TRINE
UNIVERSITY

Course Syllabus
(Hybrid)

Course Title: Systems Engineering Analysis **Term and Year: one 2024**

Course and Section Number: SYS 5013 **Time and Place: Online**

Number of Credit Hours: 3

Instructor: Hitam Zidan **Office Location/Hours:3 hours**

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Course Description: This course provides learners a foundation in the practice of systems engineering (SE) tools, processes and related analyses. Students will be challenged to design, develop, and analyze complex systems in a variety of technical disciplines using industry standard SE concepts and methods. Post-processing tools and techniques are covered to analyze and present outcomes to “what if” type scenarios.

Learning Outcomes: Upon completion of this course, the student should be able to:

1. Assess systems engineering theories, processes, and applications.
2. Analyze existing systems using systems engineering principles and concepts.
3. Develop systems engineering lifecycle models, processes and governance structures.
4. Model complex systems engineering problems to determine quantitative solutions.
5. Determine post-processing tools and techniques that answer "what if" type questions.

Prerequisites: None

Required Text:

1. Systems Analysis and Design, 11th Edition
   Published by Pearson (June 13, 2023)
   Kenneth E. Kendall
   Julie E. Kendall
   ISBN: **9780137947805**

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References:

Students are expected to read the appropriate sections in the text materials as they are assigned in order to be familiar with terminology and basic concepts. You are also expected to review the multi-media resources.

Other Materials:

Course Requirements:

Attendance/Participation: All students are expected to log in to their courses regularly throughout the week to receive instruction, materials, and updates from the instructor. It is your responsibility to check in and submit your assignments, complete your discussion board postings, and finish quizzes and exams by the due dates.

If you do not participate in the course, you will be counted absent. Simply logging in is not enough; you must submit/complete an assignment, post to a discussion board, or other similar assignment tasks to avoid being counted absent. Instructors are required to submit attendance the Monday following each week of class.

This attendance is reported to the Financial Aid Department and may result in the loss of any financial aid refund you are expecting if you have not been participating in your courses. **In addition, you will be administratively dropped from the course if you are reported absent a total of three weeks.**

Attendance requirement is met by completing a quiz, posting to the forum, or any of the other assessments.

Case study analysis

Students will complete a case study related to systems analysis and design. You will need to analyze the case study using the System/Software Design Lifecycle (SDLC) and present your findings in the single post discussion forum.

Modeling exercise

Students will create a model of an organizational system using one of the modeling techniques discussed in Chapter 2 and submit it for evaluation.

Information gathering exercise

Students will be given a case study and asked to identify appropriate interactive and unobtrusive methods for information gathering. You will need to explain their choices and submit it for evaluation.

Agile modeling exercise

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Students will be given a case study and asked to apply Agile modeling and prototyping techniques to develop a working prototype. You will need to submit their prototype and explain their methodology.

Data dictionary exercise

Students will be given a scenario and asked to create a data dictionary for the system. You will need to explain their choices and submit it for evaluation.

UML exercise

Students will be given a scenario and asked to create a UML diagram for the system. You will need to explain their choices and submit it for evaluation.

Input design exercise

Students will be given a scenario and asked to design an effective input system for a business process. They will need to explain their design choices and submit it for evaluation.

Design exercise

Students will design a user interface for a system using the principles of humancomputer interaction covered in Chapter 14. They will submit their design for evaluation.

Grading/Evaluation:

Assessment (Infographic Assignments)	40 Points
Assessment (Teach Back Assignment)	20 Points
Assessment (Podcast Assignment)	20 Points
Assessment (H5P Assignment)	10 Points
Assessment (Application Exercises)	400 Points
Discussion Forums	160 Points
Final Exam	35 Points

Trine Graduate Grading Scale:

Grade	Percentage	Quality Points	Meaning of Grade
A	93-100	4.0	Excellent

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B+	86-92	3.5	Very Good
B	81-85	3.0	Good
C+	75-80	2.5	Above Average
C	70-74	2.0	Average (lowest passing grade)
F	00-69	0.0	Failure
I	Incomplete	Not figured into GPA	
IP	In Progress (grade deferred)	Not figured into GPA	
W	Withdrawal	Withdrawal before completion of 80% of semester	
WP	Withdrawal	Withdrawal after completion of 80% of semester issued only under special circumstances and with approval of the department chair/director	

A rubric for Discussion Boards/forums, Exercises rubrics are provided.

Other Policies:

Academic Misconduct:
The University prohibits all forms of academic misconduct. Academic misconduct refers to dishonesty in examinations (cheating), presenting the ideas or the writing of someone else as one's own (plagiarism) or knowingly furnishing false information to the University by forgery, alteration, or misuse of University documents, records, or identification. Academic dishonesty includes, but is not limited to, the following examples: permitting another student to plagiarize or cheat from one's own work, submitting an academic exercise (written work, printing, design, computer program) that has been prepared totally or in part by another, acquiring improper knowledge of the contents of an exam, using unauthorized material during an exam, submitting the same paper in two different courses without knowledge and consent of professors, or submitting a forged grade change slip or computer tampering. The faculty member has the authority to grant a failing grade in cases of academic misconduct as well as referring the case to Student Life.

Plagiarism:

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You are expected to submit your own work and to identify any portion of work that has been borrowed from others in any form. An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and will result in an F for that assignment. A deliberate act of plagiarism, such as having someone else do your work, or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), will at least result in an F for that assignment and could result in an F for the course.

Artificial Intelligence (AI) is prohibited: All work submitted by students in this course must be generated by the student. Students may not have another person or entity contribute to an assignment for them, which includes using AI. Students may not incorporate any part of an AI-generated response in an assignment, use AI to formulate arguments, use AI to generate ideas for an assignment, or submit work to an AI platform for improvement. Using an AI tool to generate content may qualify as academic misconduct in this course.

Late Policy:
Students will be allowed a one-time one-week extension on graded assignments for the given week, excluding the final week of the course, for extenuating circumstances only (e.g., hospitalization, death in the family, severe illness etc.). The instructor may ask for supporting documentation regarding the unique and extenuating circumstance.

Electronic Devices:
Use of electronic devices including smart watches and cell phones is prohibited during exams or quizzes unless directly allowed by the instructor.

Additional Information: The instructor reserves the right to make changes to this syllabus and announce changes to the class.

Grading Rubric for all Application Exercises

Percentage indicates percentage of point value for the assignment (example 100 point assignment, 10% would be worth 10 of the 100 points).

Criteria	Exemplary 100%	Accomplished 75%	Developing 50%	Beginning 25%

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Content 40%	Content demonstrates a complete mastery of ideas. There is an indepth analysis and originality of thought. The submission addresses the key elements/points in the assignment with solutions.	Content demonstrates a thorough mastery of ideas. There is analysis and originality of thought. The submission addresses some of the elements/points of the assignment. The writer may or may not present solutions.	Content demonstrates a limited mastery of ideas. There is limited analysis and originality of thought. There is a narrow focus on the elements/points of the assignment with weak solutions.	Content demonstrates no mastery of ideas. There is no analysis. Originality of thought is missing. There is limited to no focus on the elements/points of the assignment. The writer proposes no solutions.
Organization and Format 25%	The written assignment is effectively organized. There is a logic and flow to the	The written assignment is effectively organized, but format choices need	The written assignment is not effectively organized. Format choices need	The written assignment's organization is difficult to follow. The written assignment
	written assignment. Format choices enhance the document. The written assignment follows APA formatting without errors.	improvement. There are some concerns with the logic and flow of the written assignment. The written assignment follows APA formatting with few errors.	improvement. The logic and flow of the written assignment are unclear. The written assignment follows APA formatting with multiple errors.	does not follow APA formatting.
Style 25%	The written assignment's style is clear and concise. The written assignment employs a professional tone.	The written assignment's style is clear, but wordy. The written assignment's tone needs improvement.	The written assignment's style is wordy, and the written assignment has many instances of awkward sentences. The written assignment's	The writer's style and word choice make the document difficult to read. The writer's tone may be unprofessional.

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			tone may be unprofessional.	
Grammar and Spelling 10%	The written assignment is free of grammatical and spelling errors.	The written assignment contains few grammatical and/or spelling errors.	The written assignment contains multiple grammatical and/or spelling errors.	The written assignment has numerous grammar and/or spelling errors. The document is difficult to read.

Grading Rubric for all Discussion Forum Posts and Responses

Percentage indicates percentage of point value for the assignment (example 100 point assignment, 10% would be worth 10 of the 100 points).

Criteria	Exemplary 100%	Accomplished 75%	Developing 50%	Beginning 25%

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Ideas, Arguments, & Analysis 25%	Ideas expressed in discussion posts include exceptional depth and detail. Learner demonstrates evidence of critical-thinking skills. Posts are thoughtful, academic, and stimulating. Viewpoints contain evidence and/or research support.	Ideas expressed in discussion posts are relevant. Learner demonstrates evidence of logical thinking and analysis. Viewpoints contain evidence and/or research support.	Ideas expressed in discussion posts have little depth or detail. Comments may not be relevant. Learner rehashes ideas without adding anything substantive to the discussion. Viewpoints may or may not contain evidence and/or research support.	Ideas expressed in the learner's post lack an understanding of the discussion topic. Posts lack depth and detail. Comments are irrelevant. Viewpoints do not contain evidence or research support.
Connection to Course Materials 25%	Clear and relevant connections reference the majority of the course materials.	Some direct connections reference the majority of the course materials.	Minimal direct connections reference the course materials. Connections are loosely implied and unclear.	No connections reference the course materials. Without proper connections to the course materials, the learner's posts are largely personal opinions.
Contribution to Online Learning Community 25%	The learner frequently initiates engagement with other students and motivates group discussion by providing	The learner contributes to the learning community by making an effort to engage with peers through relevant and	The learner occasionally contributes to the learning community but engagement is limited. The learner	The learner rarely or negligibly contributes to the learning community. The learner rarely engages with

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	feedback to peers. The learner asks follow-up questions and/or provides thoughtful comments. Respectfully encourages and considers a variety of viewpoints.	meaningful posts. Interacts respectfully with other learners.	occasionally interacts with others' postings but interaction lacks depth.	other learners and generally ignores others' posts.
Writing Quality 15%	Discussion posts are well written and articulate. The writing style is strong with correct grammar, punctuation, usage, and spelling.	Discussion posts show above average writing style that is clear. There are minor errors in grammar, punctuation, usage, and/or spelling.	Posts show an average and/or casual writing style. Writing is clear but contains some errors in grammar, punctuation, usage, and spelling.	Posts show a below average/poor writing style. Writing style is difficult for readers to follow. Writing contains frequent errors in grammar, punctuation, usage, and spelling.
Required Postings/ Timeliness 10%	All required postings by deadline (required=1 posting + 2 replies to classmates. The learner answers additional questions from the instructor and classmates.	All required postings by deadline (required=1 posting + 2 replies to classmates).	Some required posts were not submitted by the deadline (required=1 posting + 2 replies to classmate).	All required posts were not submitted by the deadline (required=1 posting + 2 replies to classmate).

References

Amr AbdelAziz (2022). *Agile modeling and prototyping* [Video]. YouTube. https://www.youtube.com/watch?v=F6SvRMul6ac

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SmartDraw (2019). *Data flow diagrams – What is DFD?* [Video]. YouTube. https://www.youtube.com/watch?v=6VGTvgaJllM

Your Agile Coach (2022). *Role of quality assurance in agile scrum* [Video]. YouTube. https://www.youtube.com/watch?v=Uu94VQcv7_8

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