

Engineering (B.S.E.)

University Catalog Description

The School of Engineering has an ABET, Inc. accredited Bachelor of Science in engineering (B.S.E.) degree with a mechanical, electrical, or computer engineering concentration. This degree is designed to prepare students to enter professional engineering practice and to provide instruction that will serve as an adequate foundation for graduate studies. All engineering majors are required to take the Fundamentals of Engineering (FE) Exam before graduation.

#	Professional Outcomes
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3	An ability to communicate effectively with a range of audiences.
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
8	An ability to apply Christian principles of stewardship.

#	ORU Outcomes
1	Spiritual Integrity: Students will learn to hear God's voice by deepening their relationship with Jesus Christ and increasing their sensitivity to the Holy Spirit—for themselves and others. Students will pursue wholeness and integrity in their relationships with others and with God. Students will expand their biblical knowledge, approach life from a Spirit-empowered worldview, and learn to share the gospel of Jesus Christ.
2	Personal Resilience: Students will learn the skills needed for motivation and perseverance in addressing the complexities of life. Students will develop the knowledge, skills, and strategies required to adapt appropriately to changing environments. Students will honor God by embracing wellness through self-management and self-care, including physical exercise, good sleep patterns, and proper nutritional habits.
3	Intellectual Pursuit: Students will learn to develop problem-solving, critical thinking, and decision-making skills in preparation for professional careers. Students will demonstrate knowledge and an increased capacity for knowledge attainment and participate in identifying, analyzing, and creating solutions for the world's most significant problems.
4	Global Engagement: Students will learn to model respect, responsibility, flexibility, adaptability, and sacrifice as they navigate the challenges and opportunities of a globalized world. Students will learn to use multiple strategies to develop culturally responsive relationships that support and encourage constructive change.
5	Bold Vision: Students will learn to recognize, develop, and communicate bold responses to today's complex issues. Students will contemplate God's purpose for their lives and God's vision for their futures while also seeking to understand the world's challenges and how these dynamics intersect. Students will learn practical, scalable objectives that assist in moving from vision to reality and be challenged to bring hope and transformation to the world.

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Key Program Assessment & Outcome Alignment

KEY PROGRAM ASSESSMENT			PROFESSIONAL OUTCOME								ORU OUTCOME				
#	Course	Assignment Name	1	2	3	4	5	6	7	8	1. Spiritual Integrity	2. Personal Resilience	3. Intellectual Pursuit	4. Global Engagement	5. Bold Vision
1	CMPE 340	Mini Project	M												
2	EGR 101	Stewardship Essay			M	M			M	M					
3	EGR 252	Matlab Programming Project						M							
4	EGR 330	Mini Project	M												
5	EGR 461	Economics Paper			M	M			M	M	M		M		
6	EGR 461	Microfinance Project				M								M	
7	EGR 498	Design Process Quiz		M											
8	EGR 498	Ethics Quiz				M					M			M	
9	EGR 498	Senior Project Research Paper							M						M
10	EGR 499	Senior Project Experimental Test Procedures						M							
11	EGR 499	Senior Project Oral Presentation			M										
12	EGR 499	Senior Project Report	M	M	M		M	M	M			M	M		
13	ME 381	Practice Exam	M												
14	ME 381	Lego Lab						M							
15	ME 444	Application Project						M							

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Key Program Assessment #1

Course: CMPE 340

Name of Assignment: Mini Project

Date: 11/30/2022

Instructions in Brightspace *See attachment. This artifact consists of the student's mini-project paper in CMPE 340 that describes the objectives, design procedure, design schematic diagram, implementation of circuit, and outcomes of the student's project.*

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	1	Problem Formulation	Formulates problem correctly, completely and in a way that will lead to a solution	Formulates problem correctly, but not completely	Formulates problem with minor errors; incomplete formulation	Formulates problem with significant errors	Not attempted	
N/A	1	Application of Karnaugh Map	Applies concept of Karnaugh Map with no errors	Applies concept of Karnaugh Map with one error	Applies concept of Karnaugh Map with multiple errors	Shows no understanding of how to use Karnaugh Map	Not attempted	
N/A	1	Application of Finite State Machine (FSM) and Implication Chart Method (ICM)	Applies concept of FSM and ICM with no errors	Applies concept of FSM and ICM with one error	Applies concept of FSM and ICM with multiple errors	Shows no understanding of how to use FSM and ICM	Not attempted	

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Key Program Assessment #2

Course: EGR 101

Name of Assignment: Stewardship Essay

Date: 11/30/2022

Instructions in Brightspace

See attachment. This artifact consists of the student's stewardship paper in EGR 101 that expresses the student's understanding of Christian stewardship and its relationship to the field of engineering.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	4	Content	Subject knowledge is evident throughout the report; all information is clear, accurate and relevant	Appropriate content is evident throughout the report; most information is clear accurate and relevant	Appropriate content is insufficient in parts of the report; a majority of the information is clear accurate and relevant	Little evidence of appropriate content; much of the information is confusing or flawed	No evidence of appropriate content	
N/A	8	Stewardship	The implications of good engineering practices as they relate to the stewardship of time, natural resources, human resources, financial resources, and the environment are clearly addressed	The implications of good engineering practices as they relate to the stewardship of the listed categories are addressed, but with some obvious omissions of content	The implications of good engineering practices as they relate to the stewardship of most of the listed categories are addressed or all categories are addressed, but considerable content is omitted	The implications of good engineering practices as they relate to the stewardship of some of the listed categories are addressed, or all categories are addressed, but content is not acceptable	Does not address stewardship	
N/A	8	Biblical References for Stewardship	Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	No biblical references are used	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	7	Research	Clear evidence of the thorough use of research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format	Clear evidence of the adequate use of research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format with only minor errors	Clear evidence of the use of some research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format with only some errors	Evidence of the use of some research resources to gain background and additional technical knowledge for project; research information is referenced in the paper; multiple formatting errors are present	No evidence of research presented	
N/A	3	Organization	The sequence of information is logical and intuitive; paths to all information are clear and direct	The sequence of information is logical; lacks some clarity and consistency	The sequence of information is somewhat logical; some ideas seem disconnected	The sequence of information is mostly illogical; ideas seem scrambled or disconnected	The sequence of information is not logical	
N/A	3	Spelling and Grammar	The project honors all rules of spelling and grammar	The project adequately honors the rules of spelling and/or grammar (3 or less)	The project minimally honors the rules of spelling and/or grammar (6 or less)	The project has multiple errors in spelling and/or grammar (7 or more)	The project has multiple errors in spelling and/or grammar (10 or more)	
N/A	3	Format	Title page, table of contents, list of references researched and in-text references are present with no errors	Title page, table of contents, list of references researched and in-text references are present with minor errors	Title page, table of contents, list of references researched and in-text references are present with multiple errors	Title page, table of contents, list of references researched and in-text references are not all present and contain multiple errors	Multiple omissions of required items; little evidence that any effort was made to follow formatting instructions	

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Key Program Assessment #3

Course: **EGR 252**

Name of Assignment: **Matlab Programming Project**

Date: **11/30/2022**

Instructions in Brightspace

See **attachment**. This artifact consists of the student's Matlab programming project in EGR 252. The project is related to scheduling for library help desk.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	6	Specifications	The program works and meets all of the specifications	The program works and produces the correct results and displays them correctly; it also meets most of the other specifications	The program produces correct results but does not display them correctly	The program is producing incorrect results	Not attempted	
N/A	6	Documentation (Comments)	The code is exceptionally well organized and very easy to follow (80...100%)	The code is fairly easy to read (60...79%)	The code is readable only by someone who knows what it is supposed to be doing (40...59%)	The code is poorly organized and very difficult to read (less than 39%)	Not attempted	
N/A	6	Reusability (Functions)	The could be reused as a whole or each routine could be reused (min 2 functions)	Most of the code could be reused in other program (1...2 functions)	Some parts of the code could be reused in other programs (1 function)	The code is not organized for reusability (1 function)	Not attempted	
N/A	6	Efficiency	The code is extremely efficient without sacrificing readability and understanding (min 4 loops)	The code is fairly efficient without sacrificing readability and understanding (min 3 loops)	Some parts of the code are fairly efficient without sacrificing readability and understanding (min 2 loops)	The code is huge and appears to be patched together (min 1 loop)	Not attempted	
N/A	6	Demonstration	Able to test program with all cases correctly; able to answer all questions correctly (usually 3...4 questions)	Able to test program with most cases correctly; able to answer ¾ questions correctly	Able to test program with some cases correctly; able to answer 1/2 questions correctly	Unable to test program correctly; able to answer < 1/2 questions correctly	Not attempted	

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Key Program Assessment #4

Course: **EGR 330**

Name of Assignment: **Mini Project**

Date: **11/30/2022**

Instructions in Brightspace *See attachment. This artifact consists of the student's mini project in EGR 330 that is related to control systems. Students integrate analog to digital measurements for the Aurdino and signal generators.*

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up **Grade Out Of: 100 points (default = 100)**

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	1	System Implementation	Control system is successfully implemented using a microprocessor, motor, drive and sensors	Control system is implemented with minor errors using a microprocessor, motor, drive and sensors	Control system is implemented with major errors using a microprocessor, motor, drive and sensors	Control system is not successfully implemented using a microprocessor, motor, drive and sensors	Implementation not attempted	
N/A	1	System Identification	Correct Bode plot for a physical system is determined from experimental frequency response data, and the corner frequency is determined	Bode plot for a physical system is determined from experimental frequency response data with minor errors, but the corner frequency is correctly determined	Bode plot for a physical system is determined from experimental frequency response data with minor errors, and the corner frequency is incorrect	Major errors in determining Bode plot and corner frequency from experimental data	No calculation of Bode plots or corner frequency	
N/A	1	System Design	A model based control design method is successfully applied and correct controller transfer function is obtained	Major procedures of the design process are correct with minor misunderstanding and some calculation mistake	Both the design procedures and the design results are partially correct	Both the design procedures and the design results are incorrect	No calculation is done and no result is given	
N/A	1	Component Modelling	Correct models of control system sensors and actuators are developed and used in the design	Correct models of control system sensors and actuators are developed, but not used in the design	Correct models of either control system sensors or actuators, but not both are developed	Correct models of control system sensors and actuators are not developed	Not attempted	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	1	Digital System Interface	Conversion from analog to digital and digital to analog values is utilized correctly	Conversion from analog to digital and digital to analog values with small errors	Conversion from analog to digital and digital to analog values with significant errors	Conversion from analog to digital and digital to analog values is not accomplished	Not attempted	
N/A	1	Solutions	Solutions are worked out in details and concise steps with appropriate units; high accuracy is maintained	Solutions are correctly worked out with appropriate units; high accuracy is maintained	Solutions are correctly worked out with correct units and reasonable accuracy	Solutions are incorrect or incomplete with incorrect units	No attempt is made to solve for the desired quantities	

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Key Program Assessment #5

Course: **EGR 461**

Name of Assignment: **Economics Paper**

Date: **11/20/2022**

Instructions in Brightspace

See attachment. This artifact consists of the student's economics paper in EGR 461 that examines Christian stewardship and its relation to economics issues.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
3	4	Content	Subject knowledge is evident throughout the report; all information is clear, accurate and relevant	Appropriate content is evident throughout the report; most information is clear accurate and relevant	Appropriate content is insufficient in parts of the report; a majority of the information is clear accurate and relevant	Little evidence of appropriate content; much of the information is confusing or flawed	No evidence of appropriate content	
1	8	Stewardship	The implications of good engineering practices as they relate to the stewardship of time, natural resources, human resources, financial resources, and the environment are clearly addressed	The implications of good engineering practices as they relate to the stewardship of the listed categories are addressed, but with some obvious omissions of content	The implications of good engineering practices as they relate to the stewardship of most of the listed categories are addressed or all categories are addressed, but considerable content is omitted	The implications of good engineering practices as they relate to the stewardship of some of the listed categories are addressed, or all categories are addressed, but content is not acceptable	Does not address stewardship	
1	8	Biblical References for Stewardship	Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	No biblical references are used	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
3	7	Research	Clear evidence of the thorough use of research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format	Clear evidence of the adequate use of research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format with only minor errors	Clear evidence of the use of some research resources to gain background and additional technical knowledge for project; all research information is properly referenced in the paper using correct format with only some errors	Evidence of the use of some research resources to gain background and additional technical knowledge for project; research information is referenced in the paper; multiple formatting errors are present	No evidence of research presented	
3	3	Organization	The sequence of information is logical and intuitive; paths to all information are clear and direct	The sequence of information is logical; lacks some clarity and consistency	The sequence of information is somewhat logical; some ideas seem disconnected	The sequence of information is mostly illogical; ideas seem scrambled or disconnected	The sequence of information is not logical	
3	3	Spelling and Grammar	The project honors all rules of spelling and grammar	The project adequately honors the rules of spelling and/or grammar (3 or less)	The project minimally honors the rules of spelling and/or grammar (6 or less)	The project has multiple errors in spelling and/or grammar (7 or more)	The project has multiple errors in spelling and/or grammar (10 or more)	
3	3	Format	Title page, table of contents, list of references researched and in-text references are present with no errors	Title page, table of contents, list of references researched and in-text references are present with minor errors	Title page, table of contents, list of references researched and in-text references are present with multiple errors	Title page, table of contents, list of references researched and in-text references are not all present and contain multiple errors	Multiple omissions of required items; little evidence that any effort was made to follow formatting instructions	
3	4	Broader Impact	Identifies the impact of engineering solutions/technology/economic activity on the public, environment and society thoroughly and with insight	Identifies the impact of engineering solutions/technology/economic activity on the public, environment and society with insight	Identifies the impact of engineering solutions/technology/economic activity on the public, environment and society with little insight	Identifies the impact of engineering solutions/technology/economic activity on the public, environment and society with no insight	Not attempted	

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Key Program Assessment #6

Course: EGR 461

Name of Assignment: Microfinance Project

Date: 11/30/2022

Instructions in Brightspace

See attachment. This artifact consists of the student's microloan research in EGR 461.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
4	4	Demonstrated Awareness of Global Economic Issues	Discussion of microfinance demonstrates a clear awareness of global economic issues	Discussion of microfinance demonstrates a good awareness of global economic issues	Discussion of microfinance demonstrates some awareness of global economic issues	Discussion of microfinance does not demonstrate an awareness of global economic issues	Not attempted	

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Key Program Assessment #7

Course:

Name of Assignment:

Date:

Instructions in Brightspace *See attachment. This artifact consists of scanned pages from a design quiz in EGR 498 in which students must describe the design process and answer questions about it.*

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up Grade Out Of: points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	2	Student is Able to Describe the Design Process Utilizing Block Diagram Form	All blocks and connections are correct	Omitting one connection or block	Multiple block or connection omissions	No block diagram	Not attempted	

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Key Program Assessment #8

Course:

Name of Assignment:

Date:

Instructions in Brightspace *See attachment.* This artifact consists of scanned pages from a quiz in EGR 498 in which students must demonstrate an understanding and ability to apply principles of engineering ethics.

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
1	4	Identification and Description of Conflict of Interest	Correctly identifies and describes conflicts of interest.	Correctly identifies conflicts of interest, however their description is inadequate.	Correctly identifies but does not describe the conflict of interest.	Does not correctly identify the conflict of interest.	Not attempted.	
1	4	Disclosure	Correctly describes when and to whom disclosure should be made.	Describes both when and to whom disclosure should be made with minor errors or omissions.	Correctly describes either when or to whom disclosure should be made but not both.	Gives incorrect or no descriptions of both when or to whom disclosure should be made.	Not attempted.	
1, 4	4	Responsibilities of Engineers	Correctly describes the responsibilities of engineers to customers, employers, the public, and regulatory agencies.	Correctly describes the responsibilities of engineers to all but one of: customers, employers, the public, and regulatory agencies.	Correctly describes the responsibilities of engineers to all but two of: customers, employers, the public, and regulatory agencies.	Incorrectly describes the responsibilities of engineers to at least three of: customers, employers, the public, and regulatory agencies.	Not attempted.	

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Key Program Assessment #9

Course:

Name of Assignment:

Date:

Instructions in Brightspace

See attachment. This artifact consists of the student's background research paper in EGR 498 for their senior project.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
	7	Use of online and print media, and published patents.	Online, print media, and published patents are all used.	Online and print media used, but no patents.	Only one medium used.	Inadequate references.	Not attempted.	
5		Proposal Adequately Addresses Design Problem	The proposal addresses the design problem, accounts for all issues, and is likely to succeed.	The proposal addresses the design problem, accounts for most issues, and is likely to succeed.	The proposal addresses the design problem, accounts for most issues, and may succeed.	The proposal addresses the design problem, ignores several important issues, or has little chance of success.	Not attempted.	

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Key Program Assessment #10

Course:

Name of Assignment:

Date:

Instructions in Brightspace

See **attachment**. This artifact consists of the student's experimental test procedures for final research paper in EGR 499 for their senior project.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	6	Testable Experimental Problem	Experimental problem is clear and testable	Experimental problem is clear but partially testable	Experimental problem is mostly clear but not testable	Experimental problem is not clear and not testable	Not attempted	
N/A	6	Design of Experiment	Experimental design is clearly described and addresses research question	Experimental design is clearly described and is relevant to research question	Experimental design partially addresses research question	Experimental design does not address research question	Not attempted	
N/A	6	Conduct Experiment	Experiment was conducted and produced reliable data	Experiment was conducted and produced somewhat inconsistent data	Experiment was conducted but did not produce useful data	Experiment was attempted but did not produce data	Not attempted	
N/A	6	Analyze Data	Data was correctly analyzed leading to valid conclusions	Data was correctly analyzed, and justified the conclusions somewhat	Data was correctly analyzed but does not justify the conclusions	Data was incorrectly analyzed	Not attempted	

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Key Program Assessment #11

Course:

Name of Assignment:

Date:

Instructions in Brightspace

See attachment. This artifact consists of the student's oral presentation for final project presentation in EGR 499 for their senior project.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	3	Speaking and Audience Engagement	Speaker presents clearly and engages the audience (e. g. eye contact).	Speaker presents clearly and engages the audience some of the time.	Speaker presents fairly clearly but does not engage the audience.	Speaker does not present clearly.	Not attempted.	
N/A	3	Slide Quality	Slides communicate clearly and hold audience interest.	Slides communicate clearly, and most slides hold audience interest.	Slides communicate clearly.	Slides do not communicate clearly.	Not attempted.	
N/A	3	Organization of Ideas	Organizes all ideas in a logical sequence.	Organizes most ideas in a logical sequence.	Organizes some ideas in a logical sequence.	Does not organize ideas.	Not attempted.	
N/A	3	Technical Content	Technical content is evident and presented clearly in an audience appropriate manner.	Technical content is evident, presented clearly, and mostly appropriate for the audience.	Technical content is evident, mainly presented clearly and somewhat appropriate for the audience.	Technical content is lacking or not presented clearly.	Not attempted.	

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Key Program Assessment #8

Course: **EGR 499**

Name of Assignment: **Senior Project Report**

Date: **11/30/2022**

Instructions in Brightspace

See attachment. This artifact consists of the student's final research paper in EGR 499 for their senior project.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
2, 3	3	Content	Subject knowledge is evident throughout the report. All information is clear, accurate and relevant.	Appropriate content is evident throughout the report. Most information is clear, accurate and relevant.	Appropriate content is insufficient in parts of the report. A majority of the information is clear, accurate and relevant.	Little evidence of appropriate content. Much of the information is confusing or flawed.	No evidence of appropriate content.	
2, 3	2	Depth and Breadth of Project Content	Clear evidence that higher level thinking skills were used in the creation of this project.	Some evidence that higher level thinking skills were used in the creation of this project.	Little evidence that higher level thinking skills were used in the creation of this project.	No evidence of higher level thinking skills were used in the creation of this project.	Not attempted	
2, 3	3	Style and Vocabulary	Articulates appropriate vocabulary and terms associated with subject. Style enhances the readability of the paper.	Some inappropriate vocabulary. Minor errors in style that do not detract from paper.	Limited use of appropriate vocabulary. Errors in style that limit readability of paper.	Inappropriate vocabulary and use occurs. Poor style. Paper has poor readability.	No evidence of correct style.	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
2, 3	7	Research	Clear evidence of the thorough use of research resources to gain background and additional technical knowledge for project. All research information is properly referenced in the paper using correct format..	Clear evidence of the adequate use of research resources to gain background and additional technical knowledge for project. All research information is properly referenced in the paper using correct format with only minor errors.	Clear evidence of the use of some research resources to gain background and additional technical knowledge for project. All research information is properly referenced in the paper using correct format with only minor errors.	Evidence of the use of some research resources to gain background and additional technical knowledge for project. Research information is referenced in the paper. Multiple formatting errors are present.	No evidence of research presented.	
2, 3	3	Organization	The sequence of information is logical and intuitive. Paths to all information is are clear and direct.	The sequence of information is logical. Lacks some clarity and consistency.	The sequence of information is somewhat logical. Some ideas seem disconnected.	The sequence of information is mostly illogical. Ideas seem scrambled or disconnected.	The sequence of information is not logical.	
2, 3	3	Spelling and Grammar	The project honors all rules of spelling and grammar.	The project adequately honors the rules of spelling and/or grammar.(3 or less).	The project minimally honors the rules of spelling and/or grammar. (6 or less).	The project has multiple errors in spelling and/or grammar. (7 or more).	The project has multiple errors in spelling and/or grammar. (10 or more).	
2, 3	3	Format	Title page, abstract, table of contents, list of references researched, appendices and in-text references are present with no errors. Individual sections as assigned are present.	Title page, abstract, table of contents, list of references researched, appendices and in-text references are present with minor errors. Individual sections as assigned are present.	Title page, abstract, table of contents, list of references researched, appendices and in-text references are present with multiple errors. Individual sections as assigned are present.	Title page, abstract, table of contents, list of references researched, appendices and in-text references are not all present and contain multiple errors. Individual sections as assigned are missing.	Multiple omissions of required items. Little evidence that any effort was made to follow formatting instructions.	
2, 3	1	Application of Engineering Concepts	Engineering concepts were applied creatively and correctly.	Engineering concepts were applied correctly.	Little application of engineering concepts.	No understanding of engineering concepts demonstrated.	Not Attempted.	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
2, 3	2	Design Problem Statement	Problem statement shows full understanding of the problem and clearly includes the definition of completeness.	Problem statement shows some understanding of the problem and includes a fairly clear definition of completeness.	Problem statement shows some understanding of the problem, but the definition of completeness is vague.	Problem statement does not show an understanding of the problem.	Problem statement is not included.	
2, 3	2	Response to Customer Needs	Design clearly meets the need of a real or hypothetical customer.	Design is responsive to customer needs.	Design minimally benefits the customer.	The design does not have a customer.	Not attempted.	
2, 3	2	Consideration of Alternatives	Design process considers several alternatives and explains the selection.	Design process considers several alternatives, but does not explain the selection.	Little consideration of alternatives.	No consideration of alternatives.	Not attempted.	
2, 3	5	Teaming	Demonstrates an understanding of good teaming, with reference to team's experience	Demonstrates an understanding of good teaming, not connected to team's experience	Reports team's experience only.	No understanding of good teaming demonstrated.	Not attempted.	
2, 3	2	Realistic Constraints	Considers realistic constraints and design successfully addresses them	Considers realistic constraints that are partially addressed by the design	Considers realistic constraints, but these are not addressed by the design	Does not consider realistic constraints	Not attempted	
2, 3	2	Engineering Standards	Identifies and clearly discusses relevant engineering standards	Identifies relevant engineering standards	Identifies somewhat relevant engineering standards	Does not identify relevant engineering standards	Not attempted	
2, 3	1	Clear Research Question	Research question is clear and testable	Research question is clear, but not testable	Research question is mostly clear	Research question is not clear	Not attempted	
2, 3	2	Design of Experiment	Experimental design is clearly described and addresses research question	Experimental design is clearly described and is relevant to research question	Experimental design partially addresses research question	Experimental design does not address research question	Not attempted	
2, 3	6	Conduct Experiment	Experiment was conducted and produced reliable data	Experiment was conducted and produced somewhat inconsistent data	Experiment was conducted but did not produce useful data	Experiment was attempted but did not produce data	Not attempted	
2, 3	6	Analyze Data	Data was correctly analyzed leading to valid conclusions	Data was correctly analyzed, and justified the conclusions somewhat	Data was correctly analyzed but does not justify the conclusions	Data was incorrectly analyzed	Not attempted	

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
2, 3	3	Abstracts for Technical and Non-Technical Audiences	Describes project clearly for both audiences	Describes project clearly for one audience	Describes project but not clearly	Does not describe project clearly	Not attempted	

Engineering (B.S.E.)

Key Program Assessment #8

Course:

Name of Assignment:

Date:

Instructions in Brightspace *See attachment. This artifact consists of scanned pages from a practice exam in ME 381 in which students must demonstrate an understanding and ability to apply principles of engineering for bearings and gears.*

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	1	Problem Formulation: Bearing Analysis	Identifies an appropriate solution method with no errors	Identifies an appropriate solution method with one minor error	Identifies an appropriate solution method with two minor or one significant error	Does not identify an appropriate solution method	Not attempted	
N/A	1	Problem Formulation: Gear Analysis	Identifies an appropriate solution method with no errors	Identifies an appropriate solution method with one minor error	Identifies an appropriate solution method with two minor or one major error	Does not identify an appropriate solution method	Not attempted	

Engineering (B.S.E.)

Key Program Assessment #8

Course: **ME 381**

Name of Assignment: **Lego Lab**

Date: **11/30/2022**

Instructions in Brightspace

See attachment. This artifact consists of the student's report related to the Lego lab in ME 381.

Instructions for Scoring

The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.

Dropbox Set-Up

Grade Out Of: **100** points (default = 100)

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	6	Clear Research Question	Research question is clear and testable	Research question is clear, but not testable	Research question is mostly clear	Research question is not clear	Not attempted	
N/A	6	Design of Experiment	Experimental design is clearly described and addresses research question	Experimental design is clearly described and is relevant to research question	Experimental design partially addresses research question	Experimental design does not address research question	Not attempted	
N/A	6	Conduct Experiment	Experiment was conducted and produced reliable data	Experiment was conducted and produced somewhat inconsistent data	Experiment was conducted but did not produce useful data	Experiment was attempted but did not produce data	Not attempted	
N/A	6	Analyze Data	Data was correctly analyzed leading to valid conclusions	Data was correctly analyzed, and justified the conclusions somewhat	Data was correctly analyzed but does not justify the conclusions	Data was incorrectly analyzed	Not attempted	

Engineering (B.S.E.)

Key Program Assessment #8

Course:

Name of Assignment:

Date:

Instructions in Brightspace *See attachment. This artifact consists of the student's application project in ME 444. Students recommend what measurements should be made and what techniques should be used to make the measurements, including specific instruments and how much they cost.*

Instructions for Scoring *The course professor will use the scoring rubric, which is a duplicate of the rubric the candidate used, to evaluate the completed assignment. Students can access: (1) professor's feedback and their individual criterion and overall rubric score in Dropbox; (2) the percentage score in Grades; and (3) their progress on the outcomes in the Progress Summary.*

Dropbox Set-Up **Grade Out Of: 100 points (default = 100)**

ORU Outcome	Program Outcome	Criterion Description/Name	Level 4 Description	Level 3 Description	Level 2 Description	Level 1 Description	Level 0 Description	% Gradebook Weighting
N/A	6	Experiment Objectives	Selects all appropriate variables & their ranges that should be measured	1 incorrect or missing variable or range that should be measured	2 incorrect or missing variables or their ranges that should be measured	More than 2 incorrect or missing variables or their ranges that should be measured	No attempt to select appropriate variables & their ranges	
N/A	6	Instrument Selection	Selects all appropriate instruments to measure needed variables	All instruments selected would work but better choices available	Improperly selected 1 instrument	Multiple instruments improperly selected	No attempt to select appropriate instruments	
N/A	6	Experimental Design	Measurement frequency & location for all devices properly specified	Only 1 measurement frequency or location improperly specified	Total of 2 measurement frequencies or locations improperly specified	More than 2 measurement frequencies or locations improperly specified	Measurement frequencies and locations not specified	