

# B.S. in Computer Engineering

The B.S. in Computer Engineering will give students access to knowledge and expertise in a vast array of aviation, aerospace and industry areas, as well as project opportunities through professional organizations such as the Institute for Electrical and Electronics Engineers (IEEE) and the Association of Uncrewed Vehicle Systems International (AUVSI).

Computer Engineering is offered at Embry-Riddle campuses in Daytona Beach and Prescott, providing students with a comprehensive education that combines computer hardware and software design. Students develop practical skills with modern technologies and are prepared for careers in fields like robotics, aerospace systems and advanced computing, with both campuses focusing on innovation, problem-solving and real-world engineering experience.

At the **Daytona Beach Campus**, students will work with and develop embedded, real-time computer systems, like those that lie at the heart of everything from mobile phones to spacecraft. Housed in the Electrical Engineering and Computer Science Department of the College of Engineering, students will benefit from a wide range of analog and digital hardware development tools and resources.

The **Prescott Campus** applies Embry-Riddle's traditional strengths in computer science and engineering with hands-on design projects. Students will benefit from world-class facilities while studying digital hardware and software applications, including avionics systems, cloud computing, computer vision and cyber-physical systems. The Bachelor of Science in Computer Engineering is housed in the Department of Computer, Electrical and Software Engineering in the College of Engineering and covers everything from analog and digital hardware to computer programming and circuit theory.

The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>), under the General Criteria and the Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs Program Criteria.

## Program-Level Student Learning Outcomes

### Students will:

- Have an ability to communicate effectively with a range of audiences.
- Have an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
- Have an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Daytona Beach Program Requirements

|                                |            |
|--------------------------------|------------|
| General Education Requirements | 39         |
| Core Requirements              | 43         |
| Area of Concentration          | 45         |
| <b>Total Credits</b>           | <b>127</b> |

### Program Details

The Bachelor of Science in Computer Engineering program requires successful completion of a minimum of 127 semester hours. The program may be completed in eight regular semesters, assuming appropriate background and full-time enrollment. A minimum cumulative grade point average of 2.0 is needed for all required CESC, CPSC, ELEC, ENGR, and SYSE courses that fulfill degree requirements.

### General Education Requirements

For a full description of Embry-Riddle General Education guidelines, please see the General Education (<https://catalog.erau.edu/general-education/>) section of the catalog. These Minimum requirements are applicable to all degree programs.

|                                                   |                                      |
|---------------------------------------------------|--------------------------------------|
| Communication                                     | 9                                    |
| COMM 122                                          | English Composition                  |
| COMM 219                                          | Speech                               |
| COMM 221                                          | Technical Communication              |
| Humanities - Lower Level                          | 3                                    |
| Social Sciences - Lower Level                     | 3                                    |
| Humanities/Social Sciences - Lower or Upper Level | 3                                    |
| Humanities/Social Sciences - Upper Level          | 3                                    |
| Mathematics                                       | 8                                    |
| MATH 241                                          | Calculus and Analytical Geometry I   |
| MATH 242                                          | Calculus and Analytical Geometry II  |
| Physical/Life Sciences                            | 10                                   |
| PHYS 150                                          | Physics with Calculus I              |
| PHYS 160                                          | Physics with Calculus II             |
| PHYS 250                                          | Physics with Calculus III            |
| PHYS 250L                                         | Physics with Calculus III Laboratory |
| <b>Total Credits</b>                              | <b>39</b>                            |

### Core Requirements

|                      |                                           |           |
|----------------------|-------------------------------------------|-----------|
| CESC 220             | Digital Circuit Design                    | 3         |
| CESC 220L            | Digital Circuit Design Laboratory         | 1         |
| CESC 320             | Microprocessor Systems                    | 3         |
| CESC 320L            | Microprocessor Systems Laboratory         | 1         |
| CESC 450             | Real-Time Embedded Systems                | 3         |
| CESC 470             | Computer Architecture                     | 3         |
| CPSC 420             | Operating Systems                         | 3         |
| ELEC 223             | Linear Circuits Analysis I                | 3         |
| ELEC 223L            | Electrical Engineering Laboratory I       | 1         |
| ELEC 302             | Electronic Devices and Circuits           | 3         |
| ELEC 302L            | Electronic Circuits Laboratory            | 1         |
| ELEC 401             | Control Systems Analysis and Design       | 3         |
| ELEC 401L            | Control Systems Laboratory                | 1         |
| ENGR 101             | Introduction to Engineering               | 2         |
| MATH 243             | Calculus and Analytical Geometry III      | 4         |
| MATH 345             | Differential Equations and Matrix Methods | 4         |
| MATH 412             | Probability and Statistics                | 3         |
| UNIV 101             | College Success                           | 1         |
| <b>Total Credits</b> |                                           | <b>43</b> |

## No Track Area of Concentration

### No Track Required Courses

|           |                                |   |
|-----------|--------------------------------|---|
| CESC 420  | Computer Systems Design I      | 3 |
| CESC 421  | Computer Systems Design II     | 3 |
| CPSC 225  | Computer Science II            | 3 |
| CPSC 225L | Computer Science II Laboratory | 1 |

### No Track Support Courses

|                       |                                                    |   |
|-----------------------|----------------------------------------------------|---|
| CESC 330              | Digital Systems Design with Aerospace Applications | 4 |
| CESC 330L             | Digital Systems Design Laboratory                  | 0 |
| CESC 410              | Digital Signal Processing                          | 3 |
| CESC 410L             | Digital Signal Processing Laboratory               | 1 |
| CESC 300              | Computing in Aerospace and Aviation                | 3 |
| CESC 315              | Signals and Systems                                | 3 |
| CPSC 222              | Introduction to Discrete Structures                | 3 |
| CPSC 462              | Computer Networks                                  | 3 |
| ELEC 300              | Linear Circuits Analysis II                        | 3 |
| SYSE 301              | Introduction to Systems Engineering                | 3 |
| CPSC 223              | Scientific Programming in C                        | 3 |
| Specified Electives * |                                                    | 6 |

**Total Credits** 45

\* **Specified Electives** - Courses selected from this category require prior approval from the academic advisor or program coordinator. These electives are intended to support a concentration within EECS or other areas or to fulfill requirements for a declared minor. Approved disciplines include, but are not limited to, aerospace, aviation, business, communications, human factors, and mathematics.

**Computer Science:** CPSC 303, CPSC 315, CPSC 317, CPSC 332, CPSC 335, CPSC 362, CPSC 432

**Electrical Communications:** ELEC 308/ELEC 417 (can be taken as a sequence)

**Robotics:** ELEC 311/MECH 503 (can be taken as a sequence)

## Suggested Plan of Study

### Year One

| Requirements                                  | Credits   |
|-----------------------------------------------|-----------|
| UNIV 101 - College Success                    | 1         |
| COMM 122 - English Composition                | 3         |
| CPSC 223 - Scientific Programming in C        | 3         |
| ECON 225 - Engineering Economics              | 3         |
| ENGR 101 - Introduction to Engineering        | 2         |
| MATH 241 - Calculus and Analytical Geometry I | 4         |
| <b>Semester Hours</b>                         | <b>16</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| MATH 242 - Calculus and Analytical Geometry II | 4         |
| PHYS 150 - Physics with Calculus I             | 3         |
| CESC 220 - Digital Circuit Design              | 3         |
| CESC 220L - Digital Circuit Design Laboratory  | 1         |
| Humanities - Lower Level                       | 3         |
| <b>Semester Hours</b>                          | <b>14</b> |

## Total Credits

Total Hours for All Requirements: 30

### Year Two

| Requirements                                    | Credits   |
|-------------------------------------------------|-----------|
| MATH 243 - Calculus and Analytical Geometry III | 4         |
| PHYS 160 - Physics with Calculus II             | 3         |
| CPSC 222 - Introduction to Discrete Structures  | 3         |
| CPSC 225 - Computer Science II                  | 3         |
| CPSC 225L - Computer Science II Laboratory      | 1         |
| COMM 221 - Technical Communication              | 3         |
| <b>Semester Hours</b>                           | <b>17</b> |

| Requirements                                         | Credits   |
|------------------------------------------------------|-----------|
| MATH 345 - Differential Equations and Matrix Methods | 4         |
| PHYS 250 - Physics with Calculus III                 | 3         |
| PHYS 250L - Physics with Calculus III Laboratory     | 1         |
| ELEC 223 - Linear Circuits Analysis I                | 3         |
| ELEC 223L - Electrical Engineering Laboratory I      | 1         |
| CESC 320 - Microprocessor Systems                    | 3         |
| CESC 320L - Microprocessor Systems Laboratory        | 1         |
| <b>Semester Hours</b>                                | <b>16</b> |

## Total Credits

Total Hours for All Requirements: 33

### Year Three

| Requirements                                                  | Credits   |
|---------------------------------------------------------------|-----------|
| SYSE 301 - Introduction to Systems Engineering                | 3         |
| ELEC 300 - Linear Circuits Analysis II                        | 3         |
| CESC 470 - Computer Architecture                              | 3         |
| CESC 330 - Digital Systems Design with Aerospace Applications | 4         |
| CESC 330L - Digital Systems Design Laboratory                 | 0         |
| CPSC 420 - Operating Systems                                  | 3         |
| <b>Semester Hours</b>                                         | <b>16</b> |

| Requirements                                   | Credits |
|------------------------------------------------|---------|
| MATH 412 - Probability and Statistics          | 3       |
| ELEC 401 - Control Systems Analysis and Design | 3       |
| ELEC 401L - Control Systems Laboratory         | 1       |
| CESC 300 - Computing in Aerospace and Aviation | 3       |
| CESC 450 - Real-Time Embedded Systems          | 3       |

|                                |           |
|--------------------------------|-----------|
| CESC 315 - Signals and Systems | 3         |
| <b>Semester Hours</b>          | <b>16</b> |

### Total Credits

Total Hours for All Requirements: 32

### Year Four

| Requirements                                     | Credits   |
|--------------------------------------------------|-----------|
| CESC 420 - Computer Systems Design I             | 3         |
| ELEC 302 - Electronic Devices and Circuits       | 3         |
| ELEC 302L - Electronic Circuits Laboratory       | 1         |
| CPSC 462 - Computer Networks                     | 3         |
| CESC 410 - Digital Signal Processing             | 3         |
| CESC 410L - Digital Signal Processing Laboratory | 1         |
| COMM 219 - Speech                                | 3         |
| <b>Semester Hours</b>                            | <b>17</b> |

| Requirements                                      | Credits   |
|---------------------------------------------------|-----------|
| CESC 421 - Computer Systems Design II             | 3         |
| HUMN 330 - Values and Ethics                      | 3         |
| Humanities/Social Sciences - Lower or Upper Level | 3         |
| Specified Elective                                | 3         |
| Specified Elective                                | 3         |
| <b>Semester Hours</b>                             | <b>15</b> |

### Total Credits

Total Hours for All Requirements: 32

### Prescott Program Requirements

|                                |                |
|--------------------------------|----------------|
| General Education Requirements | 37             |
| Core Requirements              | 43             |
| Area of Concentration          | 46-48          |
| <b>Total Credits</b>           | <b>126-128</b> |

### Program Details

The Bachelor of Science in Computer Engineering program requires successful completion of a minimum of 126 credit hours. The program may be completed in eight semesters, or four years, assuming appropriate background and full-time enrollment. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University. The program offers a Space Option and a Robotics Track for students seeking specialized study in those areas. A minimum cumulative grade point average of 2.0 is needed for all Core and Program Support courses. The courses necessary to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. Computer Engineering students must earn a grade of C or better in all prerequisite courses for courses with the CPSC, CESC, ELEC, ENGR, ESCI, or SFTW prefixes. Students are responsible for ensuring that all prerequisite and degree requirements are met prior to enrollment in advanced coursework.

### General Education Requirements

|                              |   |
|------------------------------|---|
| Communication                | 9 |
| COMM 122 English Composition |   |
| COMM 219 Speech *            |   |

|                                                                                                 |           |
|-------------------------------------------------------------------------------------------------|-----------|
| or COMM 42 Advanced Technical Communication I and Advanced Technical Communication II & COMM 43 |           |
| COMM 221 Technical Communication                                                                |           |
| Humanities - Lower Level                                                                        | 3         |
| Social Sciences - Lower Level                                                                   | 3         |
| ECON 225 Engineering Economics                                                                  |           |
| Humanities/Social Sciences - Lower or Upper Level                                               | 3         |
| Humanities/Social Sciences - Upper Level                                                        | 3         |
| HUMN 330 Values and Ethics                                                                      |           |
| or HUMN 335 Technology and Modern Civilization                                                  |           |
| Mathematics                                                                                     | 8         |
| MATH 241 Calculus and Analytical Geometry I                                                     |           |
| MATH 242 Calculus and Analytical Geometry II                                                    |           |
| Physical/Life Sciences                                                                          | 8         |
| PHYS 161 Physics with Calculus I and II                                                         |           |
| PHYS 250 Physics with Calculus III                                                              |           |
| PHYS 250L Physics with Calculus III Laboratory                                                  |           |
| <b>Total Credits</b>                                                                            | <b>37</b> |

\* COMM 420 & COMM 430 for Robotics Track

### Core Requirements

The following course of study outlines the quickest and most cost-efficient route for students to earn their B.S. in Computer Engineering. Students are encouraged to follow the course of study to ensure they complete all program required courses and their prerequisites within four years.

|                      |                                           |           |
|----------------------|-------------------------------------------|-----------|
| CESC 220             | Digital Circuit Design                    | 3         |
| CESC 220L            | Digital Circuit Design Laboratory         | 1         |
| CESC 320             | Microprocessor Systems                    | 3         |
| CESC 320L            | Microprocessor Systems Laboratory         | 1         |
| CESC 450             | Real-Time Embedded Systems                | 3         |
| CESC 470             | Computer Architecture                     | 3         |
| CPSC 420             | Operating Systems                         | 3         |
| ELEC 223             | Linear Circuits Analysis I                | 3         |
| ELEC 223L            | Electrical Engineering Laboratory I       | 1         |
| ELEC 302             | Electronic Devices and Circuits           | 3         |
| ELEC 302L            | Electronic Circuits Laboratory            | 1         |
| ELEC 401             | Control Systems Analysis and Design       | 3         |
| ELEC 401L            | Control Systems Laboratory                | 1         |
| ENGR 101             | Introduction to Engineering               | 2         |
| MATH 243             | Calculus and Analytical Geometry III      | 4         |
| MATH 345             | Differential Equations and Matrix Methods | 4         |
| MATH 412             | Probability and Statistics                | 3         |
| UNIV 101             | College Success                           | 1         |
| <b>Total Credits</b> |                                           | <b>43</b> |

### Areas of Concentration

#### Standard Track

|           |                                              |   |
|-----------|----------------------------------------------|---|
| CESC 420  | Computer Systems Design I                    | 3 |
| CESC 421  | Computer Systems Design II                   | 3 |
| CPSC 225  | Computer Science II                          | 3 |
| CESC 460  | Telecommunications Systems                   | 3 |
| CPSC 223  | Scientific Programming in C                  | 3 |
| ELEC 314  | Signal and Linear System Analysis            | 3 |
| ELEC 314L | Signal and Linear System Analysis Laboratory | 1 |
| ENGR 115  | Introduction to Computing for Engineers      | 3 |
| CPSC 222  | Introduction to Discrete Structures          | 3 |

|                                                                                                                                                                                                                          |                                |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------|
| SFTW 300                                                                                                                                                                                                                 | Software Engineering Practices | 3         |
| Technical Electives                                                                                                                                                                                                      |                                | 9         |
| ENGR 200, ENGR 201, GSIS 365, CPSC 225, Coop/Internship, and any AERO, CESC, CPSC, ELEC, ENGP, ESCI, MATH, MECH, PHYS, SFTW, SYSE course 300 level or above. Other courses may be approved by the CESE department chair. |                                |           |
| Open Electives                                                                                                                                                                                                           |                                | 9         |
| <b>Total Credits</b>                                                                                                                                                                                                     |                                | <b>46</b> |

### Standard Track with Space Option

|                                                                                                                                                                                                                |                                              |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------|
| AERO 427                                                                                                                                                                                                       | Spacecraft Preliminary Design                | 4         |
| AERO 445                                                                                                                                                                                                       | Spacecraft Detail Design                     | 4         |
| ENGP 312                                                                                                                                                                                                       | Space Systems Engineering                    | 3         |
| CESC 460                                                                                                                                                                                                       | Telecommunications Systems                   | 3         |
| CPSC 223                                                                                                                                                                                                       | Scientific Programming in C                  | 3         |
| CPSC 225                                                                                                                                                                                                       | Computer Science II                          | 3         |
| ELEC 314                                                                                                                                                                                                       | Signal and Linear System Analysis            | 3         |
| ELEC 314L                                                                                                                                                                                                      | Signal and Linear System Analysis Laboratory | 1         |
| ENGR 115                                                                                                                                                                                                       | Introduction to Computing for Engineers      | 3         |
| CPSC 222                                                                                                                                                                                                       | Introduction to Discrete Structures          | 3         |
| SFTW 300                                                                                                                                                                                                       | Software Engineering Practices               | 3         |
| Technical Electives                                                                                                                                                                                            |                                              | 6         |
| ENGR 200, ENGR 201, GSIS 365, Coop/Internship, and any AERO, CESC, CPSC, ELEC, ENGP, ESCI, MATH, MECH, PHYS, SFTW, SYSE course 300 level or above. Other courses may be approved by the CESE department chair. |                                              |           |
| Open Electives                                                                                                                                                                                                 |                                              | 9         |
| <b>Total Credits</b>                                                                                                                                                                                           |                                              | <b>48</b> |

### Robotics Track

The following course of study outlines the quickest and most cost-efficient route for students to earn their B.S. in Computer Engineering - Robotics Option. Students are encouraged to follow the course of study to ensure they complete all program required courses and their prerequisites within four years.

|                                                                                                                                                                                                                          |                                               |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------|
| CESC 460                                                                                                                                                                                                                 | Telecommunications Systems                    | 3         |
| CPSC 223                                                                                                                                                                                                                 | Scientific Programming in C                   | 3         |
| ELEC 314                                                                                                                                                                                                                 | Signal and Linear System Analysis             | 3         |
| ELEC 314L                                                                                                                                                                                                                | Signal and Linear System Analysis Laboratory  | 1         |
| ENGR 115                                                                                                                                                                                                                 | Introduction to Computing for Engineers       | 3         |
| ESCI 207                                                                                                                                                                                                                 | Fundamentals of Mechanics                     | 3         |
| CPSC 222                                                                                                                                                                                                                 | Introduction to Discrete Structures           | 3         |
| MATH 335                                                                                                                                                                                                                 | Introduction to Linear and Abstract Algebra   | 3         |
| SFTW 300                                                                                                                                                                                                                 | Software Engineering Practices                | 3         |
| ELEC 311                                                                                                                                                                                                                 | Robotics and Autonomous Systems I             | 3         |
| ELEC 426                                                                                                                                                                                                                 | Robotics and Autonomous Systems II            | 3         |
| ELEC 426L                                                                                                                                                                                                                | Robotics and Autonomous Systems II Laboratory | 1         |
| MECH 478                                                                                                                                                                                                                 | Robotic Systems Preliminary Design            | 4         |
| MECH 479                                                                                                                                                                                                                 | Robotic Systems Detail Design                 | 4         |
| Technical Electives                                                                                                                                                                                                      |                                               | 3         |
| ENGR 200, ENGR 201, GSIS 365, CPSC 225, Coop/Internship, and any AERO, CESC, CPSC, ELEC, ENGP, ESCI, MATH, MECH, PHYS, SFTW, SYSE course 300 level or above. Other courses may be approved by the CESE department chair. |                                               |           |
| Open Elective                                                                                                                                                                                                            |                                               | 3         |
| <b>Total Credits</b>                                                                                                                                                                                                     |                                               | <b>46</b> |

## Suggested Plans of Study

### Area of Concentration: Standard Track

#### Year One

| Requirements                                       | Credits   |
|----------------------------------------------------|-----------|
| COMM 122 - English Composition                     | 3         |
| ENGR 101 - Introduction to Engineering             | 2         |
| ENGR 115 - Introduction to Computing for Engineers | 3         |
| MATH 241 - Calculus and Analytical Geometry I      | 4         |
| UNIV 101 - College Success                         | 1         |
| Humanities/Social Sciences - Lower or Upper Level  | 3         |
| <b>Semester Hours</b>                              | <b>16</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| CESC 220 - Digital Circuit Design              | 3         |
| CESC 220L - Digital Circuit Design Laboratory  | 1         |
| MATH 242 - Calculus and Analytical Geometry II | 4         |
| PHYS 161 - Physics with Calculus I and II      | 4         |
| Humanities - Lower Level                       | 3         |
| <b>Semester Hours</b>                          | <b>15</b> |

#### Total Credits

Total Hours for All Requirements: 31

#### Year Two

| Requirements                                    | Credits   |
|-------------------------------------------------|-----------|
| COMM 221 - Technical Communication              | 3         |
| CPSC 223 - Scientific Programming in C          | 3         |
| CPSC 222 - Introduction to Discrete Structures  | 3         |
| MATH 243 - Calculus and Analytical Geometry III | 4         |
| PHYS 250 - Physics with Calculus III            | 3         |
| <b>Semester Hours</b>                           | <b>16</b> |

| Requirements                                         | Credits   |
|------------------------------------------------------|-----------|
| CESC 320 - Microprocessor Systems                    | 3         |
| CESC 320L - Microprocessor Systems Laboratory        | 1         |
| ELEC 223 - Linear Circuits Analysis I                | 3         |
| ELEC 223L - Electrical Engineering Laboratory I      | 1         |
| COMM 219 - Speech                                    | 3         |
| MATH 345 - Differential Equations and Matrix Methods | 4         |
| PHYS 250L - Physics with Calculus III Laboratory     | 1         |
| <b>Semester Hours</b>                                | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 32

**Year Three**

| Requirements                                             | Credits   |
|----------------------------------------------------------|-----------|
| CPSC 420 - Operating Systems                             | 3         |
| ELEC 302 - Electronic Devices and Circuits               | 3         |
| ELEC 302L - Electronic Circuits Laboratory               | 1         |
| ELEC 314 - Signal and Linear System Analysis             | 3         |
| ELEC 314L - Signal and Linear System Analysis Laboratory | 1         |
| CPSC 225 - Computer Science II                           | 3         |
| MATH 412 - Probability and Statistics                    | 3         |
| <b>Semester Hours</b>                                    | <b>17</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| CESC 460 - Telecommunications Systems          | 3         |
| ELEC 401 - Control Systems Analysis and Design | 3         |
| ELEC 401L - Control Systems Laboratory         | 1         |
| SFTW 300 - Software Engineering Practices      | 3         |
| ECON 225 - Engineering Economics               | 3         |
| Technical Elective                             | 3         |
| <b>Semester Hours</b>                          | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 33

**Year Four**

| Requirements                          | Credits   |
|---------------------------------------|-----------|
| CESC 420 - Computer Systems Design I  | 3         |
| CESC 450 - Real-Time Embedded Systems | 3         |
| Open Elective                         | 3         |
| Open Elective                         | 3         |
| Technical Elective                    | 3         |
| <b>Semester Hours</b>                 | <b>15</b> |

| Requirements                                                             | Credits   |
|--------------------------------------------------------------------------|-----------|
| CESC 421 - Computer Systems Design II                                    | 3         |
| CESC 470 - Computer Architecture                                         | 3         |
| HUMN 330 - Values and Ethics or 335 - Technology and Modern Civilization | 3         |
| Open Elective                                                            | 3         |
| Technical Elective                                                       | 3         |
| <b>Semester Hours</b>                                                    | <b>15</b> |

**Total Credits**

Total Hours for All Requirements: 20

**Area of Concentration: Standard Track with Space Option****Year One**

| Requirements                                       | Credits   |
|----------------------------------------------------|-----------|
| COMM 122 - English Composition                     | 3         |
| ENGR 101 - Introduction to Engineering             | 2         |
| ENGR 115 - Introduction to Computing for Engineers | 3         |
| MATH 241 - Calculus and Analytical Geometry I      | 4         |
| UNIV 101 - College Success                         | 1         |
| Humanities/Social Sciences - Lower or Upper Level  | 3         |
| <b>Semester Hours</b>                              | <b>16</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| CESC 220 - Digital Circuit Design              | 3         |
| CESC 220L - Digital Circuit Design Laboratory  | 1         |
| MATH 242 - Calculus and Analytical Geometry II | 4         |
| PHYS 161 - Physics with Calculus I and II      | 4         |
| Humanities - Lower Level                       | 3         |
| <b>Semester Hours</b>                          | <b>15</b> |

**Total Credits**

Total Hours for All Requirements: 31

**Year Two**

| Requirements                                    | Credits   |
|-------------------------------------------------|-----------|
| COMM 221 - Technical Communication              | 3         |
| CPSC 223 - Scientific Programming in C          | 3         |
| CPSC 222 - Introduction to Discrete Structures  | 3         |
| MATH 243 - Calculus and Analytical Geometry III | 4         |
| PHYS 250 - Physics with Calculus III            | 3         |
| <b>Semester Hours</b>                           | <b>16</b> |

| Requirements                                                                                                       | Credits   |
|--------------------------------------------------------------------------------------------------------------------|-----------|
| COMM 219 - Speech or 420 - Advanced Technical Communication I <b>and</b> 430 - Advanced Technical Communication II | 3         |
| CESC 320 - Microprocessor Systems                                                                                  | 3         |
| CESC 320L - Microprocessor Systems Laboratory                                                                      | 1         |
| ELEC 223 - Linear Circuits Analysis I                                                                              | 3         |
| ELEC 223L - Electrical Engineering Laboratory I                                                                    | 1         |
| MATH 345 - Differential Equations and Matrix Methods                                                               | 4         |
| PHYS 250L - Physics with Calculus III Laboratory                                                                   | 1         |
| <b>Semester Hours</b>                                                                                              | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 32

**Year Three**

| Requirements                                             | Credits   |
|----------------------------------------------------------|-----------|
| CPSC 225 - Computer Science II                           | 3         |
| CPSC 420 - Operating Systems                             | 3         |
| ELEC 302 - Electronic Devices and Circuits               | 3         |
| ELEC 302L - Electronic Circuits Laboratory               | 1         |
| ELEC 314 - Signal and Linear System Analysis             | 3         |
| ELEC 314L - Signal and Linear System Analysis Laboratory | 1         |
| MATH 412 - Probability and Statistics                    | 3         |
| <b>Semester Hours</b>                                    | <b>17</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| CESC 460 - Telecommunications Systems          | 3         |
| ECON 225 - Engineering Economics               | 3         |
| ELEC 401 - Control Systems Analysis and Design | 3         |
| ELEC 401L - Control Systems Laboratory         | 1         |
| SFTW 300 - Software Engineering Practices      | 3         |
| Technical Elective                             | 3         |
| <b>Semester Hours</b>                          | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 33

**Year Four**

| Requirements                             | Credits   |
|------------------------------------------|-----------|
| AERO 427 - Spacecraft Preliminary Design | 4         |
| CESC 450 - Real-Time Embedded Systems    | 3         |
| ENGP 312 - Space Systems Engineering     | 3         |
| Open Elective                            | 3         |
| Open Elective                            | 3         |
| <b>Semester Hours</b>                    | <b>16</b> |

| Requirements                                                             | Credits   |
|--------------------------------------------------------------------------|-----------|
| AERO 445 - Spacecraft Detail Design                                      | 4         |
| CESC 470 - Computer Architecture                                         | 3         |
| HUMN 330 - Values and Ethics or 335 - Technology and Modern Civilization | 3         |
| Open Elective                                                            | 3         |
| Technical Elective                                                       | 3         |
| <b>Semester Hours</b>                                                    | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 32

**Area of Concentration: Robotics Track****Year One**

| Requirements                                       | Credits   |
|----------------------------------------------------|-----------|
| COMM 122 - English Composition                     | 3         |
| ENGR 101 - Introduction to Engineering             | 2         |
| ENGR 115 - Introduction to Computing for Engineers | 3         |
| MATH 241 - Calculus and Analytical Geometry I      | 4         |
| UNIV 101 - College Success                         | 1         |
| Humanities/Social Sciences - Lower or Upper Level  | 3         |
| <b>Semester Hours</b>                              | <b>16</b> |

| Requirements                                   | Credits   |
|------------------------------------------------|-----------|
| CESC 220 - Digital Circuit Design              | 3         |
| CESC 220L - Digital Circuit Design Laboratory  | 1         |
| MATH 242 - Calculus and Analytical Geometry II | 4         |
| PHYS 161 - Physics with Calculus I and II      | 4         |
| Humanities - Lower Level                       | 3         |
| <b>Semester Hours</b>                          | <b>15</b> |

**Total Credits**

Total Hours for All Requirements: 31

**Year Two**

| Requirements                                    | Credits   |
|-------------------------------------------------|-----------|
| COMM 221 - Technical Communication              | 3         |
| CPSC 223 - Scientific Programming in C          | 3         |
| ESCI 207 - Fundamentals of Mechanics            | 3         |
| MATH 243 - Calculus and Analytical Geometry III | 4         |
| PHYS 250 - Physics with Calculus III            | 3         |
| <b>Semester Hours</b>                           | <b>16</b> |

| Requirements                                           | Credits   |
|--------------------------------------------------------|-----------|
| CESC 320 - Microprocessor Systems                      | 3         |
| CESC 320L - Microprocessor Systems Laboratory          | 1         |
| ELEC 223 - Linear Circuits Analysis I                  | 3         |
| ELEC 223L - Electrical Engineering Laboratory I        | 1         |
| MATH 335 - Introduction to Linear and Abstract Algebra | 3         |
| MATH 345 - Differential Equations and Matrix Methods   | 4         |
| PHYS 250L - Physics with Calculus III Laboratory       | 1         |
| <b>Semester Hours</b>                                  | <b>16</b> |

**Total Credits**

Total Hours for All Requirements: 32

### Year Three

| Requirements                                             | Credits   |
|----------------------------------------------------------|-----------|
| CPSC 420 - Operating Systems                             | 3         |
| ELEC 302 - Electronic Devices and Circuits               | 3         |
| ELEC 302L - Electronic Circuits Laboratory               | 1         |
| ELEC 311 - Robotics and Autonomous Systems I             | 3         |
| ELEC 314 - Signal and Linear System Analysis             | 3         |
| ELEC 314L - Signal and Linear System Analysis Laboratory | 1         |
| Technical Elective                                       | 3         |
| <b>Semester Hours</b>                                    | <b>17</b> |

| Requirements                                              | Credits   |
|-----------------------------------------------------------|-----------|
| CESC 460 - Telecommunications Systems                     | 3         |
| ELEC 401 - Control Systems Analysis and Design            | 3         |
| ELEC 401L - Control Systems Laboratory                    | 1         |
| ELEC 426 - Robotics and Autonomous Systems II             | 3         |
| ELEC 426L - Robotics and Autonomous Systems II Laboratory | 1         |
| MATH 412 - Probability and Statistics                     | 3         |
| SFTW 300 - Software Engineering Practices                 | 3         |
| <b>Semester Hours</b>                                     | <b>17</b> |

### Total Credits

Total Hours for All Requirements: 34

### Year Four

| Requirements                                                                                     | Credits   |
|--------------------------------------------------------------------------------------------------|-----------|
| COMM 420 - Advanced Technical Communication I and COMM 430 - Advanced Technical Communication II | 3         |
| CESC 450 - Real-Time Embedded Systems                                                            | 3         |
| CPSC 222 - Introduction to Discrete Structures                                                   | 3         |
| MECH 478 - Robotic Systems Preliminary Design                                                    | 4         |
| Open Elective                                                                                    | 3         |
| <b>Semester Hours</b>                                                                            | <b>16</b> |

| Requirements                                                             | Credits   |
|--------------------------------------------------------------------------|-----------|
| CESC 470 - Computer Architecture                                         | 3         |
| ECON 225 - Engineering Economics                                         | 3         |
| HUMN 330 - Values and Ethics or 335 - Technology and Modern Civilization | 3         |
| MECH 479 - Robotic Systems Detail Design                                 | 4         |
| <b>Semester Hours</b>                                                    | <b>13</b> |

### Total Credits

Total Hours for All Requirements: 29