BSE 4125-4126 - Comprehensive Design Project (2 semesters)

Credit / contact hours: 4125: 2 credits, 2 contact hours; 4126: 3 credits, 3 contact hours

Course instructor: W. Cully Hession

Textbook / materials: This course does not require a textbook. Students are expected to identify and use the appropriate reference materials necessary for the completion of their design project.

Catalog description: Identify and develop an engineering design project using the team approach; use literature resources to define project objectives and approach; present project proposal in a professionally written and oral manner; examine engineering ethics, professionalism, and contemporary issues.

Co-requisites: N/A

Pre-requisites: BSE 3334 or BSE 3524 Completion of 96 credit hours & Overall GPA of 2.0 or better

Course type: required course in program

Specific outcomes of instruction:
1. Describe the fundamental components or steps in the engineering design process,
2. Develop effective team approaches for engineering solutions,
3. Efficiently use literature resources to prepare a preliminary engineering design proposal,
4. Present engineering project plans in a professional manner using written and multimedia technologies,
5. Demonstrate an understanding of the importance of ethics, professionalism, globalization, safety, and environmentally conscious design and manufacturing in a professional engineering career, and
6. Apply appropriate and accepted planning strategies to open-ended design projects, maintain accurate project records, and project schedule.

Student outcomes addressed by course:

Outcome 1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Outcome 2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

Outcome 3: an ability to communicate effectively with a range of audiences
Outcome 4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Outcome 5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Outcome 6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Outcome 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**List of topics covered:**

- Engineering design process
- Project planning and management
- Engineering standards and specifications
- Engineering ethics and professional engineering
- Environmentally conscious designs and green engineering
- Library search tools
- Review of literature and technology for developing design alternatives
- Analysis of potential design solutions, including decision matrices
- Contemporary issues in engineering
- Teamwork skills, use of strengths (personal and team)
- Communication skills, including oral, posters, and websites