

## *Associate of Applied Science Degree in General Engineering Technology/Mechanical Engineering Technology*

**AREA:** General Engineering Technology:  
Mechanical Engineering Technology

**DEGREE:** Associate of Applied Science Degree

**LENGTH:** Four semesters (two-year) program

**PURPOSE:** This curriculum provides educational opportunities for those who seek employment in industry, for those who desire to upgrade their knowledge or acquire practical skills in the field, and for those who wish to transfer and complete a bachelor of science degree in mechanical engineering technology.

**OCCUPATIONAL OBJECTIVES:** draftsman/designer, engineer's aide, engineering technician, industrial test technician, maintenance technician or other related positions

**TRANSFER GUIDELINES:** Graduates with appropriate course selection may qualify to enter mechanical engineering technology programs at selected universities. Students preparing for transfer must consult with the program advisor. Course selection is very important to assure junior status upon transfer. Potential transfer institutions include East Tennessee State University, North Carolina State University, Old Dominion University, Rochester Institute of Technology, West Virginia Institute of Technology and West Virginia University. Students interested in transferring to other institutions, including Virginia Tech, must determine transfer requirements of their intended destination school.

**PROGRAM REQUIREMENTS:** The curriculum is designed to integrate courses in mechanical engineering technology, mechanics, physics, general education, drafting, computer information systems and technical electives. Students entering the program must have algebra I and geometry skills or be willing to improve those skills through developmental studies. The program may be completed on a part-time basis since courses are alternated between day and evening hours. Technical electives must be selected from an approved list available from the program advisor. Upon satisfactory completion of the four-semester program, the graduate will be awarded the associate of applied science degree in general engineering technology with a mechanical engineering technology specialization. Transfer opportunities for associate of applied science degrees, if existing, are very specific in nature. Students enrolling in an applied science degree with plans to transfer should explore opportunities with an advisor.

Course#	Title	Credits
<b>First Semester</b>		
EGR 110	Engineering Graphics	3
ENG 111	College Composition I	3
MEC 111	Materials for Industry	3
MTH 115	Technical Math I or Approved Higher Level Math <sup>1</sup>	3
SDV 100	College Success Skills	1
	Social Science Elective <sup>2</sup>	3
	<b>Total</b>	<b>16</b>
<b>Second Semester</b>		
CAD 241	Parametric Solid Modeling I	3
EGR 216	Computer Methods in Engineering and Technology	3
ENG 112/115	College Composition II or Technical Writing	3
MEC 112	Processes of Industry	3
MTH 158	College Algebra or Approved Higher Level Math	3
	Social Science Elective <sup>2</sup>	3
	<b>Total</b>	<b>18</b>
<b>Third Semester</b>		
CAD 242	Parametric Solid Modeling II	3
EGR 135	Statics for Engineering Technology	3
EGR 206	Engineering Economics	3
PED/HLT	Physical Education or Health	1
PHY 201	General College Physics I	4
	Technical Elective <sup>3</sup>	3
	<b>Total</b>	<b>17</b>
<b>Fourth Semester</b>		
EGR 136	Strength of Materials	3
IND 145	Introduction to Metrology	3
PHY 202	General College Physics II	4
	Technical Elective <sup>3</sup>	3
	Humanities Elective <sup>4</sup>	3
	<b>Total</b>	<b>16</b>
	<b>Program Total</b>	<b>67</b>

<sup>1</sup> Approved higher level math courses include: MTH 163/164, MTH 271/272, MTH 173/174. Students should check with program faculty.

<sup>2</sup> Students may select social science elective from approved list on page 40.

<sup>3</sup> An approved list of technical electives is available on page 42.

<sup>4</sup> Students may select humanities elective from approved list on page 40.

## *Associate of Applied Science Degree in General Engineering Technology: Civil Engineering Technology Specialization*

**AREA:** General Engineering Technology:  
Civil Engineering Technology Specialization

**DEGREE:** Associate of Applied Science Degree

**LENGTH:** Four semesters (two-year) program

**PURPOSE:** This curriculum provides educational opportunities for those who seek employment in the construction industry, for those who desire to upgrade their knowledge or acquire practical skills in the field, and for those who wish to transfer and complete a bachelor of science degree in civil engineering technology.

**OCCUPATIONAL OBJECTIVES:** construction/building inspector, construction estimator, draftsman/designer, engineer's aide, engineering technician or other related positions

**TRANSFER GUIDELINES:** Graduates with appropriate course selection may qualify to enter civil engineering technology programs at selected universities. Students preparing for transfer must consult with their program advisors. Course selection is very important to assure junior status upon transfer. Potential transfer institutions include East Tennessee State University, North Carolina State University, Old Dominion University, Rochester Institute of Technology, West Virginia Institute of Technology and West Virginia University. Students interested in transferring to other institutions, including Virginia Tech, must determine transfer requirements of their intended destination school.

**PROGRAM REQUIREMENTS:** The curriculum is designed to integrate courses in civil engineering technology, mechanics, physics, general education, drafting, computers and technical electives. Students entering the program must have algebra I and geometry skills or be willing to improve those skills through developmental studies. The program may be completed on a part-time basis since courses are alternated between day and evening hours. Technical electives must be selected from an approved list available from the program advisor. Upon satisfactory completion of the four-semester curriculum, the graduate will be awarded the associate of applied science degree in general engineering technology with a civil engineering technology specialization. Transfer opportunities for associate of applied science degrees, if existing, are very specific in nature. Students enrolling in an applied science degree with plans to transfer should explore opportunities with an advisor.

Course#	Title	Credits
<b>First Semester</b>		
ARC 130	Materials and Methods of Construction	3
EGR 110	Engineering Graphics	3
ENG 111	College Composition I	3
MTH 115	Technical Math I or Approved Approved Higher Level Math <sup>1</sup>	3
SDV 100	College Success Skills Social Science Elective <sup>2</sup>	1 3
<b>Total</b>		<b>16</b>
<b>Second Semester</b>		
ARC 221	Architectural CAD Appl. Software I	3
ARC 240	Designing Sustainable Built Environments	3
EGR 216	Computer Methods in Engineering and Technology	3
ENG 112/115	College Composition II or Technical Writing	3
MTH 158	College Algebra or Approved Higher Level Math <sup>1</sup> Social Science Elective <sup>2</sup>	3 3
<b>Total</b>		<b>18</b>
<b>Third Semester</b>		
CIV 171	Surveying I	3
EGR 135	Statics for Engineering Technology	3
EGR 206	Engineering Economics	3
PED/HLT	Physical Education or Health	1
PHY 201	General College Physics I Technical Elective <sup>3</sup>	4 3
<b>Total</b>		<b>17</b>
<b>Fourth Semester</b>		
CIV 172	Surveying II	3
EGR 136	Strength of Materials	3
PHY 202	General College Physics II Technical Elective <sup>3</sup> Humanities Elective <sup>4</sup>	4 3 3
<b>Total</b>		<b>16</b>
<b>Program Total</b>		<b>67</b>

<sup>1</sup> Approved higher level math courses include: MTH 163/164, MTH 271/272, MTH 173/174. Students should check with program faculty.

<sup>2</sup> Students may select social science electives from approved list on page 40.

<sup>3</sup> An approved list of technical electives is available on page 42.

<sup>4</sup> Students may select humanities electives from approved list on page 40.

## *Associate of Applied Science Degree in General Engineering Technology: Computer-Aided Drafting Specialization*

**AREA:** General Engineering Technology:  
Computer-Aided Drafting Specialization

**DEGREE:** Associate of Applied Science Degree

**LENGTH:** Four semesters (two-year) program

**PURPOSE:** Skills in computer-aided drafting (CAD) are increasingly valuable and sought in the workplace. This curriculum is designed to provide a thorough preparation in drafting, emphasizing the use of computers and, in particular, computer-aided design and drafting. Communication skills and problem-solving skills are also emphasized, both of which are critical to success in the workplace. This program is particularly valuable for those who wish to gain employment in technical support careers or for those who need to upgrade skills within their current fields.

**OCCUPATIONAL OBJECTIVES:** CAD operator, CAD technician, drafting technician, engineer's aid or other related positions

**TRANSFER GUIDELINES:** Although this program is not designed as a transfer program, it does include many courses which will transfer into engineering technology programs at select four-year institutions. This allows students who eventually develop a desire to transfer the opportunity to transfer about two-thirds or more of the credit earned. How much credit is actually transferable depends on the transfer institution selected. Students should work closely with an advisor if and when they develop an interest in transferring.

**PROGRAM REQUIREMENTS:** This curriculum integrates courses in civil engineering technology, mechanical engineering technology, drafting, architecture, computer programming and general education. Students entering the program must have algebra I and geometry skills, or be willing to improve those skills through developmental studies. Technical electives should be selected in consultation with an assigned advisor. Upon satisfactory completion of the curriculum, graduates will be awarded the associate of applied science degree in general engineering technology with a computer-aided drafting specialization. Transfer opportunities for associate of applied science degrees, if existing, are very specific in nature. Students enrolling in an applied science degree with plans to transfer should explore opportunities with an advisor.

Course#	Title	Credits
<b>First Semester</b>		
ARC 130	Materials and Methods of Construction	3
EGR 110	Engineering Graphics	3
ENG 111	College Composition I	3
MEC 111	Materials for Industry	3
MTH 115	Technical Math I or Approved Higher Level of Math <sup>1</sup>	3
SDV 100	College Success Skills	1
<b>Total</b>		<b>16</b>
<b>Second Semester</b>		
ARC 221	Architectural CAD Applications Software I	3
CAD 241	Parametric Solid Modeling I	3
EGR 216	Computer Methods in Engineering and Technology	3
MEC 112	Processes of Industry	3
MTH 158	College Algebra or Approved Higher Level Math <sup>1</sup>	3
	Technical Elective <sup>3</sup>	3
<b>Total</b>		<b>18</b>
<b>Third Semester</b>		
ARC 222	Architectural CAD Applications Software II	3
CAD 242	Parametric Solid Modeling II	3
CIV 171	Surveying I	3
EGR 206	Engineering Economics	3
PED/HLT	Physical Education or Health	1
	Technical Elective <sup>3</sup>	3
<b>Total</b>		<b>16</b>
<b>Fourth Semester</b>		
CIV 172	Surveying II	3
ENG 112/115	College Composition II or Technical Writing	3
IND 145	Introduction to Metrology	3
	Social Science Elective <sup>2</sup>	3
	Humanities Elective <sup>4</sup>	3
<b>Total</b>		<b>15</b>
<b>Program Total</b>		<b>65</b>

<sup>1</sup> Approved higher level math courses include: MTH 163/164, MTH 271/272, MTH 173/174. Students should check with program faculty.

<sup>2</sup> Students may select social science electives from approved list on page 40.

<sup>3</sup> An approved list of Technical Electives is available on page 42.

<sup>4</sup> Students may select humanities electives from approved list on page 40.

# *Associate of Applied Science Degree in General Engineering Technology: Industrial Electricity and Controls Technology Specialization*

**AREA:** General Engineering Technology:  
Industrial Electricity and Controls Technology  
Specialization

**DEGREE:** Associate of Applied Science Degree

**LENGTH:** Four semesters (two-year) program

**PURPOSE:** This curriculum provides educational opportunities for those seeking employment in the many manufacturing industries and businesses, which need individuals trained in basic electrical applications, including the control of machinery and processes. It is also appropriate for those attempting to upgrade their knowledge or acquire practical skills. This program can also provide critical education components to apprenticeship programs of various types. This program is not intended for transfer.

**OCCUPATIONAL OBJECTIVES:** electrical apprentice, electrician, electrician's helper, industrial electrician, journeyman or other related positions

**PROGRAM REQUIREMENTS:** This program is designed to integrate basic industrial electricity courses, basic machinery control courses, basic engineering technology courses and general education courses. Students entering the program should have basic arithmetic skills and must be willing to advance their math skills through required math courses. Most students should start with MTH 120 (Introduction to Math), but may select a higher-level math if they are prepared for it. All entering students must take a math placement test to determine their math skill level. Many of the electrical and control courses require the use of mathematics, and it is important for students to start with their math courses as early as possible in the program. The basic intent of this program is to produce technically skilled graduates, with a broad technical background and a well-rounded general education foundation. All electives, including technical electives, must come from an approved list or be approved by one of the full-time faculty members teaching technical courses in the program.

Course#	Title	Credits
<b>First Semester</b>		
EGR 110	Engineering Graphics	3
ELE 133	Practical Electricity I	3
ENG 111	English Composition I	3
MEC 111	Materials for Industry	3
MTH 115	Technical Math I or Approved Higher Level of Math <sup>1</sup>	3
SDV 100	College Success Skills	1
<b>Total</b>		<b>16</b>
<b>Second Semester</b>		
CAD 241	Parametric Solid Modeling I	3
EGR 216	Computer Methods in Engineering and Technology	3
ELE 134	Practical Electricity II	3
ENG 112/115	College Composition II or Technical Wiring	3
MEC 112	Processes of Industry	3
MTH 158	College Algebra or Approved Higher Level Math <sup>1</sup>	3
<b>Total</b>		<b>18</b>
<b>Third Semester</b>		
EGR 206	Engineering Economics	3
ELE 159	Electrical Motors	3
PED/HLT	Physical Education or Health	1
	Humanities Elective <sup>2</sup>	3
	Social Science Elective <sup>2</sup>	3
	Technical Elective <sup>3</sup>	3
<b>Total</b>		<b>16</b>
<b>Fourth Semester</b>		
ELE 135/137	National or Residential Electric Code	3
ELE 156	Electrical Control Systems	3
IND 145	Introduction to Metrology	3
	Social Science Elective <sup>2</sup>	3
	Technical Elective <sup>3</sup>	3
<b>Total</b>		<b>15</b>
<b>Program Total</b>		<b>65</b>

<sup>1</sup> Approved higher level math courses include: MTH 163/164, MTH 271/272, MTH 173/174. Students should check with program faculty.

<sup>2</sup> Students may select social science and humanities electives from list of approved electives on page 40..

<sup>3</sup> An approved list of Technical Electives is available on page 42.

# Associate of Applied Science Degree in General Engineering Technology: Technical Operations

**AREA:** General Engineering Technology:  
Technical Operations

**DEGREE:** Associate of Applied Science Degree

**LENGTH:** Four semesters (two-year) program

**PURPOSE:** This curriculum provides educational opportunities for those who are or those who seek to be employed in a field that requires a substantial technical knowledge base. The curriculum also provides an opportunity to transfer and complete a bachelor of science degree in Technical Operations from Old Dominion University, which can be completed on the Middletown or Warrenton campus of Lord Fairfax Community College. This curriculum has extended technical and science electives to allow some customization for both employers and students.

**OCCUPATIONAL OBJECTIVES:** Engineering aid, production line lead, technical support technician, testing technician, technical sales, production support technician, or other related positions.

**TRANSFER GUIDELINES:** Graduates with appropriate course selection may qualify to enter the General Engineering Technology, Technical Operations Specialization at Old Dominion University. This Bachelor of Science program can be completed at the ODU site on either the Middletown campus or the Warrenton campus of Lord Fairfax Community College. Course selection is very important to insure a smooth transfer process, and students must work closely with an advisor. Transfer to other universities must be explored by the student on a case by case basis.

**PROGRAM REQUIREMENTS:** This curriculum is designed to integrate a variety of required technical courses, substantial technical electives, science electives, and required general education courses. Students entering the program must have algebra 1 and geometry skills or be willing to improve those skills through developmental studies. Additionally, students must take courses in the proper order so that prerequisite courses are completed as appropriate. The program may be completed on a part-time basis since courses are alternated between day and evening hours. Technical electives must be approved by the program advisor. Student can work with their employers to identify the type of technical and science electives to best suit their employment advancement goals. Employers are also encouraged to work with Lord Fairfax Community College for consideration of special courses or possible work experience (typically by internship) as technical electives. Students who intend to transfer will have specific

course requirements for technical electives and should consult with their program advisor about those requirements.

Course#	Title	Credits
<b>First Semester</b>		
EGR 110	Engineering Graphics	3
ENG 111	English Composition I	3
MEC 111	Materials for Industry	3
MTH 115	Technical Math I or approved Higher Level Math <sup>1</sup>	3
SDV 100	College Success Skills	1
	Technical Elective <sup>3</sup>	3
	<b>Total</b>	<b>16</b>
<b>Second Semester</b>		
CAD 241	Parametric Solid Modeling I	3
EGR 216	Computer Methods in Engineering and Technology	3
ENG 112/115	College Composition II or Technical Writing	3
MEC 112	Processes of Industry	3
MTH 158	College Algebra or Approved Higher Level Math <sup>1</sup>	3
	Technical Elective <sup>3</sup>	3
	<b>Total</b>	<b>18</b>
<b>Third Semester</b>		
CAD 242	Parametric Solid Modeling II	3
EGR 206	Engineering Economics	3
PED/HLT	Physical Education or Health	1
	Social Science Elective <sup>2</sup>	3
	Technical Elective <sup>3</sup>	3
	Technical Elective <sup>3</sup>	3-4
	<b>Total</b>	<b>16-17</b>
<b>Fourth Semester</b>		
IND 145	Introduction to Metrology	3
	Social Science Elective <sup>2</sup>	4
	Technical Elective <sup>3</sup>	3
	Technical Elective <sup>3</sup>	3-4
	Humanities Elective <sup>4</sup>	3
	<b>Total</b>	<b>15-16</b>
	<b>Program Total</b>	<b>65-67</b>

<sup>1</sup> Approved higher level math courses include: MTH 163/164, MTH 271/272, MTH 173/174. Students should check with program faculty.

<sup>2</sup>Students may select social science electives from list of approved electives on page 40.

<sup>3</sup>An approved list of Technical Electives is available on page 42.

<sup>4</sup>Students may select humanities from list of approved electives on page 40.

## Career Studies Certificates

**AREA:** Basic Electrical Technician

**PURPOSE:** To expose students to theory and applications related to electrical systems

**OCCUPATIONAL OBJECTIVES:** To prepare students for entry-level positions in the electrical field

This certificate can be completed in two semesters if the following conditions are met:

- Students are willing to enroll in day and evening classes
- Students must take classes in the semesters they are listed

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
<b>Fall Semester</b>		
ELE 133	Practical Electricity I	3
ELE 135	National Electrical Code Residential	3
SDV 101/100	Introduction to the Trades Profession	1

**Spring Semester**

ELE 134	Practical Electricity II	3
ELE 137	National Electrical Code Industrial	3
ELE 190	Coordinated Internship or Technical elective (WEL, AIR, ELE or ITE 115)	3
<b>Total</b>		<b>16</b>

**AREA:** Drafting

**PURPOSE:** To enable students to develop drafting graphics skills related to architecture, machine design, and using specialized computer software in the drafting field

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
ARC 130	Introduction to Materials and Methods of Construction	3
ARC 221	Architectural CAD Applications Software I <sup>1</sup>	3
ARC 222	Architectural CAD Applications Software II <sup>2</sup>	3
CAD 241	Parametric Solid Modeling I	3
CAD 242	Parametric Solid Modeling II	3
EGR 110	Engineering Graphics	3
MEC 111	Materials for Industry	3
<b>Total</b>		<b>21</b>

<sup>1</sup>Prerequisite for ARC 222 is ARC 221

<sup>2</sup>Prerequisite for CAD 242 is CAD 241

**AREA:** Electrical Control Technician Intermediate

**PURPOSE:** To obtain a second career studies certificate, complimenting the first CSC Electrical Technician Basic, thus enabling student to become more employable

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
ELE 159*	Electrical Motors	3
ELE 156	Electrical Control Systems	3
AIR 134	Circuit and Controls I or ELE 134 Practical Electricity II	3
ELE 290	Coordinated Internship or Approved Elective	1
ELE 239	Programmable Controllers	3
ELE 240	Advanced Programmable Logic Controllers	3
<b>Total</b>		<b>16</b>

\*It is recommended that students complete the Basic Electrical Technician Certificate prior to starting the Electrical Control Technician Intermediate Certificate. Students who have not completed the Basic Electrical Technician Certificate will have to take ELE 126 or ELE 134.

## Career Studies Certificates

**AREA:** HVAC

**PURPOSE:** To expose students to theory and application related to HVAC

**OCCUPATIONAL OBJECTIVES:** To prepare students for entry-level positions in heating, ventilation and air conditioning

This certificate can be completed in three semesters if the following conditions are met:

- Students are willing to enroll in day and evening classes
- Students must take classes in the semesters they are listed

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
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**Fall Semester**

AIR	121	Air Conditioning and Refrigeration I	3
AIR	154	Heating Systems I	3
AIR	134	Circuits and Controls	3

**Spring Semester**

AIR	122	Air Conditioning and Refrigeration II	3
AIR	155	Heating Systems II	3
ELE	133	Electricity I	3
<b>Total</b>			<b>18</b>

**AREA:** Industrial Design

**PURPOSE:** To introduce students to the principles of sound industrial design, including related mathematics and concepts

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
EGR	135 Statics for Engineering Technology <sup>1</sup>	3
EGR	136 Strength of Materials for Engineering Technology <sup>2</sup>	3
MEC	111 Materials for Industry	3
ARC	130 Materials and Methods of Construction	3
MTH	115 Technical Mathematics I	3
MTH	116 Technical Mathematics II	3
<b>Total</b>		<b>18</b>

<sup>1</sup>Prerequisite for EGR 135 is MTH 115.

<sup>2</sup>Prerequisite for EGR 136 is EGR 135.

## Career Studies Certificates

**AREA:** Industrial Maintenance Technician Basic

**PURPOSE:** To expose students to theory and application related to the maintenance of heating, air conditioning, electrical systems and motors and welding

**OCCUPATIONAL OBJECTIVES:** To prepare students for entry-level positions in industrial maintenance

This certificate can be completed in two semesters if the following conditions are met:

- Students are willing to enroll in day and evening classes
- Students must take classes in the semesters they are listed

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
<b>Fall Semester</b>		
ELE 133	Practical Electricity I	3
SDV 101/100	Orientation to the Trades Profession	1
WEL 120	Introduction to Welding	3
<b>Spring Semester</b>		
MEC 120	Principles of Machine Technology	3
Internship	Internship or COOP	6
	<b>Total</b>	<b>16</b>

**AREA:** Industrial Maintenance Technician Intermediate

**PURPOSE:** To expose students to theory and application related to the maintenance of heating, air conditioning, electrical systems and motors and welding

**OCCUPATIONAL OBJECTIVES:** To prepare students for entry-level positions in industrial manufacturing or small business and commercial support companies

This certificate can be completed in two semesters if the following conditions are met:

- Students are willing to enroll in day and evening classes
- Students must take classes in the semesters they are listed

**PROGRAM REQUIREMENTS:**

Course#	Title	Credits
<b>Fall Semester</b>		
AIR 121	Air Conditioning and Refrigeration I	3
ELE 159	Electrical Motors	3
	Approved Tech Elective (AIR 122, ITE 115, or as approved by advisor)	3
<b>Spring Semester</b>		
ELE 134	Practical Electricity II	3
WEL 130	Inert Gas Welding	3
	Internship	1
	<b>Total</b>	<b>16</b>

\*It is recommended that students complete the Industrial Technician Basic Certificate prior to starting the Maintenance Technician Intermediate Certificate.