**ISE 3010 - Principles and Methods of Industrial & Systems Engineering**

**Spring 2025 Course Syllabus**

(proposed)

**INSTRUCTOR**

Professor: Dr. Raymond Smith

Office: 236 Slay Building

Email: [smithraym17@ecu.edu](mailto:smithraym17@ecu.edu) (recommend contact by email)

Phone: 252-328-9722 campus office

Office Hours: Tuesday (*to be determined*)

Thursday (*to be determined*)

Other times by appointment (virtual appointments by Teams available)

**COURSE INFORMATION**

Title: ISE 3010 Principles and Methods of Industrial & Systems Engineering

Credit: 3 credit hours

Times: Tuesday (T) and Thursday (TH) *Time to be determined*, Face-To-Face

Location: *To be determined*

**COURSE DESCRIPTION**

Systems engineering methodologies, and processes; conceptual system design; testing; design review; multiple criteria design decisions; and design for reliability. Introduces engineering management and organization principles, team building, leadership, motivation, and quantitative decision making.

**COURSE PREREQUISITES**

ENGR 2000 Engineering Design & Project Management I

**LEARNING OBJECTIVES**

By the end of this course, students should be able to

* Understand and apply the principles and concepts that form the foundations for industrial and systems engineering.
* Perform conceptual design and detailed planning necessary to manage development of a complex system.
* Perform system test and evaluation.
* Perform critical design review of a proposed system.
* Determine reliability of a serial network, a parallel network, or a combination of the two.
* Apply management principles of planning, organizing, leading, and controlling.

**REQUIRED TEXT**

[*Systems Engineering and Analysis* (5th Edition)](http://www.amazon.com/Engineering-Analysis-Prentice-Hall-International-Industrial/dp/0131869779/ref=pd_bbs_sr_1/104-9336681-1644712?ie=UTF8&s=books&qid=1186766504&sr=1-1) by Benjamin S. Blanchard and Wolter J. Fabrycky; ISBN-13: 978-0-13-221735-4, or ISBN-10: 0-13-221735-X

**REQUIRED SOFTWARE**

Access to a laptop computer with a current version of Microsoft Office installed is required for the course. Make sure your computer has anti-virus software installed. This course will require collaboration resources for team-based project activities.

**SPECIFIC TOPIC AREAS COVERED**

The following topics will be covered:

* system science and engineering
* bringing systems into being
* conceptual system design
* preliminary system design
* detail design and development
* systems analysis and design evaluation
* alternatives and models in decision making
* system test, evaluation, validation
* designing systems for affordability
* designing systems for reliability
* designing systems for maintainability
* designing systems for sustainability\*

**GRADING**

Assignments include a combination of assignments (group and individual), quizzes, tests, and a team-based project. Assignments will have an assigned due date and time. All assignments are due on time. Assignments not received will result either in a late penalty, a “0” for the assignment, or an “Incomplete” for the course at the discretion of the instructor.

The following approximate weightings will be used to calculate the final grade:

Assignments (~8) 100 points (20%)

Quizzes (~10) & class participation 75 points (15%)

Team based project 100 points (20%)

Tests: 3 x 75 points (15% each) 225 points (45%)

Total 500 points

Using the overall weighted average accumulated on all assignments, quizzes, projects, tests, and final exam, the final course grade will be determined according to the grading scale (percentage):

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| --- | --- | --- |
|  | | |
| A | 94 – 100% | |
| A- | 90 – 93.9 | |
| B+ | 87 – 89.9 | |
| B | 83 – 86.9 | |
| B- | 80 – 82.9 | |
| C+ | 77 – 79.9 | |
| C | 73 – 76.9 | |
| C- | 70 – 72.9 | |
| D+ | 67 – 69.9 | |
| D | 63 – 66.9 | |
| D- | 60 – 62.9 | |
| F | below 60 | |

There will be an assignment approximately every 1-2 weeks. Assignments are due according to the posted due date. Work received after the posted due date may either be subject to 30% penalty or a zero depending on the assignment and period of delinquency.

Announced and unannounced quizzes should be expected. Quizzes missed due to an unexcused absence will not be offered makeup or replacement. The lowest quiz grade is customarily dropped. There will be three tests that collectively count for 45% of the total grade.

**COURSE STRUCTURE**

This course meets two times a week, on Tuesday and Thursday from 12:30 – 1:45 pm. The principal types of classroom activities that a student should be prepared for in this course include the following:

1. Lectures: These lectures will expand upon, illustrate, and supplement the material in the text. Lecture materials will be posted on Canvas. Students are expected to take notes to supplement the posted materials, participate in class discussions, and complete all in-class assignments/activities.
2. Assignments: Homework assignments will provide students with opportunities to improve upon their writing and communication skills. Assignments may be graded for correct spelling, correct grammar, and clarity and correctness of content. Students are permitted and encouraged to have someone proofread their assignments prior to submitting them; however, the proofreader must not be another student in the class.
3. In-Class Work: These (individual and group) assignments and/or activities will be given in class. There may be unannounced quizzes or assignments in class to provide additional incentive for all students to attend regularly and be prepared for class.
4. Examinations: There will be three tests given this semester. Test dates and time are posted in the tentative schedule and are not likely to change.
5. Team Projects: There will be one team project in this course. Project guidelines and expectations will be introduced following the first test (approximately 6 weeks into the course). Project team members will be randomly assigned.

**ASSIGNMENTS**

Each assignment will have an assigned due date and time. All assignments are due on time. Any assignment submitted late will be penalized 30%. Late submissions are only accepted for 24 hours after the due date and time. An assignment that is not submitted within 24 hours of its due date and time will receive a grade of zero.

Each assignment will have specific instructions. Be sure to follow all instructions carefully. You will not receive credit if you omit an assigned problem or if you include a problem that was not assigned. Points will also be deducted if you fail to put your name on your assignment.

Most assignments are an individual activity unless the instructions state you are allowed to collaborate with others or in a group. You are encouraged to seek assistance during office hours. Some class time will also be devoted to making sure students understand what is expected on the current assignment, and students will be permitted to ask specific questions regarding the assignment during class.

**EXAMINATIONS**

All tests must be taken on the day scheduled. If you have extenuating circumstances (severe illness, family emergency, death in the family, etc.), you must email me promptly (preferably 24 hours in advance). Depending on the circumstances, it will be at the discretion of the instructor as to whether a makeup exam will be offered.

**CLASSROOM EXPECTIONS**

To create and preserve a classroom atmosphere that optimizes teaching and learning, all participants share a responsibility in creating a civil and non-disruptive forum. Students are expected to conduct themselves at all times in the classroom in a manner that does not disrupt teaching and learning. Behavior which disrupts the learning process may lead to disciplinary action and/or removal from class.

Students are expected to attend class each time it meets and arrive to class on time and be seated prior to the start time of class. Students are expected to remain in class through the entire class period. Please let me know in advance if there is a reason that you must arrive late or leave early. If you do miss class, you are responsible for all material covered as well as all announcements made during class.

**DISRUPTIVE BEHAVIOR**

East Carolina University is committed to providing each student with a rich, distinctive educational experience. Disruptive academic behavior impedes the learning environment and hinders another students’ learning. Disruptive academic behavior is any behavior likely to interfere with the normal conduct of instructional activities substantially or repeatedly, including meetings with instructors outside of class. Examples of such behavior include, but are not limited to, making loud or distracting noises; using cell phones and other electronic devices without prior approval; repeatedly speaking without being recognized; frequently arriving late or leaving early from class; and making threats or personal insults. A verbal expression of a disagreement with the instructor or other students on an academic subject matter discussed within the course, during times when the instructor permits discussion, is not in itself disruptive academic behavior.

Students who repeatedly violate reasonable standards of behavior in the classroom or other academic setting may be removed from the course by the instructor following appropriate notice. Students removed from a course under this policy will receive a “course withdrawal” according to university policy and are eligible for tuition refund as specified in the current tuition refund policy.

**ACADEMIC INTEGRITY**

Academic integrity is a cornerstone value of the intellectual community at East Carolina University. Academic integrity ensures that students derive optimal benefit from their educational experience and their pursuit of knowledge. Violating the principle of academic integrity damages the reputation of the university and undermines its educational mission. Without the assurance of integrity in academic work, including research, degrees from the university lose value, and the world beyond campus (graduate schools, employers, colleagues, neighbors, etc.) learns that it cannot trust credits, or a diploma earned at ECU. For these reasons, academic integrity is required of every ECU student.

Therefore, I will not tolerate acts of cheating, plagiarism, falsification or attempts to cheat, plagiarize, or falsify. Should I determine that an academic integrity violation has taken place, I reserve the right either to assign a grade penalty or to refer the case to the Office of Student Rights and Responsibilities for an Academic Integrity Board hearing. The grade penalty may range from having to redo an assignment to a grade of 0 on an assignment to failure of the course. Should it come to my attention that you have had a prior academic integrity violation, or if there are aggravating circumstances, I will refer the case directly to the Office of Student Rights and Responsibilities. Should the Academic Integrity Board determine that you committed and academic integrity violation, you may be assigned a grade penalty, and/or any other sanction allowed by the University, up to and including suspension from the University.

For more information, go to [Policies & Procedures | OSRR | ECU](https://osrr.ecu.edu/policies-procedures/) , which can also be found at the link <https://osrr.ecu.edu/policies-procedures/> .

**DISABILITY SUPPORT POLICY**

East Carolina University seeks to comply fully with the Americans with Disabilities Act (ADA). Students requesting accommodation based on a disability must be registered with the Department for Disability Support Services located in Suite 109 Mendenhall, telephone (252) 737-1016 (Voice/TTY). For more information, go to [The Department for Disability Support Services | DSS Students | ECU](https://accessibility.ecu.edu/students/) , which also can be found at the link <https://accessibility.ecu.edu/students/> .

Class Schedule, Spring 2025 (Proposed)

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| **Date** | **Topic** | **Material** | **Notes** |
| Week 1  1/12 | Systems Science and  Engineering | Chapter 1 | Assignment 1  Quiz 1 |
| Week 2  1/19 | 1. Bringing Systems into Being  2. Conceptual System Design | Chapter 2  Chapter 3 | Assignment 2  Quiz 2 |
| Week 3  1/26 | Preliminary System  Design | Chapter 4 | Assignment 3  Quiz 3 |
| Week 4  2/2 | Alternatives and Models in  Decision Making | Chapter 7 | NCSU Career Fair 2/4 (T)  Quiz 4 |
| Week 5  2/9 | Detailed Design Requirements | Chapter 5 | Test 1 (Chapters 1-4,7)  \*Project Released |
| Week 6  2/16 | System Test, Evaluation  and Validation  Design for Affordability | Chapter 6  Chapter 17 | Quiz 5 |
| Week 7  2/23 | Queuing Theory and Analysis | Chapter 10 | Assignment 4  Quiz 6 |
| Week 8  3/2 | Design for Reliability | Chapter 12 | Assignment 5  Quiz 7 |
| Week 9  3/9 | Spring Break | No Class | No Class |
| Week 10  3/16 | Design for Maintainability | Chapter 13 | Test 2 (Chapters 5, 6, 17)  Quiz 8 |
| Week 11  3/23 | Engineering Management  Project Work Session |  | Assignment 6  Quiz 9 |
| Week 12  3/30 | Design for Sustainability  1. Global sustainability challenges  2. Case Study (video/speaker) | Article Reading  Sustainability Pillars | Class Activity:  Life Cycle Analysis (LCA)  Assignment 7 (sustainability) |
| Week 13  4/6 | Sustainable Design Principles  1. Sustainable design practices  2. Sustainability metrics and  Indicators | Article Reading | Class Activity:  Sustainable design challenge  Assignment 8 (sustainability) |
| Week 14  4/13 | Project Work Session – Integration  of Sustainability in Design |  | Quiz 10  Test 3 (Chapters 10,12,13, EM) |
| Week 15  4/20 | Project Work Session  Final Class Meeting |  |  |
| Week 16  4/27 | No Class – Monday Makeup  Exam week |  | No class meetings |
| **Week 17**  **5/4** | Project Presentations |  | Final Exam Session |