

# WPA-EGRB-Master Rubric

Course: ORU Online

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-A- Application of Engineering Concepts	4 points  Engineering concepts applied creatively and correctly	3 points  Engineering concepts applied correctly	2 points  Little application of engineering concepts	1 point  No understanding of engineering concepts demonstrated	0 points  Not attempted	/ 4
EGRB-1-B- Formulas	4 points  Appropriate, concise, and direct formulas accurately applied in logical sequence	3 points  Correct formulas accurately applied in logical sequence	2 points  Correct formulas properly applied	1 point  Incorrect or irrelevant formulas applied, or formulas misapplied	0 points  No formula applied	/ 4
EGRB-1-C- Problem Solving Using Energy Methods	4 points  Applies concept of energy with no errors	3 points  Applies concept of energy with one error	2 points  Applies concept of energy with multiple errors	1 point  Shows no understanding of how to use energy methods	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-D- Problem Solving Using Momentum	4 points  Applies concept of momentum with no errors	3 points  Applies concept of momentum with one error	2 points  Applies concept of momentum with multiple errors	1 point  Shows no understanding of how to use momentum methods	0 points  Not attempted	/ 4
EGRB-1-E- Schematic Diagrams and Waveforms	4 points  Circuit schematics, diagrams, and waveforms correctly and neatly drawn and labeled consistent with symbols and values used	3 points  Circuit schematics, diagrams, and waveforms correctly drawn and labeled consistent with symbols and values used	2 points  Circuit schematics, diagrams, and waveforms correctly drawn and labeled with symbols and values used	1 point  Incorrect or illegible circuit schematics, diagrams, and waveforms drawn, or acceptable drawing, but without labeling	0 points  No circuit schematics, diagrams, and waveforms drawn	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-F-Theories	4 points Appropriate laws and rules applied; proper and consistent assumptions made following universally accepted standards	3 points Appropriate laws and rules applied; proper assumptions made and listed	2 points Appropriate laws and rules applied with primary assumptions listed	1 point Incorrect or irrelevant laws and rules applied, and incomplete assumptions applied	0 points No law and assumption applied	/ 4
EGRB-1-G-Theories and Assumptions	4 points Appropriate laws and rules applied; proper and consistent assumptions made following universally accepted standards	3 points Appropriate laws and rules applied; proper assumptions made and listed	2 points Appropriate laws and rules applied with primary assumptions listed	1 point Incorrect or irrelevant laws and rules applied, and incomplete assumptions applied	0 points No law and assumption applied	/ 4
EGRB-1-H-Vectors	4 points Applies vectors with no errors	3 points Applies vectors with one minor error	2 points Applies vectors with one error or two minor errors	1 point Applies vectors with multiple errors	0 points Use of vectors not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-I- Assumptions	4 points  Appropriate assumptions applied and listed along with explanations of relevant implications	3 points  Appropriate assumptions applied, with primary assumptions listed	2 points  Appropriate assumptions applied	1 point  Incorrect or incomplete assumptions applied	0 points  Assumptions not applied	/ 4
EGRB-1-J- Diagrams	4 points  All pertinent diagrams neatly and correctly drawn to assist in solution procedure	3 points  All pertinent diagrams correctly drawn to assist in solution procedure	2 points  Diagrams correctly drawn to assist in solution procedure	1 point  Incorrect or illegible diagrams drawn	0 points  Diagrams not drawn	/ 4
EGRB-1-K- Formulas	4 points  Governing mathematical and physical relations accurately and efficiently applied in logical sequence	3 points  Governing mathematical and physical relations accurately applied in logical sequence	2 points  Governing mathematical and physical relations accurately applied	1 point  Incorrect or incomplete mathematical and physical relations applied, or correct relations misapplied	0 points  Mathematical and physical relations not applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-L-Information	4 points Problems accurately interpreted and clearly restated; given information correctly applied with appropriate units	3 points Problems accurately interpreted and given information correctly applied	2 points Given information correctly applied	1 point Incorrect or irrelevant information applied	0 points Given information not applied	/ 4
EGRB-1-M-Problem Formulation: Rigid Bodies, Translation and Rotation	4 points Formulates problem correctly, completely, and in a way that will lead to a solution	3 points Formulates problem correctly, but not completely	2 points Formulates problem with minor errors; incomplete formulation	1 point Formulates problem with significant errors	0 points Does not formulate problem	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-1-N-Solutions	4 points  Solutions worked out in detailed and concise steps with appropriate units; high accuracy maintained by retaining adequate decimal points; a check is conducted	3 points  Solutions correctly worked out with appropriate units; high accuracy maintained by retaining adequate decimal points	2 points  Solutions correctly worked out with correct units; reasonable accuracy maintained	1 point  Solutions incorrect or incomplete with incorrect units	0 points  No attempt made to solve for desired quantities	/ 4
EGRB-2-A-Consideration of Alternatives	4 points  Design process considers several alternatives and explains selection	3 points  Design process considers several alternatives, but does not explain selection	2 points  Little consideration of alternatives	1 point  No consideration of alternatives	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-2-B- Depth and Breadth of Project Content	4 points  Clear evidence that higher level thinking skills were used in creation of project	3 points  Some evidence that higher level thinking skills were used in creation of this project	2 points  Little evidence that higher level thinking skills were used in creation of this project	1 point  No evidence of higher level thinking skills were used in creation of this project	0 points  Not attempted	/ 4
EGRB-2-C- Design Problem Statement	4 points  Problem statement shows full understanding of problem and clearly includes definition of completeness	3 points  Problem statement shows some understanding of problem and includes fairly clear definition of completeness	2 points  Problem statement shows some understanding of problem, but definition of completeness vague	1 point  Problem statement does not show understanding of problem	0 points  Problem statement not included	/ 4
EGRB-2-D- Engineering Standards	4 points  Identifies and clearly discusses relevant engineering standards	3 points  Identifies relevant engineering standards	2 points  Identifies somewhat relevant engineering standards	1 point  Does not identify relevant engineering standards	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-2-E- Realistic Constraints	4 points  Considers realistic constraints and design successfully addresses them	3 points  Considers realistic constraints that are partially addressed by design	2 points  Considers realistic constraints, but these are not addressed by design	1 point  Does not consider realistic constraints	0 points  Not attempted	/ 4
EGRB-2-F- Response to Customer Needs	4 points  Design clearly meets need of real or hypothetical customer	3 points  Design responsive to customer needs	2 points  Design minimally benefits customer	1 point  Design does not have a customer	0 points  Not attempted	/ 4
EGRB-2-G- Description of Design Process	4 points  Able to completely describe design process	3 points  Able to describe design process with one omission	2 points  Able to describe design process with multiple omissions	1 point  Not able to describe design process	0 points  Not attempted	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-3-A-Content	4 points  Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points  Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points  Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point  Little evidence of appropriate content; much of information confusing or flawed	0 points  No evidence of appropriate content	/ 4
EGRB-3-B-Format	4 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with no errors; individual sections as assigned are present	3 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with minor errors; individual sections as assigned are present	2 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with multiple errors; individual sections as assigned are present	1 point  Title page, abstract, table of contents, list of references researched, appendices and in-text references not all present and contain multiple errors; individual sections as assigned are missing	0 points  Multiple omissions of required items; little evidence of any effort to follow formatting instructions	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-3-C-Organization	4 points Sequence of information logical and intuitive; paths to all information clear and direct	3 points Sequence of information logical; lacks some clarity and consistency	2 points Sequence of information somewhat logical; some ideas seem disconnected	1 point Sequence of information mostly illogical; ideas seem scrambled or disconnected	0 points Sequence of information not logical	/ 4
EGRB-3-D-Organization of Ideas	4 points Organizes all ideas in a logical sequence	3 points Organizes most ideas in a logical sequence	2 points Organizes some ideas in a logical sequence	1 point Does not organize ideas	0 points Not attempted	/ 4
EGRB-3-E-Slide Quality	4 points Slides communicate clearly and hold audience interest	3 points Slides communicate clearly, and most slides hold audience interest	2 points Slides communicate clearly	1 point Slides do not communicate clearly	0 points Not attempted	/ 4
EGRB-3-F-Speaking and Audience Engagement	4 points Speaker presents clearly and engages audience (e. g. eye contact)	3 points Speaker presents clearly and engages audience some of the time	2 points Speaker presents fairly clearly but does not engage audience	1 point Speaker does not present clearly	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-3-G- Spelling and Grammar	4 points  Project honors all rules of spelling and grammar	3 points  Project adequately honors rules of spelling and/or grammar (3 or less)	2 points  Project minimally honors rules of spelling and/or grammar (6 or less)	1 point  Project has multiple errors in spelling and/or grammar (7 or more)	0 points  Project has multiple errors in spelling and/or grammar (10 or more)	/ 4
EGRB-3-H- Style and Vocabulary	4 points  Articulates appropriate vocabulary and terms associated with subject; style enhances readability of paper	3 points  Some inappropriate vocabulary; minor errors in style that do not detract from paper	2 points  Limited use of appropriate vocabulary; errors in style that limit readability of paper	1 point  Inappropriate vocabulary and use occurs; poor style; paper has poor readability	0 points  No evidence of correct style	/ 4
EGRB-3-I- Technical Content	4 points  Technical content evident and presented clearly in an audience appropriate manner	3 points  Technical content evident, presented clearly, and mostly appropriate for audience	2 points  Technical content evident, mainly presented clearly and somewhat appropriate for audience	1 point  Technical content lacking or not presented clearly	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-4-A-Disclosure	4 points Correctly describes when and to whom disclosure should be made	3 points Describes both when and to whom disclosure should be made with minor errors or omissions	2 points Correctly describes either when or to whom disclosure should be made, but not both	1 point Gives incorrect or no descriptions of both when or to whom disclosure should be made	0 points Not attempted	/ 4
EGRB-4-B-Identification and Description of Conflict of Interest	4 points Correctly identifies and describes conflicts of interest	3 points Correctly identifies conflicts of interest; however, their description is inadequate	2 points Correctly identifies but does not describe conflict of interest	1 point Does not correctly identify conflict of interest	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-4-C-Responsibilities of Engineers	4 points Correctly describes responsibilities of engineers to customers, employers, the public, and regulatory agencies	3 points Correctly describes responsibilities of engineers to all but one of the following: customers, employers, the public, and regulatory agencies	2 points Correctly describes responsibilities of engineers to all but two of the following: customers, employers, the public, and regulatory agencies	1 point Incorrectly describes responsibilities of engineers to at least three of the following: customers, employers, the public, and regulatory agencies	0 points Not attempted	/ 4
EGRB-4-D-Content	4 points Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point Little evidence of appropriate content; much of the information is confusing or flawed	0 points No evidence of appropriate content	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-4-E-Broader Impact	4 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society thoroughly and with insight	3 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with insight	2 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with little insight	1 point Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with no insight	0 points Not attempted	/ 4
EGRB-5-A-Teaming	4 points Demonstrates understanding of good teaming, with reference to team's experience	3 points Demonstrates understanding of good teaming, not connected to team's experience	2 points Reports team's experience only	1 point No understanding of good teaming demonstrated	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-6-A- Data Analysis and Interpretation	4 points  Precise and correct conclusions reached from both theoretical and measured data; discrepancy, if any, correctly discovered and interpreted with convincing reasoning	3 points  Correct conclusions reached from both theoretical and measured data; discrepancy, if any, discovered and interpreted with minor error in reasoning	2 points  Correct conclusions reached, both theoretical and measured	1 point  Conclusions incorrect or irrelevant with no explanation for discrepancy between theoretical and measured data	0 points  No attempt to reach any conclusion and to discover discrepancy between theoretical and measured data	/ 4
EGRB-6-B- Equipment Selection	4 points  All equipment correctly identified and selected with correct rating	3 points  All equipment correctly identified and selected with some misunderstanding in rating and settings	2 points  Most equipment correctly identified and selected with some misunderstanding in rating	1 point  Most selected equipment irrelevant or with wrong rating	0 points  No attempt to select any equipment	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-6-C- Experiment Procedures and Data Measurement	4 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected; all required data correctly measured	3 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected with minor error in measuring required data	2 points  Most experiment procedures correctly listed; circuit correctly connected with part of component mistaken and wrong measured data	1 point  Most experiment procedures incorrect; circuit misconnected with some component mistaken; most measured data incorrect	0 points  No attempt to connect circuit and to do any measurement	/ 4
EGRB-6-D- Theoretical Value Calculation	4 points  All required theoretical values calculated correctly following required format	3 points  All required theoretical values calculated following required format with minor miscalculation	2 points  All required theoretical values calculated without following required format and with minor miscalculation	1 point  Irrelevant formulas used and most theoretical values incorrect	0 points  No attempt to do any calculation	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-6-E-Theory	4 points Circuits clearly understood and all required formulas listed correctly	3 points Circuits clearly understood with minor errors in formulas	2 points Understand circuit with part of missing or redundant formulas	1 point Circuit misunderstood with irrelevant formulas	0 points No attempt to describe or explain circuit theory	/ 4
EGRB-6-F-Test Program with All Possible Inputs	4 points Able to test program with all cases correctly	3 points Able to test program with most cases correctly	2 points Able to test program with some cases correctly	1 point Unable to test program correctly	0 points No attempt to test program	/ 4
EGRB-6-G-Clear Research Question	4 points Research question clear and testable	3 points Research question clear, but not testable	2 points Research question mostly clear	1 point Research question not clear	0 points Not attempted	/ 4
EGRB-6-H-Design of Experiment	4 points Experimental design clearly described and addresses research question	3 points Experimental design clearly described and relevant to research question	2 points Experimental design partially addresses research question	1 point Experimental design does not address research question	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-6-I- Conduct Experiment	4 points  Experiment conducted and produced reliable data	3 points  Experiment conducted and produced somewhat inconsistent data	2 points  Experiment conducted but did not produce useful data	1 point  Experiment attempted but did not produce data	0 points  Not attempted	/ 4
EGRB-6-J- Analyze Data	4 points  Data correctly analyzed leading to valid conclusions	3 points  Data correctly analyzed, and somewhat justified the conclusions	2 points  Data correctly analyzed but does not justify the conclusions	1 point  Data incorrectly analyzed	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-7-A-Research	4 points  Clear evidence of thorough use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format	3 points  Clear evidence of adequate use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only minor errors	2 points  Clear evidence of use of some research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only some errors	1 point  Evidence of use of some research resources to gain background and additional technical knowledge for project; research information referenced in paper; multiple formatting errors present	0 points  No evidence of research presented	/ 4
EGRB-7-B-Use of Online and Print Media and Published Patents	4 points  All three media used	3 points  Online and print media used, but no patents	2 points  Only one medium used	1 point  Inadequate references	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-8-A-Biblical References for Stewardship	4 points  Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	3 points  Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	2 points  Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	1 point  Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	0 points  No biblical references used	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGRB-8-B-Stewardship	4 points  Implications of good engineering practices as they relate to stewardship of time, natural resources, human resources, financial resources, and the environment clearly addressed	3 points  Implications of good engineering practices as they relate to stewardship of listed categories addressed, but with some obvious omissions of content	2 points  Implications of good engineering practices as they relate to stewardship of most of listed categories addressed, or all categories addressed, but considerable content omitted	1 point  Implications of good engineering practices as they relate to stewardship of some of listed categories addressed, or all categories addressed, but content not acceptable	0 points  Does not address stewardship	/ 4
EGRB-8-C-References to Christian Worldview	4 points  Uses appropriate references for all contemporary issues with appropriate discussion	3 points  Uses appropriate references for most of the contemporary issues with appropriate discussion or presents limited discussion for the issues	2 points  Uses appropriate references for some of the contemporary issues with appropriate discussion or presents limited discussion for some of the issues	1 point  Uses appropriate references for one of the contemporary issues with appropriate discussion or presents limited discussion for two of the issues	0 points  No references used	/ 4

Total	/ 204
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Overall Score

<b>Level 4</b> 184 points minimum	<b>Level 3</b> 122 points minimum	<b>Level 2</b> 71 points minimum	<b>Level 1</b> 31 points minimum	<b>Level 0</b> 0 points minimum
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# WPA-EGR-CEC-Master Rubric

Course: ORU Online

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-A- Application of Engineering Concepts	4 points  Engineering concepts applied creatively and correctly	3 points  Engineering concepts applied correctly	2 points  Little application of engineering concepts	1 point  No understanding of engineering concepts demonstrated	0 points  Not attempted	/ 4
EGR-CEC-1-B- Application of Finite State Machine and Implication Chart Method	4 points  Applies concept of FSM and ICM with no errors	3 points  Applies concept of FSM and ICM with one error	2 points  Applies concept of FSM and ICM with multiple errors	1 point  Shows no understanding of how to use FSM and ICM	0 points  Not attempted	/ 4
EGR-CEC-1-C- Application of Karnaugh Map	4 points  Applies concept of Karnaugh Map with no errors	3 points  Applies concept of Karnaugh Map with one error	2 points  Applies concept of Karnaugh Map with multiple errors	1 point  Shows no understanding of how to use Karnaugh Map	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-D- Assumptions	4 points  Appropriate assumptions made and listed, along with explanations of relevant implications	3 points  Appropriate assumptions made, with primary assumptions listed	2 points  Correct assumptions made	1 point  Incorrect or incomplete assumptions applied	0 points  Assumptions not applied	/ 4
EGR-CEC-1-E- Diagrams and Curves	4 points  Pertinent diagrams and curves neatly and correctly drawn, and clearly and appropriately labeled to assist in solution procedure	3 points  Pertinent diagrams and curves correctly drawn and clearly labeled to assist in solution procedure	2 points  Diagrams and curves correctly drawn and labeled to assist in solution procedure	1 point  Diagrams and curves incorrect or illegible, or not labeled at all	0 points  Neither diagram nor curve drawn	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-F- Formulas	4 points  Appropriate, concise, and direct formulas accurately applied in logical sequence	3 points  Correct formulas accurately applied in logical sequence	2 points  Correct formulas properly applied	1 point  Incorrect or irrelevant formulas applied, or formulas misapplied	0 points  No formula applied	/ 4
EGR-CEC-1-G- Information	4 points  Problems accurately interpreted and clearly restated; necessary information correctly applied	3 points  Problems partially restated and necessary information correctly applied	2 points  Necessary information correctly applied	1 point  Incorrect or irrelevant information applied	0 points  Information not applied	/ 4
EGR-CEC-1-H- Problem Formation	4 points  Formulates problem correctly, completely, and in a way that will lead to a solution	3 points  Formulates problem correctly, but not completely	2 points  Formulates problem with minor errors; incomplete formulation	1 point  Formulates problem with significant errors	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-I-Schematic Diagrams and Waveforms	4 points Circuit schematics, diagrams, and waveforms correctly and neatly drawn, and labeled consistent with symbols and values used	3 points Circuit schematics, diagrams, and waveforms correctly drawn, and labeled consistent with symbols and values used	2 points Circuit schematics, diagrams, and waveforms correctly drawn, and labeled with symbols and values used	1 point Incorrect or illegible circuit schematics, diagrams, and waveforms drawn, or acceptable drawing, but with no labeling	0 points No circuit schematics, diagrams and waveforms drawn	/ 4
EGR-CEC-1-J-Solutions	4 points Solutions worked out in detailed and concise steps with appropriate units; high accuracy maintained	3 points Solutions correctly worked out with appropriate units; high accuracy maintained	2 points Solutions correctly worked out with correct units and reasonable accuracy	1 point Solutions incorrect or incomplete with incorrect units	0 points No attempt made to solve for desired quantities	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-K-Theories	4 points Knowledge from mathematics and physics fully and accurately applied for system modeling and analysis	3 points Knowledge from mathematics and physics accurately applied	2 points Knowledge from mathematics and physics applied with minor errors	1 point Incorrect or irrelevant knowledge from mathematics and physics applied	0 points No knowledge from mathematics and physics applied	/ 4
EGR-CEC-1-L-Theories and Assumptions	4 points Appropriate laws and rules applied; proper and consistent assumptions made following universally accepted standards	3 points Appropriate laws and rules applied; proper assumptions made and listed	2 points Appropriate laws and rules applied with primary assumptions listed	1 point Incorrect or irrelevant laws and rules applied, and incomplete assumptions applied	0 points No laws and assumptions applied	/ 4

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EGR-CEC-1-M- Assumptions	4 points  Appropriate assumptions applied and listed along with explanations of relevant implications	3 points  Appropriate assumptions applied, with the primary assumptions listed	2 points  Appropriate assumptions applied	1 point  Incorrect or incomplete assumptions applied	0 points  Assumptions not applied	/ 4
EGR-CEC-1-N- Diagrams	4 points  All pertinent diagrams neatly and correctly drawn to assist in solution procedure	3 points  All pertinent diagrams correctly drawn to assist in solution procedure	2 points  Diagrams correctly drawn to assist in solution procedure	1 point  Incorrect or illegible diagrams drawn	0 points  Diagrams not drawn	/ 4
EGR-CEC-1-O- Formulas	4 points  Governing mathematical and physical relations accurately and efficiently applied in logical sequence	3 points  Governing mathematical and physical relations accurately applied in logical sequence	2 points  Governing mathematical and physical relations accurately applied	1 point  Incorrect or incomplete mathematical and physical relations applied, or correct relations are misapplied	0 points  Mathematical and physical relations are applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-1-P-Information	4 points Problems accurately interpreted and clearly restated; given information correctly applied with appropriate units	3 points Problems accurately interpreted and given information correctly applied	2 points Given information correctly applied	1 point Incorrect or irrelevant information is applied	0 points Given information not applied	/ 4
EGR-CEC-1-Q-Solutions	4 points Solutions worked out in details and concise steps with appropriate units; high accuracy maintained by retaining adequate decimal points; a check is conducted	3 points Solutions correctly worked out with appropriate units; high accuracy maintained by retaining adequate decimal points	2 points Solutions correctly worked out with correct units; reasonable accuracy maintained	1 point Solutions incorrect or incomplete with incorrect units	0 points No attempt made to solve for desired quantities	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-2-A- Consideration of Alternatives	4 points  Design process considers several alternatives and explains selection	3 points  Design process considers several alternatives, but does not explain selection	2 points  Little consideration of alternatives	1 point  No consideration of alternatives	0 points  Not attempted	/ 4
EGR-CEC-2-B- Depth and Breadth of Project Content	4 points  Clear evidence of higher level thinking skills used in creation of project	3 points  Some evidence of higher level thinking skills used in creation of project	2 points  Little evidence of higher level thinking skills used in creation of project	1 point  No evidence of higher level thinking skills used in creation of project	0 points  Not attempted	/ 4
EGR-CEC-2-C- Design Problem Statement	4 points  Problem statement shows full understanding of problem and clearly includes definition of completeness	3 points  Problem statement shows some understanding of problem and includes fairly clear definition of completeness	2 points  Problem statement shows some understanding of problem, but definition of completeness vague	1 point  Problem statement does not show understanding of problem	0 points  Problem statement not included	/ 4

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EGR-CEC-2-D- Engineering Standards	4 points  Identifies and clearly discusses relevant engineering standards	3 points  Identifies relevant engineering standards	2 points  Identifies somewhat relevant engineering standards	1 point  Does not identify relevant engineering standards	0 points  Not attempted	/ 4
EGR-CEC-2-E- Realistic Constraints	4 points  Considers realistic constraints and design successfully addresses them	3 points  Considers realistic constraints partially addressed by design	2 points  Considers realistic constraints, but not addressed by design	1 point  Does not consider realistic constraints	0 points  Not attempted	/ 4
EGR-CEC-2-F- Response to Customer Needs	4 points  Design clearly meets needs of real or hypothetical customer	3 points  Design responsive to customer needs	2 points  Design minimally benefits customer	1 point  The design does not have a customer	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-2-G- Description of Design Process	4 points  Able to describe design process completely	3 points  Able to describe design process with one omission	2 points  Able to describe design process with multiple omissions	1 point  Not able to describe design process at all	0 points  Not attempted	/ 4
EGR-CEC-3-A- Content	4 points  Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points  Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points  Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point  Little evidence of appropriate content; much information confusing or flawed	0 points  No evidence of appropriate content	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-3-C- Format	4 points  Title page, abstract, table of contents, list of references researched, appendices, and in-text references present with no errors; individual sections as assigned are present	3 points  Title page, abstract, table of contents, list of references researched, appendices, and in-text references present with minor errors; individual sections as assigned are present	2 points  Title page, abstract, table of contents, list of references researched, appendices, and in-text references present with multiple errors; individual sections as assigned are present	1 point  Title page, abstract, table of contents, list of references researched, appendices, and in-text references not all present and contain multiple errors; individual sections as assigned are missing	0 points  Multiple omissions of required items; little evidence of any effort to follow formatting instructions	/ 4
EGR-CEC-3-D- Organization	4 points  Sequence of information logical and intuitive; paths to all information clear and direct	3 points  Sequence of information logical; lacks some clarity and consistency	2 points  Sequence of information somewhat logical; some ideas seem disconnected	1 point  Sequence of information mostly illogical; ideas seem scrambled or disconnected	0 points  Sequence of information not logical	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-3-E-Organization of Ideas	4 points Organizes all ideas in logical sequence	3 points Organizes most ideas in logical sequence	2 points Organizes some ideas in logical sequence	1 point Does not organize ideas	0 points Not attempted	/ 4
EGR-CEC-3-F-Slide Quality	4 points Slides communicate clearly and hold audience interest	3 points Slides communicate clearly, and most slides hold audience interest	2 points Slides communicate clearly	1 point Slides do not communicate clearly	0 points Not attempted	/ 4
EGR-CEC-3-G-Speaking and Audience Engagement	4 points Speaker presents clearly and engages audience (e. g. eye contact)	3 points Speaker presents clearly and engages audience some of the time	2 points Speaker presents fairly clearly but does not engage audience	1 point Speaker does not present clearly	0 points Not attempted	/ 4
EGR-CEC-3-H-Spelling and Grammar	4 points Project honors all rules of spelling and grammar	3 points Project adequately honors rules of spelling and/or grammar (3 or less)	2 points Project minimally honors rules of spelling and/or grammar (6 or less)	1 point Project has multiple errors in spelling and/or grammar (7 or more)	0 points Project has multiple errors in spelling and/or grammar (10 or more)	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-3-I- Style and Vocabulary	4 points  Articulates appropriate vocabulary and terms associated with subject; style enhances readability of paper	3 points  Some inappropriate vocabulary; minor errors in style that do not detract from paper	2 points  Limited use of appropriate vocabulary; errors in style that limit readability of paper	1 point  Inappropriate vocabulary and use occurs; poor style; paper has poor readability	0 points  No evidence of correct style	/ 4
EGR-CEC-3-J- Technical Content	4 points  Technical content evident and presented clearly in audience appropriate manner	3 points  Technical content evident, presented clearly, and mostly appropriate for audience	2 points  Technical content evident, mainly presented clearly, and somewhat appropriate for audience	1 point  Technical content lacking or not presented clearly	0 points  Not attempted	/ 4
EGR-CEC-4-A- Disclosure	4 points  Correctly describes when and to whom disclosure should be made	3 points  Describes both when and to whom disclosure should be made with minor errors or omissions	2 points  Correctly describes either when or to whom disclosure should be made but not both	1 point  Gives incorrect or no descriptions of both when or to whom disclosure should be made	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-4-B- Identification and Description of Conflict of Interest	4 points  Correctly identifies and describes conflicts of interest	3 points  Correctly identifies conflicts of interest; however, description is inadequate	2 points  Correctly identifies but does not describe conflict of interest	1 point  Does not correctly identify conflict of interest	0 points  Not attempted	/ 4
EGR-CEC-4-C- Responsibilities of Engineers	4 points  Correctly describes responsibilities of engineers to customers, employers, the public, and regulatory agencies	3 points  Correctly describes responsibilities of engineers to all but one of the following: customers, employers, the public, and regulatory agencies	2 points  Correctly describes responsibilities of engineers to all but two of the following: customers, employers, the public, and regulatory agencies	1 point  Incorrectly describes responsibilities of engineers to at least three of the following: customers, employers, the public, and regulatory agencies	0 points	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-4-D-Broader Impact	4 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society thoroughly and with insight	3 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with insight	2 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with little insight	1 point Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with no insight	0 points Not attempted	/ 4
EGR-CEC-4-E-Content	4 points Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point Little evidence of appropriate content; much information is confusing or flawed	0 points No evidence of appropriate content	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-5-A-Teaming	4 points  Demonstrates understanding of teaming, with reference to team's experience	3 points  Demonstrates understanding of good teaming, not connected to team's experience	2 points  Reports team's experience only	1 point  No understanding of good teaming demonstrated	0 points  Not attempted	/ 4
EGR-CEC-6-A-Data Analysis and Interpretation	4 points  Precise and correct conclusions reached from both theoretical and measured data; discrepancy, if any, correctly discovered and interpreted with convincing reasoning	3 points  Correct conclusions reached from both theoretical and measured data; discrepancy, if any, discovered and interpreted with minor error in reasoning	2 points  Correct conclusions reached, both theoretical and measured	1 point  Conclusions incorrect or irrelevant with no explanation for discrepancy between theoretical and measured data	0 points  No attempt to reach any conclusion and to discover discrepancy between theoretical and measured data	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-6-B- Equipment Selection	4 points  All equipment correctly identified and selected with correct rating	3 points  All equipment correctly identified and selected with some misunderstanding in rating and settings	2 points  Most equipment correctly identified and selected with some misunderstanding in rating	1 point  Most selected equipment irrelevant or with wrong rating	0 points  No attempt to select any equipment	/ 4
EGR-CEC-6-C- Experiment Procedures and Data Measurement	4 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected; all required data correctly measured	3 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected with minor error in measuring required data	2 points  Most experiment procedures correctly listed; circuit correctly connected with part of component mistaken and wrong measured data	1 point  Most experiment procedures incorrect; circuit misconnected with some component mistaken; most measured data incorrect	0 points  No attempt to connect circuit or to do any measurement	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-6-D-Theoretical Value Calculation	4 points All theoretical values required calculated correctly following required format	3 points All theoretical values required calculated following required format with minor miscalculation	2 points All theoretical values required calculated without following required format and with minor miscalculation	1 point Irrelevant formulas used and most theoretical values incorrect	0 points No attempt to do any calculation	/ 4
EGR-CEC-6-E-Theory	4 points Circuits clearly understood and all required formulas listed correctly	3 points Circuits clearly understood with minor errors in formulas	2 points Understands circuit with part of missing or redundant formulas	1 point Circuit misunderstood with irrelevant formulas	0 points No attempt to describe or explain circuit theory	/ 4
EGR-CEC-6-F-Test Program with All Possible Inputs	4 points Able to test program with all cases correctly	3 points Able to test program with most cases correctly	2 points Able to test program with some cases correctly	1 point Unable to test program correctly	0 points No attempt to test program	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-6-G- Clear Research Question	4 points Research question clear and testable	3 points Research question is clear, but not testable	2 points Research question mostly clear	1 point Research question not clear	0 points Not attempted	/ 4
EGR-CEC-6-H- Design of Experiment	4 points Experimental design clearly described and addresses research question	3 points Experimental design clearly described and is relevant to research question	2 points Experimental design partially addresses research question	1 point Experimental design does not address research question	0 points Not attempted	/ 4
EGR-CEC-6-I- Conduct Experiment	4 points Experiment conducted and produced reliable data	3 points Experiment conducted and produced somewhat inconsistent data	2 points Experiment conducted but did not produce useful data	1 point Experiment attempted but did not produce data	0 points Not attempted	/ 4
EGR-CEC-6-J- Analyze Data	4 points Data correctly analyzed leading to valid conclusions	3 points Data correctly analyzed leading to valid conclusions	2 points Data correctly analyzed but does not justify the conclusions	1 point Data incorrectly analyzed	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-7-A- Research	4 points  Clear evidence of thorough use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format	3 points  Clear evidence of adequate use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only minor errors	2 points  Clear evidence of use of some research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only some errors	1 point  Evidence of use of some research resources to gain background and additional technical knowledge for project; research information referenced in paper; multiple formatting errors present	0 points  No evidence of research presented	/ 4
EGR-CEC-7-B- Use of Online and Print media and Published Patents	4 points  All three media used	3 points  Online and print media used, but no patents	2 points  Only one medium used	1 point  Inadequate references	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-8-A-Biblical References for Stewardship	4 points  Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	3 points  Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	2 points  Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	1 point  Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	0 points  No biblical references used	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-CEC-8-B-Stewardship	4 points  Implications of good engineering practices as they relate to stewardship of time, natural resources, human resources, financial resources, and environment clearly addressed	3 points  Implications of good engineering practices as they relate to stewardship of listed categories addressed, but with some obvious omissions of content	2 points  Implications of good engineering practices as they relate to stewardship of most of the listed categories addressed, or all categories addressed, but considerable content omitted	1 point  Implications of good engineering practices as they relate to stewardship of some of the listed categories addressed, or all categories addressed, but content not acceptable	0 points  Does not address stewardship	/ 4

Total / 212

## Overall Score

**Level 4**  
191 points minimum

**Level 3**  
127 points minimum

**Level 2**  
74 points minimum

**Level 1**  
32 points minimum

**Level 0**  
0 points minimum

## School of Engineering

### College of Science and Engineering

### Master Program Outcome Rubrics

<u>Program</u>	<u>Page</u>
Biomedical Engineering (B.S.) .....	2
Engineering (B.S.E.)	
Computer .....	24
Electrical .....	46
Mechanical .....	64

# WPA-EGR-EEC-Master Rubric

Course: ORU Online

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-A- Application of Engineering Concepts	4 points  Engineering concepts applied creatively and correctly	3 points  Engineering concepts applied correctly	2 points  Little application of engineering concepts	1 point  No understanding of engineering concepts demonstrated	0 points  Not attempted	/ 4
EGR-EEC-1-B- Application of Finite State Machine and Implication Chart Method	4 points  Applies concept of FSM and ICM with no errors	3 points  Applies concept of FSM and ICM with one error	2 points  Applies concept of FSM and ICM with multiple errors	1 point  Shows no understanding of how to use FSM and ICM	0 points  Not attempted	/ 4
EGR-EEC-1-C- Application of Karnaugh Map	4 points  Applies concept of Karnaugh Map with no errors	3 points  Applies concept of Karnaugh Map with one error	2 points  Applies concept of Karnaugh Map with multiple errors	1 point  Shows no understanding of how to use Karnaugh Map	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-D- Assumptions	4 points  Appropriate assumptions made and listed along with explanations of relevant implications	3 points  Appropriate assumptions made with primary assumptions listed	2 points  Correct assumptions made	1 point  Incorrect or incomplete assumptions applied	0 points  Assumptions not applied	/ 4
EGR-EEC-1-E- Diagrams and Curves	4 points  Pertinent diagrams and curves neatly and correctly drawn, and clearly and appropriately labeled to assist in solution procedure	3 points  Pertinent diagrams and curves correctly drawn and clearly labeled to assist in solution procedure	2 points  Diagrams and curves correctly drawn and labeled to assist in solution procedure	1 point  Diagrams and curves incorrect or illegible, or not labeled at all	0 points  Neither diagram nor curve drawn	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-F-Formulas	4 points Appropriate, concise, and direct formulas accurately applied in logical sequence	3 points Correct formulas accurately applied in logical sequence	2 points Correct formulas properly applied	1 point Incorrect or irrelevant formulas applied or formulas misapplied	0 points No formula applied	/ 4
EGR-EEC-1-G-Information	4 points Problems accurately interpreted and clearly restated; necessary information correctly applied	3 points Problems partially restated and necessary information correctly applied	2 points Necessary information correctly applied	1 point Incorrect or irrelevant information applied	0 points Information not applied	/ 4
EGR-EEC-1-H-Problem Formulation	4 points Formulates problem correctly, completely and in way that leads to solution	3 points Formulates problem correctly, but not completely	2 points Formulates problem with minor errors; incomplete formulation	1 point Formulates problem with significant errors	0 points Not attempted	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-I- Problem Solving Using Energy Methods	4 points  Applies concept of energy with no errors	3 points  Applies concept of energy with one error	2 points  Applies concept of energy with multiple errors	1 point  Shows no understanding of how to use energy methods	0 points  Not attempted	/ 4
EGR-EEC-1-J- Problem Solving Using Momentum	4 points  Applies concept of momentum with no errors	3 points  Applies concept of momentum with one error	2 points  Applies concept of momentum with multiple errors	1 point  Shows no understanding of how to use momentum methods	0 points  Not attempted	/ 4
EGR-EEC-1-K- Schematic Diagrams and Waveforms	4 points  Circuit schematics, diagrams, and waveforms correctly and neatly drawn, and labeled consistent with symbols and values used	3 points  Circuit schematics, diagrams, and waveforms correctly drawn, and labeled consistent with symbols and values used	2 points  Circuit schematics, diagrams, and waveforms correctly drawn, and labeled with symbols and values used	1 point  Incorrect or illegible circuit schematics, diagrams, and waveforms drawn ,or acceptable drawing, but with no labeling	0 points  No circuit schematics, diagrams and waveforms drawn	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-L-Solutions	4 points Solutions worked out in detailed and concise steps with appropriate units; high accuracy maintained	3 points Solutions correctly worked out with appropriate units; high accuracy is maintained	2 points Solutions correctly worked out with correct units and reasonable accuracy	1 point Solutions incorrect or incomplete with incorrect units	0 points No attempt made to solve for desired quantities	/ 4
EGR-EEC-1-M-Theories	4 points Knowledge from mathematics and physics fully and accurately applied for system modeling and analysis	3 points Knowledge from mathematics and physics accurately applied	2 points Knowledge from mathematics and physics applied with minor errors	1 point Incorrect or irrelevant knowledge from mathematics and physics applied	0 points No knowledge from mathematics and physics applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-N-Theories and Assumptions	4 points Appropriate laws and rules applied; proper and consistent assumptions made following universally accepted standards	3 points Appropriate laws and rules applied; proper assumptions made and listed	2 points Appropriate laws and rules applied with primary assumptions listed	1 point Incorrect or irrelevant laws and rules applied, and incomplete assumptions applied	0 points No laws and assumptions applied	/ 4
EGR-EEC-1-O-Vectors	4 points Applies vectors with no errors	3 points Applies vectors with one minor error	2 points Applies vectors with one error or two minor errors	1 point Applies vectors with multiple errors	0 points Use of vectors not attempted	/ 4
EGR-EEC-1-Q-Diagrams	4 points All pertinent diagrams neatly and correctly drawn to assist in solution procedure	3 points All pertinent diagrams correctly drawn to assist in solution procedure	2 points Diagrams correctly drawn to assist in solution procedure	1 point Incorrect or illegible diagrams drawn	0 points Diagrams not drawn	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-R-Formulas	4 points Governing mathematical and physical relations accurately and efficiently applied in logical sequence	3 points Governing mathematical and physical relations accurately applied in logical sequence	2 points Governing mathematical and physical relations accurately applied	1 point Incorrect or incomplete mathematical and physical relations applied, or correct relations misapplied	0 points Mathematical and physical relations not applied	/ 4
EGR-EEC-1-S-Information	4 points Problems accurately interpreted and clearly restated; given information correctly applied with appropriate units	3 points Problems accurately interpreted and given information correctly applied	2 points Given information correctly applied	1 point Incorrect or irrelevant information applied	0 points Given information not applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-1-T- Problem Formulation: Rigid Bodies, Translation and Rotation	4 points  Formulates problem correctly, completely, and in way that leads to solution	3 points  Formulates problem correctly, but not completely	2 points  Formulates problem with minor errors; incomplete formulation	1 point  Formulates problem with significant errors	0 points  Does not formulate problem	/ 4
EGR-EEC-1-U- Solutions	4 points  Solutions worked out in detailed and concise steps, with appropriate units; high accuracy maintained by retaining adequate decimal points; check conducted	3 points  Solutions correctly worked out, with appropriate units; high accuracy maintained by retaining adequate decimal points	2 points  Solutions correctly worked out, with correct units; reasonable accuracy maintained	1 point  Solutions incorrect or incomplete, with incorrect units	0 points  No attempt made to solve for desired quantities	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-2-A- Consideration of Alternatives	4 points  Design process considers several alternatives and explains selection	3 points  Design process considers several alternatives, but does not explain selection	2 points  Little consideration of alternatives	1 point  No consideration of alternatives	0 points  Not attempted	/ 4
EGR-EEC-2-B- Depth and Breadth of Project Content	4 points  Clear evidence of higher level thinking skills used in creation of project	3 points  Some evidence of higher level thinking skills used in creation of project	2 points  Little evidence of higher level thinking skills used in creation of project	1 point  No evidence of higher level thinking skills used in creation of project	0 points  Not attempted	/ 4
EGR-EEC-2-C- Design Problem Statement	4 points  Problem statement shows full understanding of problem and clearly includes definition of completeness	3 points  Problem statement shows some understanding of problem and includes fairly clear definition of completeness	2 points  Problem statement shows some understanding of problem, but definition of completeness vague	1 point  Problem statement does not show understanding of problem	0 points  Problem statement not included	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-2-D- Engineering Standards	4 points  Identifies and clearly discusses relevant engineering standards	3 points  Identifies relevant engineering standards	2 points  Identifies somewhat relevant engineering standards	1 point  Does not identify relevant engineering standards	0 points  Not attempted	/ 4
EGR-EEC-2-E- Realistic Constraints	4 points  Considers realistic constraints, and design successfully addresses them	3 points  Considers realistic constraints that are partially addressed by design	2 points  Considers realistic constraints, but not addressed by design	1 point  Does not consider realistic constraints	0 points  Not attempted	/ 4
EGR-EEC-2-F- Response to Customer Needs	4 points  Design clearly meets need of real or hypothetical customer	3 points  Design responsive to customer needs	2 points  Design minimally benefits customer	1 point  Design does not have a customer	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-2-G- Description of Design Process	4 points  Ability to describe design process completely	3 points  Ability to describe design process with one omission	2 points  Ability to describe design process with multiple omissions	1 point  Unable to describe design process	0 points  Not attempted	/ 4
EGR-EEC-3-A- Content	4 points  Subject knowledge evident throughout report; all information clear, accurate and relevant	3 points  Appropriate content evident throughout report; most information clear, accurate and relevant	2 points  Appropriate content insufficient in parts of report; majority of information clear, accurate and relevant	1 point  Little evidence of appropriate content; much information confusing or flawed	0 points  No evidence of appropriate content	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-3-C- Format	4 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with no errors; individual sections as assigned are present	3 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with minor error; individual sections as assigned are present	2 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with multiple errors; individual sections as assigned are present	1 point  Title page, abstract, table of contents, list of references researched, appendices and in-text references not all present and contain multiple errors; missing individual sections	0 points  Multiple omissions of required items; little evidence of any effort to follow formatting instructions	/ 4
EGR-EEC-3-D- Organization	4 points  Sequence of information logical and intuitive; paths to all information clear and direct	3 points  Sequence of information logical; lacks some clarity and consistency	2 points  Sequence of information somewhat logical; some ideas seem disconnected	1 point  Sequence of information mostly illogical; ideas seem scrambled or disconnected	0 points  Sequence of information not logical	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-3-E-Organization of Ideas	4 points Organizes all ideas in logical sequence	3 points Organizes most ideas in logical sequence	2 points Organizes some ideas in logical sequence	1 point Does not organize ideas	0 points Not attempted	/ 4
EGR-EEC-3-F-Slide Quality	4 points Slides communicate clearly and hold audience interest	3 points Slides communicate clearly, and most slides hold audience interest	2 points Slides communicate clearly	1 point Slides do not communicate clearly	0 points Not attempted	/ 4
EGR-EEC-3-G-Speaking and Audience Engagement	4 points Speaker presents clearly and engages audience (e. g. eye contact)	3 points Speaker presents clearly and engages audience some of the time	2 points Speaker presents fairly clearly but does not engage audience	1 point Speaker does not present clearly	0 points Not attempted	/ 4
EGR-EEC-3-H-Spelling and Grammar	4 points Project honors all rules of spelling and grammar	3 points The project adequately honors the rules of spelling and/or grammar. (3 or less).	2 points Project minimally honors rules of spelling and/or grammar (6 or less)	1 point Project has multiple errors in spelling and/or grammar (7 or more)	0 points Project has multiple errors in spelling and/or grammar (10 or more)	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-3-I- Style and Vocabulary	4 points  Articulates appropriate vocabulary and terms associated with subject; style enhances readability of paper	3 points  Some inappropriate vocabulary; minor errors in style that do not detract from paper	2 points  Limited use of appropriate vocabulary; errors in style that limit readability of paper	1 point  Inappropriate vocabulary and use occurs; poor style; paper has poor readability	0 points  No evidence of correct style	/ 4
EGR-EEC-3-J- Technical Content	4 points  Technical content evident and presented clearly in audience appropriate manner	3 points  Technical content evident, presented clearly, and mostly appropriate for audience	2 points  Technical content evident, mainly presented clearly and somewhat appropriate for audience	1 point  Technical content lacking or not presented clearly	0 points  Not attempted	/ 4
EGR-EEC-4-A- Disclosure	4 points  Correctly describes when and to whom disclosure should be made	3 points  Describes both when and to whom disclosure should be made with minor errors or omissions	2 points  Correctly describes either when or to whom disclosure should be made, but not both	1 point  Gives incorrect or no descriptions of both when or to whom disclosure should be made	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-4-B- Identification and Description of Conflict of Interest	4 points  Correctly identifies and describes conflicts of interest	3 points  Correctly identifies conflicts of interest; however, description inadequate	2 points  Correctly identifies but does not describe conflict of interest	1 point  Does not correctly identify conflict of interest	0 points  Not attempted	/ 4
EGR-EEC-4-C- Responsibilities of Engineers	4 points  Correctly describes responsibilities of engineers to customers, employers, the public, and regulatory agencies	3 points  Correctly describes responsibilities of engineers to all but one of the following: customers, employers, the public, and regulatory agencies	2 points  Correctly describes responsibilities of engineers to all but two of the following: customers, employers, the public, and regulatory agencies	1 point  Incorrectly describes the responsibilities of engineers to at least three of the following: customers, employers, the public, and regulatory agencies	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-4-D-Broader Impact	4 points Identifies impact of engineering solutions/technology/economic activity on the public, environment and society thoroughly and with insight	3 points Identifies impact of engineering solutions/technology/economic activity on the public, environment and society with insight	2 points Identifies impact of engineering solutions/technology/economic activity on the public, environment and society with little insight	1 point Identifies impact of engineering solutions/technology/economic activity on the public, environment and society with no insight	0 points Not attempted	/ 4
EGR-EEC-4-E-Content	4 points Subject knowledge evident throughout report; all information clear, accurate and relevant	3 points Appropriate content evident throughout report; most information clear, accurate and relevant	2 points Appropriate content insufficient in parts of report; majority of information clear, accurate and relevant	1 point Little evidence of appropriate content; much information confusing or flawed	0 points No evidence of appropriate content	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-5-A-Teaming	4 points  Demonstrates understanding of good teaming, with reference to team's experience	3 points  Demonstrates understanding of good teaming, not connected to team's experience	2 points  Reports team's experience only	1 point  No understanding of good teaming demonstrated	0 points  Not attempted	/ 4
EGR-EEC-6-A-Data Analysis and Interpretation	4 points  Precise and correct conclusions reached from both theoretical and measured data; discrepancy, if any, correctly discovered and interpreted with convincing reasoning	3 points  Correct conclusions reached from both theoretical and measured data; discrepancy, if any, discovered and interpreted with minor error in reasoning	2 points  Correct conclusions reached, both theoretical and measured	1 point  Conclusions incorrect or irrelevant with no explanation for discrepancy between theoretical and measured data	0 points  No attempt to reach any conclusion and to discover discrepancy between theoretical and measured data	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-6-B- Equipment Selection	4 points  All equipment correctly identified and selected with correct rating	3 points  All equipment correctly identified and selected with some misunderstanding in rating and settings	2 points  Most equipment correctly identified and selected with some misunderstanding in rating	1 point  Most selected equipment irrelevant or with wrong rating	0 points  No attempt to select any equipment	/ 4
EGR-EEC-6-C- Experiment Procedures and Data Measurement	4 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected; all required data correctly measured	3 points  All experiment procedures clearly and correctly listed; circuit neatly and correctly connected with minor error in measuring required data	2 points  Most experiment procedures correctly listed; circuit correctly connected with part of component mistaken and wrong measured data	1 point  Most experiment procedures not correct; circuit misconnected with some component mistaken; most measured data incorrect	0 points  No attempt to connect circuit and to do any measurement	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-6-D-Theoretical Value Calculation	4 points All theoretical values required calculated correctly, following required format	3 points All theoretical values required calculated following required format with minor miscalculation	2 points All theoretical values required calculated without following required format and with minor miscalculation	1 point Irrelevant formulas used and most theoretical values incorrect	0 points No attempt to do any calculation	/ 4
EGR-EEC-6-E-Theory	4 points Circuits clearly understood and all required formulas listed correctly	3 points Circuits clearly understood with minor errors in formulas	2 points Understands circuit with part of missing or redundant formulas	1 point Circuit misunderstood with irrelevant formulas	0 points No attempt to describe or explain circuit theory	/ 4
EGR-EEC-6-F-Test Program with All Possible Inputs	4 points Able to test program with all cases correctly	3 points Able to test program with most cases correctly	2 points Able to test program with some cases correctly	1 point Unable to test program correctly	0 points No attempt to test program	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-6-G- Clear Research Question	4 points Research question clear and testable	3 points Research question clear, but not testable	2 points Research question mostly clear	1 point Research question not clear	0 points Not attempted	/ 4
EGR-EEC-6-H- Design of Experiment	4 points Experimental design clearly described and addresses research question	3 points Experimental design clearly described and relevant to research question	2 points Experimental design partially addresses research question	1 point Experimental design does not address research question	0 points Not attempted	/ 4
EGR-EEC-6-I- Conduct Experiment	4 points Experiment conducted and produced reliable data	3 points Experiment conducted and produced somewhat inconsistent data	2 points Experiment conducted but did not produce useful data	1 point Experiment attempted but did not produce data	0 points Not attempted	/ 4
EGR-EEC-6-J- Analyze Data	4 points Data correctly analyzed leading to valid conclusions	3 points Data correctly analyzed, and somewhat justified conclusions	2 points Data correctly analyzed but does not justify conclusions	1 point Data incorrectly analyzed	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-7-A- Research	4 points  Clear evidence of thorough use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format	3 points  Clear evidence of adequate use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only minor errors	2 points  Clear evidence of use of some research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only some errors	1 point  Evidence of use of some research resources to gain background and additional technical knowledge for project; research information referenced in paper; multiple formatting errors present	0 points  No evidence of research presented	/ 4
EGR-EEC-7-B- Use of Online and Print Media and Published Patents	4 points  All three media used	3 points  Online and print media used, but no patents	2 points  Only one medium used	1 point  Inadequate references	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-8-A-Biblical References for Stewardship	4 points  Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	3 points  Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	2 points  Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	1 point  Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	0 points  No biblical references are used	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-EEC-8-B-Stewardship	4 points  Implications of good engineering practices as they relate to stewardship of time, natural resources, human resources, financial resources, and environment clearly addressed	3 points  Implications of good engineering practices as they relate to stewardship of listed categories are addressed, but with some obvious omissions of content	2 points  Implications of good engineering practices as they relate to stewardship of most of the listed categories are addressed, or all categories are addressed, but with considerable content omitted	1 point  Implications of good engineering practices as they relate to stewardship of some of the listed categories are addressed, or all categories are addressed, but content not acceptable	0 points  Does not address stewardship	/ 4

Total / 224

## Overall Score

**Level 4**  
202 points minimum

**Level 3**  
134 points minimum

**Level 2**  
78 points minimum

**Level 1**  
34 points minimum

**Level 0**  
0 points minimum

# WPA-EGR-MEC-Master Rubric

Course: ORU Online

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-A-Application of Engineering Concepts	4 points Engineering concepts applied creatively and correctly	3 points Engineering concepts applied correctly	2 points Little application of engineering concepts	1 point No understanding of engineering concepts demonstrated	0 points Not attempted	/ 4
EGR-MEC-1-B-Assumptions	4 points Appropriate assumptions made and listed along with explanations of relevant implications	3 points Appropriate assumptions made with primary assumptions listed	2 points Correct assumptions made	1 point Incorrect or incomplete assumptions applied	0 points Assumptions not applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-C-Diagrams and Curves	4 points Pertinent diagrams and curves neatly and correctly drawn, and clearly and appropriately labeled to assist in solution procedure	3 points Pertinent diagrams and curves correctly drawn and clearly labeled to assist in solution procedure	2 points Diagrams and curves correctly drawn and labeled to assist in solution procedure	1 point Diagrams and curves incorrect or illegible, or not labeled at all	0 points Neither diagram nor curve drawn	/ 4
EGR-MEC-1-D-Formulas	4 points Appropriate, concise, and direct formulas accurately applied in logical sequence	3 points Correct formulas accurately applied in logical sequence	2 points Correct formulas properly applied	1 point Incorrect or irrelevant formulas applied, or formulas misapplied	0 points No formula applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-E- Information	4 points  Problems accurately interpreted and clearly restated; necessary information correctly applied	3 points  Problems partially restated and necessary information correctly applied	2 points  Necessary information correctly applied	1 point  Incorrect or irrelevant information applied	0 points  Information not applied	/ 4
EGR-MEC-1-F- Problem Solving Using Energy Methods	4 points  Applies concept of energy with no errors	3 points  Applies concept of energy with one error	2 points  Applies concept of energy with multiple errors	1 point  Shows no understanding of how to use energy methods	0 points  Not attempted	/ 4
EGR-MEC-1-G- Problem Solving Using Momentum	4 points  Applies concept of momentum with no errors	3 points  Applies concept of momentum with one error	2 points  Applies concept of momentum with multiple errors	1 point  Shows no understanding of how to use momentum methods	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-H-Schematic Diagrams and Waveforms	4 points Circuit schematics, diagrams, and waveforms correctly and neatly drawn, and labeled consistent with symbols and values used	3 points Circuit schematics, diagrams, and waveforms correctly drawn, and labeled consistent with symbols and values used	2 points Circuit schematics, diagrams, and waveforms correctly drawn, and labeled with symbols and values used	1 point Incorrect or illegible circuit schematics, diagrams, and waveforms drawn, or acceptable drawing, but with no labeling	0 points No circuit schematics, diagrams and waveforms drawn	/ 4
EGR-MEC-1-I-Solutions	4 points Solutions worked out in detailed and concise steps, with appropriate units; high accuracy maintained	3 points Solutions correctly worked out, with appropriate units; high accuracy maintained	2 points Solutions correctly worked out with correct units and reasonable accuracy	1 point Solutions incorrect or incomplete with incorrect units	0 points No attempt made to solve for desired quantities	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-J-Theories	4 points Knowledge from mathematics and physics fully and accurately applied for system modeling and analysis	3 points Knowledge from mathematics and physics accurately applied	2 points Knowledge from mathematics and physics applied with minor errors	1 point Incorrect or irrelevant knowledge from mathematics and physics applied	0 points No knowledge from mathematics and physics applied	/ 4
EGR-MEC-1-K-Theories and Assumptions	4 points Appropriate laws and rules applied; proper and consistent assumptions made following universally accepted standards	3 points Appropriate laws and rules applied; proper assumptions made and listed	2 points Appropriate laws and rules applied with primary assumptions listed	1 point Incorrect or irrelevant laws and rules applied, and incomplete assumptions applied	0 points No laws and assumptions applied	/ 4
EGR-MEC-1-L-Vectors	4 points Applies vectors with no errors	3 points Applies vectors with one minor error	2 points Applies vectors with one error or two minor error	1 point Applies vectors with multiple errors	0 points Use of vectors not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-M- Assumptions	4 points  Appropriate assumptions applied and listed, along with explanations of relevant implications	3 points  Appropriate assumptions applied, with primary assumptions listed	2 points  Appropriate assumptions applied	1 point  Incorrect or incomplete assumptions applied	0 points  Assumptions not applied	/ 4
EGR-MEC-1-N-Diagrams	4 points  All pertinent diagrams neatly and correctly drawn to assist in solution procedure	3 points  All pertinent diagrams correctly drawn to assist in the solution procedure	2 points  Diagrams correctly drawn to assist in solution procedure	1 point  Incorrect or illegible diagrams drawn	0 points  Diagrams not drawn	/ 4
EGR-MEC-1-O-Formulas	4 points  Governing mathematical and physical relations accurately and efficiently applied in logical sequence	3 points  Governing mathematical and physical relations accurately applied in logical sequence	2 points  Governing mathematical and physical relations accurately applied	1 point  Incorrect or incomplete mathematical and physical relations applied, or correct relations misapplied	0 points  Mathematical and physical relations not applied	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-P- Information	4 points  Problems accurately interpreted and clearly restated; given information correctly applied with appropriate units	3 points  Problems accurately interpreted and given information correctly applied	2 points  Given information correctly applied	1 point  Incorrect or irrelevant information applied	0 points  Given information not applied	/ 4
EGR-MEC-1-Q-Problem Formulation: Ball Bering Analysis	4 points  Identifies appropriate solution method with no errors	3 points  Identifies appropriate solution method with one minor error	2 points  Identifies appropriate solution method with two minor errors or one significant error	1 point  Does not identify an appropriate solution method	0 points  Not attempted	/ 4
EGR-MEC-1-R-Problem Formulation: Gear Force Analysis	4 points  Identifies appropriate solution method with no errors	3 points  Identifies appropriate solution method with one minor error	2 points  Identifies appropriate solution method with two minor errors or one major error	1 point  Does not identify appropriate solution method	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-S- Problem Formulation: Journal Bearing Analysis	4 points  Identifies appropriate solution method with no errors	3 points  Identifies appropriate solution method with one minor error	2 points  Identifies appropriate solution method with two minor errors or one major error	1 point  Does not identify appropriate solution method	0 points  Not attempted	/ 4
EGR-MEC-1-T- Problem Formulation: Rigid Bodies, Translation and Rotation	4 points  Formulates problem correctly, completely, and in a way that will lead to a solution	3 points  Formulates problem correctly, but not completely	2 points  Formulates problem, with minor errors; incomplete formulation	1 point  Formulates problem, with significant errors	0 points  Does not formulate problem	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-1-U-Solutions	4 points Solutions worked out in detailed and concise steps with appropriate unit; high accuracy maintained by retaining adequate decimal points; a check is conducted	3 points Solutions correctly worked out with appropriate units; high accuracy maintained by retaining adequate decimal points	2 points Solutions correctly worked out with correct units; reasonable accuracy maintained	1 point Solutions incorrect or incomplete with incorrect units	0 points No attempt made to solve for desired quantities	/ 4
EGR-MEC-2-A-Consideration of Alternatives	4 points Design process considers several alternatives and explains selection	3 points Design process considers several alternatives, but does not explain selection	2 points Little consideration of alternatives	1 point No consideration of alternatives	0 points Not attempted	/ 4
EGR-MEC-2-B-Depth and Breadth of Project Content	4 points Clear evidence of higher level thinking skills used in creation of project	3 points Some evidence of higher level thinking skills used in creation of project	2 points Little evidence of higher level thinking skills used in creation of project	1 point No evidence of higher level thinking skills used in creation of project	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-2-C-Design Problem Statement	4 points Problem statement shows full understanding of problem and clearly includes definition of completeness	3 points Problem statement shows some understanding of problem and includes fairly clear definition of completeness	2 points Problem statement shows some understanding of problem, but definition of completeness vague	1 point Problem statement does not show understanding of problem	0 points Problem statement not included	/ 4
EGR-MEC-2-D-Engineering Standards	4 points Identifies and clearly discusses relevant engineering standards	3 points Identifies relevant engineering standards	2 points Identifies somewhat relevant engineering standards	1 point Does not identify relevant engineering standards	0 points Not attempted	/ 4
EGR-MEC-2-E-Realistic Constraints	4 points Considers realistic constraints and design, and successfully addresses them	3 points Considers realistic constraints that are partially addressed by the design	2 points Considers realistic constraints, but these are not addressed by the design	1 point Does not consider realistic constraints	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-2-F-Response to Customer Needs	4 points Design clearly meets need of real or hypothetical customer	3 points Design is responsive to customer needs	2 points Design minimally benefits customer	1 point Design does not have a customer	0 points Not attempted	/ 4
EGR-MEC-2-G-Description of Design Process	4 points Able to describe design process completely	3 points Able to describe design process with one omission	2 points Able to describe design process with multiple omissions	1 point Unable to describe design process at all	0 points Not attempted	/ 4
EGR-MEC-3-A-Content	4 points Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point Little evidence of appropriate content; much of the information confusing or flawed	0 points No evidence of appropriate content	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-3-C-Format	4 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with no errors; individual sections as assigned are present	3 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with minor errors; individual sections as assigned are present	2 points  Title page, abstract, table of contents, list of references researched, appendices and in-text references present with multiple errors; individual sections as assigned are present	1 point  Title page, abstract, table of contents, list of references researched, appendices and in-text references not all present and contain multiple errors; individual sections as assigned are missing	0 points  Multiple omissions of required items; little evidence of any effort to follow formatting instructions	/ 4
EGR-MEC-3-D-Organization	4 points  Sequence of information logical and intuitive; paths to all information clear and direct	3 points  Sequence of information logical; lacks some clarity and consistency	2 points  Sequence of information somewhat logical; some ideas seem disconnected	1 point  Sequence of information mostly illogical; ideas seem scrambled or disconnected	0 points  Sequence of information not logical	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-3-E-Organization of Ideas	4 points Organizes all ideas in logical sequence	3 points Organizes most ideas in logical sequence	2 points Organizes some ideas in logical sequence	1 point Does not organize ideas	0 points Not attempted	/ 4
EGR-MEC-3-F-Slide Quality	4 points Slides communicate clearly and hold audience interest	3 points Slides communicate clearly, and most slides hold audience interest	2 points Slides communicate clearly	1 point Slides do not communicate clearly	0 points Not attempted	/ 4
EGR-MEC-3-G-Speaking and Audience Engagement	4 points Speaker presents clearly and engages audience (e. g. eye contact)	3 points Speaker presents clearly and engages audience some of the time	2 points Speaker presents fairly clearly but does not engage audience	1 point Speaker does not present clearly	0 points Not attempted	/ 4
EGR-MEC-3-H-Spelling and Grammar	4 points Project honors all rules of spelling and grammar	3 points Project adequately honors rules of spelling and/or grammar (3 or less)	2 points Project minimally honors rules of spelling and/or grammar (6 or less)	1 point Project has multiple errors in spelling and/or grammar (7 or more)	0 points Project has multiple errors in spelling and/or grammar (10 or more)	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-3-I- Style and Vocabulary	4 points  Articulates appropriate vocabulary and terms associated with subject; style enhances readability of paper	3 points  Some inappropriate vocabulary; minor errors in style that do not detract from paper	2 points  Limited use of appropriate vocabulary; errors in style that limit readability of paper	1 point  Inappropriate vocabulary and use occurs; poor style; paper has poor readability	0 points  Not attempted	/ 4
EGR-MEC-3-J- Technical Content	4 points  Technical content evident and presented clearly in audience appropriate manner	3 points  Technical content evident, presented clearly, and mostly appropriate for audience	2 points  Technical content evident, mainly presented clearly, and somewhat appropriate for audience	1 point  Technical content lacking or not presented clearly	0 points  Not attempted	/ 4
EGR-MEC-4- A-Disclosure	4 points  Correctly describes when and to whom disclosure should be made	3 points  Describes both when and to whom disclosure should be made with minor errors or omissions	2 points  Correctly describes either when or to whom disclosure should be made, but not both	1 point  Gives incorrect or no descriptions of both when or to whom disclosure should be made	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-4-B- Identification and Description of Conflict of Interest	4 points  Correctly identifies and describes conflicts of interest	3 points  Correctly identifies conflicts of interest; however, description inadequate	2 points  Correctly identifies but does not describe conflict of interest	1 point  Does not correctly identify conflict of interest	0 points  Not attempted	/ 4
EGR-MEC-4-C- Responsibilities of Engineers	4 points  Correctly describes responsibilities of engineers to customers, employers, the public, and regulatory agencies	3 points  Correctly describes responsibilities of engineers to all but one of the following: customers, employers, the public, and regulatory agencies	2 points  Correctly describes responsibilities of engineers to all but two of the following: customers, employers, the public, and regulatory agencies	1 point  Incorrectly describes responsibilities of engineers to at least three of the following: customers, employers, the public, and regulatory agencies	0 points  Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-4-D-Broader Impact	4 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society thoroughly and with insight	3 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with insight	2 points Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with little insight	1 point Identifies impact of engineering solutions/technology/economic activity on the public, environment, and society with no insight	0 points Not attempted	/ 4
EGR-MEC-4-E-Content	4 points Subject knowledge evident throughout report; all information clear, accurate, and relevant	3 points Appropriate content evident throughout report; most information clear, accurate, and relevant	2 points Appropriate content insufficient in parts of report; majority of information clear, accurate, and relevant	1 point Little evidence of appropriate content; much of the information confusing or flawed	0 points No evidence of appropriate content	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-5-A-Teaming	4 points Demonstrates understanding of good teaming, with reference to team's experience	3 points Demonstrates understanding of good teaming, not connected to team's experience	2 points Reports team's experience only	1 point No understanding of good teaming demonstrated	0 points Not attempted	/ 4
EGR-MEC-6-A-Experiment Objectives	4 points Selects all appropriate variables and their ranges that should be measured	3 points 1 incorrect or missing variable or range that should be measured	2 points 2 incorrect or missing variables or their ranges that should be measured	1 point More than 2 incorrect or missing variables or their ranges that should be measured	0 points No attempt to select appropriate variables and their ranges	/ 4
EGR-MEC-6-B-Experimental Design	4 points Measurement frequency and location for all devices properly specified	3 points Only 1 measurement frequency or location improperly specified	2 points Total of 2 measurement frequencies or locations improperly specified	1 point More than 2 measurement frequencies or locations improperly specified	0 points Measurement frequencies and locations not specified	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-6-C-Instrument Selection	4 points Selects all appropriate instruments to measure needed variables	3 points All instruments selected would work but better choices available	2 points Improperly selected 1 instrument	1 point Multiple instruments improperly selected	0 points No attempt to select appropriate instruments	/ 4
EGR-MEC-6-D-Test Program with All Possible Inputs	4 points Able to test program with all cases correctly	3 points Able to test program with most cases correctly	2 points Able to test program with some cases correctly	1 point Unable to test program correctly	0 points No attempt to test program	/ 4
EGR-MEC-6-E-Clear Research Question	4 points Research question clear and testable	3 points Research question clear, but not testable	2 points Research question mostly clear	1 point Research question not clear	0 points Not attempted	/ 4
EGR-MEC-6-F-Design of Experiment	4 points Experimental design clearly described and addresses research question	3 points Experimental design clearly described and relevant to research question	2 points Experimental design partially addresses research question	1 point Experimental design does not address research question	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-6-G-Conduct Experiment	4 points Experiment conducted and produced reliable data	3 points Experiment conducted and produced somewhat inconsistent data	2 points Experiment conducted but did not produce useful data	1 point Experiment attempted but did not produce data	0 points Not attempted	/ 4
EGR-MEC-6-H-Analyze Data	4 points Data correctly analyzed leading to valid conclusions	3 points Data correctly analyzed, and somewhat justified conclusions	2 points Data correctly analyzed but does not justify conclusions	1 point Data incorrectly analyzed	0 points Not attempted	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-7-A-Research	4 points  Clear evidence of thorough use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format	3 points  Clear evidence of adequate use of research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only minor errors	2 points  Clear evidence of use of some research resources to gain background and additional technical knowledge for project; all research information properly referenced in paper using correct format with only some errors	1 point  Evidence of use of some research resources to gain background and additional technical knowledge for project; research information referenced in paper; multiple formatting errors present	0 points  No evidence of research presented	/ 4
EGR-MEC-7-B-Use of Online and Print Media and Published Patents	4 points  All three media used	3 points  Online and print media used, but no patents	2 points  Only one medium used	1 point  Inadequate references	0 points  Not attempted	/ 4



Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-8-A-Biblical References for Stewardship	4 points  Uses appropriate biblical references for all listed stewardship categories with appropriate discussion	3 points  Uses appropriate biblical references for three of the listed stewardship categories with appropriate discussion or presents limited discussion for all listed categories	2 points  Uses appropriate biblical references for two of the listed stewardship categories with appropriate discussion or presents limited discussion for three of the listed categories	1 point  Uses appropriate biblical references for one of the listed stewardship categories with appropriate discussion or presents limited discussion for two of the listed categories	0 points  No biblical references used	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-8-B-Stewardship	4 points  Implications of good engineering practices as they relate to stewardship of time, natural resources, human resources, financial resources, and the environment clearly addressed	3 points  Implications of good engineering practices as they relate to stewardship of listed categories addressed, but with some obvious omissions of content	2 points  Implications of good engineering practices as they relate to stewardship of most of listed categories are addressed or all categories addressed, but considerable content omitted	1 point  Implications of good engineering practices as they relate to stewardship of some of the listed categories addressed, or all categories addressed, but content not acceptable	0 points  Does not address stewardship	/ 4
EGR-MEC-9-A-Design requirements	4 points  All design requirements are correctly interpreted and accurately translated to performance measures.	3 points  Major design requirements are correctly interpreted and accurately translated to performance measures.	2 points  Design requirements are partially interpreted and translated to performance measures.	1 point  Major design requirements are incorrectly interpreted and translated to performance measures.	0 points  None of the design requirements is applied.	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-9-B-System modelling	4 points  All information of the process to be controlled are accurately modelled and correct transfer function is obtained in standard form.	3 points  Major information of the process are correctly modelled into the transfer function.	2 points  Process information is partially modelled into the transfer function.	1 point  Major process information is incorrectly modelled and results in a wrong transfer function.	0 points  No information is applied and no transfer function is obtained.	/ 4
EGR-MEC-9-C-System design	4 points  Root locus method is successfully applied and correct controller transfer function is obtained. The required component values are correctly calculated and suitable market values are chosen.	3 points  Major procedures of the design process are correct with minor misunderstanding and some calculation mistake.	2 points  Both the design procedures and the design results are partially correct.	1 point  Both the design procedures and the design results are incorrect.	0 points  No calculation is done and no result is given.	/ 4

Criteria	Level 4	Level 3	Level 2	Level 1	Level 0	Criterion Score
EGR-MEC-9-D-System simulation	4 points The step response of both the uncompensated and compensated system is successfully simulated using Matlab and meet all the requirements.	3 points The Matlab simulation result is good and marginally meets the requirements.	2 points The Matlab simulation result partially meets the requirements.	1 point The Matlab simulation result does not meet the requirements at all.	0 points No Matlab simulation is done and no result is given.	/ 4
EGR-MEC-9-E-System implementation	4 points Both Matlab simulation and physical implementation with chosen components from market are successful with satisfactory performance.	3 points Both Matlab simulation and physical implementation marginally meet the requirements.	2 points Both Matlab simulation and physical implementation partially meet the requirements.	1 point Neither Matlab simulation nor physical implementation meets the requirements.	0 points Neither Matlab simulation nor physical implementation is done.	/ 4

Total

/ 240  
92

# Overall Score

<b>Level 4</b> 198 points minimum	<b>Level 3</b> 132 points minimum	<b>Level 2</b> 77 points minimum	<b>Level 1</b> 33 points minimum	<b>Level 0</b> 0 points minimum
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