Rubric for ABET Key Performance Indicators

Outcome 1: **An ability to identify, formulate, and solve complex engineering problem by applying principles of engineering, science, and mathematics**				
Criteria	**Low (1)**	**Needs Improvement (2)**	**Good(3)**	**Excellent (4)**
1.1. Identify the problems and applicable theories and concepts.	Fails to identify the problems and applicable theories and concepts. constraints	Shows limited and less than adequate ability to identify the problems and applicable theories and concepts.	Demonstrates satisfactory ability to identify the problems and applicable theories and concepts.	Understands and properly and accurately identify the problems and applicable theories and concepts.
1.2. Formulate the problem using appropriate objectives, assumptions and constraints by applying principles of engineering, science, and mathematics.	Fails to Formulate the problem using appropriate objectives, assumptions and constraints by applying principles of engineering, science, and mathematics.	Shows limited and less than adequate ability to Formulate the problem using appropriate objectives, assumptions and constraints by applying principles of engineering, science, and mathematics.	Demonstrates satisfactory ability to formulate the problem using appropriate objectives, assumptions and constraints by applying principles of engineering, science, and mathematics.	Understands and properly and accurately formulate the problem using appropriate objectives, assumptions and constraints by applying principles of engineering, science, and mathematics.
1.3. Solve and evaluate problem solutions and adopt the optimum solution by applying principles of engineering, science, and mathematics.	Fails to solve and evaluate problem solutions and adopt the optimum solution by applying principles of engineering, science, and mathematics.	Shows limited and less than adequate to solve and evaluate problem solutions and adopt the optimum solution by applying principles of engineering, science, and mathematics.	Demonstrates satisfactory ability to solve and evaluate problem solutions and adopt the optimum solution by applying principles of engineering, science, and mathematics.	Understands and utilize proper methodologies to solve and evaluate problem solutions and adopt the optimum solution by applying principles of engineering, science, and mathematics.

Outcome 2:

An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Criteria	Low (1)	Needs Improvement (2)	Good (3)	Excellent (4)
2.1. Define design specifications and constraints and Utilize proven design methodologies and practices and available resources to achieve design intent.	Fails to Define design specifications and constraints and Utilize proven design methodologies and practices and available resources to achieve design intent.	Shows limited and less than adequate ability to Define design specifications and constraints and Utilize proven design methodologies and practices and available resources to achieve design intent.	Demonstrates satisfactory ability to Define design specifications and constraints and Utilize proven design methodologies and practices and available resources to achieve design intent.	Understands and applies properly and accurately Define design specifications and constraints and Utilize proven design methodologies and practices and available resources to achieve design intent.
2.2. Produce design alternatives.	Fails to Produce design alternatives	Shows limited and less than adequate ability to Produce design alternatives	Demonstrates satisfactory ability to Produce design alternatives	Perform properly and accurately in producing design alternatives
2.3. Verify the component/system/process design against the design specifications and constraints.	Fails to Verify the component/system/process design against the design specifications and constraints	Shows limited and less than adequate Verify the component/system/process design against the design specifications and constraints	Demonstrate satisfactory ability to verify the component/system/process design against the design specifications and constraints	Perform properly and accurately in verifying the component/system/process design against the design specifications and constraints

Outcome 3: **An ability to communicate effectively with a range of audiences**				
Criteria	**Low (1)**	**Needs Improvement (2)**	**Good (3)**	**Excellent (4)**
3.1. Communicate technical ideas in written technical reports including engineering graphs and drawings etc.	Fails to communicate technical ideas in writing	Shows limited and less than adequate ability in writing technical ideas	Demonstrates satisfactory ability in communication using technical writing	Understands and applies proper technique in technical writing
3. 2. Conduct effective oral technical presentations to target audiences.	Fails to conduct effective oral technical presentations to target audiences	Shows limited and less than adequate understanding of conducting effective oral technical presentations to target audiences	Demonstrates satisfactory ability to conduct effective oral technical presentations to target audiences	Understands and applies appropriate technique in conducting effective oral technical presentations to target audiences

Outcome 4:

An ability to recognize ethical and professional responsibilities in engineering situations and make informal judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Criteria	Low (1)	Needs Improvement (2)	Good (3)	Excellent (4)
4.1. Understand and apply engineering professional and ethical standards in dealing with public safety and interest considering social and economic guidelines and regulatory laws.	Fails to demonstrate an understanding of engineering professional and ethical standards in dealing with public safety and interest	Shows limited and less than adequate understanding of engineering professional and ethical standards in dealing with public safety and interest	Demonstrates satisfactory an understanding of engineering professional and ethical standards in dealing with public safety and interest	Understands appropriately and accurately the engineering professional and ethical standards in dealing with public safety and interest
4.2. Recognize the impact engineering solutions in global, economic, environmental, and societal contexts using current updated research and development in civil engineering.	Fails to demonstrate commitment to Recognize the impact engineering solutions in global, economic, environmental, and societal contexts using current updated research and development in civil engineering.	Shows limited and less than adequate commitment to Recognize the impact engineering solutions in global, economic, environmental, and societal contexts using current updated research and development in civil engineering.	Demonstrates satisfactory commitment to Recognize the impact engineering solutions in global, economic, environmental, and societal contexts using current updated research and development in civil engineering.	Demonstrates appropriately and accurately commitment to Recognize the impact engineering solutions in global, economic, environmental, and societal contexts using current updated research and development in civil engineering.
4.3. Recognize contemporary local, national, regional and global issues in the civil engineering discipline.	Fail to recognize contemporary local, national, regional and global issues in the civil engineering discipline	Show limited and less than adequate to contemporary local, national, regional and global issues in the civil engineering discipline	Demonstrates satisfactory commitment to contemporary local, national, regional and global issues in the civil engineering discipline	Demonstrates appropriately and accurately to contemporary local, national, regional and global issues in the civil engineering discipline

Outcome 5:

An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

Criteria	Low (1)	Needs Improvement (2)	Good (3)	Excellent (4)
5.1. Develop team work plans and allocate resources and tasks.	Fails to develop team work plans and allocate resources and tasks	Shows limited and less than adequate ability to develop team work plans and allocate resources and tasks	Demonstrates satisfactory ability to develop team work plans and allocate resources and tasks	Understands and applies proper and accurate team work plans and allocate resources and tasks
5.2 Participate, communicate and function effectively in team work projects.	Fails to participate, communicate and function effectively in team work projects	Shows limited and less than adequate ability to participate, communicate and function effectively in team work projects	Demonstrates satisfactory ability to participate, communicate and function effectively in team work projects	Understands and applies proper strategies to, participate, communicate and function effectively in team work projects

Outcome 6:

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Criteria	Low (1)	Needs Improvement (2)	Good (3)	Excellent (4)
6.1 Use lab equipment to conduct experiments.	Fails to use lab equipment to conduct experiments	Shows limited and less than adequate ability to use lab equipment to conduct experiments	Demonstrates satisfactory ability to use lab equipment to conduct experiments	Understands and applies proper use of lab equipment to conduct experiments
6.2 Use data acquisition systems, hardware and software to collect, analyze and interpret data.	Fails to use data acquisition systems, hardware and software to collect, analyze and interpret data	Shows limited and less than adequate ability to use data acquisition systems, hardware and software to collect, analyze and interpret data	Demonstrates satisfactory ability to use data acquisition systems, hardware and software to collect, analyze and interpret data	Understands and applies proper and accurate use of data acquisition systems, hardware and software to collect, analyze and interpret data
6.3 Prepare a professional technical report.	Fails to write a professional technical report	Shows limited and less than adequate ability to write a professional technical report	Demonstrates satisfactory ability to write a professional technical report	Understands and writes an accurate and professional technical report

Outcome 7: **A ability to acquire and apply knowledge as needed, using appropriate learning strategies**				
Criteria	**Low (1)**	**Needs Improvement (2)**	**Good (3)**	**Excellent (4)**
7.1 A recognition of the need for, and an ability to engage in independent life-long learning strategies	Fails to demonstrate the ability to stay up to date and broaden knowledge and skills on the current trends of the Civil Engineering discipline through professional development and continued education	Shows limited and less than adequate ability to stay up to date and broaden knowledge and skills on the current trends of the Civil Engineering discipline through professional development and continued education	Demonstrate the ability to stay up to date and broaden knowledge and skills on the current trends of the Civil Engineering discipline through professional development and continued education	Demonstrate the ability to stay up to date and broaden knowledge and skills on the current trends of the Civil Engineering discipline through professional development and continued education