

**ENVIRONMENTAL SCIENCE AND MANAGEMENT DEPARTMENT
GUIDELINES FOR RESEARCH (ESM 401)**

I. OBJECTIVES AND PROCEDURES

ESM 401 – RESEARCH: A supervised research experience where the student works in an on or off campus active research laboratory. Prerequisite: Prior approval by an ESM faculty.

Course Objective

To provide an opportunity for a learning experience relevant to the student's educational program, explore a field of interest, and build knowledge and skills to prepare for future employment opportunities.

Procedures

1. Student discusses with a full-time faculty mentor research opportunities and areas of interest. Student then seeks and applies for a research opportunity related to their area of study.
2. Student finds a full-time ESM faculty member/professor who agrees to be their faculty mentor, if the research project is not with a full-time ESM faculty member.
3. Upon acceptance of a research project, student begins completing the necessary paperwork with their ESM faculty mentor to receive credit. **In general, 1 credit = 30 hours of work over a 10-week quarter; 4 credits = 120 hours of work or about 12 hours per week.**

All completed forms must be submitted to the ESM department office (SRTC 218) no later than the end of the first week of the quarter. These forms include:

Description of Research Plan

Narrative describing specific learning objectives and responsibilities

By Arrangement Form (obtain "Instructor ID & Signature" from ESM faculty mentor. "Dept. Chairperson & Dean" signatures will be completed by ESM department)

4. At the end of the research project, student submits to their ESM Faculty Mentor:

A Final Report

Research Supervisor Evaluation of Student Performance

II. RESPONSIBILITIES OF THE PRINCIPAL PARTICIPANTS

The Student

The student will seek placement opportunities by contacting members of the research faculty. With a project description and schedule of anticipated activities, the student completes the "Research Plan" and submits this plan to the Environmental Science and Management Department Office.

While participating in the research project, the student is expected to (1) complete the tasks and activities outlined in the "Research Plan", (2) conform with the normal work hours, (3) support the research effort by keeping the research confidential (if necessary) and work for the best interests of the research group, and (4) submit a final report and a log of daily activities as indicated in the approved "Research Plan" to their ESM faculty mentor.

The Research Supervisor

The research supervisor is asked to help develop the research plan and schedule of anticipated activities, experiences and responsibilities during the research period. The final approval for registration is made by the ESM faculty mentor and research supervisor.

When the faculty mentor agrees to host a student, supervision of the student's activities is expected, and the research program should be sufficiently flexible to permit student involvement on specific projects. The faculty mentor conducts regular reviews of the student's performance. Further, the research supervisor completes an evaluation form. The form is forwarded to the ESM faculty mentor within one week of the completion of the internship.

The research supervisor may, but is not required to, provide wages, reimbursements for travel and other needs while the student is participating in the research project.

ESM Faculty Mentor

The faculty mentor reviews the “Research Plan” to determine whether the work (1) will be an academically meaningful experience, (2) involves initiative, creative opportunities, meaningful responsibilities and assignments, in contrast to routine or continuously repetitive activities, and (3) includes appropriate supervision and direction.

The research supervisor, the student and ESM faculty member collaborate in processing the Research Plan. The faculty mentor acts on behalf of the University in granting an appropriate number of credits for the research opportunity. At the end of the term, the faculty mentor, based on the supervisor’s evaluation and the timeliness and quality of the required reports, determines if the student’s performance has been satisfactory and provides a final letter grade.

III. GUIDELINES FOR FINAL REPORT

Upon completion of the research, each student is required to submit a detailed final report.

The final report should be a **technical report** prepared in the style of a scientific paper. The required sections include:

Abstract – one paragraph summary of the work,

Introduction – description of the purpose of the work and appropriate background to set the stage for the project,

Material and Methods – description of the experimental procedures used and the data analysis techniques employed,

Results – summary of the collected data using tables and figures,

Discussion – evaluation of the significance of the results in light of the stated hypotheses, objectives, and background information provide in the introduction, and

References – a list of the literature cited in the report.

If an alternative reporting format is necessary, the research plan should indicate the format that will be used for the final research report.

Students conducting research will be encouraged to participate in departmental research days, including the presentation of research results in poster format.

Operating Principles

1. Research Students should develop specific learning objectives that can be readily identified and reviewed throughout the work period.
2. Each research student should be supported by a member of the research faculty. The role of the faculty member is to assist identifying tasks, defining learning objectives, carrying through the ideas and projects initiated, and evaluating the student’s performance.
3. Each research student should assess the worth of the research experience and produce a report and a log of daily activities illustrative of the learning realized through the experience.