

Rubrics for Assessing Students Outcomes

Rubric 1 – for assessing Student Outcome [1]:

[1]. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline

1.1. Uses appropriate tools to collect and analyze data

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to use tools and analyze data in the Computer Engineering Technology concentration; for example, oscilloscopes, multimeters, computers, protoboards, microprocessors, etc.	Student fails to use tools nor analyze data in computer engineering technology.	Student identifies tools, but struggles to use them or to analyze data.	Student correctly uses tools to collect data and analyze it, but makes minor mistakes during the process.	Student shows proficiency and familiarity with tools and uses them effectively to collect and analyze data in computer engineering technology.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to use tools and analyze data in the Construction Engineering Technology concentration; for example, concrete mixers, surveying tools. For example, surveying equipment, materials samples, measuring tools, standards and references.	Student fails to use tools nor analyze data in construction engineering technology.	Student identifies tools, but struggles to use them or to analyze data.	Student correctly uses tools to collect data and analyze it, but makes minor mistakes during the process.	Student shows proficiency and familiarity with tools and uses them effectively to collect and analyze data in construction engineering technology.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to use tools and analyze data in the Electrical Energy Engineering Technology concentration; for example, power electronics, oscilloscopes, protoboards, signal generators, multimeters, energy conversion devices, etc.	Student fails to use tools nor analyze data in electrical energy engineering technology.	Student identifies tools, but struggles to use them or to analyze data.	Student correctly uses tools to collect data and analyze it, but makes minor mistakes during the process.	Student shows proficiency and familiarity with tools and uses them effectively to collect and analyze data in electrical energy engineering technology.	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechanical ET	d. Student demonstrates an ability to use tools and analyze data in the Mechanical Engineering Technology concentration; for example, measuring resistance in pipes, specific heat, and stresses developed in components under loading.	Student fails to use tools nor analyze data in mechanical engineering technology.	Student identifies tools, but struggles to use them or to analyze data.	Student correctly uses tools to collect data and analyze it, but makes minor mistakes during the process.	Student shows proficiency and familiarity with tools and uses them effectively to collect and analyze data in mechanical engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	e. Student demonstrates an ability to use tools and analyze data in the Mechatronics Engineering Technology concentration; for example, measuring voltages of photosensors, force sending resistors, or from PLC pins.	Student fails to use tools nor analyze data in mechatronics engineering technology.	Student identifies tools, but struggles to use them or to analyze data.	Student correctly uses tools to collect data and analyze it, but makes minor mistakes during the process.	Student shows proficiency and familiarity with tools and uses them effectively to collect and analyze data in mechatronics engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

1.2. Follows scientific approach to solve broadly defined engineering problems

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to select and apply scientific and mathematical knowledge, to solve broadly defined computer technology problems; for example, ohm's law, electric loops, control theory, etc.	Student fails to apply any scientific approach to solve typical problems in computer technology.	Student identifies scientific methods, but struggles to apply them to solve problems in computer engineering technology.	Student demonstrates an ability to apply scientific methods in computer engineering technology, but occasionally commits minor mistakes while applying them.	Student displays a clear and consistent knowledge of scientific methods typical in computer engineering technology and applies them correctly to solve problems in the field.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to select and apply scientific and mathematical knowledge, to solve broadly defined construction technology problems; for example, equilibrium of forces, stress analysis, analysis of simple beams and trusses, etc.	Student fails to apply any scientific approach to solve typical problems in construction technology.	Student identifies scientific methods, but struggles to apply them to solve problems in construction engineering technology.	Student demonstrates an ability to apply scientific methods in construction engineering technology, but occasionally commits minor mistakes while applying them.	Student displays a clear and consistent knowledge of scientific methods typical in construction engineering technology and applies them correctly to solve problems in the field.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student an ability to select and apply scientific and mathematical knowledge, to solve broadly defined electrical energy technology problems; for example, the design and analysis of energy conversion devices.	Student fails to apply any scientific approach to solve typical problems in electrical energy engineering technology.	Student identifies scientific methods, but struggles to apply them to solve problems in electrical energy engineering technology.	Student demonstrates an ability to apply scientific methods in electrical energy engineering technology, but occasionally commits minor mistakes while applying them.	Student displays a clear and consistent knowledge of scientific methods typical in electrical energy engineering technology and applies them correctly to solve problems in the field.	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechanical ET	d. Student demonstrates an ability to select and apply scientific and mathematical knowledge, to solve broadly defined mechanical technology problems; for example, the principles of solid and fluid mechanics, machine design, thermodynamics, and heat transfer.	Student fails to apply any scientific approach to solve typical problems in mechanical engineering technology.	Student identifies scientific methods, but struggles to apply them to solve problems in mechanical engineering technology.	Student demonstrates an ability to apply scientific methods in mechanical technology, but occasionally commits minor mistakes while applying them.	Student displays a clear and consistent knowledge of scientific methods typical in mechanical engineering technology and applies them correctly to solve problems in the field.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	e. Student demonstrates an ability to select and apply scientific and mathematical knowledge, to solve broadly defined mechatronics technology problems; for example, the selection of the appropriate IN/OUT components to accurately measure data or achieve certain actuations.	Student fails to apply any scientific approach to solve typical problems in mechatronics engineering technology.	Student identifies scientific methods, but struggles to apply them to solve problems in mechatronics engineering technology.	Student demonstrates an ability to apply scientific methods in mechatronics technology, but occasionally commits minor mistakes while applying them.	Student displays a clear and consistent knowledge of scientific methods typical in mechatronics engineering technology and applies them correctly to solve problems in the field.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

Rubric 2 – for assessing Student Outcome [2]:

[2]. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;

2.1. Uses appropriate methods to design components and systems

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to use methods to design components and systems appropriate to the discipline; for example: coding, PLC, IoT, embedded systems, interfacing, Input/Output, etc	Student fails to use methods to design components or systems typical in computer engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems, components and/or processes relevant in computer engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.	Student displays a clear and consistent knowledge of the design process, whether of systems, components, or processes in computer engineering technology.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to use methods to design components and systems appropriate to the discipline; for example: the design and analysis of steel structures.	Student fails to use methods to design components or systems typical in construction engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in construction engineering, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the design materials and processes used in construction technology.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to use methods to design components and systems appropriate to the discipline; for example: the design and analysis of energy conversion devices.	Student fails to use methods to design components or systems typical in electrical energy engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in electrical energy engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in electrical energy engineering technology.	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechanical ET	d. Student demonstrates an ability to use methods to design components and systems appropriate to the discipline; for example: design and analysis of machine elements and mechanisms.	Student fails to use methods to design components or systems typical in mechanical engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in mechanical engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in mechanical engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	e. Student demonstrates an ability to use methods to design components and systems appropriate to the discipline; for example: design and implementation of the PLC system.	Student fails to use methods to design components or systems typical in mechatronics engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in mechatronics engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in mechatronics engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

2.2. Uses evidence-based approach to validate design and analysis

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to follow evidence-based approaches common in computer engineering technology to validate design and analysis of components, systems and processes appropriate to the discipline; example: using KVL, KCL, Ohms law to validate voltages and current in electric loops.	Student fails to understand evidence-based approaches, or properly apply them.	Student understands the concept of evidence-based approaches, but struggles to apply them to validate design and analysis	Student demonstrates an ability to use evidence-based approaches to validate design and carryout analysis relevant in computer engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.	Student displays a clear and consistent knowledge of applying evidence-based approaches to validate designs and carryout analysis of systems, components, or processes in computer engineering technology.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to follow evidence-based approaches common in construction engineering technology to validate design and analysis of components, systems and processes appropriate to the discipline; including checking against industry codes and standards, using suitable modeling and/or testing	Student fails to understand evidence-based approaches, or properly apply them.	Student understands the concept of evidence-based approaches, but struggles to apply them to validate design and analysis	Student demonstrates an ability to use evidence-based approaches to validate design and carryout analysis relevant in construction engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.	Student displays a clear and consistent knowledge of applying evidence-based approaches to validate designs and carryout analysis of systems, components, or processes in construction engineering technology.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to follow evidence-based approaches common in electrical energy engineering technology to validate design and analysis of components, systems and processes appropriate to the discipline; For example, using basics of electrical circuits and electronics to validate some complex circuits such as voltage regulators	Student fails to understand evidence-based approaches, or properly apply them.	Student understands the concept of evidence-based approaches, but struggles to apply them to validate design and analysis	Student demonstrates an ability to use evidence-based approaches to validate design and carryout analysis relevant in electrical energy engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.	Student displays a clear and consistent knowledge of applying evidence-based approaches to validate designs and carryout analysis of systems, components, or processes in electrical energy engineering technology.	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).

Mechanical ET	<p>d. Student demonstrates an ability to follow evidence-based approaches common in mechanical engineering technology to validate design and analysis of components, systems and processes appropriate to the discipline; for example, analysis of doping of semiconductors using diffusion or calculating roll force and torque in a flat rolling operation, Calculating the stresses on a component for different loading conditions using theoretical calculations and SolidWorks FE simulation and design the component accordingly.</p>	<p>Student fails to understand evidence-based approaches, or properly apply them.</p>	<p>Student understands the concept of evidence-based approaches, but struggles to apply them to validate design and analysis</p>	<p>Student demonstrates an ability to use evidence-based approaches to validate design and carryout analysis relevant in mechanical engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.</p>	<p>Student displays a clear and consistent knowledge of applying evidence-based approaches to validate designs and carryout analysis of systems, components, or processes in mechanical engineering technology.</p>	<p>At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).</p>
Mechatronics ET	<p>e. Student demonstrates an ability to follow evidence-based approaches common in mechatronics engineering technology to validate design and analysis of components, systems and processes appropriate to the discipline; for example, analysis of dynamics system using mathematical modeling, transforming the system into an equivalent Laplace representation to find the poles and zeroes. Using simulation software (i.e. MATLAB/SIMULINK) to verify the performance of the system according to the design specifications.</p>	<p>Student fails to understand evidence-based approaches, or properly apply them.</p>	<p>Student understands the concept of evidence-based approaches, but struggles to apply them to validate design and analysis</p>	<p>Student demonstrates an ability to use evidence-based approaches to validate design and carryout analysis relevant in mechatronics engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.</p>	<p>Student displays a clear and consistent knowledge of applying evidence-based approaches to validate designs and carryout analysis of systems, components, or processes in mechatronics engineering technology.</p>	<p>At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).</p>

2.3. Uses software to design components, systems and/or simulate and test prototypes

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to design components and systems and/or simulate and test prototypes using software common in computer engineering technology: C, C++, Python, etc;	Student fails to understand the design process, or properly identify components and processes typical in computer engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems, components and/or processes relevant in computer engineering technology, but occasionally commits mistakes that display a lack of clarity in understanding.	Student displays a clear and consistent knowledge of the design process, whether of systems, components, or processes in computer engineering technology.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to design components and systems and/or simulate and test prototypes using software common in construction engineering technology: Primavera, Microsoft Project, etc;.	Student fails to understand the design process, or properly identify components and processes typical in construction engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in construction engineering, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the design materials and processes used in construction technology.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to design components and systems and/or simulate and test prototypes using software common in electrical energy engineering technology: SPICE, Multisim, Homer, etc;	Student fails to understand the design process, or properly identify components and processes typical in electrical energy engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in electrical energy engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in electrical energy engineering technology.	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechanical ET	d. Student demonstrates an ability to design components and systems and/or simulate and test prototypes using software common in mechanical engineering technology: Working Model 2D, COMSOL, SolidWorks, etc;	Student fails to understand the design process, or properly identify components and processes typical in mechanical engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in mechanical engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in mechanical engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	e. Student demonstrates an ability to design components and systems and/or simulate and test prototypes using software common in mechatronics engineering technology: PLC Simulator, MATLAB/SIMULINK, FANUC ROBOGUIDE, SolidWorks, etc.	Student fails to understand the design process, or properly identify components and processes typical in mechatronics engineering technology.	Student understands the concept of designing systems, components, and/or processes to a limited extent, and strives to achieve a firmer grasp of the subject matter.	Student demonstrates an ability to design systems and components typical in mechatronics engineering technology, but occasionally commits minor mistakes.	Student displays a clear and consistent knowledge of the materials and processes used in mechatronics engineering technology.	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

Rubric 3 – for assessing Student Outcome [3]:

[3]. an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;

3.1. Writes reports and applies proper guidelines (cover page, introduction, method, results, analysis, uses complete and grammatically correct sentences)

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student demonstrates ability to effectively and clearly express thoughts in written presentations, examples: technical reports, field experience observations, etc	Student fails to effectively and clearly express thoughts in written communications.	Student expresses thoughts in writing, but fails to make an effective argument or repetitively makes grammatical mistakes and/or uses wrong sentence structure.	Student expresses thoughts in writing, but makes minor mistakes and/or struggles to articulate effective sentences and present ideas clearly.	Student demonstrates a consistent pattern of communicating effectively in writing and uses complete and effective sentences to articulate ideas clearly	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).

3.2. Communicates technical information orally in front of audience in a confident and professional manner

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student demonstrates ability to effectively and clearly express thoughts in oral presentations while showing confidence and professional manner; for example, proper appearance, faces the audience, responds to audience questions, etc	Student fails to effectively and clearly express thoughts in oral communications and/or shows lack of professionalism in appearance, or lacks interest in presentation	Student expresses thoughts orally, but fails to make an effective presentation, for example, unclear voice, in organized ideas, or not directly facing audience.	Student expresses thoughts orally, organizes the ideas, but shows a lack of confidence.	Student demonstrates a consistent pattern of communicating orally effectively with organized ideas and high level of confidence in front of audience	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).

3.3. Uses technology and modern techniques to communicate technical information

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student demonstrates ability to effectively use modern techniques and methods to clearly communicate and express thoughts in written and oral presentations; for example, Moodle, power points, projector, computer, charts, tables, illustrations, etc.	Student fails to use modern technology and visual aids to prepare, edit, or present technical information	Student is able to use modern technology and visual aids but produces inconsistent technical reports that are not coherent and/or hard to understand	Student is able to use modern technology and visual aids to prepare, edit, or present technical information in an effective and meaningful manner	Student shows proficiency in using modern technology and visual aids to prepare, edit, or present technical information in an effective and meaningful manner	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).

Rubric 4 – for assessing Student Outcome [4]:

[4]. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes;

4.1. Uses advanced software to interpret data and results

	Performance Indicator	Below Expectations - 1	Progressing to Criteria – 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to identify and use software packages that are appropriate for the computer engineering technology discipline to present results in a meaningful way; for example, Excel, Word, Project, AutoCAD, MATLAB, R stats, or develop own code for data acquisition/analysis/debugging, etc)	Student fails to identify and/or to use software to present and interpret results common in the discipline. Also, can't write code to save his life.	Student is able to load data and use only very basic functions of software but the outcome is poor, unclear, and doesn't present/interpret the data effectively. Also able to acquire data but fails to interpret its meaning.	Student demonstrates good mastery of software and its common functions to interpret results and produces meaningful results and interprets it clearly and effectively with minor mistakes. Also able to acquire data and demonstrates proper understanding of its meaning.	Student professionally uses software or combinations of software packages and/or advanced functions to present data and analyze results meaningfully and effectively. Also demonstrates ability to use a proper interpretation of data for debugging and process improvement.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to identify and use software packages that are appropriate for the construction engineering technology discipline to present results in a meaningful way; for example, Microsoft Excel, Microsoft Project, Primavera and AutoCAD.	Student fails to identify and/or to use software to present and interpret results common in the discipline.	Student uses software to interpret result but the outcome is poor, unclear, and doesn't present the data effectively	Student uses software to interpret results and produces meaningful results and interprets it clearly and effectively with minor mistakes	Student uses the software professionally to present data and analyze results meaningfully and effectively	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to identify and use software packages that are appropriate for the electrical energy engineering technology discipline to present results in a meaningful way; for example, Use MATLAB to validate the simulation results coming from projects. Use Excel to present results in a meaningful way.	Student fails to identify and/or to use software to present and interpret results common in the discipline.	Student uses software to interpret result but the outcome is poor, unclear, and doesn't present the data effectively	Student uses software to interpret results and produces meaningful results and interprets it clearly and effectively with minor mistakes	Student uses the software professionally to present data and analyze results meaningfully and effectively	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).

Mechanical ET	d. Student demonstrates an ability to identify and use software packages that are appropriate for the mechanical engineering technology discipline to present results in a meaningful way; for example, Excel, Word, Project, AutoCAD, Solidworks, WorkingModel, COMSOL, MATLAB, etc)	Student fails to identify and/or to use software to present and interpret results common in the discipline.	Student uses software to interpret result but the outcome is poor, unclear, and doesn't present the data effectively	Student uses software to interpret results and produces meaningful results and interprets it clearly and effectively with minor mistakes	Student uses the software professionally to present data and analyze results meaningfully and effectively	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	e. Student demonstrates an ability to identify and use software packages that are appropriate for the mechatronics engineering technology discipline to present results in a meaningful way; for example, Excel, Word, Project, Solidworks, Ladder Logic, MATLAB, etc.	Student fails to identify and/or to use software to present and interpret results common in the discipline.	Student uses software to interpret result but the outcome is poor, unclear, and doesn't present the data effectively	Student uses software to interpret results and produces meaningful results and interprets it clearly and effectively with minor mistakes	Student uses the software professionally to present data and analyze results meaningfully and effectively	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

4.2. Ability to use equipment and/or methods to perform tests common in the field

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to conduct standard tests and measurements; using equipment and/or methods that are typically used in computer engineering technology; for example, electrical measurements, electrical wiring codes and specifications, etc.	Student fails to use equipment and/or fails to follow correct experimental procedure to perform tests	Student shows weakness in using equipment and methods and follows correct experimental procedure but produces poor results	Student knows how to use equipment and methods and understands standard procedures to conduct tests common in the field	Student displays a clear pattern of understanding the use of equipment and methods and follows procedures to perform tests confidently	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to conduct standard tests and measurements; using equipment and/or methods that are typically used in construction engineering technology; for example, supervised field practice in the layout of construction projects, etc.	Student fails to use equipment and/or fails to follow correct experimental procedure to perform tests	Student shows weakness in using equipment and methods and follows correct experimental procedure but produces poor results	Student knows how to use equipment and methods and understands standard procedures to conduct tests common in the field	Student displays a clear pattern of understanding the use of equipment and methods and follows procedures to perform tests confidently	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).

Elect. Energy ET	c. Student demonstrates an ability to conduct standard tests and measurements; using equipment and/or methods that are typically used in electrical energy engineering technology; for example, finding optimal location for installation of solar panels using common tests, measuring voltage output of photovoltaic panels, etc.	Student fails to use equipment and/or fails to follow correct experimental procedure to perform tests	Student shows weakness in using equipment and methods and follows correct experimental procedure but produces poor results	Student knows how to use equipment and methods and understands standard procedures to conduct tests common in the field	Student displays a clear pattern of understanding the use of equipment and methods and follows procedures to perform tests confidently	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechanical ET	d. Student demonstrates an ability to conduct standard tests and measurements; using equipment and/or methods that are typically used in mechanical engineering technology; for example, advanced analyses of engineering materials.	Student fails to use equipment and/or fails to follow correct experimental procedure to perform tests	Student shows weakness in using equipment and methods and follows correct experimental procedure but produces poor results	Student knows how to use equipment and methods and understands standard procedures to conduct tests common in the field	Student displays a clear pattern of understanding the use of equipment and methods and follows procedures to perform tests confidently	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).
Mechatronics ET	d. Student demonstrates an ability to conduct standard tests and measurements; using equipment and/or methods that are typically used in mechatronics engineering technology; for example, using a digital multi-meter to debug faulty circuits and sensors.	Student fails to use equipment and/or fails to follow correct experimental procedure to perform tests	Student shows weakness in using equipment and methods and follows correct experimental procedure but produces poor results	Student knows how to use equipment and methods and understands standard procedures to conduct tests common in the field	Student displays a clear pattern of understanding the use of equipment and methods and follows procedures to perform tests confidently	At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).

4.3. Ability to make improvements to a design on the basis of experimentation

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
Computer ET	a. Student demonstrates an ability to conduct standard tests and experimentation common in the computer engineering technology, then analyze and interpret the data, and make necessary improvements; for example, program debugging, electrical measurements to modify resistance values, or voltage through PWM, etc.	Student fails to follow correct experimental procedures, or make proper measurements, or analyze and interpret results, or apply results to improve processes.	Student understands standard procedures and experimental conditions of tests, but displays difficulty in analyzing and interpreting data, and/or using results to improve processes.	Student understands standard procedures and measurements, conducts experiments correctly, and analyzes and interprets data correctly most of the time, but occasionally fails to do so.	Student displays a clear pattern of understanding procedures and tests, analyzes and interprets data confidently, and uses results obtained to improve technological processes.	At least 70% of students in CpET are expected to meet or exceed the criteria (Levels 3 and 4).
Construction ET	b. Student demonstrates an ability to conduct standard tests and experimentation common in the construction engineering technology, then analyze and interpret the data, and make necessary improvements; for example, design and analysis of steel beams, frames, columns, critical path analysis, learning program evaluation and review techniques (PERM).	Student fails to follow correct experimental procedures, or make proper measurements, or analyze and interpret results, or apply results to improve processes.	Student understands standard procedures and experimental conditions of tests, but displays difficulty in analyzing and interpreting data, and/or using results to improve processes.	Student understands standard procedures and measurements, conducts experiments correctly, and analyzes and interprets data correctly most of the time, but occasionally commits minor errors in the process.	Student displays a clear pattern of understanding procedures and tests, analyzes and interprets data confidently, and uses results obtained to improve technological processes.	At least 70% of students in CnET are expected to meet or exceed the criteria (Levels 3 and 4).
Elect. Energy ET	c. Student demonstrates an ability to conduct standard tests and experimentation common in the electrical energy engineering technology, then analyze and interpret the data, and make necessary improvements; for example, design some basic projects and circuits for renewable sources such as wind turbine, photocell, and solar cells.	Student fails to follow correct experimental procedures, or make proper measurements, or analyze and interpret results, or apply results to improve processes.	Student understands standard procedures and experimental conditions of tests, but displays difficulty in analyzing and interpreting data, and/or using results to improve processes.	Student understands standard procedures and measurements, conducts experiments correctly, and analyzes and interprets data correctly most of the time, but occasionally commits minor errors in the process.	Student displays a clear pattern of understanding procedures and tests, analyzes and interprets data confidently, and uses results obtained to improve processes involving electrical energy engineering technology	At least 70% of students in EET are expected to meet or exceed the criteria (Levels 3 and 4).

Mechanical ET	<p>d. Student demonstrates an ability to conduct standard tests and experimentation common in the mechanical engineering technology, then analyzes and interprets the data, and makes necessary improvements; for example, using design parameters to determine the minimum diameter of steel wires supporting a tower, using simulation SW to determine the best system parameters (mass, stiffness, damping, capacitance, resistance, inductance, temperature, added heat, ... etc) based on the performance characteristics and plots (time constant, rise time, overshoot, steady state time, steady state error, etc).</p>	<p>Student fails to follow correct experimental procedures, or make proper measurements, or analyze and interpret results, or apply results to improve processes.</p>	<p>Student understands standard procedures and experimental conditions of tests, but displays difficulty in analyzing and interpreting data, and/or using results to improve processes.</p>	<p>Student understands standard procedures and measurements, conducts experiments correctly, and analyzes and interprets data correctly most of the time, but occasionally commits minor errors in the process.</p>	<p>Student displays a clear pattern of understanding procedures and tests, analyzes and interprets data confidently, and uses results obtained to improve processes involving mechanical engineering technology.</p>	<p>At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).</p>
Mechatronics ET	<p>e. Student demonstrates an ability to conduct standard tests and experimentation common in the mechatronics engineering technology, then analyzes and interprets the data, and makes necessary improvements; for example, using mathematical modeling and analysis of characteristic equation to select electrical and mechanical components to improve the performance of systems and to satisfy performance specifications (rise time, overshoot, steady state time, steady state error, etc).</p>	<p>Student fails to follow correct experimental procedures, or make proper measurements, or analyze and interpret results, or apply results to improve processes.</p>	<p>Student understands standard procedures and experimental conditions of tests, but displays difficulty in analyzing and interpreting data, and/or using results to improve processes.</p>	<p>Student understands standard procedures and measurements, conducts experiments correctly, and analyzes and interprets data correctly most of the time, but occasionally commits minor errors in the process.</p>	<p>Student displays a clear pattern of understanding procedures and tests, analyzes and interprets data confidently, and uses results obtained to improve processes involving mechanical engineering technology.</p>	<p>At least 70% of students in MET are expected to meet or exceed the criteria (Levels 3 and 4).</p>

Rubric 5 – for assessing Student Outcome [5]:

[5]. an ability to function effectively as a member or leader on a technical team

5.1. Demonstrate traits conducive to team work (punctuality, flexibility, participation, respectfulness)

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student shows qualities that promote constructive team work; for example, punctuality, flexibility, participation, appreciation, and respect	Student lacks being punctual, flexible, or respectful to the team members	Student shows acceptable, but overall poor punctuality, flexibility, appreciation or respect to the team members	Student functions coherently with the rest of the team members and shows good qualities with the exception of only minor and mild incidents	Student demonstrates a consistent pattern of qualities that are conducive to team work and functions coherently and comfortably with the team members	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).

5.2. Recognizes participant roles in a team setting and fulfills appropriate roles to ensure team success.

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student demonstrates ability to effectively participate and function as a team member, to fulfill the assigned duties and to meaningfully contribute to the overall success of the team	Student fails to function effectively as a member of a technical team	Student functions as part of a technical team, but has difficulty in demonstrating effectiveness.	Student functions effectively as member of a technical team, but occasionally fails to maintain effectiveness.	Student demonstrates a consistent pattern of effectiveness as part of a technical team.	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).

5.3. Recognizes the ethical and societal responsibility in systems' design and implementation.

	Performance Indicator	Below Expectations - 1	Progressing to Criteria - 2	Meets Criteria - 3	Exceeds Criteria - 4	Score
All Concentrations	Student understands the responsibility that rests on professionals and the ethical and societal impact of their decisions	Student fails to establish a connection between technical design decisions and their ethical and societal impact. Student doesn't include evidence from recent incidents.	Student includes evidence of failed systems and/or projects but cannot establish scientific and logical connections between the technical and design decisions and their ethical and societal impact.	Student demonstrates a knowledge of the role of professionals and the ethical and societal impact supported by evidence from recent incidents and providing logical and scientific connections .	Students demonstrate appropriate comprehension of the role of professionals and the ethical and societal impact of the profession. Students are able to appropriately relate, reason, and critique evidence from recent engineering failures or incidents using technical terminology and scientific method approach.	At least 70% of students in all concentrations are expected to meet or exceed the criteria (Levels 3 and 4).