FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: April 5, 2013

SUBJECT: Curriculum Proposal #12-13-59, REVISION #4
BS Electronics Engineering Technology
Final Faculty Senate Approval 4/9/2013

I recommend approval of the attached REVISION #4 of Curriculum Proposal #12-13-59 from the College of Science and Technology, Department of Technology. The proposal is now ready for Faculty Senate.

be First

FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: March 28, 2013

SUBJECT: Curriculum Proposal #12-13-59, REVISION #3
BS Electronics Engineering Technology

I recommend approval of the attached REVISION #3 of Curriculum Proposal #12-13-59 from the College of Science and Technology, Department of Technology. This revision was requested by the Curriculum Committee after first reading.

c: Dr. Christina Lavorata
Dr. Anthony Gilberti
Mr. Larry Allen
Ms. Evie Brantmayer
Ms. Leslie Lovett

be First

FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby JRK

DATE: March 22, 2013

SUBJECT: Curriculum Proposal #12-13-59, REVISION #2
BS Electronics Engineering Technology

I recommend approval of the attached REVISION #2 of Curriculum Proposal #12-13-59 from the College of Science and Technology, Department of Technology. This revision addresses changes required after the first reading by the Curriculum Committee before the second reading.

c: Dr. Christina Lavorata
Dr. Anthony Gilberti
Mr. Larry Allen
Ms. Evie Brantmayer
Ms. Leslie Lovett

be First

FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: March 7, 2013

SUBJECT: Curriculum Proposal #12-13-59, REVISION #1
BS Electronics Engineering Technology

I recommend approval of the attached REVISION #1 of Curriculum Proposal #12-13-59 from the College of Science and Technology, Department of Technology. This revision addresses issues that were discovered after the proposal was submitted to the Curriculum Committee.

This proposal reduces the BS in Electronics Technology to 120 hours and implements the new General Studies requirements. In addition, it makes changes to meet industry trends as well as making changes to prerequisites for existing courses.

c: Dr. Christina Lavorata
Dr. Anthony Gilberti
Mr. Larry Allen
Ms. Evie Brantmayer
Ms. Leslie Lovett

FAIRMONT STATE UNIVERSITY

MEMORANDUM

TO: Curriculum Committee

FROM: Jack Kirby

DATE: March 4, 2013

SUBJECT: Curriculum Proposal #12-13-59
BS Electronics Engineering Technology

I recommend approval of the attached Curriculum Proposal #12-13-59 from the College of Science and Technology, Department of Technology.

This proposal reduces the BS in Electronics Technology to 120 hours and implements the new General Studies requirements. In addition, it makes changes to meet industry trends as well as making changes to prerequisites for existing courses.

c: Dr. Christina Lavorata
Dr. Anthony Gilberti
Mr. Larry Allen
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:	
School/Department/Program:	Science & Technology/Technology/Electronics Engineering Technology
Preparer/Contact Person:	Larry Allen
Telephone Extension:	4631
Date Originally Submitted:	Dec. 11,2012
Revision (Indicate date and label it Revision #1, #2, etc.):	
Implementation Date Requested:	Fall 2013

I. **PROPOSAL**. Write a brief abstract, not exceeding 100 words, which describes the overall content of the proposal.

This proposal includes the following modifications to the existing program:

1. Deletion (from courses of instruction in the FSU catalog) of three ELEC courses. 2215(last offered spring 2013), 2220(last offered fall 2012), and 4400(last offered fall 2012).
2. Removal of courses from other disciplines.
3. Creation of three new ELEC courses; 2225, 4401 and 4402.(see page 3 for implementation dates).
4. ELEC 4402 replaces ELEC 4400 as the Writing Intensive Course (WIC)degree requirement. See page 13 for details of implementation of WIC criteria in ELEC 4402.
5. Addition of courses from other disciplines.
6. Changes included in this proposal are designed to meet industry trends as identified by the program's Industrial Advisory Committee.
7. Adjustment of degree hours to meet the HEPC's 120 hour requirement.
8. Adjustment of curriculum to meet FSU's new general studies program.
9. Prerequisite changes to existing courses.

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. Deleted/Removed courses/credits from the program.

Course Number	Course Name	Credit Hours
CHEM 1101	General Chemistry I	4
COMM 2200	Introduction to Human Communication	3
DRAFT 1100	Engineering Graphics-***course moved to Pierpont***	3
ECON 2200	Economics	3
ELEC 2215	Basic Transistors - ***deleted***	3
ELEC 2220	Linear Electronics - ***deleted***	3
ELEC 4400	Senior Project - ***deleted***	3
INFO 1100	Computer Concepts & Applications	3
MATH 1101	Applied Technical Math I	3
MATH 1102	Applied Technical Math II	3
TECH 2290	Engineering Analysis I	4
TECH 3300	Engineering Analysis II	4
	Total deleted hours	**39**

B. Created/Added courses/credits to the program.

Course Number	Course Name	Credit Hours
COMM 2202	Introduction to Communication in the World of Work	3
ELEC 2225	Electronics Devices - ***created***	3
ELEC 4401	Senior Electronics Project I - ***created***	4
ELEC 4402	Senior Electronics Project II- ***created***	3
HIST 1107	U.S. History I	3
MATH 1113	Applied Statistics	3
MATH 1185 or MATH 1190	Applied Calculus I or Calculus I	4
MATH 1186 or MATH 3315	Applied Calculus II or Calculus II	4
TECH 1108	Drafting Fundamentals	3
	Total added hours	**30**

C. Provision for interchangeable use of course(s) with program(s)
To successfully phase in the new courses, substitutions for deleted courses are indicated below.

Deleted Course	Interchangeable Course(s)	Implementation Date
ELEC 2215	ELEC 2225	Spring 2014
ELEC 2220	ELEC 4401 or advisor approved substitution	Fall 2014*
ELEC 4400	ELEC 4402	Fall 2013*

*Rationale for implementation of ELEC 4401and 4402: As of this writing (spring 2013), most students taking senior project in the fall 2013-spring 2014 academic year have their year planned out. It is assumed that none of those students would want to go to the proposed program, even though it is less total hours for the degree. So the first offering of 4401 will be in the fall of 2014. 4402 in the fall of 2013 will include the project build and writing intensive component and will substitute for 4400 for seniors in the fall 13- spring 14 academic year. In the fall of 2014, 4401 will become the project build course, and 4402 will become the writing intensive course. The writing intensive course (4402) needs to be offered to students in the fall of 2013 to fulfill the FSU writing intensive graduation requirement.

Fall 2013 ELEC 4402 first offering– To include the project and writing component.
Fall 2014 ELEC 4401 and 4402 both offered. Both become the designed course.

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

There are no course descriptions or credit hour revisions being proposed for current courses.

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

Other than changes to prerequisites (see below in bold), there are no other changes to existing courses.

Prerequisite Changes:	
ELEC 2210 Circuit Analysis II	ELEC 1100 CR: **MATH 1186, MATH 3315 or ACT 24**
ELEC 2230 Digital Electronics	ELEC 2210, ~~ELEC 2215~~, **ELEC 2225**
ELEC 2240 Industrial Electronics	~~ELEC 2220~~, **ELEC 2225,** ELEC 2230, **ELEC 2250**
ELEC 2250 AC/DC Machinery/Cont.	ELEC 1100 **"C" in MATH 1186, or MATH 3315**
ELEC 2260 Communication Systems	**~~ELEC~~** ~~2220~~, **2225**, ELEC 2230

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

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.

   The table below indicates new course numbers, titles, credit hours, prerequisites, co-requisites, institution ownership, and course status.

Course Number	Title	Units of Credit (hrs)	Prerequisites	Co-requisites	Ownership	Status
ELEC 2225	Electronic Devices	3	ELEC 2200	ELEC 2210, MATH 1186 or MATH 3315 or ACT 24	FSU	required
ELEC 4401	Senior ELEC Project I	4	ELEC 3300, 3310, Instructor Consent	None	FSU	required
ELEC 4402	Senior ELEC Project II	3	ENGL 1108	Senior Project I (ELEC 4401)	FSU	required

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

   For course descriptions of ELEC 2225, ELEC 4401, and ELEC 4402, see Appendix B.

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

   For course outlines of ELEC 2225, ELEC 4401, and ELEC 4402, see Appendix C.

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.

   For outcome competencies and methods of assessment of ELEC 2225 ELEC 4401, and ELEC 4402, see Appendix D.

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

Enrollment in classes may change due to the addition and deletion of courses. Those potentially affected courses are listed below.

Course added to Electronics program may see increase in enrollment.	Course removed from Electronics program may see decrease in enrollment.
COMM 2202	COMM 2200
HIST 1107	CHEM 1101
MATH 1113	DRFT 1100
MATH 1185	ECON 2200
MATH 1186	INFO 1100
TECH 1108	MATH 1101
	MATH 1102
	TECH 2290
	TECH 3300

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.

The current program requires 132 credit hours whereas the proposed program meets the 120 credit hour requirement.

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 Electronics Engineering Technology's Industrial Advisory Committee recommended combining ELEC 2215 & 2220. *This is reflected in the creation of the ELEC 2225 course.*

Student Exit Interviews (conducted December of each academic year) have indicated the students' desire to increase the credit hours for ELEC 4400. This recommendation is reflected in the creation of the ELEC 4401 and 4402 courses. Faculty agree that the change is better. Students spend many hours in this highly educational project course (4400).

The reduction in hours is a response to the university's requirement for programs of study not to exceed 120 credit hours.

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 principle reasons for the curriculum change is to meet the 120 credit hour requirement, align the program with the new General Studies program, and to address the emerging needs and trends in the electronics industry.

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.

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

College/School	Dean	Signature
Science & Technology	Dr. Anthony Gilberti	
Liberal Arts	Dr. Deanna Shields	
Fine Arts	Dr. Peter Lach	

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.

APPENDIX A

B.S. Degree in Electronics Engineering Technology

Current Program

Required Major Courses				HRS
ELEC	1100	Circuit Analysis I		3
ELEC	2200	Shop Practices		3
ELEC	2210	Circuit Analysis II		3
ELEC	2215	Basic Transistors		3
ELEC	2220	Linear Electronics		3
ELEC	2230	Digital Electronics		3
ELEC	2240	Industrial Electronics		3
ELEC	2250	AC/DC Machinery & Controls		3
ELEC	2260	Communication Systems		3
ELEC	2270	Microcomputers		3
ELEC	2280	Programmable Controllers		3
ELEC	3300	Adv. Linear Electronics		3
ELEC	3310	Adv. Microcomputer Sys.		3
ELEC	4400	Senior Electronics Project		3
ELEC	4410	Data Acq & Control Sys.		4
CHEM	1101	General Chemistry I		4
DRFT	1100	Engineering Graphics		3
SFTY	1100	Saf & Env. Comp Ind		3
COMP	1101	Applied Tech Programming		3
MANF	2250	Total quality & SPC		3
MATH	1101	Applied Technical Math I		3
TECH	2290	Engineering Analysis I		4
TECH	3300	Engineering Analysis II		4
ENGL	1109	Tech Report Writing		3
TOTAL Required Major Courses				76
Major Electives				9
Minor Electives				0
Total Hours		**For Major**	**85**	

Required General Studies Courses				
First Year Experience		15-16		
INFO	1100	Information systems I		3
ENGL	1104	Written English I		3
ENGL	1108	Written English II		3
MATH	1102	Tech Math I		3
COMM	2200	Communications		3
Scientific Discovery			8	
PHYS	1101/2	Introduction to Physics I/II		8
Cultural / Civilization				9
Society / Human Interactions			6	3
				3
Artistic / Creative Expression				6
TOTAL GENERAL STUDIES HOURS				44

TOTAL FREE ELECTIVES	**3**	
TOTAL HOURS		**132**

B.S. Degree in Electronics Engineering Technology
Proposed Program

Required Major Courses		**HRS**
ELEC 1100	Circuit Analysis I	3
ELEC 2200	Shop Practices	3
ELEC 2210	Circuit Analysis II	3
ELEC 2225	Electronics Devices	3
ELEC 2230	Digital Electronics	3
ELEC 2240	Industrial Electronics	3
ELEC 2250	AC/DC Machinery	3
ELEC 2260	Communication Systems	3
ELEC 2270	Microcomputers	3
ELEC 2280	Programmable Controllers	3
ELEC 3300	Adv. Linear Electronics	3
ELEC 3310	Adv. Microcomputer Sys.	3
ELEC 4401	Senior ELEC Project I	4
ELEC 4402	Senior ELEC Project II	3
ELEC 4410	Data Acq & Control Sys.	4
TECH 1108	Drafting Fundamentals	3
SFTY 1100	Env. Safety in Industry	3
COMP 1101	Applied Tech Programming	3
MANF 2250	Total Quality & SPC	3
MATH 1113	Applied Statistics	3
MATH 1186 or MATH 3315	Applied Calculus II	4
PHYS 1102	Physics II	4
TOTAL Required Major Courses		**70**
Major Electives (See Appendix E)		**9**
Total Hours For Major		**79**

Required General Studies Courses		**HRS**
Attribute IA – Critical Analysis	ENGL 1109	3
Attribute IB – Quantitative Literacy	MATH 1185 or MATH 1190	4
Attribute IC – Written Communication	ENGL 1104/1108	6
Attribute ID - Teamwork	MANF 2250	x
Attribute IE – Information Literacy	ENGL 1108	x
Attribute IF – Technology Literacy	ENGL 1109	x
Attribute IG – Oral Communication	COMM 2202	3
Attribute III - Citizenship	HIST 1107 *(or any approved course in this attribute)	3
Attribute IV - Ethics	COMM 2202	x
Attribute V - Health	Any approved course in V	2 or 3
Attribute VI - Interdisciplinary	Any course in VI	3
Attribute VIIA - Arts	Any course in VIIA	3
Attribute VIIB - Humanities	HIST 1107*(or any approved course in this attribute)	x
Attribute VIIC – Social Sciences	Any course in VIIC	3
Attribute VIID – Natural Science	PHYS 1101	4
Attribute VIII – Cultural Awareness	Any course in VIII	3
Total General Studies Hours		**37 or 38**
Free Elective		**3 or 4**
Total Hours		**120**

**Electing to complete an approved course other than HIST 1107 will require completion of greater than 120 hours.*

APPENDIX B

Course Descriptions

ELEC 2225 Electronic Devices **3 cr.**

Devices studied will include diodes, transistors, Op Amps, PLL's, and timers. The circuitry will include power supplies, basic amplifier types, power amplifiers, switching circuits, voltage regulators, comparators and active filters. PR: ELEC 2200. CR: ELEC 2210, and one of the following: MATH 1186; MATH 3315; MATH ACT 24.

ELEC 4401 Senior Electronics Project I **4 cr.**

Instructor-approved capstone project. This course will allow the student to pursue specialized interests and show that s/he can manage and complete an individual project. This is a two course sequence and the student will select a project with faculty approval, design the project, and perform preliminary testing of the project. Project management techniques will be set up in this first course. Baccalaureate majors only. PR: ELEC 3300 and 3310, and instructor consent.

ELEC 4402 Senior Electronics Project II (*Writing Intensive Course)* **3 cr.**

Continuation of ELEC 4401. While completing the ELEC 4401 project, students will demonstrate, prepare and deliver an oral presentation, and submit a final report. PR: ENGL 1108. CR: ELEC 4401.

APPENDIX C

Course Outline

ELEC 2225 Electronic Devices

I. Diodes
   a. Diode Types and Characteristics
      i. Semiconductor Materials: Ge, Si, and GaAs
      ii. Covalent Bonding and Intrinsic Materials
      iii. Energy Levels
      iv. Extrinsic Materials: n-Type and p-Type
      v. Semiconductor Diode
      vi. Ideal Versus Practical
      vii. Resistance Levels
      viii. Diode Equivalent Circuits
      ix. Diode Specification Sheets
      x. Semiconductor Diode Notation
      xi. Diode Testing
      xii. Zener Diodes
      xiii. Light-Emitting Diodes

   b. Diode Applications
      i. Load-Line Analysis
      ii. Series Diode Configurations
      iii. Parallel and Series–Parallel Configurations
      iv. AND/OR Gates
      v. Sinusoidal Inputs; Half-Wave Rectification
      vi. Full-Wave Rectification
      vii. Zener Diodes
      viii. Practical Applications

II. Bipolar Junction Transistors
   a. Bipolar Junction Transistors
      i. Transistor Construction
      ii. Transistor Operation
      iii. Transistor Amplifying Action
      iv. Common-Emitter Configuration
      v. Limits of Operation
      vi. Transistor Specification Sheet
      vii. Transistor Testing
      viii. Transistor Casing and Terminal Identification

   b. DC Biasing-BJT's
      i. Operating Point
      ii. Fixed_Bias Configuration - Load-line
      iii. pnp Transistors
      iv. Transistor Switching Networks
      v. Troubleshooting Techniques

III. Field-Effect Transistors
   a. Field-Effect Transistors
      i. Depletion-Type MOSFET
      ii. Enhancement-Type MOSFET
      iii. MOSFET Handling
      iv. VMOS

IV. Frequency Response analysis
   a. BJT and JFET Frequency Response
      i. Logarithms
      ii. Decibels
      iii. General Frequency Considerations
      iv. Normalization Process
      v. Low-Frequency Analysis-Bode Plot
      vi. Multistage Frequency Effects
      vii. Square-Wave Testing

V. Operational Amplifiers
   a. Operational Amplifiers
      i. Differential Amplifier Circuit
      ii. BiFET, BiMOS, and CMOS Differential Amplifier Circuits
      iii. Op-Amp Basics
      iv. Practical Op-Amp Circuits
      v. Op-Amp Specifications-DC Offset Parameters
      vi. Op-Amp Specifications-Frequency Parameters
      vii. Op-Amp Unit Specifications
      viii. Differential and Common-Mode Operation

   b. Op-Amp Applications
      i. Constant-Gain Multiplier
      ii. Voltage Summing
      iii. Voltage Buffer
      iv. Controlled Sources
      v. Instrumentation Circuits
      vi. Active Filters

VI. Comparators
   a. Linear-Digital ICs
      i. Miscellaneous types
   b. Comparators
      i. Comparator Operation
      ii. Hysteresis
      iii. Applications

VII. Timers
   a. Timer Operation
      i. RC time constants
      ii. Charging/discharging Calculations
   b. The 555 IC timer
      i. Astable operation
      ii. Monostable operation

VIII. Phase-Locked Loops
   a. Voltage-Controlled Oscillator
      i. Using 555
      ii. The 556 VCO
   b. Phase-Locked Loop
      i. The 565 PLL
      ii. Setting up and testing PLL's

ELEC 4401 Senior Electronics Project I 4 cr.

I. Project Design
- A. Develop Block Diagram/Flow Chart
- B. Parts selection/approval
- C. Parts Acquisition
- D. Wiring Diagram
- E. Sensor Evaluation

II. Project Build
- A. Wire according to wiring diagram.

III. Computer Program Code
- A. Write code
- B. Download and test operation

IV. Troubleshooting

ELEC 4402 Senior Electronics Project II (*Writing Intensive Course*) **3 cr.**

I. Complete Project
- A. Finalize troubleshooting
- B. Demonstrate operation

II. Writing Submissions
- A. Semester Bi-weekly goals
- B. 2 page writing sample
- C. Resume
- D. Bi-weekly progress reports
- E. Project Paper rough draft including;
  1. Table of contents
  2. Body of technical document
  3. Schematics and Diagrams.
  4. Computer Program code
  5. Parts list and cost
- F. Completed Project report incorporating faculty feedback

III. Oral Presentation using Powerpoint.

Writing Intensive Course Requirement for ELEC 4402

WIC Criteria 1-5, as taken from the FSU website at the following URL http://www.fairmontstate.edu/academics/wic/default.asp

1. A minimum of twenty pages of written work will be assigned in a variety of formal and informal writing assignments and formats throughout the semester. This might include, but is not limited to: research reports, critical essays, laboratory reports, logs, journals, or short in-class responses.
2. The instructor will provide opportunities for substantial revision in which the student responds to instructor feedback as well as discipline-specific writing instruction.
3. At least 30% of the course grade must be based on writing assignments.
4. Prerequisites- English 1104 and English 1108
5. An enrollment cap of twenty students.

Fulfillment of the WIC requirement for ELEC 4402.

Criteria 1. Fulfilled by the following assignments:

A. Submit a written schedule, at the beginning of the semester, which contains weekly goals for each week of the semester, starting with the second week.

B. Submit a 2 page written paper, using default margins, font size, and spacing, using Microsoft Word. The topic is the student's choice.

C. Submit a resume.

D. Submit a progress report every week, indicate the goals accomplished, and how these goals compare to the goals in 1. A.

E. Submit a rough draft of the project paper, for instructor comments, at least twice in the semester.

1. The project paper shall contain the following:

a. Table of contents.

b. Body of the technical document describing the project.

c. Schematics and diagrams, (labeled).

d. Computer program code.

e. Parts list and cost.

F. Develop a Power Point presentation, to be presented at least 4 times during the semester, to show the progress of the project.

Criteria 2. Fulfilled by 1. E.

Criteria 3. Fulfilled by proportioning the grade so that 30 % comes from the fulfillment of criteria 1.

APPENDIX D

Outcome Competencies and Methods of Assessment

ELEC 2225 Electronic Devices

COURSE OUTCOME	ASSESSMENT METHOD
Demonstrate the ability to solve, build, and test for voltages, currents, gains, and impedances of the various op-amp models and configurations	Quizzes, exams, and lab experiments
Demonstrate the ability to solve, build, and test for voltages, currents, gains, of various diode and transistor circuits.	Exams and lab experiments
Demonstrate the ability to function as a member of a team.	Peer evaluation form
Demonstrate time management skills.	Success rate of completing labs within four hour segments
Demonstrate electronics solution for a calculus differentiator and integrator.	Lab

ELEC 4401 Senior Electronics Project I

COURSE OUTCOME	ASSESSMENT METHOD
Design original electronic technology project.	Block diagram
	Flowchart
	Wiring diagram
	Flowchart for computer program
	Approval of part selection and acquisition
	Evaluation of sensor data

COURSE OUTCOME	ASSESSMENT METHOD
Create original electronic technology project.	Physical build of project

COURSE OUTCOME	ASSESSMENT METHOD
Analyze the success of the original electronic technology project.	Troubleshoot project to identify needed modifications

ELEC 4402 Senior Electronics Project II

COURSE OUTCOME	ASSESSMENT METHOD
Analyze project modifications.	Determination of project success as proposed in ELEC 4401.

COURSE OUTCOME	ASSESSMENT METHOD
Revise project components/computer program code to achieve successful outcome.	Determination of project success as proposed in ELEC 4401.

COURSE OUTCOME	ASSESSMENT METHOD
Demonstrate designed project.	Determination of project success as proposed in ELEC 4401.

COURSE OUTCOME	ASSESSMENT METHOD
Explain designed project.	Write and submit technical report describing project.
	Explain project through the development of Power Point presentation.
	Present project (Power Point) to technical audience for critique.

APPENDIX E

Technical Electives List*

AVIO 2202	INSTRUMENT LANDING SYSTEMS	3
AVIO 2204	AIRCRAFT NAVIGATION SYSTEMS	3
AVIO 2209	AIRCRAFT PULSE AND RADAR SYSTEMS	3
CHEM 1101	GENERAL CHEMISTRY I	4
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
TECH 2208	FUNDAMENTALS OF CAD	3
BISM 2400	OPERATING SYSTEMS CONCEPTS	3
BISM 2600	INTRO TO NETWORKING ADMINISTRATION	3
MANF 2205	ENGINEERING ECONOMY	3
MATH 3316	CALCULUS III	4
MATH 3335	PROBABILITY & STATISTICS	3
MATH 3362	LINEAR ALGEBRA	3
MATH 4401	DIFFERENTIAL EQUATIONS	3
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
SFTY 2250	SAFETY LAW & COMPLIANCE	3
TECH 4401	WORK EXPERIENCE LABORATORY	8

*Other technical related courses, not on this list, that meet the goals of the ELEC program, will be considered for credit as a Technical Elective, on a case-by-case basis.