

TO: The Engineering Faculty
FROM: The Interdisciplinary Engineering Team
RE: New graduate course – ENGR 60200 Research Fundamentals

The Interdisciplinary Engineering team has approved the following new graduate course, which will be available residentially and online. This action is now submitted to the Engineering Faculty with a recommendation for approval.

Name: ENGR 60200 Graduate and Research Fundamentals

Semesters offered: Fall, Spring and Summer


Credits: 3 credits per semester; standard academic calendar

Pre-Requisites: None required

This course is designed to teach students basic research fundamentals, including critical analysis of scientific literature, scientific communication, hypothesis development and basics of scientific writing. At the course's end, students will be able to critically review literature and present their scientific thoughts and findings in both written and oral forms. Students will also have opportunities to implement writing, presentation, and networking strategies that are key to success beyond graduate school. An introduction to ethical research practices will also be provided. Finally, students are expected to provide feedback to peers and improve their scientific writing and editing skills through weekly writing sessions. Through self-guided reading and online discussions, students will master the art of analyzing scientific literature, communicating their arguments, and offering peer feedback to colleagues.

RATIONALE:

Research fundamentals courses like this are offered residentially and ensure that doctoral students can conduct applied, professional research and develop scientific writing, as well as critically review bodies of research. The Doctor of Engineering will primarily be offered online, which means an online course must be available for students who need opportunities to develop their critical thinking, presentation, and peer review skills, geared towards a professionally focused D.Eng. degree.



Associate Dean of Graduate and Professional Education

Link to Curriculog entry: [forthcoming](#)

ENGR 60200– Research Fundamentals

Course Information

- CRN: TBD
- Credits: 3
- Instruction Date(s)/Time(s): TBD
- Modality: Asynchronous online
- Prerequisites: n/a

Instructor Contact Information

- Name: TBD
- Email: TBD
- Office Hours: TBD

Course Description

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Learning Outcomes

After completion of this course students will be able to

LO1: understand and comprehend the basics in research methodology and applying them in research/project work.

LO2: find literature relevant to a research problem, analyze research and retain and retrieve its content for future use.

LO3: apply research guidelines regarding record keeping.

LO4: apply approaches for the development and formulation of research questions, objectives, and hypotheses

LO6: apply approaches to good writing for research proposals, papers, and theses.

LO7: communicate research plans to peers and non-expert audiences, including oral and poster presentations

LO8: identify common ethical issues in research

Potential Assignments

Assignment 1: Research Methodology Basics

Objective: LO1, LO3

Description:

Students will be provided with a set of research scenarios representing different methodologies (e.g., experimental, survey, qualitative). They will choose one scenario and outline the basic steps they would take to conduct research using that methodology. This assignment will require them to demonstrate their understanding of research methodology basics and their ability to apply them in different contexts. They will also be tasked with providing a summary of how they would utilize best practices in record keeping based on the methodology and scenario selected.

Assignment 2: Literature Review Analysis

Objective: LO2

Description:

Students will select a research topic of their interest and conduct a literature review. They will analyze at least five research articles relevant to their topic, summarizing the key findings, methodologies used, and implications. Additionally, they will identify common themes across the literature and discuss their implications for future research.

Assignment 3: Research Proposal Writing

Objective: LO4, LO6

Description:

Students will develop a research proposal on a topic of their choice. The proposal should include research questions, objectives, hypotheses, methodology, literature review, and a brief discussion of ethical considerations. Additionally, they will provide a sample outline for the proposed research paper or thesis.

Assignment 4: Research Communication

Objective: LO7

Description:

Students will prepare and deliver a short oral presentation of their research proposal to their peers and create a presentation or digital poster summarizing their research plan for non-expert audiences. Feedback will be provided by peers and the instructor on the clarity, coherence, and effectiveness of their communication.

Assignment 5: Ethical Dilemma Analysis

Objective: LO8

Description:

Students will be presented with several research scenarios involving ethical dilemmas. They will analyze each scenario, identify the ethical issues involved, and propose solutions or courses of action based on ethical principles and guidelines.