ways. The three departments and various programs proposed in the Proposal leverage existing strengths of faculty in many interdisciplinary areas and the plan is to further build on them. We strongly support this innovative approach of the proposal.

Through this proposal, once approved, we acknowledge the opportunity for collaboration and partnership between the University Library and the Gallo School. We see the following specific roles and responsibilities the Library can fulfill in this relationship to make the programs successful:

- Build strong collections to support all areas outlined in the proposal
- Provide data curation services and support existing programs like Data Carpentry to further enhance the Data Science Program
- Sustain SpARC (GIS Center) to support management and data science programs
- Enhance information literacy education in foundational courses

We very much appreciate Professor Paul Maglio for reaching out to the Library for consultation on Library's support and look forward to working with the specific programs in the Gallo School in the planning process to build a successful world class management school that sets UC Merced apart from other universities.

A handwritten signature in dark ink, appearing to read "Haipeng Li".

Haipeng Li

University Librarian
University of California, Merced



GALLO SCHOOL RESOLUTION

IN SUPPORT OF THE GALLO SCHOOL INITIATIVE
FEBRUARY 29, 2020



PURPOSE: PROCLAMATION OF ALUMNI SUPPORT FOR THE GALLO SCHOOL INITIATIVE

Whereas, the Gallo School Initiative, a faculty-led effort to develop a new interdisciplinary school at UC Merced that combines the Department of Cognitive and Information Sciences, the Department of Management and Business Economics, and the Department of Management of Complex Systems (and possibly others) focusing on the complexity of real-world problems and systems;

Whereas, the new standalone Gallo school would become the campus's fourth school, joining the schools of Engineering, Natural Sciences, and Social Sciences, Humanities and Arts, and the campus's first named school;

Whereas, its mission shall be achieving an interdisciplinary understanding of complex, human behavior and decision-making in individual, interactive, organizational, institutional, technological, and natural settings;

Whereas, it shall offer a blended competitive alternative to a traditional Masters in Business Administration and possess greater emphasis on preparation for rapidly evolving real-world systems;

Whereas, it shall initially operate with existing campus infrastructure and is funded primarily through a generous endowment from the Ernest & Julio Gallo Family and Winery;

Therefore, be it resolved that the UC Merced Alumni Association affirms its pledge of support and approval of the Gallo School Initiative.

The officers of the UC Merced Alumni Association Board of Directors hereby sign this resolution reaffirming its authenticity as passed by the Board of Directors on February 29, 2020.

Keith Ellis

Keith Ellis
Board President

03/03/2020
08:20 PM PST

Randell Rueda

Randell Rueda
Board Secretary

03/03/2020
04:33 PM PST

Brandon Ruscoe

Brandon Ruscoe
Board Vice President

03/03/2020
04:03 PM PST

Chris Abrescy

Chris Abrescy
Executive Director, Alumni Relations

03/06/2020
10:58 AM PST



GRADUATE STUDENT ASSOCIATION
UNIVERSITY OF CALIFORNIA, MERCED

Letter of Support for the formation of the Gallo School
from the Graduate Student Association

To whom it may concern:

The Graduate Student Association of the University of California, Merced is writing to express our enthusiastic support for the formation of a new Ernest & Julio Gallo Management Program. This new Gallo School proposes to combine the existing departments of Cognitive & Information Sciences; Management and Business Economics; and Management of Complex Systems.

The Graduate Student Association is the official student government of the graduate student population at the University of California, Merced. Its membership is comprised of every graduate student at UC Merced, with an Executive Council of ten elected officers, and a Delegate Assembly that consists of a representative from each graduate department at UC Merced—including those proposed to make up the new Gallo School.

A proposal for the formation of this new interdisciplinary school was brought to the GSA not only by professors working towards the faculty-led Gallo School Initiative, but also by graduate student members of the GSA Delegate Assembly. The Delegate Assembly discussions highlighted the positive impact this ‘management school of the future’ will have on the graduate student body of UC Merced. Consolidating these three departments into a school with a unified approach to complex systems science will provide UC Merced’s graduate students with teaching and funding opportunities closely aligned with their existing and emerging research goals. The Gallo School’s focus on complexity ranging from individual and collective human behavior to complex relationships between institutional, technological and natural systems will provide structure to enhance extant collaborations among graduate students and faculty while encouraging innovative research and solutions for real-world systems locally, nationally, and globally.

As careers in industry are becoming more popular for PhD graduates—such as government employment in National Laboratories or data science and analytics careers in the private sector—the formation of the Gallo School becomes more significant. The combination of these three departments into one coordinated school will foster additional avenues for UC Merced’s graduate students to develop the analytic and computational skills associated with complexity science, computational modeling, and applied ethics that will successfully prepare PhD graduates for impactful roles in industry-focused careers. These same skills will also prepare those oriented toward careers in academia to develop collaborations with non-academic institutions, enhancing UC Merced and academia’s role in understanding the complex human-environment systems that make up society today, while building a sustainable future.

The Graduate Student Association Executive Council and Delegate Assembly members would again like to voice their enthusiastic support for the formation of the Ernest & Julio Gallo Management Program. In addition, the GSA looks forward to working with the faculty-led Gallo School Initiative as this new management school of the future comes to fruition.

Sincerely,



*The Executive Council and Delegate Assembly members
of the UC Merced Graduate Student Association*

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UNIVERSITY OF CALIFORNIA, MERCED
5200 N. Lake Road
MERCED, CALIFORNIA 95343

May 1, 2020

Cognitive and Information Sciences
Graduate Student Group
University of California, Merced

To Whom it May Concern,

The Cognitive and Information Sciences Graduate Student Group (CIS-GSG) enthusiastically supports the creation of the Ernest & Julio Gallo Management Program. The CIS-GSG is made up of all current graduate students in good standing within the UC Merced CIS department, and provides group representation for CIS graduate student issues and concerns.

The integration of Cognitive & Information Sciences; Management and Business Economics; and Management of Complex Systems promises to create a school with a focus on both human behavioral research and complexity modeling. As this encompasses much of the research we do in the Cognitive and Information Sciences program, our graduate students feel that an emphasis on these areas at the 'school' level will help create new, relevant sources of instruction, professional development, and funding.

In addition, the combination of these departments consolidates a great deal of methodological expertise from faculty who focus on complementary aspects of human behavioral research and complex systems analysis. Though it has often been requested by graduate students, explicit coursework on advanced research methods and analysis for this framework has been difficult for any one department to organize. The creation of the new Gallo School and the pooling of these resources and shared interests among departments will help to refine and extend the course work offered in these areas.

Recent graduates of the Cognitive and Information Sciences program have pursued careers in academia as well as industry, including governmental work and the private sector. Current CIS graduate students have similarly diverse career goals. The increased opportunity for research partnerships and internships at non-academic institutions via the proposed Gallo School will provide necessary experience for both academic and industry-oriented graduate students within our department.

As an interdisciplinary department, we look forward to the development of new interdisciplinary courses and research collaborations that will result from the organizational structure of the Gallo School.

Signed,

The Executive Committee of the UC Merced

Cognitive and Information Sciences Graduate Student Group

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University of California, Merced
5200 N. Lake Road
Merced, CA 95343

April 30th 2020

To Whom it May Concern,

We, the undersigned Graduate Students in the Management of Complex Systems Department, support the development of the Gallo School of Management at the University of California, Merced.

As PhD Students from diverse educational backgrounds and interests, we support the mission of the Gallo School of Management because of its interdisciplinary approach to complex problems. As a collection of students we have research interests in as broad a range of topics as entrepreneurship, parks and protected areas, internet security, complex socio-ecological systems, and diversity education. We seek to integrate various disciplines into our research in order to solve some of the most pressing management problems of the 21st century.

As Master's of Management students, we seek to understand and find solutions for sustainability at the intersection of the economy, environment and people. We have broad career interests in Policy, Healthcare administration, Leadership Development, Entrepreneurship, Philanthropy and Social Change. We think an integrated understanding of management practices that support People, Planet, and Profit thinking is a necessary skillset for management leaders and believe that the Gallo School of Management is key to training those leaders.

We support this initiative because interdisciplinary research is foundational to all of our educations and the Gallo School will further enable our ability to connect in programs, course, and research projects across campus. This is an opportunity to differentiate our program as one that supports convergence research and better prepares us to tackle complex systems. The Gallo School will enable us to set us apart in the job market as researchers and leaders who are able to work transdisciplinarily and better equips us to contribute important research and solutions for multi-scalar problems.

Thank you for your time and consideration on this important issue.

Sincerely,

Taylor Fugere, PhD Student
Deseret Weeks, PhD Student
Charles Touma, PhD Student
Christopher Bernal, PhD Student
Alireza Dastan, PhD Student
Matthew Mondares, PhD Student
Daisy Gonzalez, MM Student
Mahya Arastuie, PhD Student
Patrick Coldivar, MM Student
Tomas Monroy Mendoza, MM Student
Bianca Garibay, MM Student
Chaohua Peng, MM Student
Genesis Diaz-Alvarez, MM Student
Victoria Pham, MM Student
Kavi Reddy, MM student
Karnvir S. Chauhan, MM Student
Cyndy Miguel, MM Student



5200 North Lake Road, Merced, CA 95343
Phone: 209-382-4142
Email: ucmfoundation@ucmerced.edu
Web: giving.ucmerced.edu

May 5, 2020

Dr. Paul Maglio
Professor, Ernest & Julio Gallo Management Program
Director, Division of Management and Information
University of California, Merced

Dear Dr. Maglio,

On behalf of the Board of Trustees of the University of California, Merced Foundation, the Executive Committee fully and enthusiastically supports the creation of the Ernest & Julio Gallo School of Management at UC Merced.

It is exciting to be part of the creation of the management school of the future, encompassing so many academic disciplines to incorporate multiple perspectives for solving real-world problems.

We also find it so fitting that this cutting-edge school be named for the Gallo family, who have been at the forefront of innovation and entrepreneurship in the Central Valley for nearly a century.

The board is proud to support the Ernest & Julio Gallo School of Management and we are eager to watch its progression and success as it contributes to the university's mission of teaching, research and public service.

Sincerely,

A handwritten signature in dark ink, appearing to read "Denise Watkins". The signature is fluid and cursive, with a long, sweeping underline.

Denise Watkins
Chair
UC Merced Foundation



UNIVERSITY OF CALIFORNIA
MERCED
FOUNDATION

MOTION 2020_02_01

Support for creation of the Ernest & Julio Gallo School of Management at UC Merced

That the chair of the UNIVERSITY OF CALIFORNIA MERCED FOUNDATION BOARD OF TRUSTEES, Denise Watkins, be and is hereby authorized and directed to write, on behalf of this Board, a letter to DR. PAUL MAGLIO expressing the support of the Board for the creation of the Ernest & Julio Gallo School of Management at UC Merced.

Motion offered from the floor by Trustee Carol Bright Tougas

Motion seconded by Trustee Kenni Friedman

Passed unanimously this 5th day of May 2020 by those present and voting:

Becker, J.; Bright Tougas, C.; Brostrom, N.; Friedman, K.; Hatano, D.; Kamangar, A.; Klotzbier, E.; Lane, M.; Long, C.; Oswald, J.; Pollard Carlson, L.; Riggs, C.; Roberts, G.; Sturdevant, R.; Watkins, D.

Not present:

Gallo, R.; Ruiz, F.; Tinker, R.

In witness whereof:

Art Kamangar
Secretary of the Board of Trustees

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UC Davis Graduate School of Management
Office of the Dean
(530) 752-7366

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616-8734

May 21, 2020

Dr. Paul Maglio
Chair, Department of Management of Complex Systems
School of Engineering
University of California, Merced

Dear Dr. Maglio,

Thank you for your note on April 16 regarding your intent to establish the Ernest and Julio School of Management at UC Merced. The school will form by combining three existing departments that are currently doing related work – the departments of Cognitive and Information Sciences, Economics and Business Management, and Management of Complex Systems.

Many management schools are gravitating toward incorporation of more technology and science related topics into their curriculum because our businesses have indeed become complex, within a global system that is itself quite complicated. The coalescence of three departments that collectively address this complex problem would give the Gallo School a special place in management education. I am also impressed by the aspirations of this new school to address problems of global scope. Your statement that the proposed school is like no other business school in the UC system, yet is partly like all the schools, summarizes the proposal very well. The schools in the system have been more like other top business schools in the country – offering a core of management courses followed by electives that reflect the strengths of their faculty in management. A very large majority of faculty in these schools have terminal degrees from other top management schools. In contrast, the Gallo School will have a mix of faculty that is more eclectic, looking into broad societal problems that have significant business impact. The distinct advantage of the proposed school is this mix of faculty, those who understand computers and the human brain, business and economics, and how these interact within the context of a complex system. It is exciting, both academically and as an educational experience being offered to students.

In your proposal, I noticed your statement about not pursuing AACSB accreditation. I can understand that with the current mix of degree programs, it would be difficult to pursue such accreditation. I would recommend that an undergraduate degree be offered in business, given the existing faculty talent. I would predict strong growth of the school should a new undergraduate major be offered, which will also provide you with the funds you need in the future.

I would like to congratulate the faculty and staff of the three departments that have made the decision to come together to make this school happen. As with any merger, there will be some coordination issues that will crop up. However, I see a dedicated group of faculty who are pursuing research in critical areas of management, and this noble purpose will help achieve the success you had in mind when you initiated this process. I am fully supportive of this exciting new concept and am willing to assist in any way I can. My best wishes to you all.

Sincerely,

A handwritten signature in dark ink, appearing to read "Rao Unnava".

H. Rao Unnava
Dean



Viswanathan “Vish” Krishnan
Jacobs Chair in Engineering and Management Leadership
University of California Rady School of Management
9500 Gilman Dr. #0553 La Jolla, CA 92093-0553;
Email: vk@ucsd.edu

May 20, 2020

Prof. Paul Maglio
Director, Division of Management and Information
University of California, Merced

Dear Professor Maglio,

I am writing with my feedback on the pre-proposal to establish the Ernest & Julio (E & J) Gallo School of Management at UC Merced. After graduating with a doctorate in Engineering from MIT, I have been a faculty member at Schools of Management for the last 27 years, serving currently as the founding faculty at UC, San Diego’s Rady School of Management. I also hold a joint appointment at UCSD’s Jacobs School of Engineering. In addition, I helped start the doctorate program in Management at UC San Diego in 2009. Due to my other commitments, I keep this letter short, but after reading the pre-proposal, I find the Gallo School of Management plan and pre-proposal to be highly creative and innovative, and I fully support the establishment of the E & J Gallo School of Management at UC, Merced.

As a leading professional school bringing together research, development and innovation, UCSD’s Rady School of Management was also founded not too long ago to graduate students that also have the management, collaborative, entrepreneurial and networking skills required for success in today’s knowledge-intensive industries. Put simply, business education is at an inflection point. The traditional insular business school producing expensive anecdotally-trained MBA’s is no longer a growth product. The availability of large amounts of data and the rise of mobile computing and artificial intelligence is totally changing the business world, requiring it be more analytical, agile, and accessible. The proposed Gallo School program tightly taps into these developments. By integrating faculty and knowledge from three existing departments (Cognitive and Information Sciences, Economics, and the Management of Complex systems), the proposed Gallo School is inherently cross-functional and innovative. As mentioned in the program, Data science is one common thread running through the Gallo School, and is very timely due to the demand for large number of data scientists at companies in California and beyond. The plan to establish B.S. and (self-supporting) M.S. Data Science and Analytics degree programs could help fill a significant unmet market need. Our School gets thousands of applicants for our data science degrees, so it should be quite likely to fill a Masters program with 45 students in the very first few years.

The one-year professional degree, Master of Management (M.M.), caters to the need for producing leaders for the real world. Once again, international data indicates strong demand for one-year professional degrees such as this one, so the plan is in line with the latest trend in graduate management education to lower the cost and



time required to complete a Management degree. Most existing 2-year graduate management programs are re-configuring themselves to become one-year graduate management programs, an approach pioneered by European Universities. It is good to see UC Merced not replicate the traditional 2-year graduate management program model, and embark on a 1-year M.M program.. The rise of California and the United States as a leader in innovation and technology would be well-served by developing such a graduate program.

Research forms the core of the University of California, and it is therefore laudable that a doctorate program option is also available to students in three different areas. The proposed small size of the program allows the Gallo faculty to admit a highly selective set mix of students that differs from the mix Masters of Management student. As is the case in other academic disciplines, doctoral students produce the body of knowledge that sustains intellectual inquiry and the ongoing development of the discipline. The demand for management school faculty is increasing globally even as the production of new business doctorates has not kept pace. Within five years, the US shortage of business Ph.D.'s is expected to be very significant based on the data from the AACSB International report on *Sustaining Scholarship in Business Schools*. There is a strong emerging need for scholars who contribute to our understanding of the knowledge and information-intensive economy. However, I wonder about the logistical complexity and faculty capacity challenges of launching all the Masters and doctoral programs at the same time. So I think it may be more manageable to phase in the development of doctoral program after gaining a few years of experience with the Masters programs.

The financial plan presented seems sensible as it includes a diverse set of funding sources and revenue streams, such as tuition revenues from self-supporting graduate degree programs, payouts from the nearly \$20M Gallo endowment, state funds, and additional future philanthropic support, which should be possible given the innovative nature of the program. In summary, California needs more well-trained students with deeper background in the management of innovation and technology companies. I fully support the Gallo School proposal and look forward to following its progress in the coming years.

Sincerely,

A handwritten signature in blue ink, appearing to read "V. Krishnan".

Dr. Vish Krishnan
Jacobs Family Endowed Chair
University of California, San Diego
E-mail: vk@ucsd.edu

UNIVERSITY OF CALIFORNIA, SAN DIEGO

UCSD

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

HALICIOĞLU DATA SCIENCE INSTITUTE

9500 GILMAN DRIVE
LA JOLLA, CALIFORNIA
92093-0404

19 May, 2020

Paul Maglio
UC Merced

By email: pmaglio@ucmerced.edu

Dear Paul,

Thank you for sharing with me the plans for a new management school at UC Merced. At the first glance, one would think that perhaps this is not the best time for a management school. However, a closer look reveals a compelling vision: at the intersection of engineering, natural and social sciences, the Gallo School presents a strategy of combining quantitative with the cognitive to build degree programs that are timely, very much in demand and present the most exciting developments in academia in decades.

If executed well, it will certainly add an important distinction to UC Merced as a forward-looking campus with new courses and degree programs. Among the areas that the university leadership may want to focus on is ensuring engagement of faculty in the foundational areas of statistics and computing, perhaps drawn from existing departments in natural sciences and engineering. I also think that the planned growth in grad and undergrad enrollments will benefit from a higher graduate population 14-15% range rather than current 10-12% target. I fully realize that it is a hard climb, given the current 4% graduate population. A higher grad target will be necessary in attracting faculty talent necessary to build the envisioned programs.

Overall, I find the proposal very much in keeping with the long term trends in the emerging area of data science.

Sincerely,

A handwritten signature in black ink, reading "Rajesh Gupta".

Rajesh Gupta, PhD
Distinguished Professor and Qualcomm Endowed Chair
Department of Computer Science and Engineering
Director, Halicioğlu Data Science Institute



Richard K. Lyons
Professor and former Dean, Haas School
Chief Innovation & Entrepreneurship Officer, UC Berkeley

May 22, 2020

Professor Paul Maglio, Director
Division of Management and Information
UC Merced
Via email: pmaglio@ucmerced.edu

Dear Paul:

I am writing to offer my support for the launch of a new business school at UC Merced.

An important driver of my support is the case evidence for a new school that is *distinctive*. I am referring here to the core theme of managing complex systems – physical, cognitive, and natural. This domain provides a lens on so many of society's current challenges and opportunities, not just in the private sector, but in the public and civic sectors as well.

I also appreciated the leveraging of current strength at UC Merced to deliver on Data Science and Analytics in fresh ways, and in ways that also reinforce the core theme of managing complex systems.

Finally, as a former dean I couldn't help but consider the financial dimension of the project. The funding model includes a launch endowment that, together with other funds, does a nice job of leveraging the State funds that will presumably be available for the launch.

I may be biased, but creating a business school within a new university that does not yet have one, and backing it with commitment to making it excel, is one of the best engines a university can have.

If I can provide further assistance to support the decision, you and your colleagues should feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "R. Lyons", written over a light blue horizontal line.

Richard K. Lyons
Chief Innovation & Entrepreneurship Officer
Office: 510-642-2708
lyons@berkeley.edu

U.C. Berkeley, Berkeley, CA 94720-1900
Tel: 510-642-2708, Fax: 510-643-1420
lyons@berkeley.edu



CALIFORNIA
STATE
UNIVERSITY,
FRESNO

May 20, 2020

Paul Maglio, PhD
Director, Division of Management and Information
University of California, Merced

Dear Dr. Maglio,

On behalf of the Craig School of Business, California State University, Fresno I am writing to share our interest and support of University of California, Merced's intention of creating the Ernest & Julio Gallo School of Management. Our department chairs, graduate directors, and deans have had the opportunity to review the Summary of the Proposal and the accompanying Powerpoint presentation. Further, I had the opportunity to discuss the proposal with Dr. Paul Maglio on May 15th, 2020. There are a number of intriguing areas of potential collaboration and mutual benefit, as well as overall positive outcomes for the broader community.

We find the overall approach to be innovative and unique. The proposed school would offer something that other business schools do not offer. We appreciate how UC Merced is proposing to draw from the three departments --Cognitive and Information Sciences (CIS), Economics and Business Management (EBM), and Management of Complex Systems (MCS) – to focus on complex systems. Such an approach complements rather than competes with our traditional business school approach.

We believe the Gallo School of Management would serve as a valuable pipeline for our students to earn a Master in Management or a PhD here in the Central Valley. This would be an extremely desirable option for our students to pursue advance degrees and to provide much-needed expertise in Central California as well as, potentially, a local pipeline for tenure-track positions.

We are enthusiastic about the possibility of research collaborations, grant collaborations, and even, possibly, joint degree programs between our schools. We note, in particular, the proposed school's focus on addressing socially relevant problems. As recent signatories to the United Nation's Global Compact, we believe there are a number of ways in which we could collaborate on addressing issues that would have a positive impact on our shared community.

Craig School of Business
Office of the Dean
Peters Building, Room 282
5245 N. Backer Ave. M/S PB8
Fresno, CA 93740-8001
559.278.2482
Fax 559.278.6931

THE CALIFORNIA STATE UNIVERSITY

One potential area of concern is with respect to the proposed development of an undergraduate focus in Data Analytics. We recently started a new undergraduate option in Data Analytics and, upon reading the proposal had some concern about potential overlap. However, upon discussion with Dr. Maglio, it appears the area of focus would be different. Again, we recognize the need for this area of specialization and welcome the opportunity to support one another in the growth of our two schools.

We look forward to working with UC Merced and the future Ernest & Julio Gall School of Management on strengthening our community's access to higher education, research and development opportunities for our faculty, and addressing critical issues in our community.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Julie B. Olson-Buchanan', with a long, sweeping horizontal line extending to the right.

Julie B. Olson-Buchanan, PhD
Interim Dean, Craig School of Business.

May 4, 2020

Paul Maglio
Director, Division of Management and Information
UC Merced
pmaglio@ucmerced.edu

Dear Paul.

It is with great enthusiasm that I write this letter of support for the proposal to establish the E & J Gallo School of Management at UC Merced.

I believe UC Merced's proposed Gallo School — with its focus on complexity and human-centered complex systems — will help accelerate science, engineering, and management education and research at UC and more broadly, thus creating a truly unique and valuable school by combining cognitive science, economics, and management to focus on urgent societal problems through converging disciplinary perspectives. I know of no other school, program, or institution that has carved out a comparable niche. It will provide training and leadership in the critical space at the intersection of transdisciplinary complexity research, management and data science — in relation to the myriad interconnected aspects of human-centered complex systems — that is increasingly important given the challenges the world faces today and in the future.

I am very impressed by the quality and thoroughness of the proposal. For instance, the proposed academic programs, such as Data Science, seem rigorous and promising. Based on the success of SFI's complexity postdoctoral fellows as well as graduate student attendees of our intensive Complex Systems Summer School over the last many years, I believe graduates of the Gallo School programs will be in very high demand. The integration of research programs at the proposed school across departments, directed toward complexity science and systems thinking, is clearly aligned with the Santa Fe Institute's research and outreach/translational/educational interests, and I anticipate many potential partnerships in the future. There are already obvious ties between SFI and the future Gallo School — two of our recent outstanding postdocs, currently or soon to be faculty at UC Merced, will be associated with the proposed school (Justin Yeakel and Tyler Marghetis).

On behalf of the Santa Fe Institute, I express full support for the establishment of the Gallo School of Management at the University of California at Merced.

Sincerely,



Jennifer Dunne
Vice President for Science | Santa Fe Institute



IC² Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

*Arthur B. Markman, Annabel Irion Worsham Centennial Professor of Psychology and Marketing
Executive Director, IC² Institute • 2815 San Gabriel St. • Austin, Texas • 78705 • 512-471-8900*

May 4, 2020

Dr. Paul Maglio
UC Merced
Merced, CA 95343

Dear Dr. Maglio:

I have read with great interest the proposal you sent me for the Ernest and Julio Gallo School of Management at UC Merced. I think this approach to business education is both much needed and a perfect fit for the structure of your university.

The programs at the heart of the Gallo School are interdisciplinary. That approach is an excellent one to foster both the kind of teaching that is needed for business leaders of the future as well as to spur the research that will drive business practice. This approach is similar to the one we took at the University of Texas in creating the Human Dimensions of Organizations program, which brought together the humanities and the social and behavioral sciences to teach people in business about people as individuals, groups, and cultures.

I also think the mix of programs that are being brought together to form this school is a good combination that covers the human, information, and systems levels at which business operates.

I look forward to seeing how this program develops. Please let me know if there is anything I can do to help with these efforts.

Sincerely,

A handwritten signature in blue ink, appearing to read "Arthur B. Markman", written over a light blue rectangular background.

Arthur B. Markman
Annabel Irion Worsham Centennial Professor of Psychology and Marketing
Executive Director, IC² Institute



IBM Research - Almaden
650 Harry Road
San Jose, CA 95120

Dr. Jeffrey J. Welser
Vice President and Lab Director

May 4, 2020

Paul Maglio, Director
Division of Management and Information
UC Merced

Dear Dr. Maglio:

It is with great pleasure that I write this letter of support for the proposal to establish the E & J Gallo School of Management at UC Merced.

I believe UC Merced's proposed Gallo School will greatly benefit our communities, particularly those in Central California, by helping to accelerate well-rounded science, engineering, and management education. I am excited about the truly unique management school that will combine aspects of cognitive science, economics, and management of complex systems, and its interdisciplinary research and approach to collaborative innovation that will address challenges in the San Joaquin Valley and beyond.

I am very much impressed by the high quality and thoroughness of this proposal. Considerable effort has been made to cover all the aspects of the School. The proposed academic programs, such as Data Science, are rigorous and promising. The plan for diversity is well-thought out. The financial planning for the School is reasonable and well-prepared.

Moreover, the focus of the proposed school on complex systems and on data science seems particularly appropriate to support urgent needs of industry and government to understand and manage the short- and long-term consequences of individual action and collective decisions, related for instance to health, climate, innovation, and technology. I see strong potential for graduates to be in high demand across industries and sectors.

As the leader of our IBM Global University Programs and Partnerships, I see collaboration with many different programs across the educational spectrum at many different universities. I think the program you are building is quite unique and valuable. Hence I am happy to support the establishment of the Gallo School of Management at the University of California at Merced.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeffrey J. Welser".

Jeffrey J. Welser, PhD.
VP Exploratory Science & University Partnerships, IBM Research
VP and Lab Director - Almaden, Australia, China, and Japan
Office: 1-408-927-2400
E-mail: welser@us.ibm.com



Esri Inc.
380 New York Street
Redlands, CA 92373

May 7, 2020

Dear Dr. Maglio:

I am writing in support of the establishment of the fourth school at the University of California, Merced: the E&J Gallo School of Management.

Many of the challenges that managers are likely to face in the remainder of this century, will be influenced by complex global issues. They will require an understanding of international perspectives, earth systems, emerging technologies, and the geographic relationships between humans and their planet. This understanding is critical if businesses, be they for profit or not for profit, are able to flourish through sustainable means and through methods that are genuinely attentive to customer care, the wellness of their workforce, and their impact both locally and across their supply chains.

In this light, I am excited to see UC Merced's, Gallo Program emphasis on triple bottom-line thinking with special attention to innovation, sustainability, and the employment of emerging technology. What you refer to by the acronym, MIST. For over 50 years the Environmental Systems Research Institute, or Esri, has developed geography based technologies to aid in real world problem solving and improved decision making. Our organizational culture resonates with the undergirding values of MIST. We appreciate from our own experience that holistic, geographically informed thinking is essential for better management, adaptation and organizational success. We can accordingly, predict with confidence, that your students will be grounded in useful, relevant content and will likely be in competitive demand upon graduation in our rapidly changing world.

Over the years, I have had the opportunity to work with your colleagues at UC Merced and their partnership with the National Park Service on a number of projects having to do with the management of parks and protected areas, including the National Parks Institute and our own *Green Infrastructure Initiative*. Through these exchanges, it has become clear that the newest campus of the University of California is devoted to research and teaching in the challenging domain of management with emphasis on reconciling success in organizations and across society with care for the natural world. The Gallo Management School is clearly on a trajectory to be in a leadership position in that increasingly important, *and increasing essential*, realm.

We look forward to the establishment of this new school and to future collaborative endeavors in its exciting new status as a school of management.

Sincerely,

A handwritten signature in dark ink, appearing to read "David Gadsden".

David Gadsden
Director, Conservation Solutions
Esri



GABINETE DO DIRETOR

To whom it may concern

Support letter for the proposal:

**The Ernest & Julio Gallo School of Management
University of California
Merced
USA**

Porto, Portugal, 2020, May 4th

Prepared by:

A handwritten signature in dark ink, appearing to read 'João Falcão e Cunha'.

João Falcão e Cunha
Dean

The Proposal to establish the Ernest & Julio Gallo School of Management at UC Merced by combining three existing departments – Cognitive and Information Sciences, Economics and Business Management, and Management of Complex Systems is “focused on the science, design, technology, and management of complex coupled human-technology and human-environment systems.”

UC Merced’s mission “strives for excellence in carrying out [...] teaching, research and public service, benefiting society by discovering and transmitting new knowledge and functioning as an active repository of organized knowledge.”

I believe in the importance of depth and breadth in the development of knowledge, and interdisciplinary scientific based work is the main approach for answering society challenges, and to have people’s creativity resulting in innovations that may benefit the economy, and make our society more sustainable and happy.

I am certain that the current Proposal is sound, following and contributing to the mission of UC Merced. Moreover it is supported by a very qualified group of internal staff, and has received the endorsement and support of several external individuals and organizations for its plan. In particular I believe that combining “aspects of cognition, decision-making, economics, and management with technology and engineering, with information and data science, with environmental and sustainability science, and with equity, ethics and social justice” is a very promising objective in order to develop a Gallo School with distinctive identity within management schools worldwide, being one of the “first movers” in such direction.

I am also confident that a strong cooperation with regional, national and international organizations in education programs, research projects and services will establish a very positive image for this new School.

Given the current pandemic, I also believe that the management challenges for public health, globally, may become also relevant for the Merced economy and society, and that the Gallo School will make relevant contributions given its multidisciplinary capacity.

Finally I would like to make a comment regarding the global society we are building. Given UC Merced's mission, I believe it is important supporting programs for the exchange of students and staff, within California, USA and internationally. This is particularly relevant if involving in such programs the schools, universities, and organizations established in regions having the same challenges as the Merced society and the UC Merced.

Given its openness to the frontiers of knowledge, the Gallo School will be open to the world being able to make positive contributions to the Environment, the Economy, and the Society.

Short biography of João Falcão e Cunha

I have been the Dean of the School of Engineering, University of Porto www.fe.up.pt, since 2014. Our School traces its origin to the Porto Polytechnic Academy, founded in 1823, with the mission of carrying out advanced education, research, innovation, and public service in engineering.

I have a PhD in Computing Science from Imperial College London, and an MSc in Operational Research from Cranfield University. Since 1989 I have been involved with theoretical and experimental work in software engineering, information systems, transportation systems, decision support systems, graphical user interfaces, object-oriented modelling, and service engineering and management.

In the past I was the Portuguese national delegate to the European Union Horizon 2020 Committee on Smart, Green and Integrated Transport, and before that I have reviewed and advised many European research projects in ICT, artificial Intelligence, and manufacturing.

I have coordinated at U.Porto the cooperation in Engineering with Brazil, the Industrial Engineering and Management Master and Doctoral programmes, the Service Engineering and Management Master, and I was the Academic Director of the IBM Centre for Advanced Studies in Portugal. I have also been director of the CMU Portugal initiative of the Portuguese government.



**U. S. Department of the Interior
NATIONAL PARK SERVICE**

NPS Regional Director
Interior Regions 6,7,8
Lakewood, CO
303 969 2603 office

May 26, 2020

Dr. Paul Maglio
School of Engineering
University of California, Merced
5200 Lake Rd.
Merced, CA95343

Dear Dr. Maglio:

I am writing to convey my support for the establishment of the Gallo School of Management at UC Merced.

Until December of 2019, I served as the superintendent of Yosemite National Park and became personally involved in a number of the collaborative programs that have operated successfully between UC Merced and Yosemite National Park, including: the Sierra Nevada Research Institute, The Yosemite Leadership Program, the UC Natural Reserve System partnership, and the National Parks Institute.

Prior to my time in Yosemite, I was stationed in Washington, DC as both deputy director of operations and interim director of the National Park Service. I am now a regional director stationed in Denver.

From all of these vantage points, local, regional and national, I have seen firsthand, the great value of establishing a school of management on the campus of UC Merced, particularly because of its rare focus on the cutting-edge practices of sustainable management. Your determination to create in the DNA of this new program a mission of research and teaching in the overlapping realms of innovation, sustainability and technology gives all of us involved in the management of this county's protected lands and waters great hope.

We rely on research and educational institutions as essential partners. Having the newest campus of the globally renowned University of California establish a management school that will continue to exercise what is already, a brilliant 20-year record of research and teaching collaboration is timely, relevant, and singularly useful to our work. When you consider the reputation of the UC in the global community of universities, our endorsement is even more vigorous. It will certainly elevate the effectiveness of work with our international partners on the toughest management issues around climate, fire, air and water.

We have every confidence that your program will produce managers that will find career pathways in organizations like ours that value the balance between productivity, people and stewardship.

I wish you every success on the achievement of this important step in the evolution of capacity at UC Merced.

Sincerely

Michael Reynolds
Regional Director



101 California St.
Suite 4100, SF, CA, 94111
415.399.2131
guidehouse.com

May 18, 2020

To Whom it May Concern:

I am a Director at Guidehouse, a global consulting firm, leading our Sustainability Solutions team. I support our corporate and government clients in ensuring they are prepared for change in industry, commerce, and government for years to come. I am excited to lend my support to establishing the Ernest & Julio Gallo School of Management at UC Merced. Below I present a few reasons why I support the creation of this school.

First, by combining the Departments of Cognitive and Information Sciences, with Economics and Business Management along with Management of Complex Systems, the new Gallo school of Management will be providing students with a unique educational offering, that can provide a rich background associated with how business is evolving. If there is anything that the Coronavirus pandemic has demonstrated, it is that our systems, be they business, educational, and social, are more fragile than we assumed. And at the same time, our vulnerability arose from the very structures which enabled a global economy to prosper. Topics balancing emergence and chaos are core to complex system thinking and by incorporating those into a single school, students will be better informed to manage our business and government systems to be more resilient amid uncertain change.

As a leader in a consulting practice, I need to hire more people that are prepared to solve those programs, and the approach the new school of management would take would help me staff my projects and in turn support my clients.

Second, this kind of school would help solve technical and organizational challenges facing governments and corporations in the Central Valley, California, and the world. By establishing a world-class program of Management, there will be more people prepared to support those organizations with new thinking, and in disseminating the learnings of research into the local community.

Lastly, as I've seen in working with the School of Engineering, as a member of the External Advisory Board, I have been marveled at both the drive of the students and faculty, and interest from corporations in the campus. UC Merced is a dynamic place, and it is known as a locus of innovation; standing up the school of Management makes complete sense.

The proposed new Management School is needed in Merced, both to attract more students, but to serve the communities of the Central Valley and in California.

Sincerely,

A handwritten signature in black ink, appearing to read "Noah C. Goldstein".

Noah C. Goldstein, Ph.D.
Director



Nate Monroe
Director, Center for Analytic Political Engagement
University of California, Merced

February 4, 2022

Dear Nate,

I understand from the email that you sent me recently that UC-Merced intends to place the political science group in the new Gallo School of Management. I went to the website and learned that the Gallo School will also include cognitive and information sciences, management and business economics, and management of complex systems.

Whoever came up with this should be congratulated, as I think it is superb idea. One of the unfortunate characteristics of almost all universities is the compartmentalization of academic disciplines into separate departments. Progress is stymied when researchers are unaware of relevant work being done in other fields, and this structure provides them with little incentive to look beyond the confines of their own discipline. Someone who is seeking tenure in a sociology department, for example, will have little reason to look beyond sociology for inspiration.

Over the past several decades there have been a number of exceptions to this standard arrangement. Here political scientists have been incorporated into a broader organizational matrix containing a number of other disciplines, most notably economics, psychology, management and accounting, and quantitative history. What comes to mind are the Graduate School of Industrial Administration and the School of Urban and Public Affairs at Carnegie Mellon University, the Graduate School of Business at Stanford, the Harris School of Public Policy at the University of Chicago, the Hass School of Business at the University of Chicago, and the Division of Humanities and Social Sciences at Caltech—which is where I have worked for over four decades.

The record shows they have all been highly successful enterprises. Political scientists have thrived in these institutions, where they daily interact with colleagues from a variety of other disciplines. They have produced prodigious amounts of research and trained a couple generations of graduate students who have gone on to have stellar careers. Moreover, I think they have had a tremendously disproportionate impact on their fields of study. In political science, major advances in game theory,

collective choice, data analysis, organizational theory, and experimental methods can be attributed to the work done by scholars in these multi-disciplinary institutions.

Finally, it is crucial to recognize that economists, management theorists, psychologists, econometricians, and those from a wide range of other disciplines also benefit from interacting with political scientists. Political scientists tend to be quite eclectic in the approaches they take and in the analytical tools they employ, so they are more likely than most to be the source of inter-disciplinary synergy. One example comes to mind that I think nicely illustrates what happens when political science is ignored. A very famous economic theorist (I won't name names) came to give a seminar at Caltech. This theorist had discovered that the standard spatial model of electoral competition could be enhanced by incorporating another orthogonal dimension, which, instead of running ideologically from left to right, ran from positive to negative in terms of affect. The political scientists in the audience informed him, with all due respect, that this is something we call the valence dimension, which a political scientist named Donald Stokes had come up with in 1963. I don't know for sure, but I think it is likely that Stokes was inspired by the "I Like Ike" buttons that so many people wore during the 1952 presidential campaign.

Sincerely,

D. Roderick Kiewiet
Professor of Political Science
California Institute of Technology



STANFORD

Graduate School of Business

Keith Krehbiel
Edward B. Rust Professor of Political Science

February 7, 2022

To the UC Merced Academic Senate,

At the request of one of Nate Monroe, I am writing to offer a few thoughts regarding your initiative to move the Political Science program at UC Merced to the new Gallo School of Management. My opinions are shaped by my personal history. Thirty-five years ago I was an Assistant Professor of Political Science at the California Institute of Technology when I received a call from Stanford's Graduate School of Business asking if I would be interested in joining the school to participate in the design and formation of a political economy group. Among other things, the mission was to teach business students about government, regulation, and ethics. Coming out of an Arts and Sciences training, this was not something I had ever contemplated, but the more I thought about the idea, the more appealing it became.

I eventually accepted the offer and do not regret it. From the ground floor, we built an excellent MBA and executive education curriculum in business-government relations while assembling a world-class political economy research faculty and PhD program. The PhD program regularly produces students and places them in top political science and economics faculty positions, both in professional schools and in traditional Arts and Sciences departments. To provide a few examples, in the last few years, we have had graduates hired as tenure track faculty at Princeton (Zhao Li) and the University of Michigan (Christian Fong). Others, such as Thomas Choate at Duke University and Peter Schram at Vanderbilt, have received prestigious post-doctorate positions. Now-well-established graduates of our program include Craig Volden (Public Policy School at the University of Virginia), Alan

Wiseman (Chairman of Political Science at Vanderbilt), Adam Meirowitz (Yale), Jonathan Woon (Pitt), Marc Meridith (Penn), Jason Grissome (Vanderbilt School of Education), and Zachary Peskowitz and Cliff Carrubba (both of Emory University).

The core strategy of merging economics and political science has been successful elsewhere as well. The Harris School of Public Policy, the Business and Public Policy Program in the Haas School of Business at UC Berkeley, Northwestern's Kellogg School of Management, and the substantial crossover within Caltech's Division of the Humanities and Social Sciences serve as just a few of many pertinent examples. In all of these cases, political science faculty and students have thrived as indicated by publications and high rates of graduate student placement in top political science jobs.

The core of the success of this model of integration, I believe, lies in the fact that economics and management have had a long history of being foundational – both theoretically and empirically – for work in political science. The field of positive political economy is widely recognized for fruitfully importing and merging insights from economics and political science. The tools and theoretical insights of econometrics, principal-agent models, game theory, and collective action problems also represent areas where cross-pollination has been invaluable to our discipline. Administrative proximity provides a perfect basis for students and faculty to benefit from the perspectives and insights of economics, and from the enhanced skills and fusion of ideas that produces good scholars and good scholarship.

To conclude, while, upon first consideration, it may seem odd for the Political Science program to join the Gallo School of Management, there is a compelling rationale for this kind of move that goes back decades in political science. Stanford illustrates the benefits from this approach, and I personally have found our interdisciplinary blueprint to be entirely intellectually satisfying. I am confident that similar rewards could be harvested by replication at Merced.

All the best with your upcoming transition,



Keith Krehbiel

Edward B. Rust Professor of Political Science
Stanford University Graduate School of Business