Course Syllabus

Course: ENG491 SAE – ME470 SAE Design Sequence

Credit and contact hours:
Two Semester Senior Design sequence (Fall and Spring)
3 undergraduate hours per semester (ENG491 SAE Spring, ME470 SAE Fall)
Lecture: 1 meeting/week for 1 hour
Team Meetings: 1 team meeting plus 1 sub-team meeting per week (~2hrs)
Shop time: 10 hrs min peer week (ESPL)

Instructor: Mike Philpott

Textbook(s) and/or other required material:
Required to download, and closely follow, SAE (Society of Automotive Engineers) competition rules.

Course description:
The concept behind the International SAE (Society of Automotive Engineering) design series is that a fictional manufacturing company has contracted a student design team to develop a small race car (e.g. formula style gas or electric, Baja off-road, solar racer etc). The prototype race car is to be evaluated for its potential as a production vehicle. Each student team designs, builds and tests a prototype based on a series of rules; and competes in a number of events including design and business presentations, and on-road or track racing for performance, fuel efficiency, and durability. The students are also required to submit design, cost and structural safety reports. The judges at these events are professional engineers from industry.

This is a two semester sequence: Design phase in the Fall Semester; Build, test and compete in the Spring Semester. In the Fall semester students enroll in ENG491 SAE 3 credit hour class and must perform to an acceptable level (team peer reviewed) to move on the ME470 SAE class in the Spring. No graduate credit. Departmental approval required

Prerequisites: Concurrent enrollment in no more than two required ME courses; completion of all required courses; must have attended the SAE competitions the previous year, be a team leader, and/or contributed significantly to the team. Students will typically have taken ME199 SAE during freshman/Sophomore years (recommended). Instructor approval required along with previous-year senior team leaders' confirmation of team contributions and team member effectiveness.

Designation: Satisfies Senior Design requirement in EM and ME curricula.

List of topics:
Students' primary task is to work effectively as a member of a large overall design/build/compete team. They must also take on a leadership role in a sub-team (e.g. Engine, Drivetrain, Chassis etc.), identify problems to solve (typically identified during

competition the previous year) and complete the design, build and test of the associated vehicle sub-assemblies. As team leaders, students in the class mentor and teach automotive design, with practical hands-on build/test skills, and associated engineering analysis to junior team members, as required to succeed as a competitive International SAE collegiate team.

Project phases (Fall through Spring) include:
1. Project review and selection
2. Problem statement and project objectives
4. Design vehicle (Design freeze by Thanksgiving)
5. Design Jigs, Fixtures and molds
7. Manufacture (Complete by Engineering Open House – early March)
8. Test
9. Compete (static and dynamic events April – June/July))

Assignments
Each Student is required to make status presentations at weekly class meetings and/or technical educational presentations to ME199 freshman/sophomore SAE class (minimum of 3 per semester). Each student must submit a brief 1 page proposal report (outlining plans for the semester), and a final report at the end of each semester (design report in the fall - design refinement/build/test/compete in the Spring). These final reports should be extensive reports of 20+ pages to include CAD images, photos, engineering analysis (e.g CFD, FEA etc), test results, project management, team education initiatives etc.

Grading Scheme (each semester)
Proposal Report: 25pts
Final Report: 100pts
Presentations (3): 25pts each (75pts total)
Peer Evaluations: work ethic, leadership performance and technical contributions to the team: 100pts
Total Points: **300pts**

Grade Distribution:

Excellent:	A+ >= 95%	A >= 90%	A- >= 85%
Good:	B+ >= 80%	B >= 75%	B- >= 70%
Fair:	C+ >= 65%	C >= 60%	C- >= 55%
Poor:	D+ >= 50%	D >= 45%	D- >= 40%
FAIL:	F < 40%		

A grade below a B- in the Fall semester may result in denial of instructor approval to participate in the second semester of the SAE senior design sequence. The team leaders will be consulted and if insufficient effort has been forthcoming, the student will register for the regular ME470 senior design class in the Spring.

Late Assignment Policy
Penalty for late assignments is 50% credit after the deadline up to 2 weeks late.
Zero credit after 2 weeks.

If you need an extension due to illness, university affiliated trip, death in the family or some other unexpected event, please email the instructor and request an extension, specifying the reason and proposing a revised due date.

University Policies and Procedures

COVID

Following University policy, all students are required to engage in appropriate behavior to protect the health and safety of the community, including wearing a facial covering properly, maintaining social distance (at least 6 feet from others at all times), disinfecting the immediate seating area, and using hand sanitizer. Students are also required to follow the campus COVID-19 testing protocol.

Students who feel ill must not come to class. In addition, students who test positive for COVID-19 or have had an exposure that requires testing and/or quarantine must not attend class. The University will provide information to the instructor, in a manner that complies with privacy laws, about students in these latter categories. These students are judged to have excused absences for the class period and should contact the instructor via email about making up the work.

Students who fail to abide by these rules will first be asked to comply; if they refuse, they will be required to leave the classroom immediately. If a student is asked to leave the classroom, the non- compliant student will be judged to have an unexcused absence and reported to the Office for Student Conflict Resolution for disciplinary action. Accumulation of non-compliance complaints against a student may result in dismissal from the University.

Emergency Response Recommendations

Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency-preparedness/. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at https://odos.illinois.edu/community-of-care/resources/students/religious-observances/ to request appropriate accommodations. This should be done in the first two weeks of classes.

Disability-Related Accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to https://www.disability.illinois.edu. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available that can help diagnosis a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

Anti-Racism and Inclusivity

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (https://bart.illinois.edu/). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.