

ME 455
Vehicle Design & Fabrication

Course Outcomes [Related ME Program Outcomes in brackets]

1. Apply engineering design to design components and sub-systems to achieve functional performance objectives [2, 7]
2. Integrate sub-systems into a full vehicle design to achieve vehicle functional performance objectives. [2, 5, 7]
3. Effectively present design solutions. [3]
4. Work within a multi-discipline team adhering to culture and supporting its mission. [5]

Preliminary Design (8 wks)

1. Competition rules
2. Team goals
3. Vehicle goals
4. Team Organizational Structure
5. Individual scope of work

Final Design (8 weeks)

1. CAD
2. FEA/CFD
3. Sub-system assembly model
4. Vehicle assembly model
5. Preliminary validation plan
6. Manufacturing Plan

Communication & Teamwork(embedded)

1. Preliminary Design Review (oral & written)
2. Final Design Review (oral & written)
3. Peer Evaluations (x3)

COURSE NUMBER: ME 455

COURSE TITLE: Vehicle Design and Fabrication

REQUIRED COURSE OR ELECTIVE COURSE: Elective

TERMS OFFERED: Fall

TEXTBOOK/REQUIRED MATERIAL:

None

PRE-REQUISITIES: SAE team member; Senior

COORDINATING FACULTY: Todd Nelson

COURSE DESCRIPTION: The purpose of this course is to provide guidance and infrastructure to support SAE students in designing their vehicles for the annual SAE Collegiate Design Series competition.

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ASSESSMENTS TOOLS:

1. Weekly homework.
2. Design project reports.
3. Exams and Quizzes.
4. Comprehensive final exam.

NATURE OF DESIGN CONTENT: Designs for various components and sub-systems of an SAE vehicle that is open-ended within the constraints of the competition rules and team budget.

RELATED ME PROGRAM OUTCOMES:

1. Engineering fundamentals
2. Engineering design
3. Communication skills
4. Ethical/Prof. responsibilities
5. Teamwork skills
6. Experimental skills
7. Knowledge acquisition

PROFESSIONAL COMPONENT:

1. Engineering Topics: Engineering Design – 3 credits

COMPUTER USAGE: Extensive CAD, FEA, and CFD. Matlab & Labview also required for some projects.

COURSE STRUCTURE/SCHEDULE:

Lecture - 3 days per week at 50 minutes

PREPARED BY: Todd Nelson

REVISION DATE: March 4, 2019