

- Light weight
- Low vertical center of gravity
- Consistent weight split from driver to driver
- Quick turn-in
- Enhanced lateral grip
- Minimal compliance between wheels and frame
- Smoothness and minimal compliance (drivability) in throttle mechanism
- General robustness (root out things that keep the car from being able to go out and run)

Additional outcomes relate to the infrastructure necessary to maintain and improve a facility for designing and building FSAE cars:

- Easily operated engine dynamometer with reliable measurements of torque, speed, heat rejection, fuel flow, and air flow
- Ability to design and acquire/fabricate fiber composite components

Prerequisites:

Department approval to take this course will only be granted to students who have been significantly contributing members of the Formula SAE Team in a prior competition year (as judged jointly by the Instructor and the Team Faculty Advisor). For MECH students, a passing grade in MECH 3000 is also required for Departmental approval.

Textbook:

Smith, Carroll, “The Carroll Smith Race Car Set” including: “Prepare to Win”; “Tune to Win”; “Engineer to Win”; “Carroll Smith's Nuts, Bolts, Fasteners, and Plumbing Handbook”; and “Drive to Win”, Society of Automotive Engineers (stock number B-706.SET), 1975, 1978, 1984, 1990, 1996.

Project Definition Report

The team will submit a joint report defining the scope and goals of the project during the first few weeks of class. This report will:

- Identify strengths and weaknesses of the prior year’s car;
- Propose and defend (quantitatively) a design strategy for reliably attaining the competition overall placement outcome (i.e., design needs);
- Identify engineering requirements for the design of the new machine;
- Plan the design process and summarize it on a single-page task lists with completion dates, Interdependency, deliverables, and necessary resources;
- Budget the project to three levels of decomposition (car, system, subsystem/major component) plus program costs (training, testing, recruitment, fundraising, etc.);
- Show personnel organization (preliminary).

The report will be typed and neat, and will make use of tables and outline format to serve the need for efficient communication.

Individual Progress Reports

Each student must submit a very brief weekly progress report detailing the student's direct involvement with the project during the preceding week. Length should be about ½ page, in outline or bullet format with brief opening and closing statements. Reports will be typed and neat. Number of hours of project involvement during the week must be reported.

Group Progress Reports

The Team (as a whole) will submit substantial bi-weekly progress reports. These reports will document the state of the project at that time, including:

- Personnel and organization (first to establish, then later just to report changes);
- Schedule (overall and systems, with progress to date and necessary updates);
- Budget (overall and systems, with progress to date and necessary updates);
- Current design concepts and analytical/experimental assessments;
- State of overall design development, including current estimates of mass properties and cost.

Reports will be neat and typed. Figures illustrating design progress are required.

Midterm Design Report

The Team will submit a joint midterm design report. The emphasis of the design report will be on design logic. The report will be neat and typed, following a concise format. The report will be illustrated. The report must be a cohesive document, and not an assembly of subsystem reports. The report will reflect a design still in progress at midterm, and will address plans for completion of the design process. The report will serve as a draft for the competition design report.

Midterm Cost Report

The Team will submit a joint midterm cost report, suitable as a draft for the competition cost report. The cost report will demonstrate how cost has been used as a metric to guide design decisions.

Midterm Presentation

The Team will deliver a joint midterm presentation, suitable as a draft of the competition presentation. The presentation will lay out the investment case for the design, including:

- Proposal of business relationship (to the presentees)
- Identification of market
- Suitability of design to serve market
- Scheme for volume manufacture to supply market
- Financial case study of proposed investment

Final Design and Cost Reports and Presentation

The Team will submit a joint final design and cost reports and deliver a final presentation. These

items are to show significant refinement beyond midterm, and are to be nearly ready-to-go for competition.

Peer Reviews

At the end of the term, each student will be asked to rate the effectiveness of each other student on the project Team. Claims of outstanding or insufficient performance must be supported with examples. Peer reviews must be submitted by e-mail to the Instructor.

Grading and Evaluation Procedures:

Individual	40%	(weekly written progress reports – 10%; peer review – 20%; attendance – 10%)
Group	60%	(project definition report – 20%; weekly written progress reports – 10%; midterm design report, cost report, and presentation – 10%; final design report, cost report, and presentation – 20%)

Academic Honesty Policy

All portions of the Auburn University student academic honesty code (Title XII) found in the Tiger Cub will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Attendance

Although attendance is not required, students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence.

Behavior

Professional behavior is expected of all course participants.

Contingency

If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situation (such as an H1N1 flu outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to your syllabus and/or course assignments will replace the original materials.

Disability Accommodation

Students who need special accommodations in class, as provided for by the Americans With Disabilities Act, should arrange for a confidential meeting with the instructor during office hours in the first week of classes (or as soon as possible if accommodations are needed immediately). The student must bring a copy of their Accommodation Letter and an Instructor Verification Form to the meeting. If the student does not have these forms, they should make an appointment with the Program for Students with Disabilities, 1288 Haley Center, 844-2096 (V/TT).

Evacuation

Should an unsafe environment develop in any class meeting room, design space, or shop facility, all class participants must proceed immediately outdoors, or to a designated safe area. Dismissal by the instructor is not necessary (i.e., establish your safety first – we'll worry about attendance afterwards).

Excused Absences

Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please see the Tiger Cub for more information on excused absences.

Make-Up Policy

Arrangement to make up a missed major examination (e.g.: hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the advent of university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.