

Electronic Technology

Program Design Summary

Program Information

Organization	Washburn Institute of Technology
Program Number	47.0101
Instructional Level	Certificate
Instructional Area	Electronic Technology
Last Revision Date	3/23/2011

Target Population

Grades: 11 & 12; Post-Secondary

Description

This Electronic Technology program offers a 48 credit technical certificate that prepares individuals for entry-level positions in high tech fields of electronic service, maintenance, and production, including healthcare facilities. Instruction includes DC/AC theory, solid state fundamentals, digital electronics, circuit building, and soldering. The second half of the program focuses on the electronics applications of telecommunications, programmable logic, robotics, and biomedical electronics.

Indirect Measures

1. Successful completion of the Certified Electronics Technicians Association certification test.
2. Amateur Radio license (Communications)
3. Key Train score of 5 or higher in Applied Math and Reading for Information.

Entry Requirements

1. Perspective students must pass the school general entrance assessment (WorkKeys) with a level 4 in Applied Math and level 4 in Reading for Information..
2. A background in Algebra is strongly recommended

Evaluation Summary

Grading

1. The grading scale used in Electronics Technology is the traditional scale:

90% A
80% B
70% C
60% D

2. Any make up work or late assignments must be coordinated with the instructor in advance for it to count in student's grade. A review of the student's attendance and academic habits will determine whether make up work is allowed.

3. Assignments include book work, lab work, projects, and weekly tests.

4. Grades are based on the total of scores from all tests, reading and writing assignments, and labs.

Grades can be reviewed during most lab times and it is up to the student remain cognizant of his or her current class, not the instructors.

Class Expectations

1. All students are to be professional in the classroom. This means students are expect to arrive to class on time, participate in class discussions, bring pencils, notebooks and text, take notes, and complete assignments in a timely manner. Assignments will be completed with high quality. Students must be willing to work with the instructor and their classmates. Students are expected to be respectful; harassment of any kind will not be tolerated.

2. Students will follow safe procedures in the classroom and lab. There will be no throwing or horse playing. Students will wear closed toe shoes and wear safety glasses. Work areas will be kept neat to reduce the chances of accidents.

ADA Notification Statement

Disability Services:

The Testing/ADA Coordinator's Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin; however, contact the Testing/ADA Coordinator's Office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of services. The Testing/ADA Coordinator's Office coordinates and assists in arranging services it deems appropriate for eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Who: The Testing/ADA Coordinator's Office: LeaAnn Curtis

Location: Building A (Basement), Room AC035

Phone: 785-228-6356

E-Mail: SSSCoordinator@washburntech.edu

Students may voluntarily identify themselves to the instructor for a referral to the The Testing/ADA Coordinator's Office.

Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Core Abilities

- A. Communicate effectively.
- B. Integrate technology.
- C. Learn effectively - use academics effectively.
- D. Demonstrate cooperative/teamwork skills
- E. Apply Safety
- F. Think critically and creatively
- G. Demonstrate responsible work ethics

Course Configuration						
Semester #	Course #	Course Title	Credits	Contact Hrs	Category	Req?
	ELT110	DC Fundamentals	6	135		Yes
	ELT120	AC Fundamentals	6	135		Yes
	ELT130	Solid State Fundamentals	7	135		Yes
	ELT140	Digital Logic	5	135		Yes
	ELT210	Fundamentals of Communications	6	135		Yes
	ELT235	Microcontrollers and Industrial Control	6	135		Yes
	ELT245	Introduction to Biomedical Electronics I	6	135		Yes
	ELT246	Introduction to Biomedical Electronics II	6	135		Yes

Program Course Detail

Course A -- DC Fundamentals

Course Number	ELT110
Credits	6
Contact Hours	135
Total Hours	135
Required	Yes

Course Description

Through a variety of classroom and lab activities, students learn to apply mathematics to the exploration and analysis of direct current circuits. Instruction includes the basic theory behind electron flow through conductors and passive circuit elements like resistors. Hands on activities include component identification, instrument and tool use, soldering, circuit design and topology, troubleshooting techniques, and printed circuit board design. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault

- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course B -- AC Fundamentals

Course Number	ELT120
Credits	6
Contact Hours	135
Total Hours	135
Required	Yes

Course Description Through a variety of classroom and lab activities, students learn to apply mathematics to the exploration and analysis of alternating current circuits. Instruction includes the basic theory behind electron flow through conductors and reactive circuit elements like capacitors and inductors. Hands on activities include component identification, instrument and tool use, circuit design and topology, and troubleshooting techniques. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course C -- Solid State Fundamentals

Course Number	ELT130
Credits	7
Contact Hours	135
Total Hours	135
Required	Yes

Course Description Through a variety of classroom and lab activities, students learn to apply mathematics to the exploration and analysis of solid state circuits. Instruction includes the basic theory behind electron flow through conductors and semiconductor circuit elements like diodes, transistors, thyristors, and opto-electronic devices. Hands on activities include component identification, instrument and tool use, circuit design and topology, and troubleshooting techniques. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
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Course D -- Digital Logic

Course Number	ELT140
Credits	5
Contact Hours	135
Total Hours	135
Required	Yes

Course Description

Through a variety of classroom and lab activities, students learn to apply mathematics to the exploration and analysis of digital circuits. Instruction includes the basic theory behind electron flow through conductors and digital circuit elements like logic gates, flip-flops, counters, encoders, decoders, and displays. Hands on activities include component identification, instrument and tool use, circuit design and topology, and troubleshooting techniques. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course E -- Fundamentals of Communications

Course Number	ELT210
Credits	6
Contact Hours	135
Total Hours	135
Required	Yes

Course Description

This course is an introduction to Communications. It presents a variety of communication techniques with an emphasis on the propagation of electromagnetic radiation. After the successful

completion of this class, students will understand the theory and operation of radio receivers. They will also be prepared to pass the FCC amateur radio license exam. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
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- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course F -- Microcontrollers and Industrial Control

Course Number ELT235

Credits 6

Contact Hours 135

Total Hours 135

Required Yes

Course Description Introduction to programmable microcontrollers and their use in industry. Robotic applications using the Parallax BASIC Stamp unit will also be presented. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
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- E. Repair electronic devices/circuits to return them to proper operation
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- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course G -- Introduction to Biomedical Electronics I

Course Number ELT245

Credits 6

Contact Hours 135

Total Hours 135

Required Yes

Course Description This course is an introduction to Biomedical Electronics Technology and its use in the Healthcare Industry. Through a variety of

classroom and lab activities, students learn to apply technology to the analysis and service of Biomedical equipment. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information

Course H -- Introduction to Biomedical Electronics II

Course Number ELT246

Credits 6

Contact Hours 135

Total Hours 135

Required Yes

Course Description This course is a continuation of an Introduction to Biomedical Electronics. Instruction includes the basic theory of Anatomy and Physiology that is behind the design and use of medical equipment. Student owned tools are required and a tool list is provided.

Linked Program Outcomes

- A. Communicate information efficiently with vendors, supervisors, co-workers, and customers in multiple media
- B. Completes Safety Analysis before applying power to a system
- C. Determine if electronic devices/circuits are operating properly
- D. Troubleshoot electronic devices/circuits to determine location of fault
- E. Repair electronic devices/circuits to return them to proper operation
- F. Locate technical information on electronic devices/circuits
- G. Design/determine the best electronic device/circuit solution for a specific requirement
- H. Develop additional personal electronics expertise
- I. Read technical documentation for specific information