COURSE CALENDAR DESCRIPTION

This course discusses system level analysis methodology for complex engineering cases (quantitative and qualitative methods/frameworks), technology selection, technology integration, and life cycle analysis. Prerequisites: ES/ENVS 2150 3.00 or LE/ESSE 2210 3.00, LE/MECH 2301 3.00, LE/MECH 3401 3.00.

INSTRUCTOR(S)

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<th>Name</th>
<th>Section / Format / Term</th>
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<td>O'Brien, Paul G.</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

TOPICS AND CONCEPTS

This course helps students to develop the capability of systems thinking for any realistic project and understand the importance of system level engineering. The gained knowledge and experiences in this course will be essential for leading and managing interdisciplinary engineering projects, and will be a valuable asset for performing research at the graduate level.

Topics:

*Introduction to Systems and Systems Engineering*
Basic concepts and definitions of key terms, classification of systems, systems engineering.

*Systems Engineering*
The engineered system, system life-cycle engineering, the system engineering process, system synthesis, implementing systems engineering.

*The System Design Process*
Problem definition, conceptual system design and feasibility analysis, system design, design tools and technologies, development of system engineering models.

*Systems Analysis & Design Evaluation*
Alternatives and models in decision making, decisions under risk and uncertainty, system design review and evaluation, system test, evaluation, and validation.

*Design for Operational Feasibility*
Design for reliability, design for maintainability, design for logistics and supportability, design for life-cycle costing, design for producibility, disposability, and sustainability.

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Course Learning Objectives
Upon successful completion of this course the student will be able to:

* Recognize the key terms in system engineering, system level engineering role & responsibilities.
• Apply system engineering tools (e.g., requirements development and management, robust design) to realistic problems.
• Apply the entire system level engineering process from formulation through implementation.
• Evaluate alternatives and models in system analysis and apply optimization theory to enhance the system’s design.
• Implement systems engineering from the perspectives of operational feasibility.

GRADED ASSESSMENT

Grading Scheme
Out of Class Regular Assignments - 20%
Out of Class Mini-Project - 20%
Quizzes - 25%
Final Exam - 35%

ADDITIONAL INFORMATION

Required Textbook:
Systems Engineering & Analysis, 5/E

LAND ACKNOWLEDGEMENT

We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
• The Indigenous Framework for York University: A Guide to Action can be found here:
  http://indigenous.info.yorku.ca/
• Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

ACADEMIC INTEGRITY LINKS

• Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
• Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS

• Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
• Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
• Academic Accommodation for Students with Disabilities - http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/
• Counselling and Disability Services - http://cds.info.yorku.ca/
• York University’s Policies on Sexual Violence - http://secretariat-policies.info.yorku.ca/policies/sexual-violence-policy-on/
• York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it.
Moodle @ York University