Lawrence Technological University

Assessment Plans with Curriculum Mapping: Undergraduate Programs

Academic Years: 2019, 2020, 2021

University Assessment Committee

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Core Curriculum

Table 1: Assessment Plan with Mapped Courses for the Core Curriculum

Undergraduate University Level Assessment Outcomes	Assessment Strategy	Academic Unit	Courses and Metrics	Administration Timeline	Loop-Closing Timeline
WRITTEN COMMUNICATION "LTU undergraduates who complete the core curriculum will demonstrate professional standards in written communication by mastering the fundamentals of writing mechanics and integrating evidence and analysis within a coherent structure."	5-point course embedded rubric on three Written Communication performance indictors: Style (construct original arguments that they support with evidence), Grammar (produce prose that satisfies conventions of formal, academic writing), Citations (provide citations that fulfill discipline requirements)	HSSC Department	Minimum score of 3 on all performance indicators on final papers in LLT1213/HUM1213 LLT1223/HUM1223	Annual	3-Year Cycle
ORAL COMMUNICATION "LTU undergraduates who complete the core curriculum will demonstrate effectiveness in oral communication through development of content clearly and articulately."	5-point course embedded rubric on three Oral Communication performance indicators: Structure (understand the conventions of effective nonverbal communication), Content (understand relevant rhetorical strategies), Delivery (deliver content clearly and articulately)	HSSC Department	Minimum score of 3 on all performance indicators on oral presentation i COM2103	Annual	3-Year Cycle
CRITICAL THINKING "LTU undergraduates who complete the core curriculum will demonstrate critical thinking skills in reading complex texts and analyzing arguments."	5-point course embedded rubric on three Critical Thinking performance indicators: Thesis (demonstrate an understanding of historical and aesthetic periods and their impact on human thought), Argument (construct arguments using primary and secondary sources), Course Materials (perform close reading of complex texts)	HSSC Department	Minimum score of 3 on all performance indicators on final papers in SSC2413/SSC2xx3 SSC2423/LLT2xx3	Annual	3-Year Cycle
QUANTITATIVE REASONING "LTU undergraduates who complete the core curriculum will demonstrate Quantitative Reasoning capabilities through applying mathematics and statistical methods to solve problems."	Direct assessment of three performance indicators using final exam questions: PI-1, Apply arithmetic, algebraic, geometric, technological, or statistical methods to solve problems; PI-2, Represent mathematical concepts verbally, and, where appropriate, symbolically, visually, and numerically; and PI-3, Interpret mathematical models given verbally, or by formulas, graphs, tables, or schematics, and draw inferences from them.	Mathematics + Computer Sciences Department	Score on final exam problems $\geq$ 70% in MCS1074, MCS1414, MCS1424, and MCS1254	Annual	3-Year Cycle
SCIENTIFIC ANALYSIS "LTU undergraduates who complete the core curriculum will demonstrate proficiency in principles of science and applying it to solve scientific problems."	Direct assessment of two performance indicators using selected laboratory assignments: PI-1, Students will apply elements of the scientific method via observation and experimentation; and PI-2, Students will analyze natural sciences concepts and/or problems.	Natural Sciences Department	70% of students scoring 70% or better in BIO2321, PHY2221/2421, and PHY2231/2431	Annual	3-Year Cycle

College of Architecture and Design

BS in Architecture/Master of Architecture

Table 1A: Assessment Plan for the MArch Program (Undergraduate Courses)

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	CoAD's MArch Program has defined its supporting Learning Outcomes based on the NAAB 2020 Conditions of Accreditation "Program Criteria" and "Student Criteria" (plus additional NAAB topical sub-criteria). For LTU Undergraduate Ethics: NAAB CoAD SC.2E, Professional Conduct (I scaffolding level) (Typical: Since several courses at various levels contribute to each Learning Outcome above, Bloom's taxonomy information for course-specific Learning Objectives is included under Assessment Strategy details in the Appendix materials.)	For each CoAD Learning Outcome, CoAD has developed a set of scaffolded performance criteria. Level appropriate and course-relevant criteria are distributed to each course in a Canvas Assessment Rubric each semester. Each student is evaluated on each criterion, as "Exceeding Expectations", Meeting Expectations" or "Not Meeting Expectations". Data from all three semesters is compiled into a yearly summary (numeric and graphic) of percentages of Exceeding, Meeting, and Not Meeting for each performance criterion. Performance criteria are reviewed annually to support improvements where needed.	CoAD has established benchmarks for the desired combined percentage of students Meeting/Exceeding Expectations, for each performance criterion (again level-appropriate and course-relevant). A faculty member "Interpreter", designated for each Learning Outcome, evaluates the yearly summary data against the benchmarks, along with commentary from faculty teaching the courses, and reports to the Chair. These reports form the basis of LTU CoAD Assessment Reports. Benchmarks are reviewed annually to support improvements where needed.
LEADERSHIP	Same as above. For LTU Undergraduate Leadership: NAAB CoAD PC.6, Leadership & Collaboration	Same as above.	Same as above.
TEAMWORK	Same as above. For LTU Undergraduate Teamwork: NAAB CoAD PC.6, Leadership & Collaboration	Same as above.	Same as above.
TECHNOLOGY	Same as above. For LTU Undergraduate Technology: NAAB CoAD SC.4A-G: Structural Systems, Environmental Systems, Building Envelope Systems, Materials & Assemblies, Building Services Systems, Building Costs, and Technical Documentation	Same as above.	Same as above.

VISUAL COMMUNICATION	Same as above. For LTU Undergraduate Visual Communication: NAAB CoAD PC.2B Communication & Representation (I & R scaffolding levels)	Same as above.	Same as above.

Table 1B: Assessment Plan for the MArch Program (Graduate Courses)

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ADVANCED KNOWLEDGE	Same as for Undergraduate Program above. For LTU Graduate Advanced Knowledge: NAAB CoAD PC.5A Research (Methods)	Same as for Undergraduate Program.	Same as for Undergraduate Program.
COMMUNICATION	Same as above. For LTU Graduate Communication: NAAB CoAD PC.5A Research (Communication)	Same as for Undergraduate Program.	Same as for Undergraduate Program.
ETHICS	For LTU Graduate Ethics: NAAB CoAD SC.2E, Professional Conduct (R & E scaffolding level)	Same as for Undergraduate Program.	Same as for Undergraduate Program.
TECHNOLOGY	Same as above. For LTU Graduate Technology: NAAB CoAD PC.2B Communication & Representation (E scaffolding level)	Same as for Undergraduate Program.	Same as for Undergraduate Program.

Table 2: Curriculum Map for the BS Arch/M.Arch

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**		Undergraduate: ETHICS	Undergraduate: LEADERSHIP	Undergraduate: TEAMWORK	Undergraduate: TECHNOLOGY	Undergraduate: VISUAL	Graduate: ADVANCED KNOWLEDGE	Graduate: COMMUNICATION	Graduate: ETHICS	Graduate: TECHNOLOGY
Intro to Design	DES1022		**I**	**I**						
Intro to Vis. Comm.	ARC1213					**I**				(I)
Design Principles	DES1213	(Not used for LTU Assessment)								
Visual Communication	ARC1223					**I**				(I)
Design Methodologies	DES1223						(I)	(I)		
Hist. of Designed Envir. 1	ARC3613	(Not used for LTU Assessment)								
Info. Modeling & Sim.	ARC2813				**I**					
Integrated Design 1	ARC2116	(Not used for LTU Assessment)								
Hist. of Designed Envir. 2	ARC3623	(Not used for LTU Assessment)								
Prototyping & Fabrication	ARC3823	(Not used for LTU Assessment)								
Integrated Design 2	ARC2126					**R**				(R)
Construction Systems 1	ARC2313				**I**					
Basic Structures	ARC2513				**I**					
Integrated Design 3	ARC3116				**I**					
20th Cen. Architecture	ARC4183	(Not used for LTU Assessment)								
Construction Systems 2	ARC2323				**R**					
Intermediate Structures	ARC3513				**R**					
Integrated Design 4	ARC3126	(Not used for LTU Assessment)								
Design Leadership	DES4112	**I**	**I**	**I**					(I)	
Integrated Design 5	ARC4116		**R**	**R**						
Advanced Structures	ARC4543				**E**					
HVAC & Water Systems	ARC3423				**E**					
Acous., Elect., Illum. Sys.	ARC4443				**E**					
Comprehensive Design	ARC4126	(Not used for LTU Assessment)								
Research Methods	ARC5013						**R**	**R**		
Critical Practice	ARC5804		(E)	(E)						
Design Theory	ARC5643	(R)							**R**	
Adv. Design Studio 1	ARC5814					(E)	**E**	**E**		**E**
Thesis 1	ARC6514					(E)	**E**	**E**		**E**
Professional Practice	ARC5913	(E)							**E**	
Ecological Issues	ARC5423	(Not used for LTU Assessment)								
Adv. Design Studio 2	ARC5824					(E)	**E**	**E**		**E**
Thesis 2	ARC6524					(E)	**E**	**E**		**E**

BFA in Game Design

Table 1: Assessment Plan with Mapped Courses for BFA in Game Design

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	NASAD Criteria: H.IX.C.3.f Understanding of what is useful, usable, effective, and desirable with respect to user/audience-centered digitally-based communication, objects, and environments	Direct assessment of student using course embedded rubric: (I) History of Game Design (R) Integrated Game Studio	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
LEADERSHIP	NASAD Criteria: H.VIII.D.2 Acquire the skills necessary to assist in the development and advancement of their career H.VIII.D.3 Develop teaching skills, particularly as related to their major area of study	Direct assessment of student using course embedded rubric: H.VIII.D.2 (I) Design Leadership (R) Professional Practice H.VIII.D.3 (I) Game systems (R) Multi Disciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TEAMWORK	NASAD Criteria: H.VIII.D.5 Explore multidisciplinary issues that include art and design [H.X.A.6.3d] Ability to work in teams and to organize collaborations among people from different disciplines	Direct assessment of student using course embedded rubric: H.VIII.D.5 (I) Design Methodologies (R) Multi Disciplinary Design H.X.A.6.3d (I) Design Methodologies, (R) Multi Disciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TECHNOLOGY	NASAD Criteria: H.X.A.6.4b Make critical choices among different technologies	Direct assessment of student using course embedded rubric: H.X.A.6.4b	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent

	H.IX.C.3.c Understanding of the characteristics and capabilities of various technologies (hardware and software)	(I) Intro to Game Systems (R) Game Systems Senior Project 1 H.X.A.6.4b (I) Game Systems (R) Integrated Game Studio	3 = exemplary
VISUAL COMMUNICATION	NASAD Criteria: H.VIII.B.1a Gain functional competence with principles of visual organization in visual elements in two and three dimensions, color theory and its applications, and drawing H.X.C.3.b2 Understanding of and ability to develop strategies for planning, producing, and disseminating visual communications	Direct assessment of student using course embedded rubric: H.VIII.B.1a (I) Drawing and Design Geometry 1 (R) Digital Drawing and Painting H.X.C.3.b2 (I) Drawing and Design Geometry 1 (R) Integrated Game Studio	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
ADDITIONAL PROGRAM OUTCOMES *Optional* *If Added, reorder entire table alphabetically—no need to label these additional outcomes	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time

BFA in Graphic Design

Table 1: Assessment Plan with Mapped Courses for BFA in Graphic Design

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	NASAD Criteria: H.X.C.3.e4 Ability to recognize and analyze the social, cultural, and economic implications of technology	Direct assessment of student using course embedded rubric: (I) Digital Product Design (R) Senior Thesis 1	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
LEADERSHIP	NASAD Criteria: H.VIII.D.2 Acquire the skills necessary to assist in the development and advancement of their career H.VIII.D.3 Develop teaching skills, particularly as related to their major area of study	Direct assessment of student using course embedded rubric: H.VIII.D.2 (I) Professional Practice, (R) Design Leadership H.VIII.D.3 (I) Multi Disciplinary Design, (R) Senior Seminar 2	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TEAMWORK	NASAD Criteria: H.VIII.D.5 Explore multidisciplinary issues that include art and design H.X.C.3.d Acquisition of collaborative skills and the ability to work effectively in interdisciplinary or multidisciplinary teams to solve complex problems	Direct assessment of student using course embedded rubric: H.VIII.D.5 (I) Design Methodologies (R) Multi Disciplinary Design H.X.C.3.d (I) Design Methodologies, (R) Multidisciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TECHNOLOGY	NASAD Criteria: H.X.A.6.4b Make critical choices among different technologies	Direct assessment of student using course embedded rubric: H.X.A.6.4b, X.C.3.e2	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent

	H.X.C.3.e2 [TECHNOLOGY] Ability to conduct critical evaluations of different technologies in specific design problem contexts	(I) Digital Foundations, (R) Digital Product Design	3 = exemplary
VISUAL COMMUNICATION	NASAD Criteria: H.VIII.B.1a Gain functional competence with principles of visual organization in visual elements in two and three dimensions, color theory and its applications, and drawing X.C.3.b2 Understanding of and ability to develop strategies for planning, producing, and disseminating visual communications	Direct assessment of student using course embedded rubric: H.VIII.B.1a (I) Foundations of Graphic Design, (R) Graphic Design for the Field H.X.C.3.b2 (I) Foundations of Graphic Design, (R) Graphic Design Thesis 1	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
ADDITIONAL PROGRAM OUTCOMES *Optional* *If Added, reorder entire table alphabetically—no need to label these additional outcomes	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time

BS in Interior Design

Table 1: Assessment Plan with Mapped Courses for BS in Interior Design

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	NASAD Criteria: H.X.F.3.j Functional knowledge of professional design practices and processes: 1. Ethical behaviors	Direct assessment of student using course embedded rubric: (I) Space and Empathy (R) Interior Design Practice	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
LEADERSHIP	NASAD Criteria: H.VIII.D.2 Acquire the skills necessary to assist in the development and advancement of their career H.VIII.D.3 Develop teaching skills, particularly as related to their major area of study	Direct assessment of student using course embedded rubric: H.VIII.D.2 (I) Interior Design Practice, (R) Design Leadership H.VIII.D.3 (I) Multidisciplinary Design, (R) Interiors Capstone Research Seminar	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TEAMWORK	NASAD Criteria: H.VIII.D.5 Explore multidisciplinary issues that include art and design H.X.F.3.h Acquisition of collaborative skills and the ability to work effectively in interdisciplinary or multidisciplinary teams to solve complex problems	Direct assessment of student using course embedded rubric: H.VIII.D.5 (I) Design Methodologies. (R) Multidisciplinary Design H.X.F.3.h (I) Design Methodologies, (R) Multidisciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TECHNOLOGY	NASAD Criteria: H.X.A.6.4b Make critical choices among different technologies	Direct assessment of student using course embedded rubric: H.X.A.6.4b	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary

	H.X.F.3.e Knowledge of the technical aspects of construction and building systems	(I) Visual Communication, (R) Prototyping & Fabrication H.X.F.3.e (I) Human Comfort, (R) Documentation, Detailing & Specification	
VISUAL COMMUNICATION	NASAD Criteria: H.VIII.C.3 2. Students must have the ability to communicate art/design ideas, concepts, and requirements to professionals and laypersons H.X.F.3.f Ability to hear, understand, and communicate to the broad range of professionals and clients	Direct assessment of student using course embedded rubric: H.VIII.C.3 (I) Intro to Visual Communications, (R) Interiors Capstone H.X.F.3.f (I) Bodies in Space, (R) Space and Empathy	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
ADDITIONAL PROGRAM OUTCOMES *Optional* *If Added, reorder entire table alphabetically—no need to label these additional outcomes	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time

BS in Product Design

Table 1: Assessment Plan with Mapped Courses for BS in Product Design

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	NASAD Criteria: H.X.E.3. Functional knowledge of professional design practices and processes 1. ethical behaviors	Direct assessment of student using course embedded rubric: (I) Introduction to Design (R) Professional Practice	Mean score ≥ 1 on 3-point scale rubric: 0 = deficient 1 = competent 2 = exemplary
LEADERSHIP	NASAD Criteria: H.VIII.D.2 Acquire the skills necessary to assist in the development and advancement of their career H.VIII.D.3 Develop teaching skills, particularly as related to their major area of study	Direct assessment of student using course embedded rubric: H.VIII.D.2 (I) Professional Practice, (R) Design Leadership H.VIII.D.3 (I) Multi Disciplinary Design, (R) Senior Thesis	Mean score ≥ 1 on 3-point scale rubric: 0 = deficient 1 = competent 2 = exemplary
TEAMWORK	NASAD Criteria: H.VIII.D.5 [SHARED STUDIOS] Explore multidisciplinary issues that include art and design H.X.E.3.i [TEAMS] Acquisition of collaborative skills	Direct assessment of student using course embedded rubric: H.VIII.D.5, H.X.E.3.i (I) Design Methodologies (R)Multi Disciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 0 = deficient 1 = competent 2 = exemplary
TECHNOLOGY	NASAD Criteria: H.X.A.6.4b Make critical choices among different technologies H.X.E.3.b [TECHNOLOGY] Ability to use technologies and tools associated with multi-dimensional	Direct assessment of student using course embedded rubric: H.X.A.6.4b (I) 3D Visualization 1, (R) Rapid Technology H.X.E.3.b	Mean score ≥ 1 on 3-point scale rubric: 0 = deficient 1 = competent 2 = exemplary

	design representation, development, dissemination, and application	(I) 3D Visualization 1, (R) 3D Visualization 2, Rapid Technology	
VISUAL COMMUNICATION	NASAD Criteria: *H.VIII.B.1a* *Gain functional competence with principles of visual organization in* visual elements in two and three dimensions, colour theory and its applications, and drawing H.VIII.C.3 2. Students must have the ability to communicate art/design ideas, concepts, and requirements to professionals and laypersons H.X.F.3.f Ability to communicate concepts and specifications in verbal, written, and multiple media at levels ranging from abstraction and sketches, to detailed multi-dimensional, functional, and visual representations.	Direct assessment of student using course embedded rubric: *H.VIII.B.1a* (I) Drawing & Design Geometry 1, (R) Drawing & Design Geometry 2 H.VIII.C.3 (I)Sophomore Portfolio Review, (R) Design for Impact H.X.F.3.f (I)Foundation of Product Design, (R) Senior Thesis	Mean score ≥ 1 on 3-point scale rubric: 0 = deficient 1 = competent 2 = exemplary
ADDITIONAL PROGRAM OUTCOMES *Optional* *If Added, reorder entire table alphabetically—no need to label these additional outcomes	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time

BS in Transportation Design

Table 1: Assessment Plan with Mapped Courses for BS in Transportation Design

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	NASAD Criteria: H.X.E.3.g Functional knowledge of professional design practices and processes	Direct assessment of student using course embedded rubric: H.X.E.3.g (I) Introduction to Design (R) Professional Practice	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
LEADERSHIP	NASAD Criteria: H.VIII.D.2 Acquire the skills necessary to assist in the development and advancement of their career H.VIII.D.3 Develop teaching skills, particularly as related to their major area of study	Direct assessment of student using course embedded rubric: H.VIII.D.2 (I) Professional Practice, (R) Design Leadership H.VIII.D.3 (I) Multi Disciplinary Design, (R)Professional Design Challenge	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TEAMWORK	NASAD Criteria: H.VIII.D.5 Explore multidisciplinary issues that include art and design H.X.C.3.i Acquisition of collaborative skills and the ability to work effectively in interdisciplinary or multidisciplinary teams to solve complex problems	Direct assessment of student using course embedded rubric: H.VIII.D.5 (I) Design Methodologies (R) Multi Disciplinary Design H.X.C.3.i (I) Design Methodologies, (R) Multidisciplinary Design	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
TECHNOLOGY	NASAD Criteria: H.X.A.6.4b Make critical choices among different technologies H.X.E.3.b	Direct assessment of student using course embedded rubric: H.X.A.6.4b, (I) Drawing & Design Geometry 2, (R)TD 3D Modeling 3 H.X.E.3.b	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary

	[TECHNOLOGY] Ability to use technologies and tools associated with multi-dimensional design representation, development, dissemination, and application	(I) TD 3D Modeling 1, (R)TD 3D Modeling AR/VR	
VISUAL COMMUNICATION	NASAD Criteria: H.VIII.C.3 2. Students must have the ability to communicate art/design ideas, concepts, and requirements to professionals and laypersons related to the practice of the major field H.X.E.3.f Ability to communicate concepts and specifications in verbal, written, and multiple media	Direct assessment of student using course embedded rubric: H.VIII.C.3 (I) Transportation Design: Foundations(R) Professional Design Challenge H.X.E.3.f (I) Transportation Design: Foundations (R) Professional Design Challenge	Mean score ≥ 1 on 3-point scale rubric: 1 = deficient 2 = competent 3 = exemplary
ADDITIONAL PROGRAM OUTCOMES *Optional* *If Added, reorder entire table alphabetically—no need to label these additional outcomes	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time	Complete as appropriate for the program. NA at this time

College of Arts and Sciences

BS in Chemistry and Environmental Chemistry

Table 1: Assessment Plan with Mapped Courses for BS in Chemistry and Environmental Chemistry

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Students must individually and successfully use instrumentation and chemical literature available in the department to analyze unknown substances and synthesized organic or inorganic compounds.	Direct assessment of coursework using a lab report rubric in CHM 4632 (Instrumental Analysis Lab), CHM 4541 (Advanced Spectroscopy Lab), and CHM 3463 (Advanced Synthesis Lab). Course objectives surveys in CHM 4632 (Instrumental Analysis Lab), CHM 4541 (Advanced Spectroscopy Lab), and CHM 3463 (Advanced Synthesis Lab).	80% of students will receive a "qualified" designation. 80% of students will feel "confident" or "very confident" overall regarding their mastery of the course objectives.
ETHICS & LEADERSHIP	Students will be able to evaluate the impact of scientific practices and findings on society.	Evaluation of senior project proposal using a rubric in PSC 3001 (Introduction to Senior Projects in Science). Students will consider sustainability and green chemistry issues relevant to their proposed senior project.	80% of students will perform at a "satisfactory" or "superior" level.
TEAMWORK	Students will demonstrate team-building and collaboration skills by making decisions, building consensus, resolving conflicts, and evaluating team members' contributions toward solving chemistry-related problems.	Team evaluation by instructor and team self-evaluation in CHM 3441 (Physical Chemistry 2 Lab), CHM 3411 (Biochemistry 1 Lab), and CHM 3463 (Advanced Synthesis Lab). A Likert scale of satisfaction will be used. Ethics case study assignment in PSC 3001, in which students will analyze an ethics-related situation and characterize and reflect upon the scientific misconduct involved.	80% of students will feel "always satisfied" or "frequently satisfied" regarding the contributions of their peers. The instructor will feel "always satisfied" or "frequently satisfied" 80% of the time regarding student contributions.
VISUAL COMMUNICATION	Students will demonstrate professional standards in chemistry through graphical communication.	Direct assessment of research project posters using a rubric in CHM 3411 (Biochemistry 1 Laboratory). Direct assessment of student project reports using a rubric in CHM 4001 (Computational Chemistry 2).	80% of students will perform at a "satisfactory" or "superior" level based on rubrics.

		Evaluation of student presentations using an oral presentation rubric in CHM 4912 (Chemical Sciences Project 1) and CHM 4922 (Chemical Sciences Project 2).	
ORAL AND WRITTEN COMMUNICATION	Students will demonstrate professional standards in chemistry through oral and written communication.	Direct assessment of student projects using a rubric in CHM 3403 (Biochemistry). Direct assessment of student lab reports using a rubric in CHM 4632 (Instrumental Analysis Lab). Evaluation of student oral presentations using a rubric in CHM 2313 (Organic Chemistry 1), CHM 2321 (Organic Chemistry 2 Laboratory), CHM 4912 (Chemical Sciences Project 1), and CHM 4922 (Chemical Sciences Project 2).	80% of students will perform at a "satisfactory" or "superior" level based on rubrics.
SCIENTIFIC ANALYSIS	Students will demonstrate critical thinking and apply analytical and problem-solving skills in chemistry.	Completion of an independent research project with minimal assistance in CHM 4912 (Chemical Sciences Project 1) and CHM 4922 (Chemical Sciences Project 2).	80% of students will perform at a "satisfactory" or "superior" level in the completion of their senior projects.
KNOWLEDGE IN DISCIPLINE	Students must integrate the core concepts of physical chemistry: quantum mechanics, thermodynamics, kinetics, and computational chemistry. Students must demonstrate knowledge of quantitative chemical analysis, including wet chemical and instrumental techniques. Students must demonstrate knowledge of the structure and function of the four classes of biomolecules: proteins, nucleic acids, carbohydrates, and lipids. Students must demonstrate their ability to draw and name the major classes of organic molecules, explain how they react using arrow-pushing mechanisms, and how they are characterized using mass spectrometry, IR spectroscopy, and NMR spectroscopy.	Direct assessment of final exams in CHM 3423 (Physical Chemistry 1) and CHM 3434 (Physical Chemistry 2). Direct assessment of final exam in CHM 2342 (Analytical Chemistry) and CHM 4632 (Instrumental Analysis Lab). Direct assessment of final exam in CHM 3403 (Biochemistry). Direct assessment of final exams in CHM 2313 (Organic Chemistry 1) and CHM 2323 (Organic Chemistry 2).	80% of students will perform at a "satisfactory" or "superior" level.

	Students must analyze and interpret new information on modern topics in inorganic chemistry, such as group theory, ligand field theory, x-ray crystallography, and organometallic chemistry.	Direct assessment of final exams in CHM 3452 (Intermediate Inorganic Chemistry) and CHM 4643 (Advanced Inorganic Chemistry).	

BS in Computer Science

Table 1: Assessment Plan with Mapped Courses for BS in Computer Science

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY Students will use mathematical software such as Matlab to analyze problems (Bloom's 4)	Design, implement, and evaluate a computer-based system, process, component, or program to meet its specified requirements. (3) Recognize the need for and engage in continuing professional development [and learn new technologies] and adapt to changes in the field. (7)	Direct assessment of MCS4833 Sr. Project	Students will achieve level 3 (of 4) on the Technology portion of a Sr. Project rubric
ETHICS a. Students will correctly incorporate and cite material from secondary sources in their writing. (Bloom's 3) b. Students will understand what constitutes original research contributions to the discipline. (Bloom's 4)	Secure employment and/or attend graduate school in their field, drawing on their experiences, both within and outside the major to become responsible citizens and effective professionals. (9)	Direct assessment of MCS4833 Sr. Project	Students will pass an ethics quiz based on an on-line tutorial
LEADERSHIP a. Students will understand theories of leadership germaine to the discipline. (Bloom's 2) b. Students will understand the civic responsibilites of researchers. (Bloom's 2)	Analyze the local and global impact of computing on individuals, organizations, and society. (6)	Assessed in MCS4833 Sr. Project by interview with project instructor	Students will achieve a level 3 (of 4) on the Leadership portion of a Sr. Project rubric
TEAMWORK a. Students will demonstrate team-building and collaboration skills (Bloom's 3)	Function effectively in teams to accomplish a common goal, including performing leadership tasks. (4)	Direct assessment of MCS1414 in the Calc Lab	Students will achieve a level 3 (of 4) on the Teamwork portion of a Lab Survey rubric

b. Students will evaluate team members' contributions. (Bloom's 4)			
VISUAL COMMUNICATION Students will use figures or other graphical elements in their projects and other technical reports. (Bloom's 3)	Plan, create and integrate oral, written, and graphical communication of [mathematical and algorithmic ideas] effectively to audiences having a range of technical understanding. (5)	Direct assessment of MCS1414 in the Calc Lab	Students will achieve a level 3 (of 4) on the Graphical communication portion of a Lab Survey rubric
KNOWLEDGE IN DISCIPLINE LTU graduates will demonstrate a mastery of the knowledge base in their discipline and an expertise in solving practical and theoretical problems.	Apply knowledge of computing and mathematics appropriate to the discipline. (1) Display a complete understanding of a computer language (syntax, semantics and terminology), develop and debug complex code. (10) Apply current techniques, skills, and tools necessary for computing practice. (8) Analyze a problem, and identify and define the computing requirements appropriate to its solution. (2)	Direct assessment of standard questions on final exams in MCS1142 and MCS1514 (Fall 2018) and MCS2534 (Spring 2019)	Average score greater than 70% on final exam problems mapped to course objectives

Table 2: Curriculum Map for the BSCS Program

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize**		ETHICS	KNOWLEDGE	LEADERSHIP	TEAMWORK	TECHNOLOGY	VISUAL COMMUNICATION	
Foundations of CS	MCS1243	**I**	**I**		**I**	**I**	**I**	
Computer Science 1	MCS1514	**I**	**I**			**I**	**I**	
Computer Science 2	MCS2514	**I**	**I**			**I**	**R**	
Discrete Math	MCS2523		**I**			**I**		
Software Engineering 1	MCS2513	**R**	**R**			**R**	**R**	
Data Structures	MCS2534		**R**	**R**	**R**	**R**		
Intro to Database Systems	MCS3543		**R**			**R**		
Comp. Arch. & Assembler	MCS3663		**R**			**R**		
Operating Systems	MCS4663		**E**			**E**		
Computer Networks	MCS4613		**E**			**E**		
Comparative Prog. Lang.	MCS4643		**E**			**E**		
Theory of Computation	MCS4653		**E**			**E**		
Senior Project Com 1001	MCS483(4)3	**E**	**E**	**E** **I**	**E**	**E**	**E**	

BS in Mathematics

Table 1: Assessment Plan with Mapped Courses for BS in Mathematics

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY Students will use mathematical software such as Matlab to analyze problems (Bloom's 4)	Design, implement, and evaluate a computer-based system, process, component, or program to meet its specified requirements. (3)	Direct assessment of MCS4833 Sr. Project	Students will achieve level 3 (of 4) on the Technology portion of a Sr. Project rubric
ETHICS a. Students will correctly incorporate and cite material from secondary sources in their writing. (Bloom's 3) b. Students will understand what constitutes original research contributions to the discipline. (Bloom's 4)	Secure employment and/or attend graduate school in their field, drawing on their experiences, both within and outside the major to become responsible citizens and effective professionals. (9)	Direct assessment of MCS4833 Sr. Project	Students will pass an ethics quiz based on an on-line tutorial
LEADERSHIP a. Students will understand theories of leadership germaine to the discipline. (Bloom's 2) b. Students will understand the civic responsibilites of researchers. (Bloom's 2)	Analyze the local and global impact of computing on individuals, organizations, and society. (6) Recognize the need for and engage in life-long learning, continuing professional development and adapt to changes in the field. (7)	Assessed in MCS4833 Sr. Project by interview with project instructor	Students will achieve a level 3 (of 4) on the Leadership portion of a Sr. Project rubric
TEAMWORK a. Students will demonstrate team-building and collaboration skills (Bloom's 3) b. Students will evaluate team members' contributions. (Bloom's 4)	Function effectively in teams to accomplish a common goal, including performing leadership tasks. (4)	Direct assessment of MCS1414 in the Calc Lab	Students will achieve a level 3 (of 4) on the Teamwork portion of a Lab Survey rubric

VISUAL COMMUNICATION Students will use figures or other graphical elements in their projects and other technical reports. (Bloom's 3)	Communicate mathematical ideas and models effectively to a range of audiences orally, in writing, and graphically. (5)	Direct assessment of MCS1414 in the Calc Lab	Students will achieve a level 3 (of 4) on the Graphical communication portion of a Lab Survey rubric
KNOWLEDGE IN DISCIPLINE LTU graduates will demonstrate a mastery of the knowledge base in their discipline and an expertise in solving practical and theoretical problems.	Apply knowledge of mathematics appropriate to a problem. (1) Analyze a problem, and identify and define the mathematical techniques appropriate to its solution. (2) Use current and established techniques, skills, and tools necessary for applying mathematics. (8)	Direct assessment of standard questions on final exams in MCS1142 and MCS1514 (Fall 2018) and MCS2534 (Spring 2019)	Average score greater than 70% on final exam problems mapped to course objectives

Table 2: Curriculum Map for the BS in Mathematics Program

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize**		ETHICS	KNOWLEDGE	LEADERSHIP	TEAMWORK	TECHNOLOGY	VISUAL COMMUNICATION	
Calculus 1	MCS1414		**I**		**I**		**I**	
Calculus 2	MCS1424		**I**		**I**		**I**	
Calculus 3	MCS2414		**I**	**I**	**R**	**I**		
Differential Equations	MCS2423	**I**	**R**	**I**	**R**			
Discrete Math	MCS2523		**I**				**R**	
Statistics	MCS2124	**I**	**I**			**I**		
Linear Algebra	MCS3863		**R**	**R**	**E**	**R**		
Prob and Stat	MCS3403	**R**	**R**			**R**		
Applied Stats	MCS3123		**R**				**R**	
Advanced Calc	MCS3723		**E**				**E**	
Math Modeling	MCS3523	**R**	**R**	**R**	**E**			
Numerical Analysis	MCS4813		**E**			**E**	**E**	
Senior Project 1	MCS4833	**E**	**E**	**E**		**E**		
Senior Project 2	MCS4843	**E**	**E**	**E**		**E**		

BS in Media Communication

Table 1: Assessment Plan with Mapped Courses for BS in Media Communication

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Graduates will have an industry-standard skill set in production, post-production and new media.	Student work from: MCO 2003: Intro to Video Production; MCO 3303: Video Editing; MCO 3203: Camera for Broadcast; MCO 3623: Adobe for Media	70% score 4 or higher on 5 point course specific Technology rubric
ETHICS	Graduates will understand the impact of their professional decisions on the public and broader global societies.	MCO 1003: Media, Communication & Society: Combination of Assignment scores from Media Economics in the Global Marketplace exam and Legal Controls and Freedom of Expression exam	70% Score 4 or higher on 5 point rubric
LEADERSHIP	Graduates will develop leadership and teamwork skills through collaboration and engage in ethical dimensions of technology and innovation.	Assignments in COM 1001: Pathways to Research Careers	Success metric determined by rubric specific to Pathways curriculum
TEAMWORK	Graduates will understand the importance of teamwork, diversity, and collaboration to achieve a common goal for the betterment of society.	COM 4001:Pathways Capstone Lab	Success metric determined by rubric specific to Pathways curriculum
COMMUNICATION	Graduates will possess industry-standard professional skills in writing, presentations, and interpersonal communication using Oral, Written, and Visual communication modalities.	Direct assessment of student assignments in MCO 3713: Advanced Writing for Media MCO 3623: Adobe for media	70% Score 4 or higher on Writing, Presentation and Graphical rubrics specific to each class being assessed
KNOWLEDGE IN DISCIPLINE	1a: Graduates will have an in-depth understanding of the scope and purpose of the media industry. 1b: Graduates will understand the standards of professional practices within the media industry.	For both 1a and 1b - Direct assessment of student assignments in MCO 3633: Social Media- Client Strategy Assignment; MCO 1003: Media, Communication and Society- Critical Approach Exam for 1a and Global Marketplace Exam for 1b, MCO 2563: Intro to Broadcast- Director/Tech Director Final, MCO 2543: Writing for Electronic & Print Web News Assignment	70% score 4 or higher on 5 Point Professional Practices rubric

BS in Molecular and Cell Biology

Table 1: Assessment Plan with Mapped Courses for BS in Molecular and Cell Biology

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	LTU MCB graduates will apply advanced technologies such as software or instrumentation to practical and/or theoretical problems in molecular cell biology. LTU MCB graduates will have the ability to use modeling and simulation with complex biological systems.	Direct assessment of coursework with rubric in BIO 3201 (A&P lab) (Formative), and BIO 4812 (Cell Bio lab) (Summative) Direct assessment of coursework with rubric in BIO 4103 (Evolution).	80% "satisfactory" or "superior" performance based on rubrics 80% "satisfactory" or "superior" performance based on rubrics
ETHICS & LEADERSHIP	LTU MCB graduates will be able to evaluate the impact of scientific practices and findings on society.	Ethics case study assignment in PSC 3001, in which students will analyze an ethics-related situation and characterize and reflect upon the scientific misconduct involved.	80% "satisfactory" or "superior" performance
TEAMWORK	LTU MCB graduates will have the ability to communicate and collaborate with other disciplines.	Team self-evaluation in BIO 3201 (A&P lab). Likert scale of satisfaction will be used.	80% of responses with "always satisfied" or "frequently satisfied" to survey which will include peer evaluation.
VISUAL COMMUNICATION	LTU MCB graduates will have the ability to communicate data in a graphical form.	Evaluation of student presentations using oral rubric (Bio 491X & 492X).	80% "satisfactory" or "superior" performance based on rubrics
WRITTEN AND ORAL COMMUNICATION	LTU MCB graduates will have the ability to communicate in written form and orally with biologists, other scientists and also with the non-scientific community. (Note: Written and Oral Communication is also assessed at the university level through the core curriculum)	Written proposals in PSC 3001 (Intro to Projects) and Laboratory reports/Posters in Bio 3201 (A&P lab), Bio 2321 (Micro Lab) and/or Bio 4812 (Cell Bio Lab) will be evaluated using a rubric.Evaluation of student presentations using oral rubric (Bio 491X & 492X).	80% "satisfactory" or "superior" performance.
SCIENTIFIC ANALYSIS	Students will apply elements of the scientific method via observation and experimentation. Students will analyze natural sciences concepts and/or problems.	Direct assessment of coursework with rubric in PHY 2221 (College Physics 1 lab) and/or PHY 2231 (College Physics 2 lab) and/or BIO 2321 (Micro lab) (formative) Direct assessment of coursework with rubric in BIO 491x (senior project 1) and/or BIO 492x (senior project 2) (summative)	80% "satisfactory" or "superior" performance

KNOWLEDGE IN DISCIPLINE	LTU MCB graduates will defend the modern synthesis of evolution and genetics and apply this foundational biological paradigm to biological phenomena.	Direct assessment of coursework with rubric in BIO 4103 (Evolution)	80% “satisfactory” or “superior” performance.
	Explain the intrinsic relationship between the structure and function in biological systems and be able to predict structure given functional data or vice versa.	Direct assessment of coursework with rubric in BIO 3203 (A&P A) and/or BIO 3303 (A&P B)	
	Defend biological central dogma and summarize the process of the control of gene expression.	Direct assessment of coursework with rubric in BIO 3323 (Genetics) and/or BIO 4813 (Cell Bio)	
	Compare and contrast the various ways that biological organisms harvest energy and convert it to matter.	Direct assessment of coursework with rubrics in BIO 2313 (Micro) and/or BIO 2321 (Micro lab)	
	Explain how living systems are interconnected and apply this knowledge to predict perturbations to these systems.	Direct assessment of coursework with rubric in BIO 1223 (Bio 2) and/or BIO 4103 (Evol)	

BS in Nursing

Table 1: Assessment Plan for BS in Nursing

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Utilize information management and technology to ensure safe, effective, and high quality care.	Technology rubric in program core courses.	80% "satisfactory" or "superior" performance based on rubrics
ETHICS & LEADERSHIP	Value professional nursing practice reflective of the scope and standards of nursing practice and the code of ethics. Employ interprofessional collaboration and leadership strategies to improve outcomes for individuals, communities, and systems.	Term paper in NUR 2203 Health Care Policy, Ethics, and Advocacy	80 % of the students will receive a grade of 80% or above
TEAMWORK	Ability to communicate and collaborate with others in teams.	Team self-evaluation and peer-evaluation in program core courses when teamwork occurs.	80% of responses with "always satisfied" or "frequently satisfied" to survey which will include peer evaluation.
VISUAL COMMUNICATION	Ability to communicate data in a graphical form.	Evaluation of student presentations using oral rubric (Bio 491X & 492X).	80% "satisfactory" or "superior" performance based on rubrics
KNOWLEDGE IN DISCIPLINE	(a) *Integrate* knowledge from the humanities and sciences within the context of nursing science. (b) *Implement* the principles of relationship-based care into patient centered, individualized care imparted within a caring and healing environment. (c) *Demonstrate* health promotion and disease prevention strategies across diverse settings, lifespan, and vulnerable populations to address health disparities and population health. (d) *Examine* the impact of policy, finance, and regulatory environments on healthcare.	~~(a)~~ NUR 2313 Pathophysiology/Pharmacology I (b) NUR 2102 Holistic Nursing: Complementary Therapies (c) NUR 1202 Health Promotion and Clinical Prevention (d) NUR 2203 Health Care Policy, Ethics, and Advocacy	(a) Final Exam: 80 % of the students will receive a grade of 80% or above (b) Group Project 80 % of the students will receive a grade of 80% or above (c) Family Assessment Paper 80 % of the students will receive a grade of 80% or above (d) Formal Paper 80 % of the students will receive a grade of 80% or above

Table 2: Curriculum Map for BS in Nursing

Program Objective **Key =** **Introduced = I** **Reinforced =R** **Mastery = M**	Integrate knowledge from the humanities and sciences within the context of nursing science.	Implement the principles of relationship-based care (RBC) into patient centered, individualized care imparted within a caring and healing environment.	Demonstrate health promotion and disease prevention strategies across diverse settings, lifespan, and vulnerable populations to address health disparities & pop health	Formulate plans of care designed within the frameworks of clinical reasoning, quality improvement and evidence-based practice.	Utilize information management and technology to ensure safe, effective, and high quality care.	Employ interprofessional collaboration and leadership strategies to improve outcomes for individuals, communities, and systems.	Value professional nursing practice reflective of the scope and standards of nursing practice and the code of ethics.	Examine the impact of policy, finance, and regulatory environments on healthcare
Introduction to Nursing and Social Justice	X I	X I RBC 7 principles	X I AACN Cultural Competency 1 and 4	XI Quality	XI The us of technology	X I Leadership Teamwork (RBC) ANA Standard 10 (collaboration) Teamwork and Collaboration (QSEN) Interprofessional Collaboration Domains	X I ANA Standard 8 Culturally Congruent Practice	X I Resource Driven Practice (RBC)
Holistic Nursing: Comp. Therapies		X I RBC Caring and Healing Environment; PNP			X I AACN Cultural Competency 3			
Health Care Policy, Ethics, and Advocacy		X I RBC PNP Resource Driven Practice	XI Population Health AACN 1, 4		XI QSEN safety		X I ANA Standard 7 – 8,15	X I QSEN - QI AACN Cultural Competence -4 IPEC-1
Health Promotion and Clinical Prevention	XI Micro and Genetics		X I HP Theory and Interventions		X I AACN Cultural Competency 2		X I ANA Standard 8, 12, 16	

							-Culturally Congruent -Education -Environmental Health	
Assessment Across the Lifespan	X I A/P, Patho, PSY	X I Professional nursing practice (RBC)	X I AACN Cultural Competence 1		X I Intro to EMR		X I Standard I Assessment	
Patho/Pharm I and II	X I A/P and Genetics		X I AACN Cultural Competency 1	X I EBP/Research EBP (QSEN)	X I Specific to pharmacology and nursing AACN Cultural 3		X I Standard 13 EBP/Research EBP (QSEN)	
Foundations of Professional Nursing Practice/CC	X I Chemistry, micro, biology, A/P, Patho, nutrition, Social Psychology	X I RBC 7 principles QSEN			X I Safety (QSEN) AACN Cultural Competency 3	XI QSEN	X I Standard I-6 Nursing Process	
Foundations of Interprofessional Communication and Collaboration	X I Humanities	X I Leadership Teamwork				X I -Leadership/Teamwork -Teamwork and Collaboration (QSEN) Interprofessional Collaboration – IPEC Domain 3 -AACN Cultural Competence 1	X I Standard 7, 8, 9, 10, 11	
Scholarship as Applied to Evidence Based Practice	XI Statistics			X I Theory and principles AACN Cultural Competency 2			X I Standard 13 EBP/Research EBP (QSEN)	

Informatics for Professional Nurses					X I Theory and Principles Informatics - QSEN	X I Telehealth	X I ANA Standard 14, 15 Informatics QSEN	
Nursing Care of the Adult with Acute and Chronic Illness (med-surg)	X R Chemistry, micro, biology, A/P, Patho, nutrition, Social Psychology	X R RBC 7 principles QSEN	X R ANA 1-15	X R QSEN Safety EBP QI	X R	X R QSEN Teamwork	X R ANA Standards I-15	
Mental Health and Illness	X R PSY 2623 Genetics	X R RBC 7 principles QSEN	X R ANA 1-15	X R QSEN Safety EBP QI	X R	X R QSEN Teamwork	X R ANA Standard I-15	
Nursing Care of the Elder Adult with Acute and Chronic Illness (med-surg II)	X R PSY Genetics	X R	X R	X R	X R	X R	X R	X R
Geriatric Theory	X R PSY/Soc Genetics		X I AACN Gero Competency	X I AACN Gero Competency		X I AACN Gero Competency		X I AACN Gero Competency
Nursing Care of the Childbearing Family	X R Genetics	X R	X R	X R	X R	X R	X R	X R
Nursing Care of Children and their Families	X R PSY Genetics	X R	X R	X R	X R	X R	X R	X R

Population Health and Epidemiology	X R Genetics	X R	X R	X R	X R AACN Cultural Competency 3	X R	X R AACN Cultural Competency 5	X R
Nursing Leadership for Quality Healthcare within Organizations and Systems		X R		X R	X R AACN Cultural Competency 3	X R Interprofessional Collaboration Domain 4	X R AACN Cultural Competence 4	X R
Nursing Care of Patients with Complex Needs (Theory only)	X R Chemistry, micro, biology, A/P, Patho, nutrition	XR		XR				
Immersion		X M	X M	X M	X M	X M	X M	X M
Capstone Project				X M				

Notes:

Relationship Based Care Principles – Conceptual Framework

Caring and healing environment: The physical environment and the interactions with those delivering care are the immediate context for the patient's experience. The combination of therapeutic relationships and an environment that meets physical needs and comfort, promotes healing.

Leadership: Each individual nurse has a leadership role in providing care. Compassionate nursing leadership supports the emergence of caring and compassionate leaders from all levels of the organization.

Teamwork: Every individual nurse is accountable for his or her own actions, supports the success of those around them and contributes to the mission of the organization. Commitment to excellent communication and strong collegial relationships creates an environment for great care.

Professional nursing practice:

Nurses embrace the responsibilities of professional practice: holding to a set of technical and ethical standards, ongoing self-improvement and development, and accountability for autonomy. The six practice roles that describe the nurse in the context of Relationship Based Care are: sentry, guide, healer, collaborator, teacher, and leader.

Patient care delivery: Continuity of care is of great value to the patient and supports the relationship between the patient and the nurse. The four elements that define any care delivery system:

1. Nurse/patient relationship and decision-making

2. Work allocation and/or patient assignments
3. Communication between members of the health care team
4. Management of the unit environment

Resource-driven practice: A focus on what resources are available and prioritization of what matters most to the patient and family, instead of what resources are lacking, refocuses the care to benefit the patient and the team. Staffing fluctuations are inevitable in our environment. An empowered approach to prioritized care promotes critical thinking, decision-making and individualization of care.

Outcomes measurement: Meaningful data is used to measure the impact of both relationships and care. Patient satisfaction and clinical outcomes data are used to inspire and motivate so that members of the team understand their relationship to the outcomes they influence.

ANA Scope and Standards of Practice

1. Assessment 2. Diagnosis 3. Outcome Identification 4. Planning 5. Implementation 6. Evaluation 7. Ethics
8. Culturally Congruent Practice 9. Communication 10. Collaboration 11. Leadership 12. Education 13. Evidenced Based Practice
14. Quality of Practice 15. Resource Utilization 16. Environmental Health

Quality and Safety Education for Nurses (QSEN)

Safety - Key Message: Safe, effective delivery of patient care requires understanding of the complexity of care delivery, the limits of human factors, safety design principles, characteristics of high reliability organizations and patient safety resources.

Teamwork and Collaboration - Key Message: Safe, effective, satisfying patient care requires teamwork: collaboration with and communication among members of the team, including the patient and family as active partners.

Patient Centered Care - Key Message: The patient and family are in a partnered relationship with their health care provider and are equipped with relevant information, resources, access, and support to fully engage in and/or direct the health care experience as they choose.

Evidenced Based Practice - Key Message: Safe, effective delivery of patient care requires the use of nursing practices consistent with the best available knowledge. This includes use of clinical expertise and patient preferences and values, in addition to current best research evidence.

Health Informatics - Key Message: Technology is changing how patients manage their own health care needs and how nurses manage patient care. Nurses need new skills to use and contribute to the development of electronic health records, to find and evaluate the relevance of evidence to support clinical decisions, and to use data to solve patient and system problems.

Quality Improvement - Key Message: Improving patient care requires a systematic process of defining problems in order to identify potential causes and develop strategies to improve care. This process requires the ability to measure care. We can only improve care if we can measure how well we are doing and compare our performance against others'.

Core Competencies for Interprofessional Collaborative Practice (Sponsored by Interprofessional Education Collaborative - IPEC)
Domains

1. Values and Ethics for Interprofessional Practice
2. Roles and Responsibilities
3. Interprofessional Communication
4. Teams and Teamwork

BS in Physics

Table 1: Assessment Plan with Mapped Courses for BS in Physics

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Students must individually and successfully use appropriate instrumentation available in the department, such as AFM, SEM to characterize specimen.	Direct assessment of coursework with a rubric in PHY 3661 and PHY 4781. Designation of "unsatisfactory", "satisfactory" and "superior" will be given.	At least 80% of students receive "satisfactory" or "superior".
ETHICS & LEADERSHIP	Students will be able to evaluate the impact of scientific practices and findings on society.	Ethics case study assignment in PSC 3001, in which students will analyze an ethics-related situation and characterize and reflect upon the scientific misconduct involved.	At least 80% of students perform at a "satisfactory" or "superior" level.
TEAMWORK	LTU MCB graduates will have the ability to communicate and collaborate with other disciplines.	Team self-evaluation in BIO 3201 (A&P lab). Likert scale of satisfaction will be used.	80% of responses with "always satisfied" or "frequently satisfied" to survey which will include peer evaluation.
VISUAL COMMUNICATION	Students will use figures or other graphical elements in their senior projects and other technical reports, following appropriate scientific publication standards.	Direct assessment of student assignment with appropriate rubric in courses PHY3661, PHY4781, PHY4912/22. Designation of "unsatisfactory", "satisfactory" and "superior" will be given. Evaluation of student presentations using oral advanced physics course rubric in PHY4843 and PHY4763. Designation of "unsatisfactory", "satisfactory" and "superior" will be given.	At least 80% of students receive "satisfactory" or "superior" performance based on rubrics.
WRITTEN AND ORAL COMMUNICATION	Students are aware of the publication standards from common scientific publications; and apply them in their technical reports.	Direct assessment of student assignment with appropriate rubric in courses PHY3661, PHY4781, PHY4912/22. Designation of "unsatisfactory", "satisfactory" and "superior" will be given. Evaluation of student presentations using oral advance physics course rubric in PHY4843. Designation of "unsatisfactory", "satisfactory" and "superior" will be given.	At least 80% of students receiving "satisfactory" or "superior" performance based on rubrics. At least 80% "satisfactory" or "superior" performance based on rubrics.

SCIENTIFIC ANALYSIS	Students will demonstrate critical thinking in overcoming obstacle in theoretical calculation and lab experimentation.	Students' research plan for PHY4912/22 (proposed in PSC3001) will be graded with a rubric. Designation of "satisfactory" or "unsatisfactory" will be given. Completion of an independent experiment with minimal assistance in PHY 3661 and PHY 4781. Designation of "satisfactory" or "unsatisfactory" will be given.	All students will receive "satisfactory". All students will receive at 80% or above based on rubric.
KNOWLEDGE IN DISCIPLINE	Mastery of the topic areas of Classical Mechanics, Relativity, EM, Optics/Waves, Thermal Physics, Quantum Mechanics, Atomic Physics	Course final exam average	At least 80% of students receive a grade of 80% or above.
INDEPENDENT RESEARCH	Students perform an independent open-ended scientific research project.	Senior project rubric	At least 80% of students will receive a grade of 80% or above.

BS in Psychology

Table 1: Assessment Plan with Mapped Courses for BS in Psychology

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Students will demonstrate competence and ability to use appropriate software to produce understandable reports and posters in APA style, including use of statistical analysis software, office dissemination software, and library and internet research databases.	Scores obtained from the administration of technology rubric. Target courses are PSY 2113 Research Methods and PSY 3223 -Experimental Psychology Lab	Average score should be higher than 67%.
ETHICS	Students will demonstrate knowledge of the APA ethics code in the treatment of patients, and human and non-human subjects in experimental research. Also, students will demonstrate knowledge of the norms related to the respect of the truth in scientific research.	Score is based on the ethics topic of PSY 2113-Research Method course. ;	Two criteria to meet: 1) Average higher than 67% 2) At least 15% of the students score above 90%
LEADERSHIP	Students will develop leadership and teamwork skills through collaboration and engage in ethical dimensions of technology and innovation.	Assignments in COM 1001: Pathways to Research Careers	Success metric determined by rubric specific to Pathways curriculum
TEAMWORK	Graduates will understand the importance of teamwork, diversity, and collaboration to achieve a common goal for the betterment of society.	COM 4001:Pathways Capstone Lab	Success metric determined by rubric specific to Pathways curriculum
COMMUNICATION	Graduates will possess industry-standard professional skills in writing, presentations, and interpersonal communication using Oral, Written, and Visual communication modalities.	Target courses are PSY 2113 Research Methods and PSY 3223 -Experimental Psychology Lab	70% Score 4 or higher on Writing, Presentation and Graphical rubrics specific to each class being assessed
KNOWLEDGE IN DISCIPLINE	Students will demonstrate knowledge and application in 4 content macro-areas: clinical psychology, neuroscience and cognition, experimental methods and techniques and social psychology.	Scores obtained from tests and assignments in the four areas of interest. Target courses for expertise are: 1. Clinical psychology: Introductory psychology, Clinical psychology, Abnormal psychology. 2. Neuroscience and cognition: Introductory psychology, Cognitive psychology, Behavioral neuroscience; 3. Experimental methods and techniques: Introductory Psychology, Research methods, Experimental Psychology Lab; 4. Social psychology: Introductory psychology, Social psychology	Each of the 4 single macro area scores should be higher than 67%.

Table 2: Curriculum Map for the BSBA Program (Example)

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**		COMMUNICATION (WRITTEN, ORAL, VISUAL)	CRITICAL THINKING	ETHICS	KNOWLEDGE	LEADERSHIP	TEAMWORK	TECHNOLOGY
Introductory Psychology	PSY1213				**I (F)**		**I (F)**	
Clinical psychology	PSY4633				**R (F)**			
Abnormal Psychology	PSY3633				**E (F)**			
Experimental Psychology Lab	PSY3223	**I (F)**			**I (F)**	**I (F)**	**I (F)**	**I (F)**
Behavioral Neuroscience	PSY4213	**I (F)**			**R (F)**			
Cognitive Psychology	PSY3923				**E (F)**			
Research Methods	PSY2113		**I (F)**	**I (F)**	**I (F)**	**I (F)**	**I (F)**	**I (F)**
Social Psychology	PSY3623				**E (F)**			
Senior research project 1	PSY4912	**R (F)**	**I (F)**					
Senior research project 2	PSY4922	**R (F)**	**I (F)**					

BS in Technological Humanities

Table 1: Assessment Plan for BS in Technological Humanities

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Tools	Metrics/ Indicators
TECHNOLOGY	Graduates will be able to apply advanced technologies to practical and theoretical problems across disciplines.	Semester projects from: MCS1xx1: Coding Club LLT/SSC4993: Senior Thesis	100% score 4+ on 5pt "Technology" category on HumTech Research Project rubric
ETHICS	Graduates will understand the ethical issues related to their disciplines, and the social consequences of their professional decisions	Semester projects from: COM1001: Pathways to Research COM4001: Pathways Capstone	100% average 4+ on 5pt Pathways Research Project Rubric
LEADERSHIP	Graduates will be able to collaborate across disciplinary fields	Semester projects from: COM1001: Pathways to Research COM4001: Pathways Capstone	100% average 4+ on 5pt Pathways Research Project Rubric
TEAMWORK	Graduates will be able to collaborate across disciplinary fields	Semester projects from: COM1001: Pathways to Research COM4001: Pathways Capstone	100% average 4+ on 5pt Pathways Research Project Rubric
COMMUNICATION	A. Written: Graduates will demonstrate professional writing standards in mechanics, evidentiary and analytical architecture, and editorial process. B. Visual: Graduates will be able to utilize visual media in digital and interpersonal communication contexts.	A. 1. COM3001: WPE 2. Senior Thesis B. Senior Thesis	1. 1. 100% score 23+ on 30pt WPE rubric 2. 100% score 4+ on 5pt "Written Communication" category on HumTech Research Project rubric 2. 100% score 4+ on 5pt "Visual Communication" category on HumTech Research Project rubric
CRITICAL THINKING	Graduates will be able to evaluate competing theories of cultural adaptation to technology change.	Semester projects from: HUM2103: Intro to Hum&Tech LLT4533: Lit Crit and Theory SSC4733: Hist of Technology LLT/SSC4993: Senior Thesis	100% average 4+ on 5pt HumTech Research Project rubric
KNOWLEDGE IN DISCIPLINE	Graduates will develop competencies in diverse humanistic research methodologies, and execute an interdisciplinary research project.	Semester projects from: HUM2103: Intro to Hum&Tech LLT4533: Lit Crit and Theory SSC4733: Hist of Technology LLT/SSC4993: Senior Thesis	100% average 4+ on 5pt HumTech Research Project rubric

Table 2: Curriculum Map for BS in Technological Humanities

	COM1001: Research Pathways	COM3001: Writing Proficiency Exam	COM3543: Technical Editing	COM4001: Pathways Capstone	HUM2103: Intro to HumTech	LLT3443: Am Lit Survey 1	LLT3453: Am Lit Survey 2	LLT4533: Lit Crit and Theory	MCS1xx1: MCS Coding Club	MCS1243: Foundations of Comp Sci	MCS1514: Computer Science 1	SSC3153: U.S. Hist Survey 1	SSC3163: U.S. Hist Survey 2	SSC4733: Hist of Technology	SSC/LLT4993: Senior Thesis
Knowledge in Discipline	I				I	R	R	M				R	R	M	M
Written Communication		R	M		R	R	R	R				R	R	R	M
Graphical Communication	I		M	R											M
Critical Thinking					I	R	R	R				R	R	R	R
Technology	I								R	R	R				M
Ethics	I			R	R			R						R	R
Leadership	I			R											R
Teamwork	I			R											R
I = Introduce / R = Reinforce / M = Mastery															

College of Engineering

BS/MS in Architectural Engineering (5-Yr Direct Entry)

Table 1: Assessment Plan for Undergraduate/Graduate Program

Undergraduate/Graduate Program Level Assessment Outcomes	Supporting Program Learning Objective (STUDENT OUTCOMES)	Assessment Strategy	Metrics/ Indicators
ADVANCED KNOWLEDGE (Graduate)	9. assess advanced concepts and principles in the solutions of complex problems to develop a mastery in a specialty area of architectural engineering. 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	- Evaluation of AE Graduate Project, Presentation and Final Report. - Exit Interviews -Direct assessment using deliverables in graduate level classes EAE 5633 and EAE 5613	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
ETHICS (Undergraduate)	4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	- Direct Assessment in EAE 4022, EAE 4032 and EAE 5613. - May use assessment results from EGE 3022. Work in progress.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
LEADERSHIP (Undergraduate)	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.	- Team evaluations from EAE 1081 - Direct assessment in EAE 3024 - Team evaluations and team leader reflections in EAE 4022 and EAE 4032.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
TEAMWORK (Undergraduate)	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.	- Team evaluations from EAE 1081 - Direct assessment in EAE 3024 - Team evaluations and team leader reflections in EAE 4022 and EAE 4032.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
TECHNOLOGY (Under/Graduate)	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and	- Direct assessment using deliverables in EAE 3113, EAE 3723, EAE 4633, EAE 4243, EAE 4743. - Direct assessment in EAE 4022, EAE 4032, EAE 4613, EAE 4633, ECE 4243 and ECE 4743. - Direct (formative) assessment in EAE 3113 and ECE 3011. Summative assessment in ECE 3424, ECE 4243 and EAE 6013.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.

	use engineering judgment to draw conclusions. 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	- Direct assessment in EAE 4022, EAE 4032, ECE 3211,ECE 4743,ECE 4753 and EAE6013.	
VISUAL COMMUNICATION (Under/Graduate)	3. an ability to communicate effectively with a range of audiences.	- Direct assessment in EAE 1081, EAE 3014, EAE 3024, EAE 4022, EAE 4032, EAE 5113, EAE 5623, and EAE 6013.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
ENGINEERING KNOWLEDGE (Undergraduate)	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	- Direct assessment using deliverables in EAE 3113, EAE 3723, EAE 4633, EAE 4243, EAE 4743.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
EXPERIMENTS (Under/Graduate)	6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	- Direct (formative) assessment in EAE 3113 and ECE 3011. Summative assessment in ECE 3424, ECE 4243 and EAE 6013.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
LIFELONG LEARNING (Under/Graduate)	7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	- Direct assessment in EAE 4022, EAE 4032, ECE 3211, ECE 4743, ECE 4753 and EAE 6013.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
DESIGN (Undergraduate)	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.	- Direct assessment in EAE 4022, EAE 4032, EAE 4613, EAE 4633, ECE 4243 and ECE 4743.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.
INTEGRATION (Under/Graduate)	8. an ability to integrate multiple subdisciplines of architectural engineering in design of building elements that work with architectural layout.	- Direct assessment in EAE 3014, EAE 3024, EAE 4032, EAE 5613 and EAE 5653.	- At the time of writing this report, thresholds are still to be determined by the faculty in Spring 2023.

Table 2: Curriculum Map for the MSArE Program

		Fresh	Junior											Senior									Graduate								
Outcome/KPI	**Level**	EAE 1081	EAE 3014	EAE 3024	EAE 3113	EAE 3613	ECE 3011	ECE 3013	ECE 3211	ECE 3213	ECE 3424	ECE 3523	ECE 3723	EAE 4022	EAE 4032	EAE 4113	EAE 4613	EAE 4623	EAE 4633	EAE 4243	EAE 4743	ECE 4753	EAE 5113	EAE 5123	EAE 5613	EAE 5623	EAE 5633	EAE 5653	EAE 6013	ECE 5283	ECE 5703
(SO1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.																														
1a. Identify complex problem in engineering principles.	**L1**				**X (F)**			**X**		**X**			**X (F)**		**X**	**X**			**X (S)**	**X (S)**	**X (S)**	**X**	**X**	**X**	**X (S)**		**X (S)**		**X**	**X**	**X**
1b. Fomulate, using mathematical and scientifc approaches, complex engineering problem.	**L3**				**X (F)**			**X**		**X**	**X**	**X**	**X (F)**			**X**			**X (S)**	**X (S)**	**X (S)**	**X**	**X**	**X**	**X (S)**		**X (S)**		**X**		**X**
1c. Establish a solution strategy using principles of engineering.	**L3**				**X (F)**			**X**		**X**			**X (F)**		**X**	**X**			**X (S)**	**X (S)**	**X (S)**	**X**			**X (S)**		**X (S)**		**X**		**X**
1d. Solve a complex engineering problem by applying appropriate principles of engineering, science, and mathematics.	**L3**				**X (F)**			**X**		**X**	**X**	**X**	**X (F)**		**X**	**X**			**X (S)**	**X (S)**	**X (S)**	**X**			**X (S)**		**X (S)**				**X**
1e. Examine different solution strategies to architectural engineering problems using numerical models.	**L5**																							**X (F/S)**		**X (F/S)**				
(SO2) 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.																														
2a. Formulate engineering design solutions that meet specified needs.	**L3**		**X**	**X**										**X (F)**	**X (S)**		**X (S)**		**X (S)**	**X (S)**	**X (S)**	**X**						**X**			**X**
2b. Demonstrate public health, safety and welfare considerations in engineering design solutions.	**L3**													**X (F)**	**X (S)**		**X (F)**		**X (F)**		**X (S)**							**X**			
2c. Demonstrate global impact considerations in evaluating engineering design solutions.	**L3**													**X (F)**	**X (S)**		**X (F)**		**X (F)**												
2d. Conduct assessment of environmental issues as impacted by the engineering design solutions.	**L3**		**X**											**X (F)**	**X (S)**		**X (S)**		**X (S)**												
2e. Consider cultural impact factors caused by the engineering design solutions.	**L2**													**X (F)**	**X (S)**		**X (F)**		**X (F)**												
2f. Demonstrate social impact considerations in evaluating engineering design solutions.	**L3**													**X (F)**	**X (S)**		**X (F)**		**X (F)**												
2g. Analyze economic factors in the engineering design solutions.	**L4**									**X (F)**				**X (F)**	**X (S)**		**X (S)**		**X (S)**	**X (S)**											
(SO3) An ability to communicate effectively with a range of audiences.																														
3a. Employ a logical and articulate written communication based on independent design work.	**L3**	**X (F)**												**X (F)**	**X (S)**							**X (S)**			**X (S)**			**X (S)**			**X**
3b. Utilize a detailed written form to communicate the contents of a professional, inclusive, and collaborative team project.	**L3**	**X (F)**												**X (F)**	**X (S)**							**X (S)**			**X (S)**			**X (S)**			
3c. Effectively communicate engineering solutions in the form of oral presentations to a range of audiences.	**L3**	**X (F)**	**X (F)**	**X (F)**										**X (F)**	**X (S)**							**X (S)**			**X (S)**			**X (S)**			**X**
3d. Utilize clear and concise engineering drawings to describe engineering designs for a range of audiences.	**L3**		**X (F)**	**X (S)**																		**X (S)**			**X (S)**			**X (S)**			**X**
3e. Integrate different forms of effective and persuasive communication to explain research results and draw conclusions.	**L5**																					**X (F/S)**			**X (F/S)**			**X (F/S)**			
(SO4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.																														
4a. Identify the global, economic, environmental, and societal context of an engineering situation.	**L1**													**X (F)**	**X (S)**									**X (S)**						
4b. Describe ethical and professional responsibilities related to an engineering situation.	**L2**													**X (F)**	**X (S)**				**X**					**X (S)**						
4c. Analyze issues in professional ethics in global, economic, environmental, and societal contexts considering the professional code of ethics.	**L4**													**X (F)**	**X (S)**									**X (S)**						
(SO5) 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.																														
5a. Contribute to the establishment of goals and work plans for the team.	**L3**	**X (F)**		**X (F)**										**X (F)**	**X (S)**																
5b. Demonstrate a professional attitude in a collaborative team environment.	**L3**	**X (F)**		**X (F)**										**X (F)**	**X (S)**																
5c. Engage in inclusive team environment.	**L4**	**X (F)**	**X**	**X (F)**										**X (F)**	**X (S)**																
5d. Participate in achieving the team's objectives in a timely manner	**L3**	**X (F)**	**X**	**X (F)**										**X (F)**	**X (S)**																
5e. Develop a professional leadership attitude.	**L3**	**X (F)**		**X (F)**										**X (F)**	**X (S)**																
(SO6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.																														
6a. Develop an experimental plan to collect relevant data and addresses appropriate key variables.	**L3**				**X (F)**		**X (F)**				**X (S)**								**X (S)**									**X (S)**	**X**	
6b. Conduct experimental procedure to measure and acquire data on key variables.	**L3**				**X (F)**		**X (F)**				**X (S)**								**X (S)**									**X (S)**		
6c. Analyze experimental data and interpret results for the experimental model	**L4**				**X (F)**		**X (F)**				**X (S)**								**X (S)**									**X (S)**		
6d. Utilize engineering judgement to explain or justify observed differences between experimental measurements and models.	**L5**				**X (F)**		**X (F)**												**X (S)**									**X (S)**		
6e. Draw conclusions based on experimental observations.	**L4**				**X (F)**		**X (F)**												**X (S)**									**X (S)**		
(SO7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.																														
7a. Aquire relevant new technical information, data, and knowledge from multiple sources for the analysis of an engineering topic.	**L2**						**X**		**X (F)**				**X**		**X (S)**	**X (S)**				**X**	**X (S)**	**X (S)**										
7b. Utilize relevant new technical information, data, and knowledge from multiple sources in the design of engineering systems.	**L3**								**X (F)**						**X (S)**	**X (S)**					**X (S)**	**X (S)**										
7c. Implement emerging technologies and equipment in architectural engineering.	**L3**		**X**	**X**			**X**		**X (F)**				**X (F)**		**X (S)**	**X (S)**					**X (S)**	**X (S)**										
7d. Identify knowledge gaps relevant to a research topic.	**L4**																											**X (S)**			
(SO8) An ability to integrate multiple subdisciplines of architectural engineering in design of building elements that work with architectural layout.																														
8a. Demonstrate the integration of mechanical, structural, electrical and lighting systems with the building architecture.	**L3**		**X (F)**	**X (S)**		**X**							**X**	**X (S)**											**X**						
8b. Demonstrate proficiency in software applications to integrate design and construction phases of various engineering systems.	**L3**		**X (F)**	**X (S)**										**X (S)**																	
8c. Analyze system design integration between subdisciplines of architectural engineering to optimize system operation with natural energy sources.	**L4**																							**X (S)**			**X (S)**			
(SO9) Assess advanced concepts and principles in the solutions of complex problems to develop a mastery in a specialty area of architectural engineering.																														
9a. Demonstrate knowledge and academic success in a variety of advanced subjects in a subdiscipline of architectural engineering.	**L3**																													
9b. Through a detailed experimental research project, formulate, solve and synthesize results in studying a question related to an architectural engineering subdiscipline.	**L5**																											**X (S)**			
9c. Select appropriate analytical or experimental investigations to research architectural engineering problems.	**L4**																											**X (S)**			

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BS in Audio Engineering Technology

Table 1: Assessment Plan for the BS in Audio Engineering Technology

Undergraduate Program Level Learning Outcomes	BSAET Outcomes	Assessment Strategy	Metrics/ Indicators**
TECHNOLOGY 1. Apply advanced technologies to practical and theoretical problems. (Bloom's 3) 2. Design and conduct experiments. (Bloom's 4) 3. Analyze and interpret data using appropriate tools (e.g., Excel, Minitab) (Bloom's 3)	1 4 2	Assignments in TAS4103, TIE4115 Assignments in TME3113, TEE4224 Assignments in TAS4103, TEE4214	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
ETHICS 1. Demonstrate critical thinking with respect to ethical dilemmas (Bloom's 3) 2. Discern between personal and professional ethical responsibilities (Bloom's 2) 3. Identify the ethical codes adopted by relevant professional associations. (2) 4. Predict possible social consequences of engineering/science ethical decisions. (3)	5	Assignments in EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
LEADERSHIP 1. Identify theories, models, and practices as they pertain to a personal style and philosophy of leadership. (Bloom's 1) 2. Explain the difference between leadership and management. (Bloom's 2) 3. Differentiate the characteristics of effective and ineffective leadership. (Bloom's 3)	5	Assignments in EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
TEAMWORK 1. Discuss various types of conflict and methods of resolution. (Bloom's 2) 2. Practice tools and techniques for team consensus building. (Bloom's 3) 3. Identify and integrate personal team player style in a team setting. (Bloom's 3)	5	Assignments in TAS4103, TIE4115	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
VISUAL COMMUNICATION Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	3	Graphical assignments in TME3333, TAS4103	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives

BS in Biomedical Engineering

Table 1: Assessment Plan for Biomedical Engineering Program

Undergraduate Program Level Learning Outcomes	Supporting Program learning Objective	Assessment Strategy	Metrics/ Indicators**
ETHICS	4-b (L3) Demonstrate knowledge of the professional code of ethics and government regulations. 4-c (L3) Explain the ethical dimensions of a biomedical engineering problem.	Direct assessment of student assignments from BME 3002 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.
LEADERSHIP	5-c (L3) Demonstrate effective leadership characteristics.	Direct assessment of student assignments from EGE 2123 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.
TEAMWORK	5-a (L3) Demonstrate personal responsibilities in a team. 5-b (L3) Share responsibilities and collaborate in a cross-functional team.	Direct assessment of student assignments from BME 1002, EGE 2123 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.
TECHNOLOGY	1-d (L3) Apply engineering principles to a system, device, or process. 1-f (L3) Employ techniques, skills and tools relevant to biomedical systems. 6-d (L3) Describe the challenges associated with interactions between living tissues or cells and engineered devices or materials.	Direct assessment of student assignments from BME 4103, BME 4203, BME 4801 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.
VISUAL COMMUNICATION	3-a (L3) Construct and deliver a logical and articulate communication based on independent work. 3-b (L3) Create a plan, and document methods, observations, and results of an experiment or a project. 3-c (L3) Organize and represent data collected in a clear and concise format that enhances the ability to interpret it.	Direct assessment of student assignments from BME 3101, BME 3213 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.

KNOWLEDGE IN DISCIPLINE	1-a (L3) Implement mathematical algebra, geometry, calculus, probability techniques, differential equations and/or statistics. 1-b (L3) Apply biology, chemistry, calculus-based physics or human physiology principles. 1-c (L3) Write a problem statement for a biomedical engineering problem. 1-e (L4) Evaluate solutions to a biomedical engineering problem. 2-a (L3) Use the engineering design process to generate potential solutions to a biomedical need. 2-b (L3) Examine realistic constraints related to the proposed solution. 2-c (L3) Implement, test, and demonstrate an engineered solution that meets design specifications. 4-a (L3) Recognize the contribution of science, technology, engineering and/or mathematics to society. 4-d (L3) Describe state-of-the-art and new trends in biomedical engineering. 6-a (L3) Conduct experimental procedures to measure and record data. 6-b (L3) Examine data using appropriate analytical techniques. 6-c (L3) Compose a scientific hypothesis and test the hypothesis using experimental data. 7-a (L3) Collect relevant technical information, data, and ideas from multiple sources. 7-b (L3) Recognize opportunities that enhance professional career development.	Direct assessment of student assignments from BME 1002, BME 3301, BME 3101, BME 3103, BME 3113, BME 3213, BME 3301, BME 3303, BME 3703, BME 4103, BME 4113, BME 4201, BME 4203, BME 4313, BME 4801, BME 4803 Faculty evaluation of senior design BME 4013, BME 4022 Course objective survey Alumni survey	EAMU target: Green or white flag.

[1]: Each ABET outcome is assessed using a combination of several assessment tools. Each assessment tool may involve evaluation/analysis of multiple courses or other components. Details of this approach can be found in the *BME program annual assessment report 2016-2017*.

The target level of attainment is quantified using Bloom's taxonomy:

Level 1 (L1) – Knowledge
Level 2 (L2) – Comprehension
Level 3 (L3) – Application
Level 4 (L4) – Analysis
Level 5 (L5) – Synthesis
Level 6 (L6) - Evaluation

[2]: Each key performance indicator is assessed using an "excellent, Adequate, Minimal, Unsatisfactory" (EAMU) vector. The description and nominal measurement ranges for each level are set as appropriate to the task associated with the key performance indicator. The performance vectors are classified into four categories: "Red flag", "Yellow flag", "White flag" and "Green flag" as described below:

- Red flag: Below 2.0 average performance vector and more than 10% of the class demonstrating unsatisfactory performance
- Yellow flag: Below 2.0 average performance vector and less than 10% of the class demonstrating unsatisfactory performance; or above 2.0 average performance vector and more than 10% of the class demonstrating unsatisfactory performance
- White flag: Not under Red, Yellow or Green flag classifications
- Green flag: Above 2.75 average performance vector and no indication of any unsatisfactory performance

Details of the KPI assessment method can be found in the *BME program annual assessment report 2016-2017.*

[3:] The 3-year staggered rotation schedule was decided by all BME faculty in order to achieve a more meaningful and sustainable direct assessment process. If assessment on one course shows lower than accepted level of achievement on a particular KPI, it will be re-assessed the following year based on proposed actions for improvement. In the course direct assessment report each instructor produces, a general observation will be made on the overall student achievement of all relevant KPIs to capture any abnormalities.

Table 2: Curriculum Map for BME Program

Course	Biomedical Engineering Program Key Performance Indicator	1-a (L3)	1-b (L3)	1-c (L3)	1-d (L3)	1-e (L4)	1-f (L3)	2-a (L3)	2-b (L3)	2-c (L3)	3-a (L3)	3-b (L3)	3-c (L3)	4-a (L3)	4-b (L3)	4-c (L3)	4-d (L3)	5-a (L3)	5-b (L3)	5-c (L3)	6-a (L3)	6-b (L3)	6-c (L3)	6-d (L3)	7-a (L3)	7-b (L3)
		Math	Science	Problem statement	Engineering principles	Evaluate solutions	Apply Tools	Engineering design process	Realistic constraints	Engineered solution	Articulate Communication	Document project	Organize data	STEM in society	Regulations	Ethics	State-of-the-art	Team responsibilities	Collaborate	Leadership	Experimental procedures	Analyse data	Scientific hypothesis	Bio-material interactions	Collect information	Recognize opportunities
EGE 1001	Fund. Eng. Design Proj.			I	I	I	I	I	I	I	I	I		I		I	I	I	I	I					I	I
BME 1002	Intro to BME		I	I	I		I	I			I	I	I	I	I		I	I		I	I		I	I	I	I
BME 1201	Graphics Lab						R		R		I	R	R													
BME 1202	Comp. App. Lab	I			R		R				I							I				I				
EGE 2123	Ent. Eng. Design Studio			R	R	R	R	R	R	R	R	R						R	R	R						R
EGE 2013	Statics	R	R		R																					
EGE 3012	Eng. Cost Analysis					R			R						R											
EGE 3022	Lead. & Prof. Dev. For Eng.													R	R	R		E	E	E						
EEE 2123	Circuits & Electronics	R	R		R																					
BME 3002	Best Practices										R			E	E	E	R									R
BME 3103	BioInstrum.	E	E										R								R	R		R	R	
BME 3101	BioInstrum. Lab						E						E					R				E	R			
BME 3213	Biomat.		R		R	R					E						E							E	R	
BME 3303	Biomech	E	R		R			R			R			R											R	
BME 3301	Biomech Lab	R	R		E	R	E				R	R	R				R	R			E	E	E		R	
BME 3703	Biotransp	E	R		E	R					R													R		
BME 3113	Wearable Tech Studio			R	R	R	R	E	R	R	E	R		R			E	R	E	R					E	R
BME 4113	Med. Dev Design	R	E	R	E	R	R	E	E	R	R	R		R	E		E				R			E	R	R
BME 4103	Fnd. Med. Imaging			E			R																	E		
BME 4203	MEMS	R	R	E	E	E		R	E	E	R						R								R	R
BME 4201	MEMS Lab				E	R	E	R	R	R		E	E								E	E			R	
BME 4313	Tissue Mech.	E	E			E					R			R	E		E							E	R	
BME 4803	Tissue Eng.		E	E	E	E			E		R			R		E	E							E	R	E
BME 4801	Tissue Eng. Lab		R	E	E		E						E					R			E	E	E	E		
BME 4013	Projects I	R	R	E	E	E	E	E	E	R	E	E	E	E	E	R	E	R	R	E	R	R	R	E	E	E
BME 4022	Projects 2	R	R	E	E	E	E	E	E	E	E	E	E	E	E	R	E	E	E	E	E	E	E	E	E	E

Green highlights indicates course will be assessed for KPI during 2020-2022

Introduce (I): corresponds to instances where the student outcomes are supported at an introductory level in a course.
Reinforce (R): achieved when a course serves to reinforce the attainment of a student outcome that was supported previously at an introductory level in another course.
Emphasize (E): achieved when a student outcome is supported at a more focused and advanced level.

BS in Civil Engineering

Table 1: Assessment Plan for BS in Civil Engineering Program

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
DESIGN	SO (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 (Bloom's 5)	Assessment and Evaluation (direct measures) Math (ECE4032, ECE 4051)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.
ETHICS	SO (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (Bloom's 4)	Assessment and Evaluation (direct measures) Ethics (ECE4051)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.
EXPERIMENTAL	SO (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions (Bloom's 4)	Assessment and Evaluation (direct measures) Experiments (ECE4761, ECE3324, ECE3424, ECE3821) Critical Thinking & Solving (ECE3324, ECE 3821O	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.
LEADERSHIP	SO (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (Bloom's 4)	Performance Appraisal (direct measure) Leadership (ECE 4032) Self- & Peer Evaluation (indirect measure) Leadership (ECE 4032)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.
MATH, SCIENCE & ENGINEERING PRINCIPLES	SO (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (Bloom's 4)	Assessment and Evaluation (direct measures) Math (ECE3523 & ECE3723) Natural Science (ECE 3013, ECE 4544) Engr Mechanics (ECE3723) Critical Thinking & Solving (ECE4243, ECE 4544, ECE4743)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.

TEAMWORK	SO (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 (Bloom's 3)	Performance Appraisal (direct measure) Team work (ECE 4032) Self- & Peer Evaluation (indirect measure) Team work (ECE 4032)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U. A score of 4 on a 5-point Likert Scale
TECHNOLOGY	SO (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies (Bloom's 4)	Faculty Appraisal (direct measure) Life- long Learning (ECE4032)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.
VISUAL COMMUNICATION	SO (3) an ability to communicate effectively with a range of audiences (Bloom's 5)	Performance Appraisal (direct measure) Written & Oral (ECE 4032) Self- & Peer Evaluation (indirect measure) Team work (ECE 4032)	EAMU Vector weighted average of 2.0 or above; < 20% scored at U.

The eight LTU Undergraduate Program Level Assessment Outcomes maps to the ABET Criterion 3 Student Outcomes (denoted learning objectives at LTU). The list below is used to interpret both Table 1 and Table 2. Assessment is only reported at the summative level (indicated by the highest Bloom's level of learning)

DESIGN → SO (2)
ETHICS → SO (4)
EXPERIMENTAL → SO (6)
LEADERSHIP → SO (5)
MATH, SCIENCE & ENGINEERING PRINCIPLES → SO (1)
TEAMWORK → SO (5)
TECHNOLOGY → SO (7)
VISUAL COMMUNICATION → SO (3)

Table 2: BSCE Curriculum Map of ABET SO (1) through (7) to CEBOK: SO1, 2, 3, 4, 6, 7, 8, 10, 13, 15, 16, 17, 18, 20, 21.

ABET /	SO(1)				SO(2)					SO(3)	SO(4)			SO(5)	SO(6)		SO(7)
BSCE	SO1	SO2	SO6	SO8	SO3	SO4	SO10	SO13	SO15	SO16	SO10	SO20	SO21	SO17	SO7	SO8	SO18
Required Civil Engineering Subjects																	
1011	1			3	2	2		3		4		3	3	3		3	2
1013	3			3						3				3	3#	3	
1101				2#				1								2#	
1102	1			2#												2#	
1413		3	2	3				3		4		2	2	3	3	3	
3011	2	1		3				1							3#	3	
3013	3	3	3	3												3	
3211	2			3				1		3						3	
3213			1				2	2	2	3	2						
3324	3	1		3				3		4					4#	3	
3424	2	1	3	3				1		4				3	4#	3	
3523	3		3	3												3	
3723	3		4#	3				3#								3	
3821	2	1		3				1		4				3	4#	3	
3823	3			3	2			3		4				3	3	3	
4022			3	3	3	3		4	3	5		4	4	3		3	4
4032					3	3		5#	3	5		4	4	3			4
4051						3			2	4		4	4				3
4243				4			2	4#		4	2			3		4	
4544	3	3	4	4				4		4				3	4#	4	
4743	3		3	4				4		4						4	
4761	3		4							4				3	4#		
LEVEL	L3	L3	L4	L4	L3	L3	L2	L5	L3	L5	L2	L4	L4	L3	L4	L3	L4

The Level (LX) represents the level of cognitive achievement (level of attainment) for a particular outcome in a particular course.

Level 1 (**L1**): Remember
Level 2 (**L2**): Comprehend
Level 3 (**L3**): Apply
Level 4 (**L4**): Analyze
Level 5 (**L5**): Synthesize
Level 6 (**L6**): Evaluate

BS in Computer Engineering

Table 1: Assessment Plan for BSCE

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	- Demonstrate knowledge of the professional code of ethics (ABET PI 4-(2))	EEE3011 Intro to Capstone Project	60%/70%
LEADERSHIP	- Exhibit leadership traits such as: accountability, listening, initiative, vision, and motivation (ABET PI 5-(1))	EEE3231 Microprocessors Lab EEE4812 Capstone Project I EEE4822 Capstone Project II	60%/70% 60%/70% 60%/70%
TEAMWORK	- Collaborate to establish goals, plan tasks, and meet objectives (ABET PI 5-(3))	EEE2114 Circuits 1 EEE3124 Circuits 2 EEE3121 Circuits 2 Lab EEE4812 Capstone Project I EEE4822 Capstone Project II	60%/60% 60%/60% 60%/60% 60%/70% 60%/70%
TECHNOLOGY	- Ability to verify engineering solution using technological tools (cf, ABET PI 1-(4))	EEE 4514 Control Systems and Lab, Lab 7	80%/80%
VISUAL COMMUNICATION	- Use appropriate visual aids in both oral and written communications (cf. ABET PI 3-(2))	EEE3223 Advanced Digital Electronics, project based Exam 2 and VHDL in homework EEE4812 ECE Capstone Project 1, Final Report, Presentation and Poster	80%/80% 60%/70%

Table 2: Curriculum Map for the BSCE

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**		ETHICS	LEADERSHIP	TEAMWORK	TECHNOLOGY	VISUAL COMMUNICATION
Control Systems and Lab	EEE4514	**E(S)**			**E(S)**	
Advanced Digital Electronics	EEE3223					**I(S)**
ECE Capstone Project 1	EEE4812		**E(S)**	**E(S)**		**E(S)**
ECE Capstone Project 2	EEE4822		**E(S)**	**E(S)**		
Intro to Capstone Projects	EEE3011	**I(S)**				
Microprocessors Lab	EEE3231		**E(S)**			
Circuits 1	EEE2114			**I(S)**		
Circuits 2	EEE3124			**I(S)**		
Circuits 2 Lab	EEE3121			**I(S)**		

BS in Construction Engineering Technology and Management

Table 1: Assessment Plan with Mapped Courses for the BS in Construction Engineering Technology and Management

Undergraduate Program Level Learning Outcomes	ETAC Outcomes	Assessment Strategy	Metrics/ Indicators**
TECHNOLOGY 1. Apply advanced technologies to practical and theoretical problems. (Bloom's 3) 2. Design and conduct experiments. (Bloom's 4) 3. Analyze and interpret data using appropriate tools (e.g., Excel, Minitab) (Bloom's 3)	Outcome c, d, e	Assignments in TCE1023, TCE2073, TCE3013, TCE3093, TCE4133, TIE3163, TIE4133, TME3333	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
ETHICS 1. Demonstrate critical thinking with respect to ethical dilemmas (Bloom's 3) 2. Discern between personal and professional ethical responsibilities (Bloom's 2) 3. Identify the ethical codes adopted by relevant professional associations. (2) 4. Predict possible social consequences of engineering/science ethical decisions. (3)	College of Engineering	Assignments in EGE1001, EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
LEADERSHIP 1. Identify theories, models, and practices as they pertain to a personal style and philosophy of leadership. (Bloom's 1) 2. Explain the difference between leadership and management. (Bloom's 2) 3. Differentiate the characteristics of effective and ineffective leadership. (Bloom's 3)	College of Engineering	Assignments in EGE1001, EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
TEAMWORK 1. Discuss various types of conflict and methods of resolution. (Bloom's 2) 2. Practice tools and techniques for team consensus building. (Bloom's 3) 3. Identify and integrate personal team player style in a team setting. (Bloom's 3)	Outcome h, i	Assignments in TCE3053, TCE4113, TIE4115, TME4113	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives

VISUAL COMMUNICATION Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Outcome a, f	Graphical assignments in TCE2143, TCE4113, TCE4213	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives

BS in Electrical Engineering

Table 1: Assessment Plan with Mapped Courses for the BS in Electrical Engineering

Undergraduate Program Level Assessment Outcomes	Supporting Program Learning Objective	Assessment Strategy	Metrics/ Indicators
ETHICS	- Demonstrate knowledge of the professional code of ethics (ABET PI 4-(2))	EEE3011 Intro to Capstone Project	60%/70%:
LEADERSHIP	- Exhibit leadership traits such as: accountability, listening, initiative, vision, and motivation (ABET PI 5-(1))	EEE3231 Microprocessors Lab EEE4812 Capstone Project I EEE4822 Capstone Project II	60%/70%. 60%/70% 60%/70%
TEAMWORK	- Collaborate to establish goals, plan tasks, and meet objectives (ABET PI 5-(3))	EEE2114 Circuits 1 EEE3124 Circuits 2 EEE3121 Circuits 2 Lab EEE4812 Capstone Project I EEE4822 Capstone Project II	60%/60 60%/60% 60%/60% 60%/70% 60%/70%
TECHNOLOGY	- Ability to verify engineering solution using technological tools (cf, ABET PI 1-(4))	EEE 4514 Control Systems and Lab, Lab 7	80%/80%
VISUAL COMMUNICATION	- Use appropriate visual aids in both oral and written communications (cf. ABET PI 3-(2))	EEE3223 Advanced Digital Electronics, project based Exam 2 and VHDL in homework EEE4812 ECE Capstone Project 1, Final Report, Presentation and Poster	80%/80% 60%/70%

Table 2: Curriculum Map for the BS in Electrical Engineering

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**		ETHICS	LEADERSHIP	TEAMWORK	TECHNOLOGY	VISUAL COMMUNICATION
Control Systems and Lab	EEE4514				**E(S)**	
Advanced Digital Electronics	EEE3223					**I(S)**
ECE Capstone Project 1	EEE4812		**E(S)**	**E(S)**		**E(S)**
ECE Capstone Project 2	EEE4822		**E(S)**	**E(S)**		
Intro to Capstone Projects	EEE3011	**I(S)**				
Microprocessors Lab	EEE3231		**E(S)**			
Circuits 1	EEE2114			**I(S)**		
Circuits 2	EEE3124			**I(S)**		
Circuits 2 Lab	EEE3121			**I(S)**		

BS in Industrial Engineering

Table 1: Assessment Plan for the BS in Industrial Engineering

Undergraduate Program Level Learning Outcomes	ABET Outcomes	Assessment Strategy	Metrics/ Indicators
TECHNOLOGY 1. Apply advanced technologies to practical and theoretical problems. (Bloom's 3) 2. Design and conduct experiments. (Bloom's 3) 3. Analyze and interpret data using appropriate tools (e.g., Excel, Minitab) (Bloom's 3)	Outcome 1 (an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics) Outcome 2 (an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions)	1. Evaluation of application of technology in EIE 4252 – Senior Project Fundamentals and EME 4253 - Sr. Capstone Project 2. Exam/homework questions on experimental design in operations research, work design, statistical methods for process improvement, simulation and occupational ergonomics curses) 3. Exam questions on industrial engineering laboratory technique (new IE Lab course)	1. Checklist to apply technologies, all students use a certain of technologies (which vary by project) 2. 70% of students receive a score of 60% or higher 3. 70% of students receive a score of 60% or higher
ETHICS 1. Demonstrate critical thinking with respect to ethical dilemmas (Bloom's 3) 2. Discern between personal and professional ethical responsibilities (Bloom's 2) 3. Identify the ethical codes adopted by relevant professional associations. (2) 4. Predict possible social consequences of engineering/science ethical decisions. (3)	Outcome 4 (an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts)	1. Homework assignment in EGE 3022 2. Homework (or classroom) assignment in EGE 3022 3. Homework assignment in EGE 1001 4. Team classroom assignment in EGE 3022	1. Grading rubric (Metrics TBD) 2. Grading rubric 3. Grading rubric 4. Evaluation rubric
LEADERSHIP 1. Identify theories, models, and practices as they pertain to a personal style and philosophy of leadership. (Bloom's 1) 2. Explain the difference between leadership and management. (Bloom's 2) 3. Differentiate the characteristics of effective and ineffective leadership. (Bloom's 3)	Outcome 4 (an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts)	1. Homework assignment in EGE 3022 2. Homework assignment in EGE 3022 3. Team Project rubric in EGE 3022	1. Grading rubric (Metrics TBD) 2. Grading rubric 3. Evaluation rubric

TEAMWORK 1. Discuss various types of conflict and methods of resolution. (Bloom's 2) 2. Practice tools and techniques for team consensus building. (Bloom's 3) 3. Identify and integrate personal team player style in a team setting. (Bloom's 3)	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)	1. Homework assignment in EGE 3022 2. Team assignment in EGE 3022 3. Homework assignment in EGE 3022	1. Grading rubric (Metrics TBD) 2. Evaluation rubric 3. Grading rubric
VISUAL COMMUNICATION Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Outcome 3 (an ability to communicate effectively with a range of audiences)	Graphical assignments from statistical control of process improvement, operations research projects, simulation project reports, work design and measurement projects, human factors projects and sr. capstone project reports. Poster rubric in senior projects courses.	Graphical elements of written rubric: (80% will receive 70%) Projects Posters: 80% of students will score 80% or higher.

Table 2A: Curriculum Map of BSIE with ABET Outcomes 1-7

		Tools/Measures	
	Assessment	**Courses**	**Semester**
1	Evaluate exam problems using problem solving rubrics	EIE 3123, EIE 3353, EIE 4013, EIE 3043, EIE 3453, EIE 4453	Based on course scheduling and graduation
2	Faculty advisor evaluate written proposals using proposal rubric	EIE 4252, EIE 4253	
	Faculty advisor evaluate final reports using final report rubric	EIE 4252, EIE 4253	
3	Evaluate oral presentations using presentation rubric Evaluation of technical report writing using writing rubric	EIE 3043, EIE 3453 EIE 3753, EIE 4013	
4	10 multiple choice ethics questions	EGE 3022	
	Case study assignment on ethics	EIE 4013	
	Ethics/integrity statement on final report	EIE 4252, EIE 4253	
	Mandatory attendance at seminar series/workshops	EIE 4252, EIE 4253	
	Assignment on how engineering solutions impact global, economic, environmental and societal issues	EIE 4013, EIE 4252, EIE 4253	
5	Students evaluate teammates using peer evaluation form/rubric	EIE 4252, EIE 4253	
	Faculty Advisor meeting with team to discuss team functionality	EIE 4252, EIE 4253	
	Faculty & IAB evaluation of teamwork at final presentation	EIE 4252, EIE 4253	
6	Evaluate exam problems using problem solving rubrics	EIE 3753	
7	Literature review in production planning and control	EIE 3043	
	Evaluate project paper Statistical Methods for Process Improvement	EIE 3453	

Table 2B: Curriculum Map of BSIE with ABET Outcomes 1-7

Course Student Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**
EEE 2123 Circuits & Electronics	R	-	-	R	R	-	-
EGE 1001 Fund. of Eng. Design Proj.	I	I	I	I	I	I	I
EGE 1023 Engineering Materials	I	I	I	I	I	I	I
EGE 1102 Engineering Computer Application Lab	I	I	-	-	-	-	-
EGE 2013 Statics	E	R	-	-	-	R	-
EGE 2123 Entrepreneurial Engineering Design Studio	I	I	I	I	I	I	I
EGE 3003 Thermodynamics	R	R	R	-	-	R	-
EME 2011 Materials Lab	R	I	R	I	R	E	-
EIE 3023 Manufacturing Processes	R	R	R	I	-	R	-
EIE 3033 Engineering Numerical Methods	R	-	-	-	-	-	-
EIE 1011 - Foundations of Industrial Engineering	I	I	I	I	I	I	I
EIE 3043 - Production, Planning & Control	R	I	R	I	-	I	-
EIE 3123 - Plant Layout	R	I	R	I	-	I	-
EIE 3353 - Operations Research Techniques	E	I	R	-	-	R	-
EIE 3453 - Stat Methods for Process	E	R	-	-	-	R	-
EIE 3653 - Stochastic Modeling	R	R	R	I	-	R	-
EIE 3753 - Simulation in System Design	E	R	E	I	-	R	R
EIE 4013 - Work Design and Measurement	R	R	R	R	-	R	R
EIE 4252 - Senior Project Fundamentals	E	E	E	E	E	R	E
EIE 4253 - Senior Capstone Project	E	E	E	E	E	R	E
EIE 4453 - Applied Operations Research	E	R	E	R	-	E	E
EIE 4553 - Occupational Ergonomics	R	R	E	I	-	E	R
EIE 4653 - Industrial and Engineering Finance	R	E	R	-	-	R	-

Note. Introduce (I): corresponds to instances where the student outcomes are supported at an introductory level in a course. Reinforce (R): achieved when a course serves to reinforce the attainment of a student outcome that was supported previously at an introductory level in another course. Emphasize (E): achieved when a student outcome is supported at a more focused and advanced level.

BS in Mechanical Engineering

Table 1: Assessment Plan for the BS in Mechanical Engineering

BSME Learning Outcomes	BSME ABET Outcomes	Assessment Tools	Metric/Indicators	Administration Timeline	Loop-Closing Timeline
TECHNOLOGY 1. Apply advanced technologies to practical and theoretical problems. (Bloom's 3) 2. Design and conduct experiments. (Bloom's 3) 3. Analyze and interpret data using appropriate tools (e.g., Excel, MATLAB) (Bloom's 3)	#6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.	A. Exam questions on laboratory technique in EME4412 (Thermal Science Lab) B. Rubric to evaluate assignment in EME 3653 (Measurement Systems)	A. 75% of students receive a score of 70% or higher B. 75% of students score at least "marginal" for all indicators	Every Semester Spring	3-year cycle
GRAPHICAL COMMUNICATION Demonstrate professional standards in graphical communication (including figures, plots, and tables) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	#3: An ability to communicate effectively with a range of audiences	Rubric for graphical assignments from Dynamics and Heat Transfer courses.	Graphical elements of written rubric: (Dynamics: 60% will receive 80%; Heat Transfer: 70% will receive 80%)	Dynamics: Fall Heat Transfer: Spring	3-year cycle
LEADERSHIP 1. Identify theories, models, and practices as they pertain to a personal style and philosophy of leadership. (Bloom's 1) 2. Explain the difference between leadership and management. (Bloom's 2) 3. Differentiate the characteristics of effective and ineffective leadership.	#4: An ability to recognize professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts #5: an ability to function effectively on a team whose members together provide	1. Homework assignment in EGE 3022 2. Homework assignment in EGE 3022 3a. Team Project rubric in EGE 3022 3b. Teamwork evaluation survey containing leadership questions used in	1. Grading rubric (70% of students will score 80% or above) 2. Grading rubric (see 1) 3a. Evaluation rubric 3b. Competition Projects 1 & 2: 80% of students	1, 2, 3a. Every Semester 3b. Competition Projects 1 and	3-year cycle

(Bloom's 3)	leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	Competition Projects 1 and 2 and ISP A and B.	will meet all of the desired outcomes ISP A: 80% of students will score 70% or above. ISP B: 80% of students will score 70% or above	ISP A: Fall. Competition Projects 2 and ISP B: Spring.	
TEAMWORK An ability to function on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	#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	Teamwork survey and project completion/milestones targets in EME 4212 (Comp Proj 1), 4312 (ISP A), 4221 (Comp Proj 2) , 4321 (ISP B) Note: these are Capstone Projects 1 and 2 which are split between Competition Projects and Industry Sponsored Projects.	Competition Projects 1 & 2: 80% of students will meet all of the desired outcomes ISP A: 80% of students will score 70% or above. ISP B: 80% of students will score 70% or above.	Competition Projects 1 and ISP A: Fall. Competition Projects 2 and ISP B: Spring.	3-year cycle
ETHICS 1. Demonstrate critical thinking with respect to ethical dilemmas (Bloom's 3) 2. Discern between personal and professional ethical responsibilities (Bloom's 2) 3. Identify the ethical codes adopted by relevant professional associations. (Bloom's 2) (May not keep this) 4. Predict possible social consequences of engineering/science ethical decisions. (Bloom's 3)	#4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	1. Homework assignment in EGE 3022 2. Homework (or classroom) assignment in EGE 3022 3. Homework assignment in EGE 1001 4. Team classroom assignment in EGE 3022	1. Grading rubric (Metrics TBD) 2. Grading rubric 3. Grading rubric 4. Evaluation rubric NOTE: These are under development.	Every Semester Every Semester Every Fall Every Semester	3-year cycle

Table 2: Mapping of the BSME Engineering Core Classes to the ABET Outcomes

	Student Outcomes										
Course	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
EEE 2123 Circuits & Electronics	R	-	-	R	-	R	-	R	-	-	-
EGE 1001 Fund. of Eng. Design Proj.	I	I	I	I	I	I	I	I	I	I	I
EGE 1023 Engineering Materials	I	I	I	I	I	I	I	I	I	I	I
EGE 1102 Engineering Computer Application Lab	I	-	I	-	I	-	-	-	-	-	I
EGE 2013 Statics	E	R	R	-	I	-	-	-	-	-	I
EGE 2123 Entrepreneurial Engineering Design Studio	I	I	I	I	I	I	I	I	I	I	I
EGE 2233 Entrepreneurial Mindset for Engineers	I	I	I	I	I	I	I	I	I	I	I
EGE 3003 Thermodynamics	R	R	R	-	E	-	R	-	-	-	R
EGE 3012 Engineering Cost Analysis	R	I	-	-	R	-	-	-	-	-	R
EME 1011 Foundations of Mech. Eng.	I	I	I	I	I	I	I	I	I	I	I
EME 2011 Materials Lab	R	E	I	R	I	I	R	-	-	-	I
EME 2012 Mechanical Eng. Graphics	I	-	I	-	I	-	-	-	-	-	I
EME 3011 Introduction to Eng. Projects	R	-	R	E	E	R	E	E	-	R	R
EME 3013 Mechanics of Materials	E	I	R	-	R	-	-	-	-	-	R
EME 3023 Manufacturing Processes	R	R	R	-	R	I	R	-	-	-	R
EME 3033 Engineering Numerical Methods	R	-	-	-	-	-	-	-	-	-	E
EME 3043 Dynamics	R	R	R	-	R	I	R	I	-	I	R
EME 3123 Fluid Mechanics	E	R	R	-	E	-	R	-	-	-	E
EME 3133 Kinematics & Dynamics of Machines	E	R	E	-	E	-	-	-	-	-	E
EME 3214 Mechatronics	E	R	R	R	E	-	R	R	R	R	E
EME 4003 Design of Machine Elements	E	R	E	R	E	E	R	R	R	R	R
EME 4013 Heat Transfer	E	-	R	-	E	-	R	-	-	-	R
EME 4212 Engineering Projects 1	E	R	E	E	E	E	E	E	R	E	E
EME 4222 Engineering Projects 2	E	E	E	E	E	E	E	E	E	E	E
EME 4252 Senior Project Fundamentals	E	R	E	E	E	E	E	R	-	R	E
EME 4253 Sr. Capstone Project	E	R	E	E	E	E	E	E	-	R	E

EME 4402 Mechanics Lab	R	E	-	-	-	-	R	-	-	-	E
EME 4412 Thermal Science Lab	R	E	R	E	E	R	E	R	R	R	E

Table 3: ABET Outcome Assessment Mapping

	a	b	c	d	e	f	g	h	i	j	k
EGE 1102 Engineering Computer Applications Lab											I
EGE 2103 Statics					I						
EGE 3003 Thermodynamics					R						
EME 2011 Engineering Materials Lab							I				
EME 2012 Mechanical Engineering Graphics											I
EME 3013 Mechanics of Materials					R						
EME 3123 Fluid Mechanics					R						
EME 3033 Engineering Numerical Methods	R										R
EME 3133 Kinematics and Dynamics of Machines	E										
EME 3043 Dynamics	R						R				
EME 3214 Mechatronics										E	E
EME 4003 Design of Machine Elements					E						
EME 4013 Heat Transfer					E		E				
EME 4212 Engineering Projects 1				E				R		R	
EME 4222 Engineering Projects 2			E	E		E					
EME 4252 Senior Project Fundamentals			E	E				R		R	
EME 4253 Senior Capstone Project			E	E		E					
EME 4412 Thermal Science Lab		E					E				
Alumni Survey									x		
Registrar's Data									x		
Exit interview									x	x	

Note. Introduce (I): corresponds to instances where the student outcomes are supported at an introductory level in a course. Reinforce (R): achieved when a course serves to reinforce the attainment of a student outcome that was supported previously at an introductory level in another course. Emphasize (E): achieved when a student outcome is supported at a more focused and advanced level.

Table 4: ABET Student Outcomes Mapping from "a – k" to new "1 – 7"

Current Student Outcomes (a – k)	Tools	New Student Outcomes (1 – 7)
(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems	• FE style problems in Numerical Methods, Kinematics, and Dynamics • Final Exam problem in Statics, Mechanics of Mat., DME, Thermo, Fluids & Heat Transfer	**1.** an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics *Complex is defined as having one of the following:* • *involving wide-ranging or conflicting technical issues* • *having no obvious solution* • *addressing problems not encompassed by current standards and codes* • *involving diverse groups of stakeholders* • *including many component parts or sub-problems* • *involving multiple disciplines* • *having significant consequences in a range of contexts.*
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	Final exam questions in Thermal Science Lab	**6**. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	Rubric for final report in Competition Projects 2 and ISP B	**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
(d) an ability to function on multidisciplinary teams	Teamwork peer evaluation form used in Competition Projects 1 and 2 and ISP A and B	**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

(f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues	• Multiple choice ethics test in Competition Projects 2 and ISP B • Rubric to score paper in Competition Projects 1 and ISP A • Rubric to score paper in Mechatronics	**4**. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts *Consideration/judgement of the impact (risks and trade-offs)*
(g) an ability to communicate effectively	• Oral rubric to score presentation in Thermal Science Lab and Materials Lab • Rubric to score project in Dynamics and Heat Transfer	**3**. an ability to communicate effectively with a range of audiences *Need to determine the range of audiences*
(i) a recognition of the need for, and an ability to engage in life-long learning	Exit survey of graduating seniors – number of professional memberships and professional goals	**7**. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	• Rubric to score final exam questions in ECAL and Numerical Methods • Rubric to score final report in Competition Projects 1 and 2 and ISP A and B	Implied in **1**, **2**, and **6**

BS in Mechanical and Manufacturing Engineering Technology

Table 1: Assessment Plan for the BS in Mechanical and Manufacturing Engineering Technology

Undergraduate Program Level Learning Outcomes	BSMMET Program Criteria	Assessment Strategy	Metrics/ Indicators**
TECHNOLOGY 1. Apply advanced technologies to practical and theoretical problems. (Bloom's 3) 2. Design and conduct experiments. (Bloom's 4) 3. Analyze and interpret data using appropriate tools (e.g., Excel, Minitab) (Bloom's 3)	1. Geometric dimension and tolerance; computer aided drafting and design 2. Selection, set-up, and calibration of instrumentation 5. Materials Science, Selections and Strength of Materials 8. Electrical Circuits and Control	Assignments in TEE3103, TEE4193, TEE4214, TEE4224, TIE4115, TIE4193, TIE4214, TME1023, TME4103, TME4113	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
ETHICS 1. Demonstrate critical thinking with respect to ethical dilemmas (Bloom's 3) 2. Discern between personal and professional ethical responsibilities (Bloom's 2) 3. Identify the ethical codes adopted by relevant professional associations. (2) 4. Predict possible social consequences of engineering/science ethical decisions. (3)	College of Engineering	Assignments in EGE1001, EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
LEADERSHIP 1. Identify theories, models, and practices as they pertain to a personal style and philosophy of leadership. (Bloom's 1) 2. Explain the difference between leadership and management. (Bloom's 2) 3. Differentiate the characteristics of effective and ineffective leadership. (Bloom's 3)	College of Engineering	Assignments in EGE1001, EGE3022	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives
TEAMWORK 1. Discuss various types of conflict and methods of resolution. (Bloom's 2) 2. Practice tools and techniques for team consensus building. (Bloom's 3) 3. Identify and integrate personal team player style in a team setting. (Bloom's 3)	9. Product Design, Tooling and Assembly	Assignments in TIE3063, TIE3203, TIE4115	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives

VISUAL COMMUNICATION Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	9. Product Design, Tooling and Assembly 10.Statistics, Quality, Continuous Improvement, and Industrial Management	Graphical assignments in TCE2143, TCE4113, TCE4213	At least 70% of students will score 75% on questions designed to directly address each of the course Learning Objectives

Table 2: Curriculum Map of BSMMET Program

Mapping of BSMMET Program Outcomes to ETAC, ASME and SME Outcomes

BSMMET Program Criteria	ABET Student's Outcomes											Mechanical Eng. Tech Outcomes							Manuf. Eng. Tech. Outcomes				Supporting Courses*
	a	b	c	d	e	f	g	h	i	j	k	a	b	c	d	e	f	g	h	a	b	c	d	
1. Geometric dimensioning and Tolerancing; computer aided drafting and design	X	X										X							X					***TIE4193 GD&T***, TME1023 Tech Graphics, TME4113 Design Graphics
2. Selection, set-up, and calibration of instrumentation	X	X			X	X							X											**TEE4224** Transduces and Instrumentation
3. Engineering Mechanics, Statics and Dynamics			X		X	X								X		X								**TME3113** Engineering Mechanics
4. Differential and Integral Calculus	X	X													X									MCS2313 Technical Calculus, MCS3324 Applied Calculus & Diff. Eq.
5. Materials Science, Selections and Strength of Materials					X	X		X		X			X			X				X				**TIE4413** Engineering Materials, TIE 4115 Senior Project
6.Manufacturing Processes and Systems			X	X				X	X	X		X				X			X	X	X	X		TME 4413, Lean Manufacturing, **TIE 3063** Engineering Manufacturing Process, ***TIE 4193 Machininh Processes***
7. Thermal Sciences			X			X											X							TME3204 Applied Termal Fluid
8. Electrical Circuits and Control			X	X		X							X					X						TEE3103 DC/AC Curcuts, TEE4214 Embeded Processes
9. Product Design, Tooling & Assembly			X		X				X												X			TIE4115 Senior Project, TME4113 Design Graphics
10. Statistics, Quality, Continuous Improvement, and Industrial Management	X	X				X	X	X		X	X												X	TME3333 Six Sigma 1, TME4343 Six Sigma 2, TIE3203 Tec Project Management
11. Technical Communications, Oral and Written					X		X												X					TIE 3203 Tech Project management, TIE4115 Senior Project, COM2103 Technical Communications, Comm 300 (writing Profficency Exam)

BS in Robotics Engineering

Table 1: Assessment Plan with Mapped Courses for the BS in Robotics Engineering

BSRE Learning Outcomes	BSRE ABET Outcomes	Assessment Tools	Metric/Indicators	Administration Timeline	Loop-Closing Timeline
TECHNOLOGY An ability to: 1. develop and conduct appropriate experimentation, 2. analyze and interpret data, 3. and use engineering judgement to draw conclusions	Outcome 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.	Class term project grade in MRE3024 Unified Robotics III	75% of students will score 70% or above	Spring Semester	3-year cycle
GRAPHICAL COMMUNICATION An ability to communicate effectively with a range of audiences	Outcome 3: An ability to communicate effectively with a range of audiences	Rubric to score project in Dynamics and for graphical communication	70% of students will score 70% or higher	Fall and Spring Semester	3-year cycle
LEADERSHIP An ability to function effectively on a team whose members together: 1. provide leadership, 2. create a collaborative and inclusive environment,	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	Teamwork evaluation tool (not peer evaluation) in MRE 4902 Capstone Projects 1 Teamwork evaluation tool (not peer evaluation) in MRE 4912 Capstone Projects 2	80% of students will meet each goal (strongly agree + agree or quantitative)	Every Semester	3-year cycle
TEAMWORK An ability to function effectively on a team whose members together: 1. create a collaborative and inclusive environment, 2. establish goals, 3. plan tasks, 4. and meet objectives	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	Teamwork evaluation tool (not peer evaluation) in MRE 4902 Capstone Projects 1 Teamwork evaluation tool (not peer evaluation) in MRE 4912 Capstone Projects 2	80% of students will meet each goal (strongly agree + agree or quantitative)	Every Semester	3-year cycle

ETHICS An ability to: 1. recognize ethical and professional responsibilities in engineering situations and 2. make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts)	Outcome 4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Rubric to score entrepreneurial assignment in MRE3024 Unified Robotics III Rubric to score individual assignment in EGE3022 Leadership and Prof. Develop. for Eng.	50% of students will score 70% or above 70% of students will score 70% or above	Spring Semester Fall and Spring Semester	3-year cycle

Table 2: New ABET assessment plan for BSRE program

New Student Outcomes (1 – 7)	Assessment Method	Timeline
1. an ability to identify, formulate, and solve *complex* engineering problems by applying principles of engineering, science, and mathematics *Complex is defined as having one of the following:* • *involving wide-ranging or conflicting technical issues* • *having no obvious solution* • *addressing problems not encompassed by current standards and codes* • *involving diverse groups of stakeholders* • *including many component parts or sub-problems* • *involving multiple disciplines* • *having significant consequences in a range of contexts.*	• Final exam problem in Statics, Mechanics of Materials, Unified Robotics III, Unified Robotis IV • Evaluate design problem (exam or project) in System Modeling and Control and Discrete Control	Start Fall 2019 Start Spring 2020
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	• Rubric for feasibility study in Unified Robotics III • Rubric for design in Unified Robotics IV • Rubric for final report in Capstone Projects 2	Start Spring 2020
3. an ability to communicate effectively with a range of audiences	• Rubric for technical paper evaluation in Unified Robotics II (written) • Rubric for presentatin in Capstone Projects 2 (oral) • Rubric to score project in Dynamics (graphical)	Start Spring 2020
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	• Rubric for feasibilty study in Unified Robotics III • Evaluate student's work in EGE 3022 Leadership and Professional Development for Engineers	Start Spring 2020
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	• Peer evaluation in Unified Robotics III • Teamwork survey and evaluation in Capstone Projects 1 and 2	Start Spring 2020
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	• Rubric for experimental in Unified Robotics I • Rubric for experimental in Unified Robotics III	Start Fall 2019
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	• Evaluate literature survey in Unified Robotics II • Evaluate literature review in Unified Robotics III • Rubric on contemporary issues in Unified Robotics IV	Start Fall 2019

College of Business and Information Technology

BS in Business Administration

Table 1: Assessment Plan for the BSBA Program

Undergraduate Program Level Learning Outcomes	Student Outcomes	Assessment Strategy	Metrics/ Indicators
TECHNOLOGY	(a) Apply technology via media and quality of slides in presentations. (Bloom's 3) (b) Analyze and interpret data using appropriate tools (Bloom's 3)	Direct assessment of assignment using course embedded rubric in ACC2023, INT2103, MGT2203, MKT2013, FIN3103, HRM 3023, MGT3103. MGT3113	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
ETHICS	(a) Identify the ethical issues implicit in a business situation. (Bloom's 2) (b) Describe and use ethical frameworks application to business situations. (Bloom's 3) (c) Develop a variety of ethical alternatives for resolving or at least addressing a problem in business. (Bloom's 3-4)	Direct assessment of assignment using course embedded rubric in MGT2203, MKT2013, MGT2113, FIN3103, HRM 3023, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
LEADERSHIP	(a) Explain the difference between leadership and management. (Bloom's 2) (b) Demonstrate effective leadership skills in a team project in terms of motivation, delegation, and conflict resolution. (Bloom's 3)	Direct assessment of assignment using course embedded rubric in MGT2203, MKT2013, HRM3023, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
TEAMWORK	Demonstrate appropriate group techniques to participate in a team task that results in effective performance in terms of attendance, preparation, contribution, participation, and accountability. (Bloom's 3)	Direct assessment of assignment using course embedded rubric in MGT2203, MKT2013, HRM3023, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
VISUAL COMMUNICATION	Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Direct assessment of assignment using course embedded rubric in MKT2013, FIN3103, MGT3103, HRM 3023, MGT3113, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
WRITTEN AND ORAL COMMUICATION	Demonstrate professional-standards in written and oral communication (oral presentations, written essays) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Direct assessment of assignment using course embedded rubric in MGT2203, MKT2013, HRM3023, MGT3113, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
KNOWLEDGE IN DISCIPLINE	Demonstrate knowledge and ability to apply facts, concepts, theories and analytical methods in core business administration concepts in accounting, economics, management, quantitative business analysis, finance, marketing, legal and social environment, information systems, and international issues.	A comprehensive standardized examination organized into multiple content areas of business knowledge administered to all seniors in MGT4213.	ETS Major Field Test in Business. Target scaled score ≥ 1 standard deviation (SD) below the standardized scale mean of the annual comparative data.

Table 2: Curriculum Map for the BSBA Program

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**	Intro to Fin Acct	Intro to Manag Acct	Principles of Mgmt	Marketing	Info Tech Mgmt	Intro to Bus Law	Fin Mgmt	Project Mgmt	Int'l Trade	Human Res Mgmt	Opera-tions Mgmt	Strat. Mgmt & Bus Policy
	ACC2013	ACC202	MGT2203	MKT2013	INT2103	MGT2113	FIN3103	MGT3103	MGT3033	HRM3023	MGT3113	MGT4213
TECHNOLOGY	**I (F)**	**I (F)**	**I (F)**		**I (F)**		**R (F)**	**R (F)**		**R (F)**	**R (F)**	
ETHICS			**I (F)**	**I (F)**		**R (F)**	**R (F)**			**E (F)**		
LEADERSHIP			**I (F)**	**R (F)**						**R (F)**		
TEAMWORK			**I (F)**	**R (F)**						**R (F)**		
VISUAL COMMUNICATION				**I (F)**			**R (F)**	**R (F)**		**R (F)**	**R (F)**	
WRITTTEN/ORAL COMMUNICATION			**I (F)**	**R (F)**						**R (F)**		
KNOWLEDGE IN DISCIPLINE												**E (S)**

BS in Information Technology

Table 1: Assessment Plan for the BSIT Program

Undergraduate Program Level Learning Outcomes	Student Outcomes	Assessment Strategy	Metrics/ Indicators
TECHNOLOGY	(a) Apply technology via media and quality of slides in presentations. (Bloom's 3) (b) Analyze and interpret data using appropriate tools (Bloom's 3)	Direct assessment of assignment using course embedded rubric in INT2103, INT2123, INT2134, MGT2203, INT3203, INT3703, INT3803,MGT3103. MGT3113, INT4203	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
ETHICS	(a) Identify the ethical issues implicit in a business situation. (Bloom's 2) (b) Describe and use ethical frameworks application to business situations. (Bloom's 3) (c) Develop a variety of ethical alternatives for resolving or at least addressing a problem in business. (Bloom's 3-4)	Direct assessment of assignment using course embedded rubric in INT2103, MGT3103	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
LEADERSHIP	(a) Explain the difference between leadership and management. (Bloom's 2) (b) Demonstrate effective leadership skills in a team project in terms of motivation, delegation, and conflict resolution. (Bloom's 3)	Direct assessment of assignment using course embedded rubric in INT2103, MGT 2203, INT3803, INT4203	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
TEAMWORK	Demonstrate appropriate group techniques to participate in a team task that results in effective performance in terms of attendance, preparation, contribution, participation, and accountability. (Bloom's 3)	Direct assessment of assignment using course embedded rubric in MGT 2203, MKT 2013, HRM 3023, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
VISUAL COMMUNICATION	Demonstrate professional standards in graphical communication (including figures, plots, tables, and posters) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Direct assessment of assignment using course embedded rubric in MKT 2013, FIN3103, MGT3103, HRM 3023, MGT3113, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary
WRITTEN AND ORAL COMMUICATION	Demonstrate professional-standards in written and oral communication (oral presentations, written essays) by integrating evidence and analysis within a coherent structure. (Bloom's 3 and 4)	Direct assessment of assignment using course embedded rubric in MGT2203, MKT 2013, HRM 3023, MGT3113, MGT4213	Mean score ≥ 3.5 on 6-point scale course embedded rubric: 1, 2 = deficient; 3, 4 = competent 5, 6 = exemplary

KNOWLEDGE IN DISCIPLINE	Demonstrate knowledge and ability to apply facts, concepts, theories and analytical methods in core business administration concepts in accounting, economics, management, quantitative business analysis, finance, marketing, legal and social environment, information systems, and international issues.	A comprehensive faculty generated examination organized into multiple content areas of information technology knowledge administered to all seniors in INT4303.	Faculty generated final exam deployed to seniors in INT4203. Criterion performance is 75% of students scoring ≥ 70% on final exam.

Table 2: Curriculum Map for the BSIT Program

LEARNING OUTCOME **I = Introduce** **R = Reinforce** **E = Emphasize** **F = Formative** **S = Summative**	Principles of Mgmt MGT2203	Info Tech Mgmt INT2103	Web Design INT2123	Intro to Java INT2134	Project Mgmt MGT3103	Comp Network 1 INT 3203	Enter. Resource Plan Systems INT 3703	Database Systems 2 INT 3803	Systems Analysis & Design INT 4203	Capstone INT4303
TECHNOLOGY	**I (F)**	**I (F)**	**R (F)**	**R (F)**	**R (F)**	**R (F)**	**R (F)**	**R (F)**	**E (F)**	
ETHICS		**I (F)**			**I (F)**					
LEADERSHIP	**I (F)**	**R (F)**						**R (F)**	**R (F)**	
TEAMWORK	**I (F)**	**R (F)**						**R (F)**	**R (F)**	
VISUAL COMMUNICATION				**R (F)**	**R (F)**					
WRITTEN/ORAL COMMUNICATION	**I (F)**	**R (F)**						**R (F)**	**R (F)**	
KNOWLEDGE IN DISCIPLINE										**E (F)**