

**MIAMI UNIVERSITY
SCHOOL OF APPLIED SCIENCE
DEPARTMENT OF ENGINEERING TECHNOLOGY**

MPC 497-498	SENIOR DESIGN	2,2
Course Number	Title	Credit Hours

DESCRIPTION

Student teams conduct major open-ended research and design projects. Elements of the design process including establishment of objectives, synthesis, analysis, and evaluation are integral parts of the capstone. Real-world constraints such as economical and societal factors, marketability, ergonomics, safety, aesthetics, and ethics are also integral parts of the capstone. 497: feasibility studies performed; 498: implementation, testing, and production of design. Includes guest lecturers, team presentations, team building sessions, team meetings, and guided discussions relating to design. Continuous interaction with faculty and outside professionals. Prerequisite: [ENT 316](#) and senior standing in engineering technology or permission of instructor.

Miami Liberal Education Plan Principles

MPC 497/498 is a Miami Plan Capstone sequence. All Miami plan courses contain the following principles:

PURPOSE

The diverse educational communities of a comprehensive university have a common interest in liberal learning: it nurtures capabilities for creatively transforming human culture and complements specialized work by enlarging one's personal and vocational pathways. Liberal education involves thinking critically, understanding contexts, engaging with other learners reflecting and acting, habits that extend liberal learning through a lifetime to benefit both the individual and society.

THINKING CRITICALLY

Thinking critically promotes imagination and intuition along with reasoning and evaluation. These diverse abilities contribute to achieving perspective, constructing and discerning relationships, and gaining understanding. Confidence in working with data and materials, skepticism in analyzing arguments or presentations, persistence in engaging complex problems and facility in communicating about technical matters are central to thinking critically. A skillful use of written and spoken languages, and informed use of mathematics and an ability to employ contemporary information sources are integral to thinking critically.

Critical Thinking Course Outcomes:

- An ability to apply scientific reasoning and inductive logic to experimental design, including justification, conditional arguments, testing theoretical hypotheses, and decision analysis.

- An ability to apply creativity in the design of systems, components, or processes appropriate to program objectives.

UNDERSTANDING CONTEXTS

Liberal learning cultivates the perspective that present cultural circumstances are an historical and a changing situation. Decisions about what is to be studied, the forms in which knowledge appears and the ways reasoning develops are to be continually examined. Ways of knowing need active attention: gender, class, racial identity, ethnicity, economic status and regional identity condition our understanding; temporal and spatial relationships, institutional traditions, religious commitments, philosophic perspectives, and political objectives shape our assumptions; influences originating beyond geographic and social boundaries affect what we know. Crucial to our future is knowledge of the conceptual frameworks and achievements of the arts, sciences, and technology, as well as understanding of the earth's ecosystem and the character of global society.

Understand Contexts Course Outcomes:

- An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
- An ability to investigate all aspects related to the course, including environmental, cultural, ethical, moral, and historical frameworks.
- An application of proper economic and management techniques in the investigation, analysis, and design of engineering systems.

ENGAGING WITH OTHER LEARNERS

A healthy exchange of conflicting ideas and differing viewpoints encourages rethinking of accepted perspectives; it requires making choices and taking risks. Diversity among learners, a supportive atmosphere of group work, active listening, opportunities for presenting and criticizing the results of inquiry and creative effort encourage learning, aid growth and stimulate imagination. Thoughtful and systematic inquiry about the learning process supports shared efforts, and positive advising situations and experiences outside the classroom reinforce them.

Engaging With Learners Course Outcomes:

- An ability to function effectively on teams, including exchanging conflicting ideas and differing viewpoints with other team members; modify ideas based on critical input from others; and defending the group's solutions to outside critique.
- A respect for diversity, including age, gender, religion, physical ability, sexual orientation, cultural values, and political views.

REFLECTING AND ACTING

Thinking critically and understanding contexts for knowledge in an engaging learning situation lead to reflection and informed action. Making thoughtful decisions and examining their consequences enhance personal moral commitment, enrich ethical understanding, and strengthen civic participation.

Reflecting and Acting Course Outcomes:

- A demonstrated commitment to quality, timeliness, and continuous improvement.
- A comprehension of, and ability to reflect on, professional, ethical and social responsibilities.

GRADING:

ENT 497:	Percent of Final Grade
Proposal :	25%
Reflective Essay:	15%
Presentation:	25%
Journal:	10%
Final Report	25%

ENT 498:

Mid Term Report:	25%
Reflective Essay:	15%
Presentation (External Judges Evaluation)	25%
Journal:	10%
Final Report	25%

TEXT

The chosen textbook will be used for both ENT 497 and ENT 498. Reading assignments will not progress from cover to cover, but will address the discussion at hand. Therefore, some chapters will be highlighted more than once, and the planned order of reading will not necessarily follow the author's chapter sequence.

Tools and Tactics of Design, Peter G Dominick, 1st ed., John Wiley & Sons, 2001.

METHOD OF PRESENTATION

In this course, a variety of methods are offered to the students to enable them to develop their designs. There will be no structured weekly lectures as in other courses. Instead, there will be continuous interaction with faculty and outside professionals on a regular basis to discuss the various aspects of the projects and design in general. In each of these meetings, team coordinator will generate minutes that describe the discussions, activities to be conducted in the future, progress to date, and persons responsible for future tasks. These detailed minutes are to be kept within a loose leaf, three ring note book and updated at least weekly by the team coordinator. Each week the minutes are to be sent to the professor. As appropriate, seminars on topics

relevant to the projects and design may be conducted by the faculty, students, and guest speakers from industry and other institutions.

Miami University Learning Community:

Miami University is committed to fostering a supportive learning environment for all students irrespective of individual differences in gender, race, national origin, religion, handicapping conditions, sexual preferences, or age. Students should expect, and help create, a learning environment free from all prejudice. Disparaging comments, sexist or racist humor, or questioning the academic commitment of students based upon these individual differences are behaviors that undermine our learning community. If such behaviors occur in class, please seek the assistance of your instructor or department chair.