

Syllabus

AESP 428 Design

1	Course Information
---	--------------------

Course Description

Techniques for managing, planning and executing engineering projects. Computer based analysis and synthesis techniques. Manufacturing and assembly techniques. Statistical methods to support manufacturing, safety and reliability-based design. Engineering Ethics. Social impact of engineering decisions and projects. Effective written and oral communication.

Pre-requisites: AESP 350 Aerospace systems (D or better), EMCH 577 Aerospace structures (D or better).

Co-requisites: EMCH 377 Manufacturing (D or better), AESP 314 Energy power and propulsion (D or better)

Contact hours – 3 hours lecture

2	Instructor Information
---	------------------------

Wout De Backer

Email: wdbacker@cec.sc.edu

Phone: 803-629-4498

Office Hours: Tuesdays & Thursdays 2:30 – 3:25 PM

Office: McNair Center, 1000 Catawba St., Ste. 150

3	Textbook
---	----------

- First Read This: Systems Engineering in Practice by Ed van Hinte and Michel van Tooren. Publisher: nai010 publishers (April 30, 2013), ISBN-10: 9064506434, ISBN-13: 978-9064506437
- Engineering Design: A Materials and Processing Approach, Dieter, 4th Edition, 2008 McGraw-Hill
- Selected course handouts

4	Meeting Time/Location
---	-----------------------

Meeting Time

Section 1: Tuesdays & Thursdays 1:15 – 2:30 PM

Meeting Location

Section 1: 300 Main St., Room B101

5	Course Topics
---	---------------

1. Project Management and Systems Engineering
2. Market Analysis
3. Introduction to Applied Systems Theory
4. Requirements Analysis and Specification
5. Functional and Operational analysis
6. Technical Risk Assessment and resource budgets
7. Economic factors, cost, and business plan
8. Safety, reliability, ethics, and social impact

6	Course Outcomes
---	-----------------

1. Students will apply computer-based and statistical analysis methods and tools to the design of aerospace systems, subsystems, and components.
2. Student will explain techniques and tools used to plan, schedule, and execute engineering projects.
3. Students will select effective manufacturing fabrication and assembly techniques for their design.
4. Students will explain how engineering ethics and social impact affect engineering design.
5. Students will present their project using techniques for effective oral and written communication.

7	Lecture Schedule
---	------------------

<u>Lecture</u>	<u>TOPIC</u>	<u>READINGS</u>
1	Introduction	Book + handouts
2	Project Management and Systems Engineering	Book + handouts
3	Project Management and Systems Engineering	Book + handouts
4	Project Management and Systems Engineering	Book + handouts
5	Design Reports	
6	Market Analysis	Book + handouts
7	Market Analysis	Book + handouts
8	Introduction to Applied Systems Theory	Book + handouts
9	Requirements Analysis and Specification	Book + handouts
10	Functional and Operational analysis	Book + handouts
11	Functional and Operational analysis	Book + handouts
12	Design specification (conceptual and detail)	Book + handouts
13	Technical Resource Budgets	Book + handouts
14	Technical Risk Assessment	Book + handouts
15	Design for Manufacturing and Assembly	Book + handouts
16	Design for Manufacturing and Assembly	Book + handouts
17	Design for Manufacturing and Assembly	Book + handouts
18	Progress Presentations	

19	Progress Reports	
20	Economic factors	Book + handouts
21	Business plans	Book + handouts
22	Safety and Reliability	Book + handouts
23	Safety and Reliability	Book + handouts
24	Safety and Reliability	Book + handouts
25	Ethics and social impact	Book + handouts
26	Ethics and social impact	Book + handouts
27	Final Reports	
28	Final Presentations	

8	Grading Policy
---	----------------

The course is designed to provide students with the basics of project management and systems engineering tools and an overview of tools and methods available for system design, manufacture and presentation. The course is guiding them during the capstone design project. The typical class session will consist of:

- Presentation of new material
- Assignment of reading work and tasks related to the capstone design project
- Discussing issues
- Question/answer session

Course Requirements

Students are expected to attend class, complete the weekly readings before class, ask questions, participate in individual and group assignments, and provide oral and written reports.

Assignments

Design Proposal. A written proposal including problem statement, constraints, a project plan and schedule, and at least three alternative design solutions being considered.

Progress Report. A written report including components of the design proposal plus a preliminary final design and manufacturing/assembly plan and an updated project plan and schedule.

Progress Presentation. An oral presentation of the progress report.

Final Report. A written report including components of the design proposal plus a final design and manufacturing plan with supporting analysis, a business/economic analysis, and a discussion of how engineering ethics and social impact affected the design process.

Final Presentation & Poster. An oral presentation of the final report, and a poster of the system.

Peer Evaluation. An written evaluation of yourself and team members.

Assessment and Grading

Students will be evaluated on written reports and oral presentations. Grades will be assigned using the following weights:

10% Design Proposal

- 10% Progress Report
- 10% Progress Presentation
- 40% Final Design, Functionality & Report
- 20% Final Presentation & Poster
- 10% Peer Review Score

Assignments will not be accepted after the due date. Exceptions will only be made in extenuating circumstances associated with an excusable absence at the discretion of the instructor.

Grades will be assigned as follows:

Grade	Points
A	90-105
B+	85-89
B	80-84
C+	75-79
C	70-74
D+	65-69
D	60-64
F	< 60

9	Attendance Policy
---	-------------------

When you miss class, you miss important information. If you are absent, you are responsible for learning material covered in class. If you are absent when an assignment is due, you must have submitted the assignment prior to the due date to receive credit. Attendance is required during group/team meetings, as agreed upon with the group. Attendance will be a portion of your peer review grade.

10	Miscellaneous Policies
----	------------------------

Accommodating Disability

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Student Disability Resource Center: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by Close-Hipp Suite 102. All accommodations must be approved through the Student Disability Resource Center.

Academic Integrity

University policies and procedures regarding academic integrity are defined in policy STAF 6.25, Academic Responsibility - The Honor Code (see <http://www.sc.edu/policies/ppm/staf625.pdf>). Prohibited behaviors include plagiarism, cheating, falsification, and complicity. All potential Honor Code violations will be reported to the Office of Academic Integrity, which has the authority to implement non-academic penalties as described in STAF 6.25. Academic penalties for Honor Code violations in this course range from a zero on the assignment to failure of the course.