

# ENGINEERING WITH EMPHASIS IN SOFTWARE ENGINEERING APPLICATIONS LEVEL - 2 (CERTIFICATE T0843)

## Natural Science Division

The Engineering with Emphasis in Software Engineering Applications program concentrates on the design of complex computing systems through the applications of computing languages, contextualized problem-solving, control systems, and applied mathematics. This degree program is for job seekers interested in electrical software engineering technology as well as students interested in university programs in software engineering and software engineering technology.

Engineering with Emphasis in Software Engineering Applications Level 2 certificate incorporates the engineering, science, and communications skills needed by an entry-level software engineering technology employee. Completion of this certificate will prepare graduates for multiple terminal technologist positions, including engineering technician, software engineering technician, application developer, assistant engineer, technical sales, technical consultant and other endeavors related to electrical systems. Through this program, students will develop proficiency with electrical systems, mechanical systems, Microsoft Excel, oral communication, functional analysis, project management, developing presentations, laboratory analysis, programming, numerical methods, software development, and hardware interface tools. Completion of this certificate may facilitate transfer into B.S. programs in Engineering Technology, Software Engineering or Computer Science related degree programs.

## Required Courses

| Course Prefix | Course Name   | Units          |
|---------------|---|----------------|
|               | Completion of Engineering Fundamentals coursework   | 16-17          |
|               | PLUS  |                |
|               | Completion of Engineering with Emphasis in Software Engineering Applications - Level 1 coursework | 15.5           |
|               | PLUS  |                |
|               | Completion of Engineering with Emphasis in Software Engineering Applications - Level 2 coursework | 11.5 - 13      |
|               | <b>Total Units</b>  | <b>43-45.5</b> |

| Course Prefix | Course Name  | Units |
|---------------|--|-------|
|               | <b>Completion of Engineering Fundamentals Coursework</b> |       |
| ENGL 1A       | Freshman Composition                                     | 4     |
| or ENGL 1AH   | Freshman Composition - Honors                            |       |
| or ENGL 1AM   | College Composition for Non-Native English Speakers      |       |
| or AMLA 1A    | College Composition for Non-Native English Speakers      |       |
| ENGR 1        | Introduction to Engineering                              | 2     |
| ENGR 1C       | Engineering Critical Thinking                            | 3     |
| MATH 150      | Trigonometry   | 3     |
| or MATH 160   | Precalculus Mathematics                                  |       |
| or MATH 180   | Calculus and Analytic Geometry                           |       |

|                    |                 |                |
|--------------------|-----------------|----------------|
| PHYS 2AG           | General Physics | 4              |
| <b>Total Units</b> |                 | <b>16 - 17</b> |

| Course Prefix      | Course Name  | Units       |
|--------------------|--|-------------|
|                    | <b>Completion of Engineering with Emphasis in Software Engineering Applications - Level 1 Coursework</b> |             |
| CSCI 110           | Fundamentals of Computer Science   | 3.5         |
| CSCI 190           | Discrete Mathematics Applied to Computer Science   | 4           |
| ENGR 6             | Introduction to Engineering Programming Concepts and Methodologies                                       | 4           |
| SPCH 1A            | Public Speaking  | 4           |
| or SPCH 1AH        | Public Speaking - Honors   |             |
| <b>Total Units</b> |  | <b>15.5</b> |

| Course Prefix      | Course Name  | Units            |
|--------------------|--|------------------|
|                    | <b>Completion of Engineering with Emphasis in Software Engineering Applications - Level 2 Coursework</b> |                  |
| CSCI 140           | C++ Language and Object Development  | 4                |
| or CSCI 220        | Data Structures I  |                  |
| or CSCI 240        | Data Structures and Algorithms   |                  |
| ENGR 16            | Introduction to Digital Electronics with FPGA Programming  | 4                |
| MATH 181           | Calculus and Analytic Geometry   | 4                |
| <b>Total Units</b> |  | <b>11.5 - 13</b> |

Please see the Mt. San Antonio College Engineering, Engineering Technology and Surveying Program Website (<https://www.mtsac.edu/engineering/>) for updated information on program courses, transfer help, extracurricular activities, faculty contact information and more.