

MANAGEMENT OF INNOVATION, SUSTAINABILITY, AND TECHNOLOGY  
MANAGEMENT OF COMPLEX SYSTEMS Ph.D. AND M.S. DEGREE REQUIREMENTS

Revised: July 8, 2019, March 22, 2022  
Graduate Council Approval: April 11, 2022

Table of Contents

A. Introduction

- 1) Aims and Scope
- 2) Admissions Requirements
  - a) Prerequisites
  - b) Deficiencies
- 3) General Committees
  - a) Executive Committee

B. Master's Degree Requirements

- 1) Degree Plan I- Thesis
  - a) Program Learning Outcomes (PLOs)
  - b) Course Requirements - Core and Electives
    - i) Core Courses
    - ii) Elective Courses
    - iii) Summary
  - c) Special Requirements
  - d) Advancement to Candidacy
  - e) Thesis Requirements
- 2) Degree Plan II- Non-Thesis
  - a) Program Learning Outcomes (PLOs)
  - b) Course Requirements - Core and Electives
    - i) Core Courses
    - ii) Elective Courses
    - iii) Summary
  - c) Special Requirements
  - d) Advancement to Candidacy
  - e) Comprehensive Examination
    - i) Timing
    - ii) Outcome
- 3) Advising Structure and Mentoring
- 4) Committees
  - a) Thesis Committee
  - b) Comprehensive Examination Committee
  - c) Other
- 5) Normative Time to Degree
- 6) Typical Timeline and Sequence of Events
- 7) Sources of Funding

**C. Doctoral Degree Requirements**

- 1) Program Learning Outcomes (PLOs)
- 2) Course Requirements - Core and Electives
  - a) Core Courses
  - b) Elective Courses
  - c) Summary
- 3) Special Requirements
- 4) Dissertation Plan
- 5) Advising Structure and Mentoring
- 6) Committees
  - a) Candidacy Committee
  - b) Doctoral Committee
  - c) Other
- 7) Advancement to Candidacy
- 8) Qualifying Examination Requirements
- 9) Dissertation Requirements
- 10) Normative Time to Degree
- 11) Typical Timeline and Sequence of Events
- 12) Sources of Funding
- 13) Leaving the Program Prior to Completion of the PhD Requirements.

**D. General Information**

- 1) PELP, In Absentia and Filing Fee Status

**A. Introduction**

- 1) **Aims and Scope:** The Doctor of Philosophy (Ph.D.) and Master of Science (M.S.) degree programs offered by the Graduate Group in Management of Innovation, Sustainability, and Technology (MIST) at the University of California, Merced, are distinctive educational experiences that flexibly integrate graduate course offerings from MIST and other programs on campus, combining faculty and graduate students with diverse disciplinary backgrounds to create unique interdisciplinary research and education opportunities at the intersection of management, innovation, sustainability, and technology. The programs provide training in qualitative and quantitative management skills tailored for the 'wicked problems' often encountered in complex adaptive systems, addressing the need for developing deep knowledge and leadership in areas of management relevant to the campus, the region, and the state.
- 2) **Admissions Requirements:** Applicants admitted into the graduate programs in MIST will be expected to have completed a bachelor's degree at a four-year accredited college or university and to have attained an undergraduate academic record that satisfies the standards established by the Graduate Division, University of California, Merced. In addition to the following requirements, all applicants must meet the general requirements as set forth in the Graduate Studies section of the General Catalog.

Any applicant who spent the majority of their primary and secondary education in a nation/territory where English is not the primary language must take an approved English proficiency examination prior to admission. Proficiency in English may be demonstrated by passing one of two standardized, internationally administered tests: TOEFL (the Test of English as a Foreign Language) or IELTS (International English Language Testing System). Passing scores are defined as 550 on the TOEFL paper test or 80 on the TOEFL iBT (internet-Based Testing); or a score of at least 6.5 on the IELTS. For more detailed information please refer to the Graduate Handbook located on the Graduate Division website.

The regular schedule for applications will be for admission in Fall semester, but faculty may accept students off-cycle for admission in Spring semester with the approval of the MIST GG Chair.

- a) **Prerequisites:** There are no prerequisites.
  - b) **Deficiencies:** No prior coursework deficiencies may be made up.
- 3) **General Committees:** According to the MIST Graduate Group Bylaws, there is one standing faculty committee:
    - a) **Executive Committee:** The Executive Committee (EC), in consultation with the faculty, determines and implements policy for the good of the Group, establishes and guides the educational requirements of the Group, and represents the interests of the Group to the University and other agencies. The EC consists of the Graduate Group

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

Chair and at least two elected members from the MIST faculty. The Executive Committee will make appointments to ad hoc committees of the Group.

The Executive Committee's duties include:

- i. Hear student grievances, make determinations of fact, and rule on grievance cases. Final resolution lies with the Dean of the Graduate Division as described in UC Merced's Graduate Advisors Handbook.
- ii. Establish and maintain documentation on MIST Group curricula.
- iii. Prepare and execute all reviews of MIST Group programs.
- iv. In consultation with Group faculty, coordinate and document proposed changes in programmatic requirements. All changes to programmatic requirements of MIST curricula and associated requirements must be approved by vote of the eligible faculty.
- v. Review applications for admissions in consultation with Group faculty. The Committee will make recommendations for admissions to the Dean of Graduate Studies, explore graduate student support mechanisms, and allocate intramural financial assistance.
- vi. Recommend the allocation of intramural financial assistance, fellowships, and awards for new and continuing students.
- vii. Create and staff additional committees as needed. EC duties may be delegated.

### **B. Master's Degree Requirements**

Students pursuing an M.S. degree must complete M.S. course requirements, fulfill the university residency requirement, and either give a public oral presentation and successfully defend a master's thesis containing original research (Plan I) or pass a comprehensive exam (Plan II). M.S. students will, in consultation with their faculty advisor, select either the exam or thesis option in Fall semester of the first year and then constitute either a thesis committee or an exam committee, as appropriate.

#### **1) Degree Plan I – Thesis**

Degree Plan I – Thesis requires a minimum of 26 semester units in approved courses, at least 20 of which must be from graduate-level courses in the 200 series and taken for a letter grade. A final thesis and general examination is also required.

- a) **Program Learning Outcomes (PLOs):** The goal is for the students to master MIST's cross-disciplinary management concepts and their application in a range of real-world problems, providing a solid basis for future academic and industry positions. There are five PLOs:
  - *Foundations.* Students will 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.

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

- *Methods.* Students will be able to apply contemporary social science and scientific methods needed to conduct rigorous research in their area of specialization.
- *Communication.* Students will 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 Practice and Independence.* Students will be able to initiate and conduct independent research (e.g. review of literature, development of a research question and methodology, analysis, discussion, and conclusion) that makes an original contribution to knowledge, and which may be published in a peer reviewed outlet.
- *Research ethics and societal context.* Students will demonstrate familiarity with all aspects of research ethics and the societal context of their work.

b) **Course Requirements - Core and Electives (total 26 units):** M.S. students must

- Complete at least two semesters of full-time academic residence at UC Merced (12 units minimum per semester for students supported on university employment or fellowships and 8 units for self-supported students.)
  - Complete a minimum of 26 units of courses at the upper division and graduate levels, with at least 20 units of graded graduate (200-level) courses, including Foundations I and II (MIST 252 & 253) and at least two courses in research methods (with letter grade B or better).
  - Enroll in the Management of Complex Systems seminar (MIST 251) twice for credit (S/U)
  - Give a public oral presentation and successfully defend a master's thesis containing original research.
- i. **Core Courses (total 10 units):** All M.S. students must take Foundations I and II and register for the Graduate Seminar twice for credit.

Course No.	Title	Units
MIST 251	Graduate Seminar	1
MIST 252	Foundations I	4
MIST 253	Foundations II	4

- Elective Courses (total 16 units):** All M.S. students must take four graduate level courses, including at least two courses which must be in research methods. A list of approved graduate level elective courses current as of the date of this document is provided below. A current list of elective courses is maintained by the Graduate Group chair and available on the MCS webpage. Courses marked by an asterisk (\*) qualify as research

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

methods courses given their focus on quantitative or qualitative analysis and methodologies. Additional courses can qualify but require the approval of a student's faculty advisor and the MIST GG Chair.

<b>Course No.</b>	<b>Title</b>	<b>Units</b>
<b>MIST 215</b>	Political Ecology and Complexity	4
<b>MIST 218</b>	Social Reality	4
<b>MIST 231</b>	Organizational Behavior	4
<b>MIST 241</b>	Management Information Systems	4
<b>MIST 254</b>	Systems Thinking	4
<b>MIST 260</b>	Research Methods	4*
<b>MIST 261</b>	Qualitative Methods	4*
<b>MIST 264</b>	Energy Policy	4
<b>MIST 270</b>	Data Science	4*
<b>MIST 271</b>	Network Science	4*
<b>MIST 295</b>	Graduate Student Research	1-5
<b>COGS 204</b>	Complex Adaptative Systems	4
<b>EECS 255</b>	Advanced Human-computer Interaction	4*
<b>ES 222</b>	Organic Matter	3
<b>ES 232</b>	Applied Climatology	3*
<b>IH 203</b>	Pedagogy in Interdisciplinary Humanities	4
<b>POLI 215</b>	Intro to Game Theory	4*
<b>PSY 202A</b>	Advanced Psychological Statistics	4
<b>SOC 205</b>	Graduate Writing & Publishing	4
<b>SOC 210</b>	Graduate Statistics I: Linear Regression	4*
<b>SOC 215</b>	Graduate Research Methods	4*

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

- iii. **Summary:** M.S. students must complete a minimum of 26 units of courses at the upper division and graduate levels, with at least 20 units of graded graduate (200-level) courses, including Foundations I and II (MIST 252 & 253) and at least two research methods courses (with letter grade B or better), and they must enroll in the Management of Complex Systems seminar (MIST 251) twice for credit (S/U).
  
- c) **Special Requirements:** M.S. students in Plan I – Thesis must give a public oral presentation and successfully defend a master's thesis containing original research.
  
- d) **Advancement to Candidacy:** Before advancing to candidacy for the Master's degree, a student must have maintained a minimum GPA of 3.0 in all course work undertaken during the first semester. Normally, students advance after one semester.

In the case of the Master's degree, the terms and deadlines for formal advancement to candidacy are outlined in the Graduate Division dates and deadlines website (<https://graduatedivision.ucmerced.edu/current-students/calendar-and-deadlines>). An Application for Advancement to Candidacy initiated by the student and approved by the Graduate Group should be submitted to the Graduate Dean before the specified deadline. The application must be accompanied by petitions for any course credits that have not already been approved by the Graduate Dean. Committee membership for master's degree must be included on the advancement to candidacy form. For thesis track (Plan I), the graduate student, graduate advisor, and the Graduate Group chair must complete the Conflict of Interest Statement on the form. Students must be advanced to candidacy prior to degree conferral.

- e) **Thesis Requirements:** The thesis committee will typically be constituted in the Fall of the first year, and will consist of at least three faculty members, one of whom would ordinarily be the faculty advisor and committee chair. A majority of the committee must be members of the MIST Graduate Group. One member may (but is not required to) be a non-MIST UC or equivalently credentialed faculty member, as appropriate. M.S. students pursuing the thesis option will work closely with the thesis committee on a research project that integrates the graduate curriculum. The composition of thesis committee must be approved by the MIST GG Chair.

Thesis committee meetings: Once the committee is formed, the candidate and advisor should meet at least once a semester with the other members of the thesis committee to discuss progress and any changes in research objectives.

Thesis: Research for the Master's thesis is to be carried out under the supervision of a faculty member of the program and must represent an original contribution to knowledge in the field. The thesis research must be conducted while the student is enrolled in the program. The thesis is submitted to the thesis committee at least

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

one month before the scheduled defense. All committee members must approve the thesis in its entirety and sign the title page before the thesis is submitted electronically to the Graduate Division for final approval. Should the committee determine that the thesis is unacceptable, even with substantial revisions, the program may recommend the student for disqualification from the program.

The thesis must be submitted by the deadlines outlined in the Graduate Division website, in the semester in which the degree is to be conferred. Those students who complete requirements and submit thesis after the end of the semester and prior to the start of the subsequent semester will earn a degree for the following semester, but will not be required to pay fees for that semester.

### **2) Degree Plan II - Non-thesis**

Degree Plan II – Non-thesis requires a minimum of 26 semester units in approved courses, at least 20 of which must be from graduate-level courses in the 200 series and taken for a letter grade. A comprehensive final examination in the major subject is required. No thesis is required.

a) **Program Learning Outcomes (PLOs):** The goal is for the students to master MIST's cross-disciplinary management concepts and their application in a range of real-world problems, providing a solid basis for future academic and industry positions. There are five PLOs:

- *Foundations.* Students will 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.
- *Methods.* Students will be able to apply contemporary social science and scientific methods needed to conduct rigorous research in their area of specialization.
- *Communication.* Students will 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 Practice and Independence.* Students will be able to initiate and conduct supervised research (e.g. review of literature, development of a research question and methodology, analysis, discussion, and conclusion).
- *Research ethics and societal context.* Students will demonstrate familiarity with all aspects of research ethics and the societal context of their work.

b) **Course Requirements - Core and Electives (total 26 units):** M.S. students must

- 1) Complete at least two semesters of full-time academic residence at UC Merced (12 units minimum per semester for students supported on university employment or fellowships and 8 units for self-supported students.)



***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

- 2) Complete a minimum of 26 units of courses at the upper division and graduate levels, with at least 20 units of graded graduate (200-level) courses in the major subject, including Fundamentals I and II (MIST 252 & 253) and at least two in research methods (with letter grade B or better).
  - 3) Enroll in the Management of Complex Systems seminar (MIST 251) twice for credit (S/U)
  - 4) Pass a comprehensive exam.
- i. **Core Courses (total 10 units):** All M.S. students must take Foundations I and II and register for the Graduate Seminar twice.

Course No.	Title	Units
MIST 251	Graduate Seminar	1
MIST 252	Foundations I	4
MIST 253	Foundations II	4

- iii. **Elective Courses (total 16 units):** All M.S. students must take four graduate level courses, including at least two courses which must be in research methods. A list of approved graduate level elective courses current as of the date of this document is provided below. A current list of elective courses is maintained by the Graduate Group chair and available on the MCS webpage. Courses marked by an asterisk (\*) qualify as research methods courses given their focus on quantitative or qualitative analysis and methodologies. Additional courses can qualify but require the approval of a student's faculty advisor and the MIST GG Chair.

Course No.	Title	Units
MIST 215	Political Ecology and Complexity	4
MIST 218	Social Reality	4
MIST 231	Organizational Behavior	4
MIST 241	Management Information Systems	4
MIST 254	Systems Thinking	4
MIST 260	Research Methods	4*
MIST 261	Qualitative Methods	4*
MIST 264	Energy Policy	4
MIST 270	Data Science	4*

***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

<b>MIST 271</b>	Network Science	4*
<b>MIST 295</b>	Graduate Student Research	1-5
<b>COGS 204</b>	Complex Adaptative Systems	4
<b>EECS 255</b>	Advanced Human-computer Interaction	4*
<b>ES 222</b>	Organic Matter	3
<b>ES 232</b>	Applied Climatology	3*
<b>IH 203</b>	Pedagogy in Interdisciplinary Humanities	4
<b>POLI 215</b>	Intro to Game Theory	4*
<b>PSY 202A</b>	Advanced Psychological Statistics	4
<b>SOC 205</b>	Graduate Writing & Publishing	4
<b>SOC 210</b>	Graduate Statistics I: Linear Regression	4*
<b>SOC 215</b>	Graduate Research Methods	4*

- iii. **Summary:** M.S. students must complete a minimum of 26 units of courses at the upper division and graduate levels, with at least 20 units of graded graduate (200-level) courses in the major subject, including Foundations I and II (MIST 252 & 253) and at least two courses in research methods. (with letter grade B or better), and they must enroll in the Management of Complex Systems seminar (MIST 251) twice for credit (S/U)
- c) **Special Requirements:** M.S. students in degree Plan II – Non-thesis must pass a comprehensive exam.
- d) **Advancement to Candidacy:** Before advancing to candidacy for the Master's degree, a student must have maintained a minimum GPA of 3.0 in all course work undertaken during the first semester. Normally, students advance after one semester.

In the case of the Master's degree, the terms and deadlines for formal advancement to candidacy are outlined in the Graduate Division dates and deadlines website (<https://graduatedivision.ucmerced.edu/current-students/calendar-and-deadlines>). An Application for Advancement to Candidacy initiated by the student and approved by the Graduate Group should be submitted to the Graduate Dean before the specified deadline. The application must be accompanied by petitions for any course credits that have not already been approved by the Graduate Dean. Committee membership for master's degree must be included on the advancement

## *MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures*

to candidacy form. Students must be advanced to candidacy prior to degree conferral.

- e) **Comprehensive Examination:** The comprehensive exam may be given as an oral or written exam based on questions developed and graded by the Comprehensive Examination Committee. The committee will typically be constituted in the Fall of the first year, and will consist of at least three MIST faculty members, one of whom would ordinarily be the faculty advisor and committee chair. The composition of committee must be approved by the MIST GG Chair. To create the exam questions, the committee will solicit questions from the instructors of courses the student has taken, and meet with the student during the spring semester to set expectations regarding the material to be covered by the exam. The results of the examination will be reported to Graduate Division using the "Final Report for the Master's Degree Form."

  - i) **Timing:** Students may take the comprehensive examination once they have advanced to candidacy. Typically, students will take the exam near the end of the coursework for the Master's degree (at the end of the first year). To take the exam, a student must be registered or in current filing fee status.
  - ii) **Outcome:** Examinations can result in either a pass, fail, or partial pass by unanimous consensus of the examination committee.
    - a. A student has passed when the Comprehensive Examination Committee unanimously votes that the student passed the entire examination with scholarship that is at least acceptable. If agreed unanimously by the committee the student may be allowed to make minor modifications prior to submitting the results of the examination.
    - b. A student has failed when the Comprehensive Examination Committee votes unanimously that the student failed the entire examination. The second examination may have a format different from the first, but the substance should remain the same. A student whose performance on the second attempt is also unsatisfactory, or who does not undertake a second examination within a reasonable period of time, is subject to academic disqualification. A third examination may be given only with the approval of the Graduate Group committee and the Vice Provost and Dean of Graduate Education.
    - c. A student has partially passed when the Comprehensive Examination Committee votes unanimously that the student passed some components but failed others. In this instance, the following apply:
      - i. The student has the option of taking the examination one more time as detailed in above on the components failed; and
      - ii. The chair of the committee must write a letter to the student, with a copy to the Graduate Division, conveying the information about the

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

student's performance (pass, fail, or partial pass) on each of the components covered during the examination.

- 3) **Advising Structure and Mentoring:** The graduate advisor is the faculty member who supervises the student's research and thesis. The Graduate Advisor, who is appointed by the MIST Graduate Group Chair, is a resource for information on academic requirements, policies and procedures, and registration information. The Graduate Group Staff assists students with identifying appointments and general university policies. Mentoring guidelines can be found on the Graduate Division website: [UCM Mentoring Guidelines](#).
- 4) **Master's Degree Committees**
  - a) **Thesis Committee:** The thesis committee will typically be constituted in the Fall of the first year, and will consist of at least three faculty members, one of whom would ordinarily be the faculty advisor and committee chair. A majority of the committee must be members of the MIST Graduate Group. One member may (but is not required to) be a non-MIST UC or equivalently credentialed faculty member, as appropriate. M.S. students pursuing the thesis option will work closely with the thesis committee on a research project that integrates the graduate curriculum. The student, in consultation with the graduate advisor and graduate group chair, nominate three faculty to serve on the Thesis Committee. The composition of thesis committee must be approved by the MIST GG Chair and the Graduate Dean.
  - b) **Comprehensive Examination Committee:** The committee will typically be constituted in the Fall of the first year, and will consist of at least three MIST faculty members, one of whom would ordinarily be the faculty advisor and committee chair. The student, in consultation with the graduate advisor and graduate group chair, nominate three faculty members to serve on the Comprehensive Examination Committee. The committee shall approve the subject, pass on the content of examination, and administer the examination. The composition of committee must be approved by the MIST GG Chair and the Graduate Dean.
- 5) **Normative Time to Degree:** Normative time to degree for the M.S. is one year.
- 6) **Typical Timeline and Sequence of Events:**

*Year 1*

*Fall: MIST 251 (1), MIST 252 (4), Methods I (4), Elective I (4)*

*Spring: MIST 251 (1), MIST 253 (4), Methods II (4), Elective II (4), thesis or exam*
- 7) **Sources of Funding:** Students admitted to the M.S. degree may be supported on through a combination of teaching assistantships (TAs), merit- or need-based scholarships and fellowships, and graduate student research assistantships (GSRs) on faculty grants.

## **C. Doctoral Degree Requirements**

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

The Ph.D. program emphasizes collaborative and interdisciplinary research training. Typically, graduate students work closely with one or more faculty in pursuing scientific research, while taking a series of courses that can be tailored to the specific needs and specialization of the student. In short, students must complete Ph.D. course requirements, complete first and second year research projects, complete the technical seminar, fulfill the university residency requirement, pass the integrative review paper, pass the Ph.D. qualifying exam, and successfully defend the dissertation.

Though students may enter the program without a Master's degree, additional courses will be required equivalent to M.S. coursework requirements (24 units). If additional courses are required, students will work with their advisor and the graduate group chair to tailor a specific program of study.

Ph.D. students electing not to continue their graduate studies after completing 26 units of course requirements (a two-semester foundations program (MIST 252 and 253), the MIST 251 graduate seminar during two semesters, 16 units of graduate-level courses, at least two courses which must be in research methods) may elect to terminate with an M.S. degree by choosing and successfully completing either the M.S. exam or thesis option.

**1) Program Learning Outcomes (PLOs):** The goal is for the students to master MIST's cross-disciplinary management concepts and their application in a range of real-world problems, providing a solid basis for future academic and industry positions. There are five PLOs:

- *Foundations.* Students will 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.
- *Methods.* Students will be able to apply contemporary social science and scientific methods needed to conduct rigorous research in their area of specialization.
- *Communication.* Students will 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 Practice and Independence.* Students will be able to initiate and conduct independent research (e.g. review of literature, development of a research question and methodology, analysis, discussion, and conclusion) that makes an original contribution to knowledge, and which may be published in a peer reviewed outlet.
- *Research ethics and societal context.* Students will demonstrate familiarity with all aspects of research ethics and the societal context of their work.

**2) Course Requirements - Core and Electives (28 units):** Ph.D. students holding appropriate masters degrees must complete 28 units of course requirements (a two-semester foundations program (MIST 252 and 253), the MIST 251 graduate seminar during four semesters, 16 units of graduate-level courses, at least two courses of which must be in research methods).

Ph.D. students without appropriate masters degrees must also complete the equivalent of the coursework requirements (i.e., complete a minimum of 24 units of courses at the

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

upper division and graduate levels, with at least 20 units of graded graduate (200-level) courses in the major subject (with letter grade B or better).

- a) **Core Courses (12 units):** All Ph.D. students must take Foundations I and II and register for the Graduate Seminar for at least four semesters.

<b>Course No.</b>	<b>Title</b>	<b>Units</b>
<b>MIST 251</b>	Graduate Seminar	4
<b>MIST 252</b>	Foundations I	4
<b>MIST 253</b>	Foundations II	4

- b) **Elective Courses (16 units):** All Ph.D. students must take four graduate level courses, including at least two courses which must be in research methods. A list of approved graduate level elective courses current as of the date of this document is provided below. A current list of elective courses is maintained by the Graduate Group chair and available on the MCS webpage. Courses marked by an asterisk (\*) qualify as research methods courses given their focus on quantitative or qualitative analysis and methodologies. Additional courses can qualify but require the approval of a student's faculty advisor and the MIST GG Chair.

<b>Course No.</b>	<b>Title</b>	<b>Units</b>
<b>MIST 215</b>	Political Ecology and Complexity	4
<b>MIST 218</b>	Social Reality	4
<b>MIST 231</b>	Organizational Behavior	4
<b>MIST 241</b>	Management Information Systems	4
<b>MIST 254</b>	Systems Thinking	4
<b>MIST 260</b>	Research Methods	4*
<b>MIST 261</b>	Qualitative Methods	4*
<b>MIST 264</b>	Energy Policy	4
<b>MIST 270</b>	Data Science	4*
<b>MIST 271</b>	Network Science	4*
<b>MIST 295</b>	Graduate Student Research	1-5
<b>COGS 204</b>	Complex Adaptative Systems	4

*MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures*

EECS 255	Advanced Human-computer Interaction	4*
ES 222	Organic Matter	3
ES 232	Applied Climatology	3*
IH 203	Pedagogy in Interdisciplinary Humanities	4
POLI 215	Intro to Game Theory	4*
PSY 202A	Advanced Psychological Statistics	4
SOC 205	Graduate Writing & Publishing	4
SOC 210	Graduate Statistics I: Linear Regression	4*
SOC 215	Graduate Research Methods	4*

c) **Summary:** Ph.D. students must satisfy the following course requirements. When necessary, students may consult with their advisors and advisory committee to identify particular courses that satisfy the requirements:

- A two-semester foundations program (Letter grade, B+ or better required)
- Enrollment in the MIST graduate seminar for four semesters (Letter grade, B+ or better required)
- A minimum of two graduate-level courses in research methods, for example in the areas of statistics, data analysis, computational modeling or survey methods. (Letter grade, B+ or better required)
- Two additional graduate-level courses, selected from the Electives course lists (Letter grade, B+ or better required)

3) **Special Requirements:** In addition to course requirements, prior to taking the qualifying exam, students must complete first- and second-year research projects, and pass the integrative review paper.

- Language Requirement:** N/A.
- Research Projects in First and Second Years:** Each student must give a talk on a research project they are working on at the end of their first year, and at the end of their second year. Unless otherwise arranged, first and second year talks will occur on the same day near the end of the semester, such as the 2nd Friday of May, in a mini-conference format attended by MIST members. All 1st year reports will be due shortly after the day of presentations (e.g. last Friday of May, to allow time for revision based on feedback), and all 2nd year reports will be due shortly beforehand (e.g. first Friday of May, to give faculty advisors time to review it before talks). Advisory committees will evaluate reports and presentations in terms of

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

progress towards professional academic work in one or more areas of MIST. 1st and 2<sup>nd</sup> year reports will be given a grade of Pass, Conditional Pass, or Fail. Faculty must provide the first round of feedback by one month from submission of their respective reports, and the final grade by three months from submission.

- iii. **Open Technical Seminar:** Students are required to give at least one oral presentation prior to graduation. The seminar may be given in any scholarly public venue that is approved by the student's advisory committee (at the time the talk is given). At least one MIST faculty member must be present at the seminar.
- iv. **Integrative Review Paper:** Students must receive passing grades on one integrative review paper (no less than 5500 words, about 30 references) submitted to their advisory committee, normatively in the third year of the program.

4) **Dissertation Plan:** In accordance with University of California policy, a minimum of four semesters in academic residence is required prior to awarding the Ph.D. All graduate students are considered resident graduates not candidates for a degree, unless admitted to candidacy after completion of all candidacy requirements and approval by the Graduate Division after formal application. A student advances to candidacy for the Ph.D. upon successfully demonstrating a high level of scholarship at the Ph.D. level, and upon completing all preparatory work and demonstrating readiness to proceed to the dissertation phase.

5) **Advising Structure and Mentoring:** The graduate advisor is the faculty member who supervises the student's research and thesis. The Graduate Advisor, who is appointed by the MIST Graduate Group Chair, is a resource for information on academic requirements, policies and procedures, and registration information. The Graduate Group Staff assists students with identifying appointments and general university policies. In the case of separation between faculty mentor and student, the Graduate Chair assumes temporary mentoring responsibilities for the student. In such cases, the student will have one full semester to secure a main graduate advisor before falling into unsatisfactory progress. Mentoring guidelines can be found on the Graduate Division website: [UCM Mentoring Guidelines](#).

### **6) Doctoral Degree Committees**

Ph.D students will work closely with their advisory committees on 1<sup>st</sup>-year projects, 2<sup>nd</sup>-year-projects, an integrative review paper, qualifying exam, and doctoral dissertations. An advisory committee comprises at least three members, including at least one Core MIST faculty member as chair (typically the student's primary advisor). A second member must be either MIST Core or Affiliate faculty; other members may be MIST Core or Affiliate faculty, other UC faculty or similarly credentialed faculty from other institutions,



## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

as appropriate to support the student's area of research. A student will typically constitute the 1<sup>st</sup>-year project committee in Fall of the first year, the 2<sup>nd</sup>-year project committee in Fall of the second year, the integrative paper committee in Fall of the third year, and the dissertation committee (including candidacy committee) in Fall of the fourth year. A student, along with his or her advisor, may elect to maintain the same committee over time or may elect to constitute a new committee for each requirement (with committee membership eligibility as described above). Advisory committees must be approved by the MIST Graduate Group Chair and the Graduate Dean.

- a) **Candidacy Committee:** The Candidacy Committee comprises at least three members, including at least one Core MIST faculty member as chair (typically the student's primary advisor); a second member must be either MIST Core or Affiliate faculty; and other members may be MIST Core or Affiliate faculty, other UC faculty or similarly credentialed faculty from other institutions, as appropriate to support the student's area of research. The Candidacy Committee is charged with determining the fitness of the student to proceed with the doctoral dissertation through a formal Qualifying Examination. The student, in consultation with graduate advisor, nominates three faculty members to serve on the Candidacy Committee. These nominations are submitted to the Graduate Group Chair for formal appointment in accordance with Graduate Council policy. The Application for Qualifying Examination available on the Graduate Division website must be submitted one month prior to the proposed examination date. Students must be in good academic standing and registered for the semester in which the examination is held. The Candidacy Committee conducts the exam and submits results to the Graduate Division using the "Qualifying Examination Report Form."
  - b) **Doctoral Committee:** The Doctoral Committee consists of at least a three member committee. The majority of the committee must be affiliated with the MIST program. The role of the Dissertation Committee is to advise the doctoral student on the research topic and methods, and then to review the final completed dissertation for acceptance. The Doctoral Committee Chair should determine the desires of the individual members regarding assistance with the research and dissertation review at the time the doctoral committee is constituted. Students are expected to meet with the Chair of their doctoral committee regularly. Doctoral committee members are expected to read and comment on a dissertation within one month of submission. The student and faculty will coordinate a timeline for the student to present the thesis to the doctoral committee. This timeline must allow all doctoral committee members enough time to fulfill their responsibilities within the indicated deadline.
- 7) **Advancement to Candidacy:** The student is expected to advance to candidacy by the end of their third year. Students who enter the program without a Masters degree may require additional semesters to advance to candidacy. Before advancing to candidacy, a student must have satisfied all other requirements, must have maintained a minimum GPA of 3.0 in all course work undertaken. The student must file the appropriate paperwork ("Advance to Candidacy for the Degree of Doctor Philosophy Form" and

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

“Conflict of Interest Form”) with the Graduate Division and pay the candidacy fee in order to be officially promoted to Ph.D. Candidacy.

- 8) **Qualifying Examination Requirements:** Students must pass a qualifying exam, typically at the end of their third year. Students who enter the program without a Masters degree may require additional semesters before taking their qualifying exam. The exam consists of a written dissertation proposal (about 8000 words in length) and an oral defense of the proposal, which takes place privately with the student’s advisory committee. The oral defense may also include general questions about topics in MIST covered in the student’s integrative review paper.

Conduct of the Exam. Although the formal Qualifying Examination for candidacy ordinarily is conducted in a single day, the Committee may meet intermittently over a longer period, and may decide to reexamine the student on one or more topics after a specified interval. When the Committee meets to conduct the oral Qualifying Examination, it must report to the Graduate Council via the Vice Provost and Dean of Graduate Education within 30 days. Upon completion of the qualifying examination and all other Graduate Group requirements for Advancement to Candidacy, the results should be submitted to the Graduate Division on the “Qualifying Examination Report Form,” which must be signed by all committee members at the time the qualifying examination is concluded. Prior to convening a student committee for advancement to qualifying exam, the Faculty Advisor, the Graduate Group Chair, and the graduate student must sign the “Statement on Conflict of Interest” form. If the unanimous recommendation of the Committee is favorable, the student must pay the current advancement to candidacy fee. The student must then submit the advancement to candidacy form to the Graduate Division. The candidate and graduate program will be notified of formal advancement and the appointment of a Doctoral Committee. Advancement to Candidacy begins with the first academic term following completion of all requirements (including submission of all forms).

Outcome of the Exam. Before voting upon its recommendation for or against candidacy, the Committee shall meet with the student, and any member of the Committee will have the right to pose appropriate questions to the student. The Committee must conclude its examination when convened with the student present. The committee, having reached a unanimous decision, shall inform the student of its decision to:

- **Pass.** A student has passed when the Qualifying Examination Committee unanimously votes that the student passed the entire examination with scholarship that is at least acceptable. The committee must report to the Graduate Council via the Vice Provost and Dean of Graduate Education within 30 days. If agreed unanimously by the committee the student may be allowed to make minor modifications prior to submitting the results of the examination.
- **Fail.** A student has failed when the Qualifying Examination Committee votes unanimously that the student failed the entire examination. The second examination may have a format different from the first, but the substance should remain the same. A student whose performance on the second attempt is also

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

unsatisfactory, or who does not undertake a second examination within a reasonable period of time, is subject to academic disqualification. A third examination may be given only with the approval of the Graduate Group committee and the Vice Provost and Dean of Graduate Education.

- **Partial Pass.** A student has partially passed when the Qualifying Examination Committee votes unanimously that the student passed some components but failed others. In this instance, the student has the option of taking a second examination as detailed in above on the components failed, and the chair of the committee must write a letter to the student, with a copy to the Graduate Division, conveying the information about the student's performance (pass, fail, or partial pass) on each of the components covered during the examination.

If a unanimous decision is "Partial Pass" or "Fail", the Chair of the Candidacy Committee must include in its report a specific statement, agreed to by all members of the committee, explaining its decision and must inform the student of its decision.

- 9) **Dissertation Requirements:** Students must successfully complete a written doctoral dissertation containing an original contribution to scientific knowledge in some domain related to management of innovation, sustainability, and technology in the context of complex coupled human-natural systems. The dissertation should contain material of a quality that is worthy of scholarly publication, and must be formatted according to campus guidelines for dissertation manuscripts. The student must also give an oral presentation of the dissertation that is open to the campus community, and the presentation may be followed by a private session of questions and discussion with the advisory committee. The Committee recommendation must be unanimous.

The dissertation must be submitted to each member of the dissertation committee at least one month before the student expects to make the defense. Informing committee members of progress as writing proceeds helps the members to plan to read the dissertation and provide feedback.

Upon completion of the final examination and approval of the dissertation, the Doctoral Committee recommends, by submission of the "Report on Final Examination of the Ph.D. Degree Form", the conferral of the Ph.D. subject to final submission of the approved dissertation for deposit in the University Archives.

All dissertations submitted in fulfillment of requirements for advanced degrees at UC Merced must conform to certain University regulations and specifications with regard to format and method of preparation. Filing instructions are found in the UC Merced Thesis and Dissertation Manual. The end of the semester is the deadline for submitting dissertations during each semester. Those students who complete requirements and submit dissertations after the end of the semester and prior to the start of the subsequent semester will earn a degree for the following semester, but will not be required to pay fees for that semester. In accordance with UC and UC Merced policy, all approved dissertation manuscripts automatically become available for public access and circulation as part of the UC Libraries collections.

## ***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

10) **Normative Time to Degree:** Expected normative time for completion of the Ph.D. is 4 years for students who enter with an appropriate M.S. and 5 years for students who do not.

### **11) Typical Timeline and Sequence of Events**

#### **Year 1**

Fall MIST 251 (1), MIST 252 (4), Elective I (4), MIST 295 (4)  
Spring MIST 251 (1), MIST 253 (4), Elective II (4), MIST 295 (4), 1<sup>st</sup>-year Project

#### **Year 2**

Fall: MIST 251 (1), Methods I (4), MIST 295 (8)  
Spring MIST 251 (1), Methods II (4), MIST 295 (8), 2<sup>nd</sup>-year Project

#### **Year 3**

Fall MIST 295 (12), Integrative Review Paper  
Spring MIST 295 (12), Qualifying Exam

#### **Year 4**

Fall MIST 295 (12), Technical Seminar  
Spring MIST 295 (12), Dissertation Defense

12) **Sources of Funding:** Ph.D. students will be supported through a combination of teaching assistantships (TAs), merit- or need-based scholarships and fellowships, and graduate student research assistantships (GSRs) on faculty grants. Non-resident international Ph.D. students who have not advanced to candidacy are eligible to receive a NRST award for their first four semesters to specifically cover the NRST fee charged to their student account based on the criteria listed in the Graduate Handbook. They are also eligible for an additional two semesters of NRST award that may either be used before candidacy, or be used three or more years after advancing to candidacy (NRST is waived for the first three years post-candidacy for international students). Ph.D. students who are U.S. citizens or permanent residents classified as non-California residents are eligible only during their first two semesters of graduate study at UC Merced. Please note that NRST awards are not guaranteed and subject to available funds.

13) **Leaving the Program Prior to Completion of the PhD Requirements:** A student admitted for the Ph.D. degree, which, in the judgment of the faculty should not continue past the master's degree, must be notified in writing by the Graduate Group Chair of the Graduate Group offering the degree. A copy of the letter must be sent to the Vice Provost and Dean of Graduate Education. In some cases a doctoral student may choose to leave the program with only a master's degree.

## **D. General Information**

1) **PELP, In Absentia and Filing Fee status.**

***MIST - Management of Complex Systems Ph.D./M.S. - Policies and Procedures***

Information about PELP (Planned Educational Leave Program), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found in the [Graduate Group Policies and Procedures Handbook](#)