FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: March 28, 2013

SUBJECT: Curriculum Proposal #12-13-55, REVISION #1
BS Mechanical Engineering Technology
Final Faculty Senate Approval 4/9/2013

I recommend approval of the attached REVISION #1 of Curriculum Proposal #12-13-55 from the College of Science and Technology, Department of Technology. This proposal is now ready for Faculty Senate.

be First

FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: March 4, 2013

SUBJECT: Curriculum Proposal #12-13-55
BS Mechanical Engineering Technology

I recommend approval of the attached Curriculum Proposal #12-13-55 from the College of Science and Technology, Department of Technology.

This proposal reduces the BS in Mechanical Engineering Technology to 120 hours and implements the new General Studies requirements.

c: Dr. Christina Lavorata
Dr. Anthony Gilberti
Mr. Jason Bolyard
Ms. Evie Brantmayer
Ms. Leslie Lovett

be First

CURRICULUM PROPOSAL (Submit one hard copy and an electronic copy to the Associate Provost by the second Tuesday of the month.)

Proposal Number: 12-13-55

School/Department/Program: College of Science and Technology, School of Technology, B.S. in Mechanical Engineering Technology

Preparer/Contact Person: Jason Bolyard

Telephone Extension: 4849

Date Originally Submitted:

Revision (Indicate date and label it Revision #1, #2, etc.):

Implementation Date Requested: August 2013

I. **PROPOSAL.**

This proposal is being submitted to remove 13 hours of course work and add 7 hour of course work including 1 hour of free elective to the B.S. in Mechanical Engineering Technology. These changes and the new general studies requirements will allow for the B.S. in Mechanical Engineering Technology program to be reduced from 130 hours to exactly 120 hours. The MECH 4400 course is also been modified to satisfy the university writing intensive course requirement. The TECH 1108 and 2208 courses that are being added have been previously approved and can be found in curriculum proposal 12-13-54.

II. **DESCRIPTION OF THE PROPOSAL.** Provide a response for each letter, A-H, and for each Roman Numeral II–V. If any section does not apply to your proposal, reply N/A.

A. Deletion of course(s) or credit(s) from program(s)

DRFT 1100 Engineering Graphics	3 hours
DRFT 2200 Fundamentals of CAD	3 hours
DRFT 2235 Technical Drafting	3 hours
CHEM 1102 General Chemistry II	4 hours

Total hours deleted. 13

B. Addition of course(s) or credit(s) from program(s)

Free Elective	1 hour
TECH 1108 Engineering Graphics I	3 hours (see Proposal 12-13-54 for course syllabus)
TECH 2208 Engineering Graphics II	3 hours (see Proposal 12-13-54 for course syllabus)

Total hours added. 7

C. Provision for interchangeable use of course(s) with program(s)

N/A

D. Revision of course content. Include, as an appendix, a revised course description, written in complete sentences, suitable for use in the university catalog.

The MECH 4400 Mechanical Measurements course is being revised to include a writing intensive component. The revision is included to meet the university writing intensive course requirement. See Appendix B.

E. Other changes to existing courses such as changes to title, course number, and elective or required status.

N/A

F. Creation of new course(s). For each new course

N/A

1. Designate the course number, title, units of credit, prerequisites (if any), ownership (FSU or shared) and specify its status as an elective or required course. If you are creating a shared course, attach a memo from the Deans of the affected Schools explaining the rationale for the course being shared.

2. Include, as an appendix, a course description, written in complete sentences, suitable for use in the college catalog.

3. Include, as an appendix, a detailed course outline consisting of at least two levels.

4. In order to meet the requirements as outlined in Goal One of the Strategic Plan, please include Outcome Competencies and Methods of Assessment as an appendix. Examples are available upon request from the Chair of the Curriculum Committee.

G. Attach an itemized summary of the present program(s) affected, if any, and of the proposed change(s).

Describe how this proposal affects the hours needed to complete this program. Specifically, what is the net gain or loss in hours? Use the format for Current and Proposed Programs in Appendix A.

III. **RATIONALE FOR THE PROPOSAL.**

A. **Quantitative Assessment**: Indicate the types of assessment data, i.e., surveys, interviews, capstone courses, projects, licensure exams, nationally-normed tests, locally developed measurements, accreditation reports, etc., that were collected and analyzed to determine that curricular changes were warranted. Quantitative data is preferred.

The B.S. in Mechanical Engineering Technology program requires that two courses be removed from its curriculum and one free elective hour be added to be at the maximum 120 hour limit. These courses are DRFT 1100 and CHEM 1102. The DRFT 1100 course is a traditional pencil and paper drafting course. The CHEM 1102 course is the second course in general chemistry. The DRFT 2200 and DRFT 2235 are being replaced by TECH 1108 and TECH 2208 respectively.

See Appendix C for ETAC of ABET outcome criteria. The requirements from ABET aided in the revisions required to be at the 120 hour limit.

B. **Qualitative Assessment**: Based upon the assessment data above, indicate why a curricular change is justified. Indicate the expected results of the change. Be sure to include an estimate of the increased cost, or reduction in cost of implementation. FOR EXAMPLE: Will new faculty, facilities, equipment, or library materials be required?

The current ETAC of ABET outcomes do not require a B.S. in Mechanical Engineering Technology program to include a traditional drafting course or a second course in chemistry.

No new faculty, facilities, equipment or materials will be needed.

IV. Should this proposal affect any course or program in another school, a memo must be sent to the Dean of each school impacted and a copy of the memo(s) must be included with this proposal. In addition, the Deans of the affected schools must sign below to indicate their notification of this proposal.

N/A

By signing here, you are indicating your college's/school's notification of this proposal.

College/School	Dean	Signature
Business & Technology	D. Gilbert	

V. Should this proposal affect any course to be added or deleted from the general studies requirements, a memo from the chair of the General Studies Committee indicating approval of the change must be included with this proposal.

N/A

VI. ADDITIONAL COMMENTS.

N/A

APPENDIX A

B.S. Degree in Mechanical Engineering Technology

Current Program

Required Major Courses			HRS
MECH	1100	Statics	3
MECH	2200	Strength of Materials	4
MECH	2210	Thermodynamics I	3
MECH	2220	Fluid Mechanics	3
MECH	2240	Machine Design I	3
MECH	3300	Thermodynamics II	3
MECH	3340	Heating, A/C, and Ventilation	3
MECH	3320	Dynamics	3
MECH	3330	Heat Transfer I	3
MECH	4400	Mechanical Measurements	3
MECH	4410	Thermodynamics III	3
MECH	4430	Heat Transfer II	3
CHEM	1101	General Chemistry I	X
CHEM	1102	General Chemistry II	4
COMP	1101	Applied Technical Programing	3
DRFT	1100	Engineering Graphics	3
DRFT	2200	Fundamentals of CAD	3
DRFT	2235	Technical Drafting	3
ECON	2200	Intro to Economics	X
ELEC	1100	Circuit Analysis	3
ELEC	2250	AC/DC Machinery & Controls	3
ENGL	1109	Technical Report Writing	3
MANF	1100	Materials and Processes	3
MATH	1101	Applied Tech. Math I	3
MATH	1102	Applied Tech. Math II	X
PHYS	1101	Intro to Physics I	X
PHYS	1102	Intro to Physics II	4
TECH	2290	Engineering Analysis I	4
TECH	3300	Engineering Analysis II	4
TOTAL Required Major Courses			80
Major Electives			9
CIVL	2200	Introduction to Surveying	3
CIVL	2210	Light Construction	3
CIVIL	2290	Introduction to Structures	3
COMP	1102	Principles of Programming I	3
COMP	1108	Principles of Programming II	3
COMP	2200	Object-Oriented Programming	3
COMP	2201	Machine Organization	3
DRFT	2205	Introduction to Solid Modeling	3
DRFT	2225	Descriptive Geometry	3
DRFT	2995	Tool Design	3
ELEC	2210	Circuit Analysis II	3
ELEC	2280	Programmable Controllers	3

INFO	2250	Networking Fundamentals	3	
INFO	2251	Router Theory & Router Technologies	3	
INFO	2252	Advanced Routing & Switching	3	
MANF	2205	Engineering Economy	3	
MATH	1113	Applied Statistics	4	
MATH	3316	Calculus III	4	
MATH	3335	Probability & Statistics	3	
MATH	3362	Linear Algebra	3	
MATH	4401	Differential Equations	3	
MECH	3350	Numerical Methods	3	
SFTY	1100	Safety & Environmental Comp. of Industry	3	
SFTY	2250	Safety Law & Compliance	3	
TECH	3399	Advanced PLCS	3	
TECH	4401	Work Experience Laboratory	3	
Minor Electives				0
TOTAL HOURS FOR MAJOR				**89**

Required General Studies Courses				
First Year Experience				15
ENGL	1104	Written English I	3	
ENGL	1108	Written English II	3	
INFO	1100	Computer Concepts and Applications	3	
MATH	1102	Applied Technical Mathmatics	3	
COMM	2200, 2201, OR 2202	Communication	3	
Scientific Discovery				8
CHEM 1101, PHYS 1101				
Cultural / Civilization Exploration				9
Society / Human Interactions				3
ECON 2200				
Artistic / Creative Expression				6
TOTAL GENERAL STUDIES HOURS				**41**
TOTAL FREE ELECTIVES				**0**
TOTAL HOURS				**130**

B.S. Degree in Mechanical Engineering Technology
Proposed Program

Required Major Courses			HRS	
MECH	1100	Statics	3	
MECH	2200	Strength of Materials	4	
MECH	2210	Thermodynamics I	3	
MECH	2220	Fluid Mechanics	3	
MECH	2240	Machine Design I	3	
MECH	3300	Thermodynamics II	3	
MECH	3340	Heating, A/C, and Ventilation	3	
MECH	3320	Dynamics	3	
MECH	3330	Heat Transfer I	3	
MECH	4400	Mechanical Measurements	3	
MECH	4410	Thermodynamics III	3	
MECH	4430	Heat Transfer II	3	
CHEM	1101	General Chemistry I	4	
COMP	1101	Applied Technical Programing	3	
TECH	1108	Engineering Graphics I	3	
TECH	2208	Engineering Graphics II	3	
ECON	2200	Intro to Economics	X	
ELEC	1100	Circuit Analysis	3	
ELEC	2250	AC/DC Machinery & Controls	3	
ENGL	1109	Technical Report Writing	X	
MANF	1100	Materials and Processes	3	
MATH	1101	Applied Tech. Math I	X	
MATH	1102	Applied Tech. Math II	3	
PHYS	1101	Intro to Physics I	X	
PHYS	1102	Intro to Physics II	4	
TECH	2290	Engineering Analysis I	4	
TECH	3300	Engineering Analysis II	4	
TOTAL Required Major Courses				74
Major Electives				9
CIVL	2200	Introduction to Surveying	3	
CIVL	2210	Light Construction	3	
CIVIL	2290	Introduction to Structures	3	
COMP	1102	Principles of Programming I	3	
COMP	1108	Principles of Programming II	3	
COMP	2200	Object-Oriented Programming	3	
COMP	2201	Machine Organization	3	
ELEC	2210	Circuit Analysis II	3	
ELEC	2280	Programmable Controllers	3	
INFO	2250	Networking Fundamentals	3	
INFO	2251	Router Theory & Router Technologies	3	
INFO	2252	Advanced Routing & Switching	3	
MANF	2205	Engineering Economy	3	
MATH	1113	Applied Statistics	4	
MATH	3316	Calculus III	4	
MATH	3335	Probability & Statistics	3	
MATH	3362	Linear Algebra	3	

MATH	4401	Differential Equations	3	
MECH	3350	Numerical Methods	3	
SFTY	1100	Safety & Environmental Comp. of Industry	3	
SFTY	2250	Safety Law & Compliance	3	
TECH	3399	Advanced PLCS	3	
TECH	4401	Work Experience Laboratory	3	
Minor Electives				XX
TOTAL HOURS FOR MAJOR				**83**

Required General Studies Courses	
Attribute IA – Critical Analysis	X
Major Course – MECH 1100	
Attribute IB – Quantitative Literacy	3
MATH 1101	
Attribute IC – Written Communication	3
ENGL 1104	
Attribute ID - Teamwork	X
Major Course – MECH 4430	
Attribute IE – Information Literacy	3
ENGL 1108	
Attribute IF – Technology Literacy	3
ENGL 1109	
Attribute IG – Oral Communication	3
COMM 2200 or 2201 or 2202	
Attribute III - Citizenship	3
HIST 1107 or 1108	
Attribute IV - Ethics	X
COMM 2200 or 2201 or 2202	
Attribute V - Health	2
PHED 1100	
Attribute VI - Interdisciplinary	3
any course in VI	
Attribute VIIA - Arts	3
Any course in VIIA	
Attribute VIIB - Humanities	X
HIST 1107 or 1108	
Attribute VIIC – Social Sciences	3
Major Course – ECON 2200	
Attribute VIID - Natural Science	4
PHYS 1101	
Attribute VIII – Cultural Awareness	3
Any course in VIII	
Additional General Studies hours	X
Major Course – MECH 4400 writing intensive course	
TOTAL GENERAL STUDIES HOURS	36

TOTAL FREE ELECTIVES	**1**
TOTAL HOURS	**120**

APPENDIX B

MECH 4400: Mechanical Measurements Couse Description and Outline

MECH 4400: Mechanical Measurements (WIC) 3 hours
This course is a study of the measurement of motion, force, torque, power, temperature, pressure, fluid flow, and strain. Topics include direct and indirect measurement, sensor theory of operation and selection, curve fitting and data analysis. A writing intensive experience will be included in this course through multiple writing assignments including laboratory and design reports. PR: MECH 3320 or CR: MECH 3320, PR: ENGL 1108

Writing Intensive Component
During the course of the semester students in MECH 4400 will complete four writing assignments. The writing assignments include a laboratory report, technical memo, research proposal, and design report. Each student will have an opportunity to make extensive revisions on each assignment based on instructor feedback. The outline for the laboratory report, technical memo, research proposal, and design report can be seen below.

Laboratory Report
- Abstract
- Introduction
- Experimental Setup
- Procedure
- Results
- Conclusions and Recommendations
- References

Technical Memo
- Memo cover sheet
- Experimental Setup
- Procedure
- Results
- References

Research Proposal
- Introduction
- Literature review
- Methodology
- Expected results
- Budget
- References

Design Report
- Description
- Assumptions
- Model Information
- Material Properties
- Boundary Conditions
- Results
- Conclusions
- References

The course assignments meet or exceed the 20 page minimum for an approved writing intensive course. The grading structure for the MECH 4400 can be seen below. It can be seen that writing assignments account for 70% of the student's final grade.

In class Laboratory Exercises 30%
Laboratory Report 20%
Technical Memo 15%
Design Report 15%
Research Proposal 20%

APPENDIX C

B.S in Mechanical Engineering Technology ETAC of ABET Outcome Criteria

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;

e. an ability to function effectively as a member or leader on a technical team;

f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;

g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

h. an understanding of the need for and an ability to engage in self-directed continuing professional development;

i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

j. a knowledge of the impact of engineering technology solutions in a societal and global context; and

k. a commitment to quality, timeliness, and continuous improvement.

The mechanical engineering technology discipline encompasses the areas (and principles) of materials, applied mechanics, computer-aided drafting/design, manufacturing, experimental techniques/procedure, analysis of engineering data, machine/mechanical design/analysis, conventional or alternative energy system design/analysis, power generation, fluid power, thermal/fluid system design/analysis, plant operation, maintenance, technical sales, instrumentation/control systems, and heating, ventilation, and air conditioning (HVAC), among others. As such, programs outcomes, based on specific program objectives, may have a narrower focus with greater depth, selecting fewer areas, or a broader spectrum approach with less depth, drawing from multiple areas. However, all programs must demonstrate an applied basis in engineering mechanics/sciences.

Baccalaureate degree programs must demonstrate that graduates can apply specific program principles to the analysis, design, development, implementation, or oversight of more advanced mechanical systems or processes depending on program orientation and the needs of their constituents.