CERTIFICATE IN ENGINEERING FUNDAMENTALS

Engineering and engineering technology are fields that require the use of engineering knowledge, methods, and technical skills. Upon completion of this certificate, students will have the basic knowledge needed to work with electrical and mechanical systems, basic engineering computer programming techniques, structure and component load calculations as well as fatigue and failure calculations. This program incorporates lower undergraduate level engineering and math courses that will prepare students seeking careers in the engineering and engineering technology fields as well as prepare students interested in entering 4-year engineering and engineering technology programs.

Learning Outcomes

Certificate of Achievement Level Student Learning Outcomes

Students completing the Engineering Fundamentals Certificate of Achievement will:

1. Identify various engineering disciplines and the types of education and training needed to complete a degree, obtain a professional engineering license, and work as a professional engineer.
2. Use vector statics principles to analyze practical engineering problems including equilibrium of rigid bodies, force distribution, normal and shear stress applications, truss, frame, and cable force calculations and strain rate calculations.
3. Demonstrate understanding of programming concepts applicable to MATLAB and Excel VBA to solve practical engineering problems.
4. Identify the correct theory and apply the proper equations to calculate internal stresses, strains, and displacements of rigid members.
5. Demonstrate the use of differential and integral calculus for solving practical engineering problems.

Requirements

Code	Title	Units
ENGR 101	Introduction to Engineering	3
ENGR 135	Engineering Mechanics: Statics	3
ENGR 138	Computer Programming and Numerical Methods for Engineers	4
ENGR 140	Mechanics of Materials	4
MATH 190	Calculus with Analytic Geometry I	5
or MATH 191	Calculus with Analytic Geometry II	
or MATH 210	Calculus with Analytic Geometry III	
Total Units		**19**

Career Information

Career Opportunities

There are a variety of careers you can do with this major.

To explore more about this major, schedule an appointment (https://www.citruscollege.edu/stdntsrv/ctcenter/Pages/ApptSchedule.aspx) with a career counselor.