

**Miami University**  
**Department of Engineering Technology [www.ent.muohio.edu](http://www.ent.muohio.edu)**  
**B.S. Engineering Technology, Electromechanical Concentration**  
**Yearly Schedule (Updated: July 14, 2009)**

**Distance Education Delivery to Columbus State Community College, Shawnee State University, North Central State College, Rhodes State College, Edison State, Terra Community College, Southern State, Zane State, and Northwest State.**

There are thirteen courses delivered by Miami University to your college through interactive video. The remaining courses (which include bridge courses and the Ohio Transfer Module) are taken at your college. See your college articulation agreement for details.

This schedule assumes full time students start in the summer and finish in the following spring.

<u>Summer</u>	<u>Fall</u>	<u>Spring</u>
ENT 311(3)	ENT 301 (3)	ENT 310 (3)
ENT 316 (3)	ENT 311 (3)	ENT 401 (3)
ENT 407 (3)	ENT 401 (3)	ENT 402 (3)
	ENT 497 (2)	ENT 418 (3)
	STA 301 (3)	ENT 498 (2)
		MTH 231 (3)

Notes: Total Distance Credits: 34

All EMET students are required to bring their own Windows based laptop computer to class. The computer must have Windows XP or VISTA installed and a processor speed greater than 1Ghz. Storage capacity must be such that the hard drive can hold Microsoft Office, Microsoft Project, Labview, Working Model, CUBLOC, and Matlab.

**Course Titles**

- ENT 301 Dynamics (3) Prerequisite- Statics, Calculus
- ENT 310 Fluid Mechanics (3) Prerequisite- Statics, Calculus
- ENT 311 Process Control Interface Design (3) Prerequisite- Circuit Analysis, Programming Course
- ENT 316 Project Management (3) Co-requisite-STA 301. Prerequisite: Economics
- ENT 401 Computerized Instrumentation (3) Prerequisite-ENT 311, Calculus
- ENT 402 Industrial Automation (3) Prerequisite- ENT 311
- ENT 407 Modern Manufacturing Systems (3) Prerequisite- ENT 151,272
- ENT 418 Electromechanical Control Systems (3) Prerequisite- ENT 301,401, Calculus
- ENT 497/498 Senior Design I and II (4) Prerequisite- ENT 316 and Senior Standing
- STA 301 Statistics (3) Prerequisite- Calculus
- MTH 231 Discrete Mathematics (3) Prerequisite- Calculus

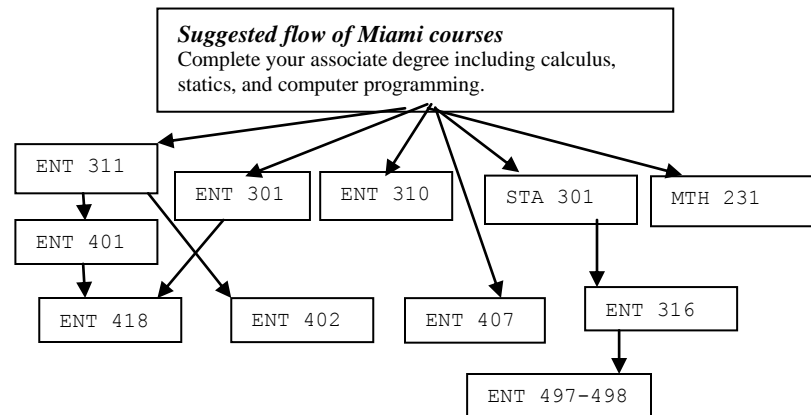
-Classes are generally offered Tuesday and Thursday evenings.

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## -Courses Description and Prerequisites

### ENT 301 Dynamics (3) Prerequisite- *Statics, Calculus*

- The basic concepts of force, mass, and acceleration; work and energy; and impulse and momentum are introduced and applied to problems involving particles and rigid bodies. Topics include displacement, velocity, and acceleration of a particle; relations between forces acting on a particle or rigid body; and the changes in motion produced.

### ENT 310 Fluid Mechanics (3) Prerequisite- *Statics, Calculus*

- The application of fluid statics and fluid dynamics to the solution of fundamental engineering fluid problems. The one dimensional energy and momentum equations are introduced and applied to the solution of fluid flow problems.

### ENT 311 Process Control Interface Design (3) Prerequisite- *Circuit Analysis, Programming Course*

- An introduction to data acquisition and control with a graphical user interface (GUI). Topics include parallel, serial and network access. Data transfetechnology such as Object Linking and Embedding and Dynamic Data Exchange are also covered.

### ENT 316 Project Management (3) Co-requisite- STA 301. Prerequisite: *Economics*

- A course of upper-level students in Engineering Technology. This course covers background, techniques, and case studies in project management particularly focused on engineering technology applications. The student will develop a fundamental understanding of the concepts for managing both small and large projects. Discussion, evaluation, and presentation skills will be enhanced. Some of the specific topics to be covered include: Gantt charts, PERT charts, projects life-cycle, budgeting, cost analysis, breakeven analysis, conflict resolution, organization tools, project planning, statistical process control, and other selected quality improvement tools. Microsoft Project and Microsoft Excel will be used as software tools throughout the course.

### ENT 401 Computerized Instrumentation (3) Prerequisite- *ENT 311, Calculus*

- Overview of the requirements for the design of servo-mechanisms including stability, transfer functions, loop dynamics, and digital signal processing. Covers digital and analog signal conditioning, transducers, and controllers.

### ENT 402 Industrial Automation (3) Prerequisite- *ENT 311*

- This course uses lab based experiences to investigate common electrical and mechanical instrumentation including hydraulic and pneumatic equipment, programmable logic controllers (PLC), microcontrollers, and industrial SQL databases.

### ENT 407 Modern Manufacturing Systems (3) Prerequisite- *ENT 151,272*

- Coverage of topics related to the manufacturing environment including metal deflection and tolerance, robotics, programmable controller applications, and manufacturing cells.

### ENT 418 Electromechanical Control Systems (3) Prerequisite- *ENT 301,401, Calculus*

- This course covers advanced control topics including state variable models, higher order system response, transient response, and stability analysis.

### ENT 497/498 Senior Design I and II (4) Prerequisite- *ENT 316 and Senior Standing*

- Student teams conduct major open-ended research and design projects. Elements of the design process including establishment of objectives, synthesis, analysis, and evaluation are integral parts. Real-world constraints such as economical and societal factors, marketability, ergonomics, safety, aesthetics, and ethics are also integral parts. 497: feasibility studies performed. 498: implementation, testing, and production of design. Includes guest lecturers, team presentations, team building sessions, team meetings, and guided discussions relating to design. Continuous interaction with faculty and outside professionals.

### STA 301 Statistics (3) Prerequisite- *Calculus*

- A first course in applied statistics including an introduction to probability, the development of estimation and hypothesis testing, and a focus on statistical methods and applications. Includes introduction to probability of events, random variable, binomial and normal distributions, mathematical expectation, sampling distributions, estimation, and hypothesis testing. Statistical methods include one and two sample procedures for means and proportions, chi-square tests, analysis of variance, and linear regression.

### MTH 231 Discrete Mathematics (3) Prerequisite- *Calculus*

- Topics, techniques and terminology in discrete mathematics: logic, sets, proof by mathematical induction, matrix algebra, relations, counting, finite-state machines. Credit does not count toward a major in mathematics and statistics.

*Program prerequisites:* Associate degree in electrical, mechanical, electro-mechanical, or similarly titled engineering technology programs and these courses or their equivalent: ENT 135 Computer Aided Drafting, ENT 151 Engineering Materials ENT 192 Circuit Analysis, ENT 196 Basic Electronics, ENT 271 Mechanics I: Statics, ENT 272 Mechanics II: Strength of Materials, ENT 293 Digital Switching.