

Department:

Engineering Graphics and Technologies

Course Description:

This introductory course the concepts and capabilities of Computer Numeric Control machine tools. Topics to include setup, operation, and basic applications. Upon completion students should be able to explain operator safety, machine operation, data input, program preparation, and program storage.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Apply all personal and work place safety procedures.
2. Perform machine tool related mathematical calculations.
3. Demonstrate an awareness of the types of machine control and processes.
4. Job process planning, tooling and materials.
5. Identify, understand, and write a basic programming code.
6. Create geometry and toolpaths from specifications on a blueprint for simple parts using programming software, simulate code and store.
7. Setup and operate controller software.
8. Load code into controller software and simulate machine operation.

Course Content:

- A. Numerical Control
- B. Axis and Coordinate System
- C. Computer Numeric Control Math
- D. Machine Centers
- E. Machine Centers Tools, Inserts, Speeds, and Feeds
- F. Machining Centers Carbide Insert Fundamentals
- G. Programming Processes for Machining Centers
- H. Programming Codes for Machining Centers
- I. Program Format for Vertical Machining Centers
- J. Canned Cycles for Machining Centers
- K. Turning Centers
- L. Turning Centers Tools, Inserts, Speeds, and Feeds
- M. Programming Process for Turning Centers
- N. Programming Codes for Turning Centers
- O. Canned Cycles for Turning Centers
- P. Subprograms
- Q. Electrical Discharge Machining

Learning Assessments:

Competency in this course will be assessed by written and oral assignments, quizzes, exams, and demonstration of practical skills.

Instructional Materials:

Textbooks: Giselbach, R. A. (2009). *CNC Machining Fundamentals and Applications*. Tinley Park, IL: Goodheart-Willcox. ISBN-13: 978-1590707906

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).