

## Engineering

### Overview

#### Associate of Science

##### **SPECIALIZATIONS:**

Mechanical/General Engineering  
Chemical/Biological Engineering  
Electrical/Computer Engineering

**PURPOSE:** The demand for technically trained people is increasing rapidly in Virginia as well as throughout the world. The engineer is a most important member of the technical team, which includes the scientist, technician, and skilled craftsman. Opportunities are unlimited for men and women in the field of engineering. Science is so diversified now that one may enter almost any specialization and find employment. The preparation for the engineering profession is based on a rigorous program, especially in mathematics and science.

The Associate of Science degree in Engineering is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree in one of the following engineering fields: aerospace, agriculture, architecture, biomedical, chemical, civil, computer, electrical, environmental, industrial, materials, mechanical, mining, nuclear, or ocean.

**ADMISSION REQUIREMENTS:** General college curricular admission

The **Mechanical/General Engineering specialization** is designed for persons who plan to transfer to a four-year college or university to pursue a degree in mechanical, civil, aerospace, ocean, or mining engineering. For students who do not yet know which discipline they want to pursue, this specialization provides a fundamental engineering education that will help prepare students for a future in any engineering field.

The **Chemical/Biological Engineering specialization** is designed for students who plan to transfer to a four-year college or university to pursue a bachelor's degree in chemical, biomedical, biological, or environmental engineering.

The **Electrical/Computer Engineering specialization** is designed for students who plan to transfer to a four-year college or university to pursue a degree in electrical or computer engineering.

**PROGRAM NOTES:** Applicants shall have (a) completed placement testing and (b) met with their advisor to establish a planned course of study prior to being allowed to register for courses.

Satisfactory completion of the following high school units or their equivalent, at a minimum, is strongly recommended: four units of English, one unit of laboratory science (preferably physical science), one unit of social studies, and four units of mathematics (two units of algebra, one unit of plane geometry, one unit of advanced mathematics or trigonometry and solid geometry).

This program requires a steady progression through at least four high-level mathematics courses, generally taken at a rate of one per semester. MTH 263 and MTH 264 are pre- or co-

requisites for several engineering courses. Applicants who place into developmental mathematics will face additional mathematics courses, which do not count toward degree progress, before even qualifying for MTH 263. Accordingly, applicants are urged to study their math thoroughly before taking the mathematics placement test to avoid having to repeat one or more mathematics courses unnecessarily.

This program includes the courses usually required in the first two years of a baccalaureate engineering curriculum. Students should consult with their engineering advisor at the earliest possible date to acquaint themselves with the requirements of the engineering program at the college or university to which transfer is planned.

**COMPUTER COMPETENCY REQUIREMENT:** Students in this program will meet the college's computer competency requirement by successfully completing EGR 124.

# REYNOLDS COMMUNITY COLLEGE

## Roadmap

Mechanical/General Engineering Specialization

Order	Course	Title	Credits
1	SDV 101	Orientation to STEM Disciplines	1
2	MTH 263	Calculus I	4
3	ENG 111	College Composition I	3
4	CHM 111	General Chemistry I	4
5	ECO 201 <sup>8</sup> or ECO 202 <sup>7</sup> or HIS 101	Social/Behavioral Science Elective	3
6	EGR 110 or CSC 130	Engineering Graphics or Scientific Programming	3-4
7	EGR 124	Introduction to Engineering and Engineering Methods	3
8	ENG 112	College Composition II	3
9	EGR 140	Engineering Mechanics - Statics	3
10	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Elective	3
11	MTH 264	Calculus II	4
12	PHY 241	University Physics I	4
13	EGR 245 <sup>1</sup> or EGR 246 <sup>2</sup> or EGR 248 <sup>3</sup> or EGR 251 and EGR 255 <sup>4</sup> or MTH 266 <sup>5</sup> or CSC 210 <sup>6</sup>	Approved Electives	3-4
14	EGR 245 <sup>1</sup> or EGR 246 <sup>2</sup> or EGR 248 <sup>3</sup>	Approved Electives	3-4

	or EGR 251 and EGR 255 <sup>4</sup> or MTH 266 <sup>5</sup> or CSC 210 <sup>6</sup>		
15	MTH 265	Calculus III	4
16	ECO 201 or ECO 202 <sup>7,8</sup> or HIS 101	Social/Behavioral Science Electives	3
17	EGR 245 <sup>1</sup> or EGR 246 <sup>2</sup> or EGR 248 <sup>3</sup> or EGR 251 and EGR 255 <sup>4</sup> or MTH 266 <sup>5</sup> or CSC 210 <sup>6</sup>	Approved Electives	3-4
18	PHY 242	University Physics II	4
19	MTH 267	Differential Equations	3
20	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Elective	3
21	HLT 105 or PED 111 or PED 109	Personal Wellness Electives 1	1
<b>TOTAL</b>	<b>Engineering Associate of Science-Mechanical/General Engineering Specialization</b>		<b>65-68</b>

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Options for approved electives based upon engineering majors at VCU and VT

<sup>1</sup> VCU - Mechanical/Nuclear; VT - Mechanical, Aerospace, Ocean, Biol Systems, Industrial and Systems

# Transfer Associate Degrees & Certificates

<sup>2</sup> VCU - Mechanical/Nuclear; VT - Mechanical, Civil and Environmental, Aerospace, Ocean, Material Science, Material Science-Nuclear Option, Construction Engineering and Management

<sup>3</sup> VCU - Mechanical/Nuclear

<sup>4</sup> VCU - Mechanical/Nuclear, Biomed, Electrical, Computer; VT - Electrical, Computer

<sup>5</sup> VT - All engineering majors (Mechanical, Electrical, Computer, Civil and Environmental, Aerospace, Ocean, Chemical, Material Science, Material Science-Nuclear Option, Biol Systems, Construction Engineering and Management, Industrial and Systems)

<sup>6</sup> VCU - Electrical, Computer; VT - Computer, Civil and Environmental

<sup>7</sup> VT - Civil and Environmental, Aerospace, Ocean

<sup>8</sup> VCU - Mechanical/Nuclear - Students completing ECO 201 and ECO 202 as part of their Engineering AS degree will receive credit for VCU's ECON 205 which is equivalent to Reynolds EGR 206.

## CURRICULUM:

Chemical/Biological Specialization

Order	Course	Title	Credits
1	SDV 101	Orientation to STEM Disciplines	1
2	MTH 263	Calculus I	4
3	ENG 111	College Composition I	3
4	CHM 111	General Chemistry I	4
5	ECO 201 or ECO 202 or HIS 101	Social/Behavioral Science Electives	3
6	EGR 110 <sup>4</sup> or CSC 130 <sup>6</sup>	Engineering Graphics or Scientific Programming	3-4
7	EGR 124	Introduction to Engineering and Engineering Methods	3
8	ENG 112	College Composition II	3
9	CHM 112	College Chemistry II	4
10	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Electives	3

11	MTH 264	Calculus II	4
12	PHY 241	University Physics I	4
13	BIO 101 <sup>1</sup> or BIO 102 <sup>2</sup> or CHM 241 and CHM 245 <sup>3</sup> or CHM 242 and CHM 246 <sup>3</sup> or MTH 266 <sup>4</sup> or EGR 140 <sup>5</sup>	Approved Electives	3-5
14	BIO 101 <sup>1</sup> or BIO 102 <sup>2</sup> or CHM 241 and CHM 245 <sup>3</sup> or CHM 242 and CHM 246 <sup>3</sup> or MTH 266 <sup>4</sup> or EGR 140 <sup>5</sup>	Approved Electives	3-5
15	MTH 265	Calculus III	4
16	ECO 201 or ECO 202 or HIS 101	Social/Behavioral Science Electives	3
17	PHY 242	University Physics II	4
18	BIO 101 <sup>1</sup> or BIO 102 <sup>2</sup> or CHM 241 and CHM 245 <sup>3</sup> or	Approved Electives	3-5

# REYNOLDS COMMUNITY COLLEGE

	CHM 242 and CHM 246 <sup>3</sup> or MTH 266 <sup>4</sup> or EGR 140 <sup>5</sup>		
<b>19</b>	MTH 267	Differential Equations	3
<b>20</b>	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Electives	3
<b>21</b>	HLT 105 or PED 111 or PED 109	Personal Wellness Electives	1
<b>TOTAL</b>	<b>Engineering Associate of Science- Chemical/Biological Engineering Specialization</b>		<b>66-73</b>

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Options for approved electives based upon engineering majors at VCU and VT

<sup>1</sup> VCU - Chemical and Life Science, Biomed; VT - Biol Systems

<sup>2</sup> VCU - Chemical and Life Science (Life Science concentration), Biomed (Pre-med track); VT - Biol Systems

<sup>3</sup> VCU - Chemical and Life Science, Biomed (Pre-med track); VT - Chemical, Biol Systems

<sup>4</sup> VT - All engineering majors (Mechanical, Electrical, Computer, Civil and Environmental, Aerospace, Ocean, Chemical, Material Science, Material Science-Nuclear Option, Biol Systems, Construction Engineering and Management, Industrial and Systems)

<sup>5</sup> VCU - Mechanical/Nuclear, Biomed (together with EGR 246); VT - Mechanical, Civil and Environmental, Aerospace, Ocean, Material Science, Material Science-Nuclear Option, Biol Systems, Construction Engineering and Management, Industrial and Systems

<sup>6</sup> VCU - Chemical and Life Science, Biomed

## CURRICULUM:

Electrical/Computer Specialization

Order	Course	Title	Credits
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<b>1</b>	SDV 101	Orientation to STEM Disciplines	1
<b>2</b>	MTH 263	Calculus I	4
<b>3</b>	ENG 111	College Composition I	3
<b>4</b>	CHM 111 <sup>1</sup>	General Chemistry I	4
<b>5</b>	ECO 201 or ECO 202 or HIS 10	Social/Behavioral Science Electives	3
<b>6</b>	EGR 110 <sup>2</sup> or EGR 206 <sup>3</sup>	Engineering Graphics or Engineering Economy	3
<b>7</b>	EGR 124	Introduction to Engineering and Engineering Methods	3
<b>8</b>	ENG 112	College Composition II	3
<b>9</b>	CSC 130	Scientific Programming	4
<b>10</b>	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Electives	3
<b>11</b>	MTH 264	Calculus II	4
<b>12</b>	PHY 241	University Physics I	4
<b>13</b>	CSC 210	Programming with C++	3
<b>14</b>	MTH 266	Linear Algebra	3
<b>15</b>	EGR 251 and EGR 255	Basic Electrical Circuits I and Electric Circuits Laboratory	3 and 1
<b>16</b>	MTH 265	Calculus III	4
<b>17</b>	ECO 201 or ECO 202 or HIS 101	Social/Behavioral Science Electives	3
<b>18</b>	PHY 242	University Physics II	4
<b>19</b>	MTH 267	Differential Equations	3
<b>20</b>	PHI 220 or PHI 111 or ARC 201	Humanities/Fine Arts Electives	3
<b>21</b>	HLT 105 or PED 111 or PED 109	Personal Wellness Electives	1
<b>TOTAL</b>	<b>Engineering Associate of Science- Electrical/Computer Engineering Specialization</b>		<b>67</b>

# Transfer Associate Degrees & Certificates

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<sup>1</sup> CHM 112 may be required by some four-year institutions for their engineering baccalaureate degree programs. Students should verify the chemistry requirements of the institutions to which they plan to transfer. JMU requires both CHM 111 and CHM 112.

<sup>2</sup> Virginia Tech - all engineering majors

<sup>3</sup> Virginia Commonwealth University - Computer and Electrical engineering