SE 5346 System Architecture & Design

Course Syllabus (v02)

Summer 2024 Semester

University of Texas at El Paso

Master of Science in Systems Engineering

Course Description

System Architecture & Design involves the conceptualization of a technical system solution to a technical problem. The technical problem is stated in terms of system requirements to which the architect must devise a solution that meets a range of system performance, reliability safety, etc. objectives. The realization of the engineering of the system is generally undertaken by teams of engineers responsible for various elements of the system. It is the architect's job to take the system requirements (the statement of the problem) and conceptualize or devise a practicable solution in the faces of competing constraints of cost, schedule, quality, and performance. This can become a highly challenging technical endeavor, and requires planning and coordination on the part of the architect. The ultimate product of the architecture work is the Architecture Description which is produced for use by the rest of the engineering staff to proceed with the detailed design and development, construction, testing, operations, and eventual disposal of the system. The Architecture Description must conform to accepted standards of syntax and semantics in order to minimize the potential for misinterpretation and misunderstanding by the rest of the organization. This course prepares the student to be able to plan a system architecture project, develop system architecture artifacts, and deliver an acceptable Architecture Description product.

By the end of this course, participants will be able to:

- Become conversant in the terminology used in Architecture Development
- Appreciate the role of the Architecture process in the Systems Engineering Lifecycle
- Process stakeholder needs in the form of technical requirements as inputs to the System Architecture process
- Establish Use Cases for the System of Interest (SOI)
- Create an Architecture Management Plan (AMP)
- Identify and define required system functionality
- Allocate system requirements to system functions
- Allocate system functions to physical components
- Perform system trades to identify a preferred candidate solution
- Appreciate the delivery of a complete Architectural Description as a principle output
- Become conversant in the Zachman Framework and Unified Architectural Framework
- Abide by CMMI and INCOSE best practices
- Enhance Complex Systems thinking and creativity

Summary of Course Structure

Course content is provided in seven modules that are posted onto Blackboard on the Saturday before the beginning of each module (every two weeks). Each module will have a menu to guide participants through the content and identify discussion board postings and/or assignments/tests to be submitted to Blackboard. The first module provides course overview and objectives, facilitates attendee's introductions and team building, and discusses SE main concepts addressed in the course. The section titled "Detailed Course Description" lists the detailed activities for each module that you will be responsible for. The seven modules for this course are as follows:

Module Number	Module Name
1	Systems Foundation and Systems Engineering Life Cycle Models
2	Stakeholder Problem Assessment and System Functionality
3	Architecture Frameworks and Modeling Methodologies
4	Architecture Description, Management Plan, and Technical Measurement
5	Systems Thinking and Complex Systems
6	Elements of Form and Function
7	Axiomatic Design and Solution-Neutral Functionality

Important Notices About This Course

- Late assignments and tests (not delivered or delivered after the due date/time) receive 0 points
  - An exception to this policy exists for Week 1 (see details below)
- "Three Strikes" Policy
  - Upon a student missing an assignment or test, the Instructor will send a warning notification to the student
  - The notification will warn that the student will be dropped from the course by the Instructor on the occurrence of three missed unexcused deliveries (any combination of assignments or tests) for non-participation in the course
- The instructor understands that unplanned situations can interfere in delivery of assignments and tests
  - Simply notify the instructor by email, and alternative delivery arrangements will be made
- Tests are purposely designed to be challenging in order to separate high performers from average performers from low performers
  - Prepare accordingly
- It is advisable for you to monitor your point performance throughout the semester, and adjust assignment and test submission performance and quality as needed to hit the targeted letter grade by the end of the semester
  - The instructor will NOT advise you if you are slipping into a lower grade
  - Students can request a grade analysis by the instructor at any time
- ANY Student Conduct issues will be evaluated by the instructor for consideration of elevation to the Office of Student Conduct and Conflict Resolution (OSSCR) and/or the Department and/or University Title IX Coordinator (for harassment investigation), so avoid:

- Use of plagiarism in assignment submissions
- Use of Generative AI tools to produce assignment responses
- Not properly citing sources of information you used in assignment submissions
- Colluding (cheating) on assignments and tests (see details below)
- ANY disrespectful or harassing treatment of another student
- Other disciplinary-related issues
- Best advise: Stick to attending to your studies and avoid conflicts

Instructor

Mr. John Artus

Contact Information	
e-mail	jgartus@utep.edu
Online office hours	M, W, Th, Fr after 6pm Mountain Time Please email me to coordinate an appointment on Zoom
Video Class Meeting	**Tuesdays at 6pm Mountain Time** **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address** Some exceptions may exist due to holidays, etc. Always check the course calendar on the Blackboard home page for this course to see exactly when the video class sessions will be held.

Course Content Summary (use hyperlink to jump to selected week)

SE 5346 Systems Architecture & Design	
Refer to the calendar posted on Blackboard for specific assignment and test due dates	
Module 1 - Systems Foundation	**Week 1**
Module 1 - Systems Engineering Life Cycle Models	**Week 2**
Module 2 - Stakeholder Problem Assessment	**Week 3**
Module 2 - System Functionality	**Week 4**
Module 3 - Architecture Frameworks	**Week 5**
Module 3 - Modeling Methodologies	**Week 6**
Module 4 - Architecture Description and Management Plan	**Week 7**
Module 4 - Technical Measurement	**Week 8**
Module 5 - System Thinking	**Week 9**
Module 5 - Complex Systems	**Week 10**
Module 6 - Elements of Form	**Week 11**
Module 6 - Elements of Function	**Week 12**
Module 7 - Axiomatic Design	**Week 13**
Module 7 - Solution-Neutral Functionality	**Week 14**

Grading Policy

Point Distribution

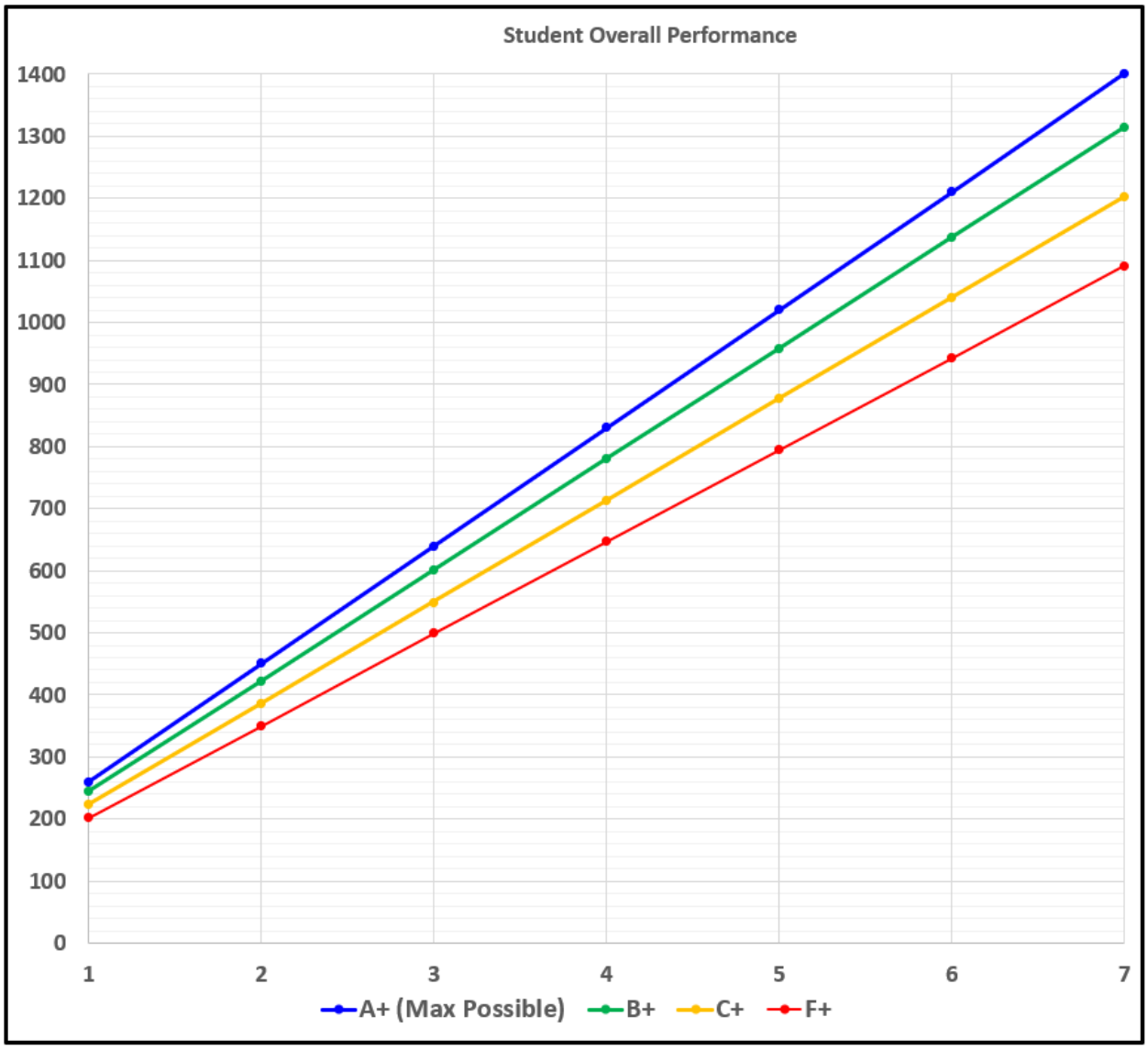
Artifact	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Total
Readings and Lecture	0	0	0	0	0	0	0	**0**
Video Class Attendance	0	0	0	0	0	0	0	**0**
Video Class Debate	40 Points per Student							**40**
Discussion Assignments	50	50	50	50	50	50	50	**350**
Individual Assignments	40	40	40	40	40	40	40	**280**
Group Assignments	40	40	40	40	40	40	40	**280**
Tests	90	60	60	60	60	60	60	**450**
Total	**220**	**190**	**190**	**190**	**190**	**190**	**190**	
							Grand Total	**1400**

The maximum points achievable is 1400. The final letter grades to be assigned to students at the end of the course will be from among the set (A,B,C,F). The following scale is used for assigning letter grades.

Grade	Percentage	Score
A	[94 % and above]	1316-> 1400
B	[86 % - 93 %]	1204 -> 1315
C	[78 % - 85 %]	1092 -> 1203
F	[0 % - 77%]	0 -> 1091

The instructor reserves the right to lower the grade scale if it is deemed appropriate.

It is the student's responsibility to keep track of their own progress regarding points awarded for submitted assignments and tests that are needed to achieve a certain desired letter grade at the end of the course. The instructor will NOT advise you if you are slipping into a lower grade. Students can request a grade analysis by the instructor AT ANY TIME. The following graphic is useful for students to track their grade performance throughout the semester.



There is no policy in this course for granting additional points simply to "bump" a student to a higher letter grade. If you wish to achieve a certain letter grade at the end of the course, it is incumbent upon **YOU** to ensure that you submit work throughout the semester that qualifies you for receiving the desired letter grade. Letter grades are assigned at the end of the semester strictly by points earned by the student throughout the semester.

The instructor is a seasoned Systems Engineering professional of 40+ years, and you can be assured that the grades you receive on instructor-graded assignments will reflect the quality of your assignment submission.

Extra Credit

There is a process in this course for earning extra credit. It is addressed in a later paragraph of this syllabus.

Detailed Course Description

Refer to the course calendar posted on Blackboard for specific video class session dates, assignment dates, and test due dates.

Refer to the Blackboard "Reading Resources" section for each Module for exact links to use to locate online resources.

Module 1, Week 1: Systems Foundation and Stakeholder Requirements

Activity	Description
Module 1, Week 1 Readings and Lesson Presentations	**Required Reading** 1. Course Syllabus (this document) 2. INCOSE Handbook v5 Sections 1.1 thru 1.3 3. SEBoK v2.8 Part 2, System Engineering Fundamentals 4. SEBoK v2.8 Part 2, Introduction to System Fundamentals 5. J.G.Artus Lecture 10: Role of the System Architect
Module 1, Week 1 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 1, Week 1 Discussion 1	Welcome to the SE 5346 System Architecture course. Your first activity is to introduce yourself to your classmates and to your Instructor. State your expectations for what you expect to learn from this class. Please include your UTEP email address so that group team members can make first contact with you.
Module 1, Week 1 Assignment 1	In your own words, explain the relationships / dependencies between the terms: • System • Engineered System • System of Interest • System Element • Enabling System • System Life Cycle
Module 1, Week 1 Group Assignment 1	*Team Communication Infrastructure* As a team, you need to create an infrastructure to facilitate both team communication and virtual space to share and control your team documents. Because the team may meet at least twice a week; you need to reach consensus on which days and times to meet. In addition, the team needs to create rules for managing the working meetings and the expected behavior for each member; for example, delivering quality work, fulfilling individual commitments, and conducting professional and respectful team communication at all times. Describe your Team Communication Infrastructure plan.
Module 1, Week 2 Syllabus Test	*Syllabus Test* This test covers the content of the syllabus relating to student conduct in the course. The test does not cover details of particular assignments due for a given module. The test consists of 15 multiple choice questions with 5 possible answers at 2 points each for a maximum score of 30 points. The test is open book and will last 60 minutes. Only one test attempt is allowed.

Module 1, Week 2: Systems Engineering Life Cycle Models

Activity	Description
Module 1, Week 2 Readings and Lesson Presentations	**Required Reading** 1. INCOSE Handbook v5 Section 2.3.5.4 2. J.G.Artus Lecture 45: SE Life Cycle Models
Module 1, Week 2 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 1, Week 2 Discussion 2	Provide insightful responses to the following: 1. Describe the differences between the contexts for the Architecture Vee versus the Entity Vee 2. Describe the reasons why a systems architect would venture up versus down when pursuing off-core activities of the Architecture Vee 3. Describe the concept behind the Dual-Vee in terms of how the Architecture Vee and the Entity Vee relate to each other.
Module 1, Week 2 Assignment 2	Figure 4.6 in the INCOSE Handbook presents the IPO diagram for the Architecture Definition Process. Describe what is the significance of the following inputs, activities, and outputs to the Architecture Definition Process 1. Inputs: System requirements, System functional interface identification, System requirements traceability 2. Activities: Develop architecture viewpoints, Assess architecture candidates 3. Outputs: Architecture definition strategy, System architecture description, System architecture rationale
Module 1, Week 2 Group Assignment 2	Provide insightful answers to the following questions: 1. Why is there no Multiple Delivery Method for a life cycle model that follows the Unified – Linear method? 2. What are the relative advantages / disadvantages of the Unified Primary Delivery Method as compared to the Incremental Primary Delivery Method? 3. What are the relative advantages / disadvantages of the Linear Secondary Delivery Method as compared to the Evolutionary Secondary Delivery Method?
Module 1, Week 2 Module Test	*Module 1 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 2, Week 3: Stakeholder Problem Assessment

Activity	Description
Module 2, Week 3 Readings and Lesson Presentations	**Required Reading** 1. INCOSE Handbook v5 Section 2.3.5.3 2. JG Artus Lecture 12 Use Case Modeling v01
Module 2, Week 3 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 2, Week 3 Discussion 1	Provide insightful answers to the following: 1. Briefly describe the task steps that a SE would perform when conducting use case development. 2. Describe in which of these processes you believe use case development should be performed. 3. What information must you first have access to before you can begin developing Use Cases? 4. At what point during the development of Use Cases should a SE stop developing further Use Cases?

Activity	Description
Module 2, Week 3 Assignment 1	1. Perform an internet survey of the pros and cons of using use cases in system (or software) analysis. "Internet survey" means to go out to the internet and find your own sources of material for this assignment. 2. Present your interpretation of the three strongest pros and three strongest cons as identified in the internet resources you researched.
Module 2, Week 3 Group Assignment 1	1. Develop a set of Stakeholder Need Statements for an ATM System. 2. Develop a set of System Requirements from the Stakeholder Need Statements. 3. Using PowerPoint or similar tool, develop a requirements diagram. 4. Develop a set of use cases for the following ATM usage scenarios a. Check Balance b. Withdraw Cash c. Deposit Funds d. Transfer Funds 5. Create a Use Case Diagram that summarizes these four use cases. 6. Produce a Use Case Description document for each of the above uses cases.

Module 2, Week 4: System Functionality

Activity	Description
Module 2, Week 4 Readings and Lesson Presentations	**Required Reading** 1. INCOSE Handbook v5 Sections 3.2.4 2. Craig Borysowich article: Overview of Functional Decomposition 3. Gerald Recktenwald article: Details on Functional Decomposition 4. NASA Presentation: Functional Analysis Module 5. Javapoint.com article: Cohesion and Coupling 6. Stuart Burge article: N2 Diagrams
Module 2, Week 4 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 2, Week 4 Discussion 2	Provide insightful answers to the following questions: 1. Explain why functional decomposition is discouraged in use case analysis, but welcome in functional analysis of the system. 2. Explain why functional decomposition is welcome in functional analysis of the system. 3. Explain why it is desired to have high (or tight) cohesion when discussing system functionality. 4. Explain why it is desired to have low (or loose) coupling when discussing system functionality.
Module 2, Week 4 Assignment 2	1. Identify three critical insights into the architecture of a system that N2 diagrams expose 2. Identify how this information can be exploited to improve the system architecture
Module 2, Week 4 Group Assignment 2	For each use case on your group project, 1. Identify the functions involved in your project 2. Decompose the functions 3. Provide a text description of the functions 4. Construct a functional hierarchy diagram 5. Construct an N2 diagram for the entire system
Module 2, Week 4 Module Test	*Module 2 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 3, Week 5: Architecture Frameworks

Activity	Description
Module 3, Week 5 Readings and Lesson Presentations	**Required Reading** 1. SE 5346 Enterprise Architecture and the Zachman Framework.pdf 2. SE 5346 Unified Architecture Framework.pdf 3. John Zachman article: Concise Definition of The Zachman Framework 4. John Zachman article: Conceptual, Logical, Physical - It Is Simple 5. John Zachman article: Architecture is Architecture is Architecture 6. Aurelijus Morkevicius article: Applying Unified Architecture Framework (UAF) for Systems of Systems Architectures
Module 3, Week 5 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 3, Week 5 Discussion 1	1. Identify three Views in the DoD Architecture Framework (DoDAF) 2. Describe what each view is attempting to convey to the reader of the architecture description. 3. Provide an explanation of the relationship of the Conceptual, Logical, and Physical models to the Zachman framework. 4. How does the UAF compare to the Zachman Framework for Enterprise Architecture? 5. How are they similar (apart from the obvious grid structure)? 6. How are they different?
Module 3, Week 5 Assignment 1	1. In the article “Architecture is Architecture is Architecture”, John A. Zachman says that the Roman Coliseum is NOT architecture. 2. Explain why it is not. 3. Explain what “implementation” means. 4. Explain what “an instance” is. 5. Explain what is meant by “reification”. 6. What kind of architecture problems are best served by the Zachman Framework? 7. What kind are best served by the UAF? 8. Does it matter which Architecture Framework is used for a particular project?
Module 3, Week 5 Group Assignment 1	1. For your group project, identify two elements from your architecture for each of the six interrogatives of the Zachman Framework for the Architect perspective. If your architecture does not already have two for each interrogative, come up with additional new ones. 2. Between the UAF and the Zachman Framework, which would you choose to develop the AD for your group project? Why? Discuss with your group and come up with a consensus opinion.

Module 3, Week 6: Modeling Methodologies

Activity	Description
Module 3, Week 6 Readings and Lesson Presentations	**Required Reading** 1. SE 5346 SysML Introduction.pptx 2. SE 5346 Modeling Methodology.pptx 3. Aurelijus Morkevicius, et. al. paper: MBSE Grid - A Simplified SysML-Based Approach for Modeling Complex Systems 4. No Magic presentation: Model Based Systems Engineering with MagicGrid
Module 3, Week 6 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**

Activity	Description
Module 3, Week 6 Discussion 2	1. In Figure 8 of the No Magic paper on MagicGrid methodology, the figure shows an <<abstraction> > dependency relationship from the Components in the Solution domain up to Subsystems in the Problem domain. Explain what is meant by this abstraction relationship. 2. Explain why Subsystem 2 is an abstraction of two Components in the Solution domain. 3. There appears to be an error in the abstraction arrangement shown in the figure between the White Box view and the Solution view under the Structure column. Do you see anything wrong here? If you see a problem, describe what the problem is, and how it should be repaired.
Module 3, Week 6 Assignment 2	1. What exactly is meant by "Layer of Abstraction"? 2. In which direction is the abstraction oriented? In other words, going down are we becoming more or less abstract? 3. Describe in words the following three traces: • «derives» from White Box to Black Box under Requirements • «allocate» on White Box going from Behavior to Structure • «satisfy» going from Solution to White Box, from Structure to Requirements 4. For each of these traces, describe how the source (tail end of arrow) traces to the target (head end of arrow). 5. In other words, what is it about the source that allows it to claim the kind of traceability that is shown in the figure?
Module 3, Week 6 Group Assignment 2	1. For your group project, identify a set of six Performance Requirements that your system must satisfy. 2. For each of the six system performance requirements that the system must satisfy, identify the MOEs that would go into a «block» in the system architecture. 3. Describe how your system would be evaluated (tested) to show that it meets each of the six MOEs.
Module 3, Week 6 Module Test	*Module 3 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 4, Week 7: Architecture Description and Architecture Management Plan

Activity	Description
Module 4, Week 7 Readings and Lesson Presentations	**Required Reading** • SE 5346 Architecture Description.pptx • Architecture Management Plan Template.docx • INCOSE Handbook v5, Sections 2.3.5.4 • Rich Hilliard 42010 FAQ Website: A Conceptual Model of Architecture Description • Rich Hilliard 42010 FAQ Website: Various sections as described on Blackboard
Module 4, Week 7 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 4, Week 7 Discussion 1	1. ISO/IEC/IEEE 42010 describes the elements that constitute and Architecture Description in very general terms without telling you exactly what Viewpoints, Views, Model Kinds, etc. to produce in an Architecture Description, while this is done in great detail in the DoDAF. Explain why ISO/IEC/IEEE 42010 does not go into this level of detail while DODAF does.

Activity	Description
	2. The ISO/IEC/IEEE 42010 FAQ states "just as 'the map is not the territory', an architecture description is not the architecture." Explain what this phrase is attempting to relate. 3. In your own words, explain what is the difference between a "Viewpoint" and a "View"? Explain any new concepts you introduce in your response.
Module 4, Week 7 Assignment 1	1. When reviewing Stakeholder requirements, what would be three primary items you look for in them to identify the system boundary? 2. What is the primary value that Architecture Frameworks with their specification of Viewpoints and Views bring to the architect to improve workflow and products? 3. What is the difference between a System, its Architecture, and the Architecture Description?
Module 4, Week 7 Group Assignment 1	1. Using the provided Architecture Management Plan Template, populate the following sections • 1.1 Scope • 2.1 External Documents • 3.2 System Overview • 3.3 Known System External Interfaces • 4.1 Architecture Development Approach • 4.2 Architecture Description • 5.2 System Architecture Development Work Flow • 5.3 System Requirements Flow • 5.4 Architecture Model Releases • 6.1 Architecture Modeling Tools • 7.1.1 Chief Architect • 7.1.2 Model Administrator • 7.1.3 Model Developer • 8.1 Requirements Development Process • 8.2 Detail Design Process • 8.5 Configuration Management • 9.1 Architecture Reviews

Module 4, Week 8: Technical Measurement

Activity	Description
Module 4, Week 8 Readings and Lesson Presentations	**Required Reading** 1. INCOSE Handbook v5, Section 2.3.4.7 2. JG Artus Lecture 13 Technical Measurement
Module 4, Week 8 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 4, Week 8 Discussion 2	1. What is the significance of Measures of Effectiveness (MOEs) to the architectural design of a system? 2. What is the significance of Measures of Performance (MOPs) to the architectural design of a system? 3. What is the significance of Technical Performance Measures (TPMs) to the architectural design of a system? 4. What is the significance of Key Performance Parameters (KPPs) to the architectural design of a system?

Activity	Description
	5. Describe how MOEs, MOPs, and TPMs are related to each other. 6. Why is it important for the MOEs to be independent of the technical solution alternatives?
Module 4, Week 8 Assignment 2	1. Describe the critical aspects of the concept of "margin" to a system architectural design. 2. Of what significance to the system architect is negative margin? 3. How does negative margin expose risk? 4. What is meant by "positive margin"? Of what significance to the system architect is positive margin? 5. How does positive margin reduce risk? 6. In the example Satellite Launch Enterprise, how is margin gained during the development phase?
Module 4, Week 8 Group Assignment 2	1. Develop a MOE/MOP/TPM hierarchy for your ATM system a. You should have 1 MOE b. You should have a minimum of 2 MOPs that support the MOE c. Choose one MOP to derive a minimum of 2 TPMs that support the MOP i. Leave only one TPM free to control (indicate which one in the table) 2. Develop a table in which you indicate the a. Measure Type b. Measure Item c. Measure Threshold d. Measure Indicator
Module 4, Week 8 Module Test	*Module 4 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 5, Week 9: Systems Thinking

Activity	Description
Module 5, Week 9 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 01: Introduction to Systems Architecture 2. J.G.Artus Lecture 02: Systems Thinking 3. J.G.Artus Lecture 40: Dealing with Information Ambiguity 4. Nancy Leveson paper: Medical Devices: The Therac-25 5. Wikipedia page: List of Auto Parts
Module 5, Week 9 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 5, Week 9 Discussion 1	Provide insightful answers to the following questions: 1. Read the Leveson paper “Medical Devices: The Therac-25” (Reading Resource 3), Sections 1, 2, and 4. 2. Identify two Awareness-Understanding issues from each of the eleven causal factors cited in Section 4 of the paper. 3. For each of the issues in Part 1, characterize them as being representative of one of the cells in the Awareness-Understanding Matrix. 4. Provide rationale for why you made this choice.
Module 5, Week 9 Assignment 1	1. Read the Leveson paper “Medical Devices: The Therac-25” (Reading Resource 3), Sections 3 thru 3.5.1.

Activity	Description
	2. Refer to the extracts from the paper that are found in the assignment template. 3. Indicate in the table provided in the template, by placing an "X" in the appropriate column, what type of emergence the incidents described in these extractions represent: a. Anticipated, Desired (AD) b. Anticipated, Undesired (AU) c. Unanticipated, Desired (UD) d. Unanticipated, Undesired (UU) 4. Provide rationale for your selection. 5. You are an engineer responsible for drafting the section of your company's Architecture Management Plan that addresses aspects of the Architecture Development Process at your company. You are tasked with providing the descriptive text that goes along with the diagram in the assignment template.
Module 5, Week 9 Group Assignment 1	1. Review the Wikipedia List of Auto Parts (Required Reading 4). 2. Develop a component hierarchy diagram for an automobile. 3. Decide which blocks make up Tiers 2 and 3. 4. Provide screenshots of each diagram. 5. Review the Product Development Hierarchy assembled in Part 1. 6. Identify at least one function that each of the components at the lowest level implement. 7. List the functions that are performed by these components (the entities of form).

Module 5, Week 10: Complex Systems

Activity	Description
Module 5, Week 10 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 03: Complex Systems 2. J.G.Artus Lecture 41: Cynefin Framework 3. David Snowden video: The Cynefin Framework
Module 5, Week 10 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 5, Week 10 Discussion 2	1. Consider the architecture development of the five system types described in the template 2. For each system type decide which of the following architecture development approaches you would take a. Top-Down b. Bottom-Up c. Outer-In d. Middle-In 3. Explain your rationale for the choice you make 4. Consider the process of structural decomposition. 5. Discounting the normal constraints of budget and schedule, what are some criteria that would guide you, as an architect, to be able to decide at what point to stop decomposing a system structure. 6. Come up with at least two criteria.
Module 5, Week 10 Assignment 2	1. For the parts you identified for your ATM project, construct a SysML Block Definition Diagram (bdd) for the ATM system using PowerPoint or similar drawing tool.

Activity	Description
	2. Provide a screenshot of your SysML bdd. 3. For the parts you identified for your ATM project, construct a SysML Internal Block Diagram (ibd) using PowerPoint or similar drawing tool for the ATM system that illustrates one possible configuration of the parts defined in your bdd. 4. Provide a screenshot of your SysML ibd. 5. Create a taxonomy as a SysML bdd for types of road vehicles using PowerPoint or similar drawing tool. 6. Provide a screenshot of your taxonomy of road vehicles. 7. Describe how the figure in the template illustrates the concept of recursion.
Module 5, Week 10 Group Assignment 2	1. Review the operational situation scenarios provided in the template. 2. Assess which domain in the Cynefin Framework each situation scenario typifies. 3. Provide rationale as to why you think this is the correct choice. 4. Review the technical paper "How Complex Systems Fail" by Richard Cook (Required Reading 4). 5. For each of the scenarios presented in Part 1, identify which of the findings in this paper apply to each scenario. 6. Identify at least one finding for each scenario. 7. Use the Findings List included in the assignment template to enter the number of the applicable finding in the table. 8. Provide rationale as to why you think this the correct choice.
Module 5, Week 10 Module Test	*Module 5 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 6, Week 11: Elements of Form

Activity	Description
Module 6, Week 11 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 04: Analysis of Form 2. United States Patent No. US 6,206,284
Module 6, Week 11 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 6, Week 11 Discussion 1	1. Why is form required before function can be realized? 2. According to the authors of "System Architecture", what is "structure"? 3. Explain, in your own words, what is the difference between Formal Entities and Operands? 4. Why is form by itself not considered to be capable of enabling the emergence of desirable behavior? 5. How does structure contribute to emergence? 6. Describe an example of dynamic structure.
Module 6, Week 11 Assignment 1	1. Identify 5 major elements of form of the ATM System 2. For each of these, identify a function that the element is instrumental in producing 3. For each of these, identify an operand associated with the element of form or the element of function 4. Explain the relationship of the operand to the element of form and/or function 5. Explain how this object qualifies as an operand

Activity	Description
	6. Explain the difference between an Object of Form and an Object of Function 7. Explain the difference between an Object of Function and an Operand 8. Explain why, typically, the developer of a system does not supply consumables when the system is delivered 9. In the case of an automobile manufacturer, some critical system-level operands are provided on delivery. Describe one such operand. 10. In the case of an ATM delivered by its developer/manufacturer, identify a major operand provided on delivery, or, if there are none, explain why not
Module 6, Week 11 Group Assignment 1	1. Review the description of United States Patent No. US 6,206,284 2. Construct a Connectivity Structure Diagram that includes the following components a. 10a Box b. 10b Door c. 22 Cash Dispensing Output d. 24 Cash Slot e. 28 Check Deposit Intake f. 30 Check Deposit Slot g. 32 Computer Unit h. 33 Power Supply 3. Construct a Connectivity Structure Matrix that includes the same components as above 4. Construct a Connectivity Structure Matrix that shows only the boundary of the ATM, and external connectivity relationships to external entities 5. Include all relevant external entities that interact with the ATM

Module 6, Week 12: Elements of Function

Activity	Description
Module 6, Week 12 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 05: Analysis of Function
Module 6, Week 12 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 6, Week 12 Discussion Assignment 2	1. How are internal functionality and external functionality related? 2. How is system value related to emergence? 3. What is the difference between a good and a service? 4. An architecture is often in the difficult position of balancing two roles: company representative, and customer representative. 5. Explain the conflict that exists between satisfying these two roles simultaneously. 6. For the ATM system, give three examples of external functionality. 7. For the ATM system, give three examples of internal functionality. 8. For both external and internal functionality, identify the element of form that implements the function. 9. For each of the examples of external ATM functionality, describe a measure of performance that the system must present. 10. For each of the examples of internal ATM functionality, describe an operand that is involved in the execution of the internal function. 11. For each of these operands, indicate whether they are created, modified, or consumed.

Activity	Description
	12. For each of these operands, indicate whether they are Value-Related or not. 13. For each of these operands, identify the process involved in the creation, modification, or consumption of the operand.
Module 6, Week 12 Individual Assignment 2	1. Consider the processes and operands involved in a "Debit Card Verification Function" of the ATM System 2. Identify at least 5 processes involved in the authentication of a customer's debit card 3. Identify the single most important input operand and the single most important output operand associated with each processes 4. Construct a Process-Operand (PO) Array in which the final value-related operand is the presentation of a menu of ATM services available to the customer indicating that the debit card has been validated 5. Indicate the value pathway (using arrows) involving processes and operands along which value develops 6. Using the results of Part 1, create an OPM diagram
Module 6, Week 12 Group Assignment 2	1. Consider the processes and operands involved in a "Cash Withdrawal Function" of the ATM System 2. Identify at least 5 processes involved in the cash withdrawal transaction 3. Identify the operands associated with the identified processes 4. Construct a Process-Operand (PO) Array 5. Indicate the value pathway (using arrows) involving processes and operands along which value develops 6. Using the results of Part 1, create an OPM diagram
Module 6, Week 12 Module Test	*Module 6 Test* This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Module 7, Week 13: System Architecture and Axiomatic Design

Activity	Description
Module 7, Week 13 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 06: System Architecture 2. Nam Suh paper: Axiomatic Design Theory for Systems 3. Jussi Kantola presentation: Principles of Axiomatic Design and their Application 4. Taesik Lee thesis: Complexity Theory in Axiomatic Design, Sections 2.1 and 2.1.1 5. Math Is Fun website: How to Multiply Matrices
Module 7, Week 13 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 7, Week 13 Discussion Assignment 1	1. Explain the significance of the Independence Axiom. 2. Explain the significance of the Information Axiom. 3. What is the significance of determining the FRs in a solution-neutral environment? 4. Indicate the value pathway involving processes and operands along which value develops 5. Explain the meaning of the following statement "When all probabilities are equal to one, the information content is zero, and conversely, the information required is infinite when one or more probabilities are equal to zero." 6. Explain the significance of the above figure to the architect developing an architectural design of a system.

Activity	Description
	7. It is stated in *Axiomatic Design Theory for Systems* that "the design that has the least information content is the best design." Identify two methods that would help the architect to achieve a design with the least information.
Module 7, Week 13 Individual Assignment 1	1. Explain what it is about the first design for the faucet where the choice of DPs to cause the FRs to not be independent of each other 2. Explain what it is about the second design for the faucet where the choice of DPs corrects the problem of lack of independence among the FRs in the first design 3. Using matrix algebra, develop the equations for FR1, FR2, and FR3 for each of the three design types: Uncoupled, Decoupled, and Coupled 4. Using the resulting first set of equations, provide an explanation for what makes the equations demonstrate an uncoupled design 5. Using the resulting second set of equations, provide an explanation for what makes the equations demonstrate a decoupled design 6. Using the resulting third set of equations, provide an explanation for what makes the equations demonstrate a coupled design
Module 7, Week 13 Group Assignment 1	1. Identify the concept of the ATM that your FRs and DPs apply to. Use simple text description to describe your ATM concept. 2. Identify a set of 5 functional requirements (FRs) for an ATM, using any combination of a) your Group's set of functional requirements for an ATM, or b) individual group member's set of functional requirements for an ATM, or c) new set of functional requirements for an ATM created for this assignment 3. Assign an ID and a short descriptor for each of the 5 FRs 4. Describe the FRs 5. Identify at least one DP that can be used as a component solution that can satisfy one or more FRs 6. Provide enough DPs such that all FRs are satisfied 7. Assign an ID and a short descriptor for each of the DPs 8. Describe the DPs 9. Develop a set of equations that define the relationship between the DPs and the FRs 10. Using the equations developed above, construct a design matrix, using PowerPoint or similar drawing tool, that characterizes the product design using "X" to indicate a relationship between DPs and FRs, and "0" to indicate no relationship between DPs and FRs 11. Provide an image of your design matrix

Module 7, Week 14: Solution-Neutral Function and Concepts

Activity	Description
Module 7, Week 14 Readings and Lesson Presentations	**Required Reading** 1. J.G.Artus Lecture 07: Solution-Neutral Function and Concepts
Module 7, Week 14 Video Classroom	Weekly video classroom hour to discuss topics, assignments, and Q&A **See the SE 5346 Blackboard Home Page for the Zoom Meeting Address**
Module 7, Week 14 Discussion Assignment 2	1. What does the term "solution-neutral" imply? 2. Why is it emphasized the importance of defining functions that are solution-neutral? 3. What is meant by "specializing the solution-neutral function into a concept"?

Activity	Description
	4. How does the "Template for Deriving Concept from Solution-Neutral Functional Intent" help the architect develop a concept? 5. How does the "Scheme for Organizing Alternative Concepts" assist the architect in selecting a preferred concept? 6. What kind of concept development artifacts might be useful to an architect in developing a more complete understanding of why a particular stakeholder problem exists, that might lead to a more applicable solution? 7. Explain the difference between a good and a service. 8. How can a Morphological Matrix be used by an architect to further expand the concept space for consideration of alternatives?
Module 7, Week 14 Individual Assignment 2	*Student Survey* • Please provide your assessment of the course content and value
Module 7, Week 14 Group Assignment 2	1. Develop an expanded Morphological Matrix for use in conceptualizing solutions to the ATM problem (providing bank teller services using automation), using PowerPoint or similar drawing tool. 2. You are free to envision novel concepts but stay within the bounds of reason. 3. Identify the concept of the ATM that you developed with the aid of the Morphological Matrix.
Module 7 Test	*Module 7 Test* • This test covers reading assignments, discussions, individual assignments, group assignments, and presentations in the module.

Required Reading Material

The instructor will provide directions to reading resources required throughout the course.

Much of the course is based on the textbook System Architecture, Strategy and Product Development for Complex Systems 1st edition, by Edward Crawley, Bruce Cameron, and Daniel Selva, Publisher: Pearson Education, January 1, 2015, ISBN-10: 1292110848, ISBN-13: 978-1292110844

Unfortunately, this textbook is out of print. However, it is not absolutely necessary to obtain this text in order to succeed in this course. The textbook could help students better understand lecture material by referencing additional information in the textbook, such as additional explanation and examples. The UTEP Library will be making chapters from this text available as needed. The instructor will advise you in advance of the need to access chapters from this textbook via the UTEP Library Reserves.

Other Reading Resources Required:

- International Council on Systems Engineering. (2015). *INCOSE systems engineering handbook: A guide for system life cycle processes and activities.* Fifth edition. Eds. Walden, D., Shortell, T., Roedler, G., et. al. Hoboken, NJ: Wiley. (See the Blackboard Homepage for this course for instructions on creating an INCOSE CAB account as well as instructions on how to download the handbook)
- SEBoK Editorial Board. (2021). *The Guide to the Systems Engineering Body of Knowledge 2.8*, R.J. Cloutier (Editor in Chief). Hoboken, NJ: The Trustees of the Stevens Institute of Technology. www.sebokwiki.org. BKCASE is managed and maintained by the Stevens of Technology Systems

Engineering Research Center, the International Council Engineering, and the Institute of Electrical and Electronics Engineers Systems Council (available from the SEBoK website.)

Other Reading Resources Recommended (not required for this course):

- CMMI Product Team. (2010). *CMMI for development. Version 1.3*. CMMI Institute. CMMIInstitute.com. (Please see the UTEP Library Guide for MSSE 5341 for instructions on obtaining this resource.)
- Visualizing Project Management 1st edition, by Kevin Forsberg, Hal Mooz, Howard Cotterman. Publisher: John Wiley & Sons, 2005, ISBN-10: 0471648485, ISBN-13: 978-0471648482
- SysML Distilled, by Lenny Delligatti. Publisher: Addison-Wesley, 2014, ISBN-10: 0321927869, ISBN-13: 978-0321927866

Required Computer Software

Standard Microsoft Office products are required for assignment submission. An internet browser is required to access online resources.

Video Classroom

The instructor will deliver a video class once a week on the Tuesday of each week, except as noted in the class calendar posted on the Blackboard Home Page for this course. The video class will be delivered based on the instructor's availability. Situations may prevent the instructor from delivering a video class during a given week. The instructor will attempt to give as much advance notice as possible when a video class will not be delivered. Student attendance is totally optional. The video class is made available for the student's benefit. It is suggested that you take advantage of the opportunity to bring questions to the class and have them answered by the instructor. For example, this is a good opportunity to ask questions about the reading material, the assignments, and the tests. Occasionally, the video class may be scheduled on a day of the week other than Tuesday. Always check the course schedule posted on Blackboard to determine the current dates for scheduled course activities. The video classes will be recorded and posted on Blackboard for students to review as needed. Technical difficulties may impact the ability to record or upload video recordings of these sessions, so it is recommended not to become dependent on availability on the recordings, but instead make every effort to attend the sessions live.

Students who attend the weekly video classroom sessions tend to learn more and perform better in the assignments and tests. Participation in these sessions is for your benefit. Your participation will not be graded, so you can be open and frank with your questions about course material. In fact, the best learning is done when a student engages with the professor on subjects that the student has doubts about.

Are you afraid to ask a dumb question?

Do not be afraid to ask a dumb question since, in learning, there is no such thing as a dumb question. The instructor is here to provide you with the opportunity to learn the course material. I encourage you to take advantage of that opportunity by asking ANY question about course subjects you need help understanding. The video class sessions are an "open learning environment." The instructor will NOT call

anybody out for asking a "dumb" question. On the contrary, the instructor is actively interested in helping any student clarify any kind of misunderstanding of the course material. Simply ask any question. You will be PLEASED to see how cooperative the instructor is in getting you the information you need. Any information shared by the instructor during a video classroom session will be considered course material and is subject to being included in module tests.

Student Resources

Student resources include the course textbook, internet resources related to lectures for each Module, instructions for collaborative work, and links to the Library Guide, UTEP Bookstore, and UTEP technology support. Some of the work that must be performed by students is done in a group collaborative setting. The collaborative section in Blackboard identifies the groups and group members for this course. The student resources section is located in the Blackboard Home Page for this course. Go to ***Home -> Welcome to SE 5346 System Architecture & Design -> Student Resources***.

Difference Between Learning and Knowledge Demonstration

The weekly rhythm of this course is broken into two parts: 1) Learning, and 2) Knowledge Demonstration. Learning is accomplished at the beginning of the week as the student reads/reviews the learning material made available for that week. During Knowledge Demonstration (submitting assignments and taking tests) the student then demonstrates what knowledge has been gained during Learning. Once knowledge has been demonstrated by submitting assignments and taking tests, there is no further opportunity to demonstrate the knowledge for that week by resubmitting assignments with modifications or retaking tests. For this reason, the Instructor highly recommends that students attend the weekly video class armed with questions about the course material to be learned during that week in order to maximize the learning opportunity prior to entering the period for demonstrating the knowledge gained.

Student Deliverables

Deliverables are assignments and tests that the student is responsible for delivering on time and with the required quality to earn points towards the desired grade. Full instructions on the requirements and due dates for assignments and for test taking will be included in Blackboard postings. The goal in delivering assignments is for the student to clearly demonstrate command of the knowledge gained/derived from class readings and assignments. The student should expect to convince the instructor, though the submitted assignments/tests, that the student has command of the knowledge gained during the course. Students are responsible for delivering the following artifacts as part of this course.

Video Class Debate

Each student will be required to participate in one “debate” at a Video Class session. These are not actually debates, but more like presentations. The presentation lasts 5 minutes. The student will address a topic of the Instructor’s selection. Students will be informed of the week’s debate topics in advance by the Instructor to allow for preparation. During the debate, one student acts as protagonist and delivers a

5 minute presentation on the chosen topic. Another student acts as antagonist and delivers a 5 minute presentation. The antagonist addresses points that protagonist missed or points that protagonist got wrong. Both protagonist and antagonist may use prepared notes during their presentations. Each student earns points for quality of presentation

Three topics will be debated at each video class for a total of 10 minutes per topic. Students will schedule a time slot with the Instructor, in advance, for participation throughout the semester. Protagonist and antagonist will not know who each other are in advance. Both students independently prepare discussion points related to the topic. The better a student prepares by compiling a full set of discussion points to cover the topic completely, the better they will perform during their presentations. The Instructor will stay out of the presentations unless needed to keep the debate on track. The Instructor will cut off the presentations at the 5 minute mark.

Participation in these debates is treated as an assignment. Zero points are earned for no-shows, and counts toward the Three-Strike rule. Each student MUST participate in one debate or lose the 40 points.

Discussion Assignment

A Discussion Assignment is prepared by the student alone and submitted on (normally) the Thursday of each week. Occasionally, the Discussion Assignment may be due on a day of the week other than Thursday. Always check the course schedule posted on Blackboard to determine the current assignment due dates. A set of instructions will be provided by the instructor for each assignment as part of the module. The instructions will indicate the dedicated sources of knowledge the student should pull from to develop the assignment response. The student is free to access any additional resources the student feels will support an argument being developed. In all cases, the student is required to cite the source of any points made in the argument that are derived from sources other than the student's own knowledge resource (the student's own brain). The purpose of the discussion assignment is to open up a topic for class discussion. The Discussion Assignment submission will be shared with other students in the class. The idea is that other students can argue in support of or against an argument made in the submitted assignment.

Discussion Reply Assignment

A Discussion Reply Assignment is prepared by the student alone and submitted on (normally) the Friday of each week. Occasionally, the Discussion Reply Assignment may be due on a day of the week other than Friday. Always check the course schedule posted on Blackboard to determine the current assignment due dates. The student will choose a minimum of two discussion assignment submittals from other students to respond to. When responding to someone else's submissions, do not simply say "I agree with your point…." Agreeing is easy. If you wish to agree with a point, provide additional evidence to support why the point deserves further consideration. Disagreeing, and saying why you disagree is more difficult, but may allow the student to better demonstrate command of knowledge for the instructor to consider. Do not feel inhibited from disagreeing with a fellow student. Look for a student submission to comment on, pick submissions that you either agree or disagree with and then say why you agree or disagree, with evidence. Always respond to your peers with respect.

Points will not be awarded for the discussion reply if the reply does not "advance the technical discourse." This means that I will be looking for a technical discussion in the response that provides additional information or clarity on a technical basis.

Individual Assignment

An Individual Assignment is prepared by the student alone and submitted (normally) on the Friday of each week. Occasionally, the Individual Assignment may be due on a day of the week other than Friday. Always check the course schedule posted on Blackboard to determine the current assignment due dates. A set of instructions will be provided by the instructor for each assignment as part of the module. The instructions will indicate the dedicated sources of knowledge the student should pull from to develop the assignment response. The student is free to access any additional resources the student feels will support an argument being developed. In all cases, the student is required to cite the source of any points made in the argument that are derived from sources other than the student's own knowledge resource (the student's own brain). The individual assignment submission will not be shared with other students in the class.

Group Assignments

Some of the work that must be performed by students is done in a group collaborative setting. The instructor will assign students to groups. Refer to the Blackboard Home Page for this course to locate the particular group that you have been assigned to. Go to ***Home -> Welcome to SE 5346 Systems Architecture & Design -> Course Management Resources -> Group Membership and Organization***.

The Instructor will provide instructions on what is expected of the group deliverable for each Group Assignment. Some of the weekly group assignments may build up from previous assignments. The group will review the assignment for the week and decide on an equitable distribution of tasks to each group member.

The group will segregate the individual tasks to group members to perform. When the individual contributions are submitted, they are merged by the group into a single group deliverable to be submitted. In the submission, the group MUST clearly indicated which member of the group prepared which section(s) of the assignment. It is not sufficient to indicate that an individual group member "collaborated" with others or "reviewed" the assignment prior to submission. Such tasks are insufficient as material contributions in this course. Groups SHOULD review their work prior to submission to ensure that all individual contributions flow together well. Reviewing is everyone's responsibility, not an individual responsibility.

Students should develop soft skills to properly and effectively work as a group member. Group members are expected to be respectful of each other, have a positive attitude, deliver quality work on time, participate in peer reviews, and support other group members. All submitted group assignments shall clearly indicate who did what work. *A student can only receive credit for the group project work, if he/she is an equally contributing member of a group*.

If a group member is not working or is performing poorly or irresponsibly, the group must let the member know about the problem, offer him/her help, and inform the Instructor of the situation. If a group member continues performing poorly or irresponsibly, the group may request the Instructor to remove the student from the group. The group leader shall send an e-mail to the Instructor and all

group members including the affected group member with a brief explanation of the circumstances. Depending on the severity of the situation, the Office of Student Conduct and Conflict Resolution (OSCCR) and/or the Department and/or University Title IX Coordinators may be called in to adjudicate the situation (by University policy and US Federal Law).

Assignment Submission Logistics

Group Leader

Each group will designate a Group Leader. The role of the group leader is that of organizer and promoter of good group practices. The role of the group leader is not to take on additional assignment work load. The group leader DOES NOT do the work of students that do not provide their contribution to the group effort. If a group member does not provide the expected contribution to the group assignment, the group leader should indicate that fact in the assignment submission so that the rest of the group is not penalized for the missing contribution. Not all people have leadership skills. Each group should discuss the group leader role and select someone who is capable of being a good leader for the group. For the selected group leader, this is an opportunity for you to practice your leadership skills. Your job is to take the steps necessary to ensure the group is well coordinated, not to bail the group out by taking on other people's assignments for them.

Late Delivery of Assignments

There is no such thing as late assignment delivery in this course. If an assignment is not submitted by the due date/time, the assignment will receive a zero score. Blackboard automatically indicates which assignments are late. Take care to observe the due date and due time. If an assignment is one second late, Blackboard will flag the assignment as late. Zero points will be rewarded for late assignments. Be sure to start your work sufficiently in advance of the due date/time in order to submit assignments on time.

The instructor is well aware that life/work/school issues sometime arise that prevent a student from fulfilling assignment/test obligations. The student need only contact the instructor to coordinate a workaround schedule for submitting missed assignments/tests.

It is the student's responsibility to notify the instructor by email with as much advance notice as possible when it is known that an assignment due date/time will be missed for legitimate reason. If such advance notice is not possible, still notify the instructor by email so that alternative assignment delivery arrangements can be made. Students WILL NOT be penalized for events beyond their control which prevent them from turning assignments and tests in on time. However, in these cases, the student must notify the instructor for alternate submission arrangements. Notification of events that occurred more than 7 days in the past (one week) will not be considered for relief.

An exception to the late delivery policy is made during Week 1, while students become familiar with the course assignment submission policy and pace. However, ALL WEEK 1 ASSIGNMENTS must be turned in by 11pm Mountain Time on the last day of Week 1. Starting with Week 2, the late delivery policy will be in full force.

Minimum Word Count

Many assignments come with a minimum word count requirement in the instructions. The purpose of the word count is to encourage the student to develop a fully thought-out response. Do not pack your discussions and arguments with fluff, filler, or nonsense just to meet the word count limit. Provide good, well-thought-out discussions, with good explanation of your argument points on technical merits. The instructor is a seasoned Systems Engineering professional. The instructor will not be swayed by nonsense arguments. The instructor will grade assignments based on the quality of the arguments provided by the student.

Answering Questions Requiring an Essay Response

Some assignments will pose questions for the student to address using an "essay" format. The student is strongly advised to provide responses in the format of Thesis – Supporting Argument – Supporting Evidence. This format is outlined here:

- Thesis
  - Supporting Argument 1
    - Evidence 1.1
    - Evidence 1.2
    - Evidence 1.n
  - Supporting Argument 1
    - Evidence 1.1
    - Evidence 1.2
    - Evidence 1.n
  - Supporting Argument m
    - Evidence m.1
    - Evidence m.2
    - Evidence m.n

The thesis is a brief statement (usually one or two sentences) that directly addresses the assignment question; being brief, concise, and direct to the point of the question.

Supporting arguments are just that. The argument points that you would like to make that support your thesis.

Evidence is some kind of known, defendable example from the literature that illustrates how the argument has been illustrated in real-world experience.

The number of supporting arguments and evidence needed to make your point is up to the student to determine.

Example question:

What is the value of modeling and simulation to the development of a modern socio-technical engineered system?

Thesis: Modeling and simulation brings value to system development in at least three important areas: 1) exploring the potential of operational concepts, 2) confirming the expected performance of the system, and 3) training system operators for field operations.

Supporting Argument 1: By exploring the potential of operational concepts, these concepts can be validated resulting in successful concepts being promoted for further consideration, and infeasible concepts being eliminated.

Evidence 1.1: Prior to the 1980s, automobile internal combustion engines were largely mechanical devices with only a few variables controlling their performance. However, the 1990s saw a dramatic increase in the number of whole-system variables that influenced operation of the engine, such as the velocity of the vehicle combined with the current transmission gear ratio. Ricardo Software, a company dealing specifically with the modeling and simulation of internal combustion engines, had to significantly modify their modeling and simulation of such engines to include these additional control variables in order to allow automobile designers to better understand how design decisions in one area of the vehicle influenced the performance of the engine. [1]

Supporting Argument 2: Modeling and simulation is used to confirm the expected performance of the system, thereby avoiding potentially catastrophic system failures.

Evidence 2.1: On 4 June 1996, the maiden flight of the Arianespace Ariane 5 rocket failed catastrophically due to incompatible units of measure embedded in reused code from the inertial reference platform of the Ariane 4 that did not undergo sufficient modeling and simulation to prove its worthiness for reuse. The failure report of the incident concluded that designers "did not include adequate analysis and testing of the inertial reference system or of the complete flight control system, which could have detected the potential failure." [2]

Supporting Argument 3: Modeling and simulation is used to train system operators for field operations, thus providing the operators with a detailed understanding of proper system operations and identification of potential system fault conditions resulting from typical operator usage patterns.

Evidence 3.1: On April 11, 1986, an operator of the Therac-25 Radiotherapy machine at the East Texas Cancer Center used the device on a patient who eventually died of over-radiation exposure. On investigation, it was discovered that the operator had employed a series of keystrokes on the console that resulted in an incorrect system setting and an application of a very high dosage of radiation. The manufacture issued a change in operating procedures that stated "the key used for moving the cursor back through the prescription sequence … must not be used for editing or any other purpose." Had proper modeling and simulation techniques been used, it would likely have resulted in the identification of the faulty key sequence and a correction to the fault resulting in the saving of at least one life. [3]

[1] The Impact of Modelling and Simulation Technology on Engineering Problem Solving, by Dodgson, Gann, and Salter, https://www.researchgate.net/publication/43476661_The_Impact_of_Modelling_and_Simulation_Technology_on_Engineering_Problem_Solving

[2] Ariane 5 Flight 501 Failure Report by the Inquiry Board, http://sunnyday.mit.edu/nasa-class/Ariane5-report.html

[3] An Investigation of the Therac-25 Accidents – Part III, by Leveson and Turner, https://www.cse.msu.edu/~cse470/Public/Handouts/Therac/Therac_3.html

This example is written to clearly illustrate the purpose of each section of this format. Your assignment submissions do not have to have the same word count length as this example. You should tailor your word count to 1) meet the required minimum word count (if applicable), and 2) provide sufficient input so as to convince the Instructor of the knowledge you have gained that applies to the question posed.

Assignment Grading Criteria

The Instructor grades assignments according to two sets of criteria: Objective Criteria and Subjective Criteria.

Objective Grading Criteria using Rubrics

Rubrics are an objective way of assessing work. They provide clear criteria that can be shared with students so that they know how they will be graded. The objective criteria used for each assignment basically addresses logistical concerns, such as using the correct filename for assignment submission, etc. These criteria are included in the templates provided for submitting each assignment and represent demerits, or points to be deducted from a student's score, for not meeting the criteria outlined in the rubric.

Subjective Grading Criteria using Instructor's Experience in the Field

Many assignments that test the student's cognitive understanding are not simply judged on objective criteria that can be codified in rubrics. In these cases, the grade will be assessed by the Instructor primarily on a subjective basis, using 40+ years of engineering experience to determine whether 1) the student understands the critical points being raised in the assignments and 2) the student is able to address these issues with critical thinking and logical argument presentation. The Instructor will grade these types of assignments based on the quality of the responses provided by students. The quality criteria the Instructor will be using includes:

- Do you demonstrate command of the knowledge topic being discussed?
- Are your responses to topics to-the-point, clear, crisp, and concise?
- Do you use the correct terminology?
- Do you provide relevant supporting data to back up the main points you make?

The Instructor only has so much time to read and digest your responses. If a response is confusing to read and break down, or if you ramble, using techno-babble jargon that makes no technical sense, then the Instructor will be unable to follow your technical argument and you may likely not receive the grade that you expect for that portion of the assignment.

It is suggested that you keep your responses clear and to the point, and review your responses prior to submission to ask yourself whether what you are submitting makes sense to you, and whether it will make sense to the Instructor.

Tests

Tests are administered (normally) on Sundays via Blackboard. Occasionally, a test may be scheduled on a day of the week other than Sunday. Always check the course schedule posted on Blackboard to

determine the current dates that tests are administered. Tests will be available to take at 1pm on test day. Tests will be due by 11pm on test day. Be sure to start the test far enough in advance of the test due time of 11pm in order to complete the test by 11pm. If a test falls on a weekday (working day) due to schedule, the instructor will open the test early to give working students a greater window of opportunity to schedule their test taking time.

If you miss taking the test by the due date/time, you will receive zero points with no provision to take the test at a different time. Tests will be open book. However, the questions will require selection of an answer in a short amount of time, so be sure you understand the course material. If you have any doubts about understanding, ask questions of your fellow students in the discussion board and at the video classroom sessions. Tests will focus on course material covered in the current module up to that point in time, possibly including material from prior modules. Tests are to be taken individually, not collaboratively.

Taking a test requires uninterrupted online connectivity. If you are in an environment with questionable connectivity, you may have issues that prevent you from completing the test. It is advised that if you have such issues, resolve them (preferably by getting to a location that does not have connectivity issues) prior to starting the test. If you are located near campus, the UTEP Library has computing assets available to you to login and take tests with near 100% certain connectivity.

Syllabus Test

A test will be issued at the end of the first week of Module 1 to test the student's understanding of the rules of student conduct for this course. The test will be available to take at 1 pm Mountain Time on the Sunday of the first week of each module. The test is due on the same Sunday at 11 pm Mountain Time. The test is open book. The test must be taken by the due date/time or it receives a zero grade. There is no makeup opportunity for this test. The test covers the content of the syllabus related to rules of student conduct for this course. The test does not cover the details of assignments given each week. The test consists of 15 multiple choice questions, each of which have five possible answers. Select the best possible answer for each question. The test duration is 60 minutes. There is only one test attempt allowed.

Module Tests

A test will be issued once for each module. Tests are given on the second Sunday of each module. Occasionally, due to a non-standard weekly schedule, the Module Test may be due on a day of the week other than Sunday. Always check the course schedule posted on Blackboard to determine the current dates for Module Test dates. The test will be available to take at 1 pm Mountain Time on the Sunday of the second week of each module. The test is due on the same Sunday at 11 pm Mountain Time.

Tests are open book. The test must be taken by the due date/time or it receives a zero grade. There is no makeup opportunity for tests. Tests cover reading assignments, discussions, individual assignments, group assignments, and presentations in the module. Tests consists of 60 multiple choice questions, each of which have five possible answers. Select the best possible answer for each question. The test duration is 60 minutes. There is only one test attempt allowed.

Note: Test grades account for 33% of the course grade. This is a significant percentage of the course grade. Students should note that test dates are given well in advance, and students should be prepared to make

themselves available to be in place and ready to take the test during the 10-hour window that the test is available to be taken.

Note: **Tests are designed to be CHALLENGING!** Tests are meant to separate those that truly know the material from those that do not know the material. Do not expect to have easy questions presented to you. Do not expect to get perfect scores on every test. Expect to do the best you can on each test, through preparation, diligence, and persistence.

Midterm and Final Exams

There is no midterm exam or final exam in this course (yet).

Test Grading Criteria

All tests consist of 100% multiple choice questions, and are automatically graded by Blackboard.

Extra Credit Policy

There is no policy in this course for issuing extra credit to individual students for the purpose of bumping up from one final course grade (such as B) to another (such as A). The best assurance for receiving the grade you desire is to perform the work throughout the semester to the level of quality needed to achieve a certain final grade in the course. The Instructor is a seasoned Systems Engineering professional, and the grades issued throughout the semester that result in a final grade letter issued to a student can be counted on confidently to reflect the quality of work delivered by any individual student, as assessed by the Instructor.

However, there is a general **extra credit** opportunity available throughout the semester to all students in need of extra credit assistance. This opportunity revolves around a student performing their own scoring progress assessment, and is made available according to the students current grader at the end of each module, as follows:

If your current grade is A at the end of a module, then you can perform and submit to the Instructor your own score assessment for 10 extra credit points each, up to a course maximum of 1 assessment.

If your current grade is B at the end of a module, then you can perform and submit to the Instructor your own score assessment for 10 extra credit points each, up to a course maximum of 2 assessments.

If your current grade is C at the end of a module, then you can perform and submit to the Instructor your own score assessment for 10 extra credit points each, up to a course maximum of 3 assessments.

If your current grade is F at the end of a module, then you can perform and submit to the Instructor your own score assessment for 10 extra credit points each, up to a course maximum of 4 assessments.

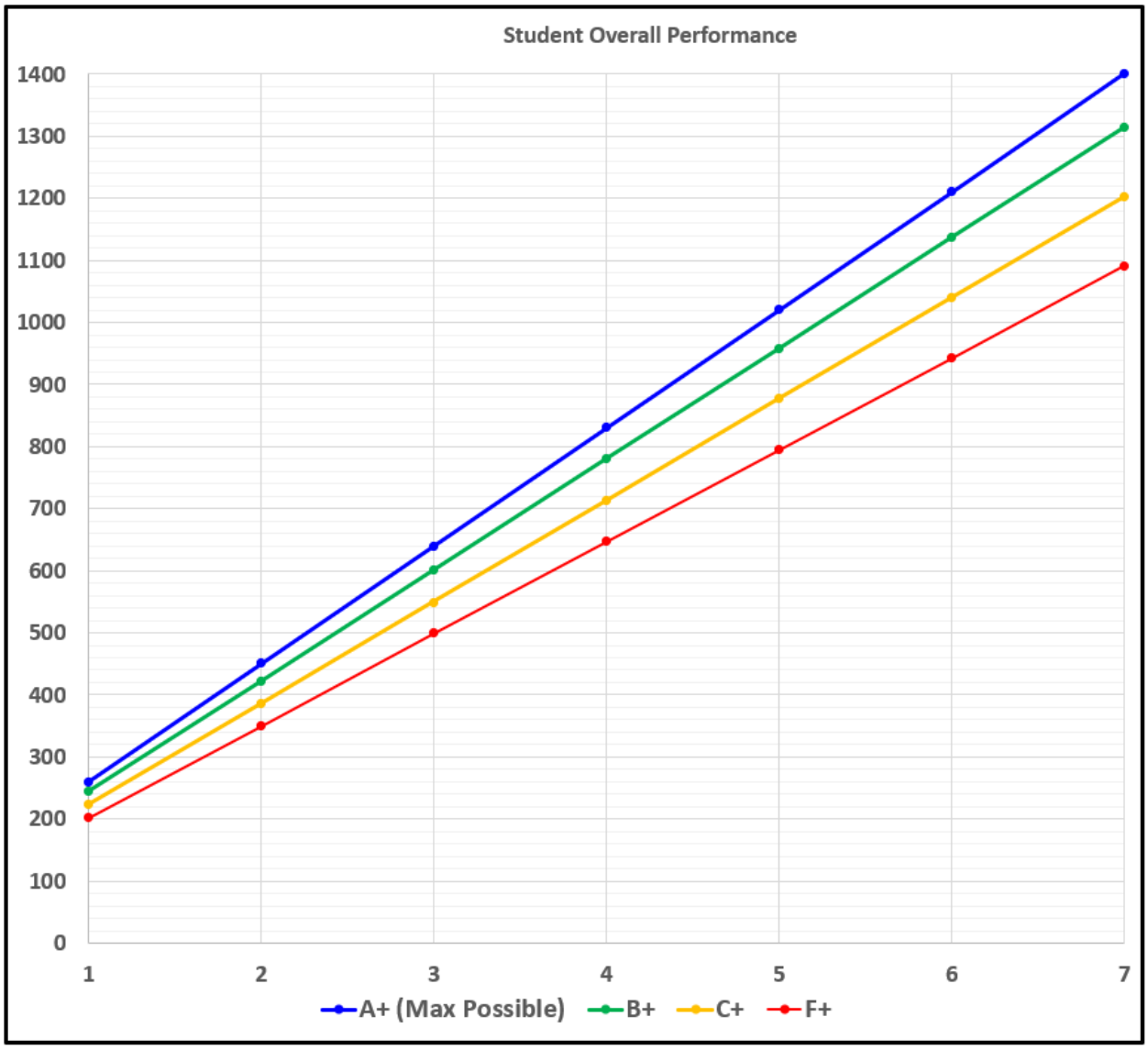
The following table presents the maximum score that delineates one letter grade from another for each of the seven modules in the course.

	End of	End of	End of	End of	End of	End of	End of

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7
A+	260	450	640	830	1020	1210	1400
B+	244	422	601	780	958	1137	1315
C+	223	386	550	713	877	1040	1203
F+	202	350	499	647	795	943	1091

This chart assumes the student has already participated in the Video Class Debates. I you have not yet participated in the debates, simply add the score you believe you will be able to attain to your current score, based on your own assessment of your potential performance.

Students wishing to take advantage of this extra credit opportunity need only plot their score progression indicating the score at the end of each module up to the most recent completed module, on a copy of the graphic form shown below, and submit the result to the Instructor by email. All grading data needed to perform this process is available on Blackboard.



Only one scoring assessment is allowed per module.

The time window for taking the assessment will depend on the time that the Instructor has available to perform grading following the completion of a module. The Instructor will endeavor to complete grading as soon as possible following the completion of a module. But circumstances may impact the Instructor's ability to provide immediate grading turnaround. If you are wishing to take advantage of this extra credit opportunity, it is suggested that you inform the Instructor of your desire to do so, at the end of a module, by email.

A Scoring Assessment Tool (basically a PowerPoint template) is available in Blackboard for you to use to develop your scoring assessment graph for this extra credit opportunity.

Student Integrity and Discipline of Inappropriate Behavior

Harassment

In accordance with Texas Education Code § 51 ("SB 212"), and as a UTEP employee, the instructor is bound by law to report incidences reasonably believed to constitute sexual harassment, sexual assault, dating violence, or stalking, and which is alleged to have been committed by or against a person who was a UTEP student or employee at the time of the incident. I will interpret any incident of harassment of ANY FORM by one student on any other in this course as an incident to be reported to the UTEP Title IX Coordinator. The instructor has had to take this step in past situations, and will do so again as the need warrants. If you feel you have been harassed by another student in this course, please inform me in confidence so that the situation may be reported to the appropriate authorities.

Academic Dishonesty

Academic dishonesty is prohibited and is considered a violation of the *UTEP Handbook of Operating Procedures*. It includes, but is not limited to, cheating, plagiarism, collusion, misrepresentation, and fabrication.

- Cheating can involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports.
- Plagiarism occurs when someone intentionally or knowingly represents another person's words or ideas as his or her own.
- Collusion involves unauthorized collaboration with another person or group to commit any academically dishonest act.
- Misrepresentation involves falsifying information with the goal of deception. This can include the inclusion of generative AI text in an assignment submission as if it were your own work.
- Fabrication occurs when false information is included on a works-cited page.

Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Office of Student Conduct and Conflict Resolution for possible disciplinary action. The instructor has had to take this step in past situations, and will do so again as the need warrants. Students may be suspended or expelled from UTEP for such actions. You can find more information in the *UTEP Handbook of Operating Procedures*, under the heading "4.14: Alleged Student Scholastic Dishonesty," and in the Regents' Rules and Regulations.

Plagiarism

Do not plagiarize. Credit all sources. It's perfectly OK to quote a source, as long as it is credited. But, if your whole argument is based on an extensive quote, you won't receive much credit for originality. Plagiarism will simply NOT be tolerated.

The University policy on Plagiarism is:

Plagiarism is the act or instance of using, or closely imitating the language and/or thoughts of another author; including words, ideas, illustrations, structure, computer code, and other expressions or media; and presenting that material without authorization and/or the representation of that author's work as

one's own academic work, being offered for credit or in conjunction with a program, course, or degree requirements.

The instructor is bound by the University's Handbook of Operating Procedures (HOP) to report any such incident of plagiarism to the Office of Student Conduct and Conflict Resolution (OSCCR). The instructor has had to take this step in past situations, and will do so again as the need warrants.

With regard to citing the source of information obtained from sources, formal citation, as in using MLA, ALA, Chicago, etc. formats is recommended, but is not required. Students are required to provide sufficient citation information that allows the instructor to track down and review the source.

For further information on formal citation, here is a good source:

https://www.easybib.com/guides/citation-guides/how-do-i-cite-a/

Cheating

With regard to cheating, there are two areas of concern in this course: Assignments and Tests.

With regard to assignments, you are allowed and encouraged to "collaborate" with fellow students - up to a point. Collaboration on understanding of the purpose of an assignment, the requirements, as far as what you are being requested to provide in your assignment submissions, and possible general approaches to solutions is acceptable behavior in this course. In fact, you are encouraged to use the discussion forum to discuss these kinds of topics in collaboration with your fellow classmates. However, this is the point at which collaboration ends. At this point you are obligated to pursue the identification and definition of a specific solution to an assignment problem on your own. Working with other students beyond this point, except obviously for group assignments, moves into "collusion." You do not have the authority to collude with other students. This qualifies as cheating.

UTEP defines collusion as:

Unauthorized collaboration with another person in preparing academic assignments offered for credit; in other words, seeking aid from another for an assignment without having authority to do so.

And

Collaboration with another person to commit a violation of the rules on scholastic dishonesty.

Collaboration on tests is permitted in this course only to include scholarly study in preparation for taking a test. Once the scholarly preparation is complete, no further collaboration may take place. Any form of collusion by passing answers to tests from one person to another, or by obtaining and using answers obtained from outside sources, or by employing any other types of dishonesty, is strictly prohibited.

In all cases of Plagiarism and Cheating and any other form of Academic Dishonesty, the instructor is required to, and will be reporting such cases to the OSCCR. In cases of collusion on tests, the instructor will recommend to the OSCCR the harshest penalty be applied. In doing so, the instructor is effectively defending the case for those students that worked hard to prepare and submit work that reflects their dedicated efforts against those that would cheat to get the same grade for little to no effort put forth.

Use of Generative Artificial Intelligence in Assignment Submissions is Prohibited

This course is about the student being exposed to and learning about the concepts associated with the development of a system architecture. The student demonstrates the capture of that knowledge by expressing their own thoughts on various subjects posed to them by the instructor in assignments. Text provided by the student in responses to questions MUST originate from the student's own understanding of the issues being discussed in the assignments.

Use of AI technologies or automated tools, particularly generative AI such as ChatGPT or DALL-E, is ***not allowed*** for assignments in this class. Each student is expected to use critical and creative thinking skills to complete tasks and not rely on AI-generated ideas. Any direct use of AI-generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Student Conduct and Conflict Resolution (OSCCR).

I cannot think of any specific application use case of generative AI text in this course. If you have a specific use case in mind, inform the instructor FIRST before submitting such material in an assignment deliverable. Use of such material will only be accepted after the instructor has reviewed the proposed use case and has approved it use in a specific assignment.

Summary

As a student pursuing a Master's degree in Engineering, you should understand the gravity of these issues and commit to yourselves, and for your own integrity, to comply with these rules of conduct.

Instructor Integrity

Discrimination and Bias

As a UTEP Instructor, I, John G. Artus, do not discriminate any student from any other student on the basis of race, color, national origin, sex, religion, age, disability, genetic information, veteran's status, sexual orientation, or gender identity, or any other personal characteristic or lifestyle preference. As a UTEP Instructor, I, John G. Artus, only discriminate one student from any other student on the basis of performance on assignments and tests.

As a UTEP student, if you seek to be "discriminated" from your peers on the basis of performance, then the better the quality of your assignment submissions and the better you prepare for tests, the better grade you will receive to discriminate you from those students who do not prepare as well as you, because there will be no other basis for discrimination between one student or another in this course.

Student Participation

Students bring a wealth of knowledge and experience to this course from their respective fields; however, students' knowledge and technological expertise vary. The course is designed to be an enjoyable learning experience for everyone, with support for every participant. This course will immerse students into a community of practice so that students can develop skills and knowledge that facilitate their professional development.

Students are expected to complete all weekly content and to participate actively and respectfully on discussion boards, chats, and blogs, as well as synchronous or asynchronous collaboration tools where the main course concepts are discussed and class projects are developed. Furthermore, students should finish tests and deliver complete quality assignments and projects on time.

Regarding participation in the course, the following policies will be enforced:

- This is a graduate-level course; students are expected to manage their own participation level
  - The instructor WILL NOT "supervise" student participation
  - Students should carefully monitor their own participation level
  - It only takes a few missed assignments before students can slip into "F" territory
- The instructor WILL NOT automatically advise students when they are falling into "B" or "F" territory
  - This is strictly for students to monitor for themselves
- The instructor WILL NOT provide "make-up" assignments for students that suddenly find themselves in grade trouble for not turning in assignments, or taking tests on time
- **Students can request an evaluation of their grade status by the instructor at any time**

Class Interaction and Communication

Being Successful Online

This section has some tips about how to be successful online. Online learning is not a spectator sport. It is everyone's responsibility to participate as fully as they can so everyone can get the most from the experience. Here are some simple rules to follow to ensure your participation and engagement in the learning process:

- Ask questions: If you don't know the answer, someone else will. The discussion board is the place for asking questions related to content, or any problems (related to the class) you are having. Make sure that you have clearly indicated the subject of your message.
- Reach out to others: Offer a fact, article, link, or other item that can help others learn something you can share. Use the discussion board for this purpose.
- Both the student posting a question, and the student responding with a satisfactory answer can earn **extra credit** points by using this problem-solving mechanism.
- Be appropriate: The online classroom is not the place for insulting or insensitive comments, attacks, or venting. Inappropriate behavior can be subject to disciplinary action, as well.
- Be diplomatic: When sending messages on emotionally charged topics, try writing the message and then walk away for at least an hour before re-reading the message and then sending it. Re-reading emotionally charged messages ensures that they are constructive instead of destructive. Think respectfully of the person at the other end.
- Stay focused: Stay on topic to increase the efficiency of your learning.

Assessing Student Learning

This course uses several different methods to assess student learning. A description of each method follows:

Peer Review: In a peer review, students can get the feedback they need to become more successful in a less stressful situation. For peer review to be successful, the instructor will provide clear guidelines and/or questions to be answered by the student reviewers.

Self-Reflection/Self-Evaluation: Reflection and self-evaluation develop metacognitive thinking. By engaging in self-review, students can carry their learning into other parts of their lives and take more responsibility for their own learning. Although not all students take self-evaluation seriously, those who do will benefit greatly from it.

Group Problem Solving: Students will be assigned to a group. When students work together to solve a problem or complete a project, they learn from each other and expand learning for all. Student-to-student interaction is increased, which in turn increases student learning and assignment completion.

Each group will designate a group leader. The group leader coordinates the activities of the group, but IS NOT responsible for performing other students' work. The group leader resolves any technical problems, in coordination with the instructor, if necessary. Personnel problems are first handled by the group leader and then escalated to the instructor, if necessary. The group leader has the authority to assign tasks, review status, and resolve issues within his or her technical scope.

In business, all employees are required and expected to be respectful of all other employees. The same applies to students in groups. All students will be treated with respect and will be given a chance to voice their opinion within the group. The instructor, in coordination with the department and the university, will deal directly with any complaints from students related to lack of respect and lack of inclusion within the groups.

Ground Rules for Discussion Board Participation

Remember your place: A Web-based classroom is still a classroom, and comments that would be inappropriate in a regular classroom are likely to be inappropriate in a Web-based course as well.

This is permanent: Think carefully about the content of your message before contributing it. Once sent to the discussion board, there is no taking it back. Members of the class and the instructor will be reading any postings.

Respect your fellow students and instructor. Respect and courtesy must be provided to classmates and to instructor at all times. Do not use inappropriate language, all capital letters, or language short cuts. No harassment, flaming, or inappropriate postings will be tolerated.

Giving feedback professionally: Write constructive feedback by addressing the idea, not the person. People may have different points, positions and believes in the aspects being discussed. The discussion must be limited to the aspects/ideas only. Personal attacks are not tolerated. When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation. Even if you disagree with another student's argument, you can provide a counter-argument in a positive, constructive way.

Be forgiving: If someone states something that you find offensive, mention this directly to the instructor. Remember that the person contributing to the discussion is also new to this form of communication. What you find offensive may quite possibly have been unintended and can best be cleared up by the instructor.

Language: Given the absence of face-to-face clues, written text can easily be misinterpreted. Avoid the use of strong or offensive language and the excessive use of exclamation points. If you feel particularly strongly about a point, it may be best to write it first as a draft and then to review it, before posting it, in order to remove any strong language.

Test for clarity: Messages may often appear perfectly clear to you as you compose them, but turn out to be perfectly obtuse to your reader. One way to test for clarity is to read your message aloud to see if it flows smoothly. If you can read it to another person before posting it, even better.

Submit quality work. Online entries should be written in Standard Writing English with edited spelling, grammar, and punctuation. Although the grammar and spelling of a message typically are not graded, they do reflect on you, and your audience might not be able to decode misspelled words or poorly constructed sentences. It is a good practice to compose and check your comments in a word-processor before posting them.

Follow the parameters / Stick to the point: Follow the posting requirements and parameters set up by the instructor. Contributions to a discussion should have a clear subject header, and you need to stick to the subject. Don't waste others' time by going off on irrelevant tangents.

Read first, write later: Don't add your comments to a discussion before reading the comments of other students unless the assignment specifically asks you to do so. Ignoring your fellow students is rude. Avoid repetition of what someone else has already said. Add something new to the discussion. Comments related to the content of previous messages should be posted under them to keep related topics organized, and you should specify the person and the particular point you are following up on.

Quality posts get credit: There will be no credit given for answers that simply say “Yes” or “No” or something similar with no technical discussion. Posts should justify positions and provide specific examples. Students must demonstrate that they have read the assignment and their classmates' comments carefully and thoughtfully.

Meet the deadline: Be sure to post assignments in a timely fashion to receive credit for the discussion. Pay close attention to the posted deadlines. Late deliveries will receive a score of zero (0).

When work or personal events interfere with the class: As soon as you know that you may have a meeting, business travel, or other event that interferes with being able to complete and submit your homework on time, you must send me an email ***IMMEDIATELY,*** preferably with a one-to-two-day advanced notice, so I can take that into account when grading your work. Please send the email to my UTEP address jgartus@utep.edu.

Policy on Copyright and Fair Use

The University requires all members of its community to follow copyright and fair-use requirements. Students are individually and solely responsible for violations of copyright and fair-use laws. The University will neither protect nor defend students and will not assume any responsibility for students who violate fair-use laws. Violations of copyright laws can result in federal and state civil penalties and criminal liability, as well as disciplinary action under University policies.

Other References

- UTEP Handbook of Operating Procedures https://www.utep.edu/hoop/
- UTEP Office of Student Conduct and Conflict Resolution https://www.utep.edu/student-affairs/osccr/
- UTEP Office of Institutional Compliance https://www.utep.edu/compliance/
- UT Regents' Rules and Regulations https://www.utsystem.edu/offices/board-regents/regents-rules-and-regulations

Disability Statement

If you have a disability and need special accommodation, please contact the Center for Accommodations and Support Services (CASS) at 915-747-5148, send email to cass@utep.edu, or visit the office located in UTEP Union East, Room 106. Then notify me as soon as CASS has approved your request for accommodation. Otherwise, you are expected to complete all assignments and meet all deadlines as specified in this syllabus and as specified within the Blackboard pages for this course.

For additional information, please visit the CASS website at www.sa.utep.edu/cass.

COVID-19 Precautions

Please stay home if you (1) have been diagnosed with COVID-19, or (2) are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org

Software Requirements

In addition to technical software identified in the section titled "Required Computer Software", you will need the following software on your computers to efficiently work in this course. In some cases, your computer may already have some of these programs installed.

- **Adobe Acrobat Reader.** You can get the program by going to http://www.adobe.com/ and then clicking on the icon on the center of the screen which says 'Get Adobe Reader' Follow instructions to install the reader.
- **Adobe Flash Player.** You can get the player by going to http://www.adobe.com/ and then clicking on 'Get Adobe Flash Player'. Follow instructions to install the player.
- **Apple QuickTime Player.** You can get this player by going to http://www.apple.com/. Once there, click on the 'Downloads' tab on the top of the page and then click on QuickTime 'Download' and follow instructions.

- **Microsoft Office.** As students, you should be able to obtain this from the Engineering Technology Center at https://www.utep.edu/engineering/etc/Software/ or https://my.apps.utep.edu/
- **Email tool** with file attachment capability. Please use your UTEP email account.
  - If you do not have a UTEP e-mail account, please get one immediately. Here is how:
    - Go to https://newaccount.utep.edu/
    - Create your account (remember that your date of birth is in the form mm/dd/yyyy: two digits for the month and day, and four digits for the year).
    - After you create your account, you must wait 48 hours, then go back to the site and click on "Check on existing account." Enter your UTEP Student ID Number (e.g. 80XXXXXX) and date of birth, and you will get your login name and password. Please let one of us know if you have any difficulty. You may also call UTEP Technology Support at 915-747-4357.
    - The Technology Support desk hours are given below:
      Mon-Fri 7:00am - 8:00pm (Mountain Time)
      Sat 9:00am - 2:00pm (Mountain Time)
      Sun 12:00pm - 5:00pm (Mountain Time)

Equipment Requirements

You ***need a personal computer*** to view course material, submit assignments, and take the tests at the end of the modules. You will also need to install software applications that may require administrative privileges. You should be aware that some organizations protect their computer equipment with firewalls, other security applications, and do not provide administrative privileges to their employees. If you are using a computer from your work, you may not be able to take the tests or to install software applications required in some classes; however, this is not a valid excuse for not taking a test or uploading assignments to Blackboard on time.

Glossary

Cyber-Harassment, or the use of a computer to cause a person harm such as anxiety, distress or psychological harm, including abusive, threatening or hateful emails and messages and the posting of derogatory information online.

Cyberbullying, or intimidating messages sent directly to the victim via email or other Internet communication mediums, and/or the use of technological means to interfere with a victim's use of the Internet such as hacking or denial of services attacks. This can also include spreading rumors about the victim in internet forums or discussion boards; subscribing the victim to unwanted online services or sending messages to others in the victim's name.

Cyberstalking, or threatening behavior or unwanted advances directed at another using the Internet and other forms of online and computer communications. With personal information becoming readily available to an increasing number of people through the Internet and other advanced technology, state legislators are addressing the problem of stalkers who harass and threaten their victims over the World Wide Web.

Flaming, or hostile and insulting interaction between internet users. It is frequently the result of the discussion of heated real-world issues such as politics, religion, and philosophy, or of issues that polarize subpopulations, but can also be provoked by seemingly trivial differences.

Deliberate flaming, as opposed to flaming as a result of emotional discussions, is carried out by individuals who are specifically motivated to incite flaming. Usually, are subtler than their counterparts, or trolls, who also post inflammatory messages in an online community. Their primary intent is to provoke readers into an emotional response and disrupt normal, on-topic, discussion.

Plagiarism, or the presentation of another person's work as your own, whether you mean to or not (i.e. copying parts of or whole papers off the Internet).

Collusion, or lending work to another person to submit as his or her own.

Fabrication, or deliberately creating false information on a works cited page.