



## Machining Technology Credential: Diploma in Machining Technology D50300

The Machining Technology curriculum is designed to develop skills in the theory and safe use of hand tools, power machinery, computerized equipment and sophisticated precision inspection instruments. Students will learn to interpret blueprints, set up manual and Computer Numerical Controllers (CNC) machines, perform basic and advanced machining operations and make decisions to insure that work quality is maintained. Employment opportunities for machining technicians exist in manufacturing industries, public institutions, governmental agencies, and in a wide range of specialty machining job shops.

Program Length: 3 semesters

Career Pathway Options: Associate in Applied Science in Machining Technology with a Concentration in Tool, Die and Mold Making (Higher entrance standards required); Diploma in Machining Technology

Program Sites:

Lee Campus - Day Program

Harnett Campus - Day Program

### Course Requirements for Machining Technology Diploma

A. General Education Courses (9/10 SHC)		C-L-SHC
*ENG 102	Applied Communication II OR	3-0-3
ENG 110	Freshman Composition OR	3-0-3
ENG 111	Expository Writing	3-0-3
ENG 111A	Expository Writing Lab	0-2-1
*MAT 101	Applied Mathematics I OR	2-2-3
MAT 120	Geometry and Trigonometry Humanities/Fine Arts Elective	2-2-3 3-0-3

### B. Required Major Core Courses (26 SHC)

MAC 111	Machining Technology I	2-12-6
MAC 112	Machining Technology II	2-12-6
MAC 113	Machining Technology III	2-12-6

### Required Subject Areas

BPR 111	Blueprint Reading	1-2-2
BPR 121	Blueprint Reading: Mechanical	1-2-2
MAC 121	Introduction to CNC	2-0-2
MAC 124	CNC Milling	1-3-2

### C. Other Major Hours Required for Graduation (8 SHC)

CIS 111	Basic PC Literacy	1-2-2
ISC 110	Workplace Safety	1-0-1
MAC 151	Machining Calculations	1-2-2
MEC 141	Manufacturing Processes	2-2-3

Total Semester Hours Credit required for graduation: 43/44

### Semester Curriculum for Machining Technology Diploma

1st Semester (Fall)		C-L-SHC
BPR 111	Blueprint Reading	1-2-2
CIS 111	Basic PC Literacy	1-2-2
ISC 110	Workplace Safety	1-0-1
MAC 111	Machining Technology I	2-12-6
MAC 121	Introduction to CNC	2-0-2
MAC 151	Machining Calculations	1-2-2
MEC 141	Manufacturing Processes	2-2-3
		10-20-18

2nd Semester (Spring)		
BPR 121	Blueprint Reading: Mechanical	1-2-2
*ENG 102	Applied Communication II OR	3-0-3
ENG 110	Freshman Composition OR	3-0-3
ENG 111	Expository Writing	3-0-3
ENG111A	Expository Writing Lab	0-2-1
MAC 112	Machining Technology II	2-12-6
MAC 124	CNC Milling	1-3-2
*MAT 101	Applied Mathematics I OR	2-2-3
MAT 120	Geometry and Trigonometry	2-2-3
		9-19-16/17

3rd Semester (Summer)		
MAC 113	Machining Technology III Humanities/Fine Arts Elective	2-12-6 3-0-3
		5-12-9

\*These courses are not transferable to the Associate in Applied Science Degree.

Total Semester Hours Credit: 43/44

### COURSE DESCRIPTIONS

**BPR 111 Blueprint Reading** 1-2-2  
This course introduces the basic principles of blueprint reading. Topics include line types, orthographic projections, dimensioning methods, and notes. Upon completion, students should be able to interpret basic blueprints and visualize the features of a part.

**BPR 121 Blueprint Reading: Mechanical** 1-2-2  
*Prerequisites: BPR 111 or MAC 131*  
This course covers the interpretation of intermediate blueprints. Topics include tolerancing, auxiliary views, sectional views, and assembly drawings. Upon completion, students should be able to read and interpret a mechanical working drawing.

**CIS 111 Basic PC Literacy** 1-2-2  
This course provides an overview of computer concepts. Emphasis is placed on the use of personal computers and software applications for personal and fundamental workplace use. Upon completion, students should be able to demonstrate basic personal computer skills.

**ENG 102 Applied Communications II** 3-0-3  
*Prerequisites: RED 080 and ENG 090 or appropriate placement test scores*

This course is designed to enhance writing and speaking skills for the workplace. Emphasis is placed on generating short writings such as job application documents, memoranda, and reports and developing interpersonal communication skills with employees and the public. Upon completion, students should be able to prepare effective, short, and job-related written and oral communications. The computer is

used as a writing and design tool for this course. *This is a diploma-level course.*

**ENG 110 Freshman Composition** 3-0-3  
*Prerequisites: RED 080 and ENG 090 or appropriate placement test scores*

This course is the first course in a series of two designed to develop informative and business writing skills. Emphasis is placed on logical organization of writing, including effective introductions and conclusions, precise use of grammar, and appropriate selection and use of sources. Upon completion, students should be able to produce clear, concise, well-organized short papers.

**ENG 111 Expository Writing** 3-0-3  
*Prerequisites: RED 090 and ENG 090 or appropriate placement test scores*

*Corequisites: ENG 111A*

This course is the required first course in a series of two designed to develop the ability to produce clear expository prose. Emphasis is placed on the writing process including audience analysis, topic selection, thesis support and development, editing, and revision. Upon completion, students should be able to produce unified, coherent, well-developed essays using standard written English. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in English composition.

**ENG 111A Expository Writing Lab** 0-2-1  
*Prerequisites: RED 090 and ENG 090 or appropriate placement test scores*

*Corequisites: ENG 111*

This writing laboratory is designed to apply the skills introduced in ENG 111. Emphasis is placed on the editing and revision components of the writing process. Upon completion, students should be able to apply those skills in the production of final drafts in ENG 111. The computer is used as a writing and design tool for this course.

**ISC 110 Workplace Safety** 1-0-1

This course introduces the basic concepts of workplace safety. Topics include fire, ladders, lifting, lock-out/tag-out, personal protective devices, and other workplace safety issues related to OSHA compliance. Upon completion, students should be able to demonstrate an understanding of the components of a safe workplace.

**MAC 111 Machining Technology I** 2-12-6

This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, drilling machines, saws, milling machines, bench grinders, and layout instruments. Upon completion, students should be able to safely perform the basic operations of measuring, layout, drilling, sawing, turning, and milling.

**MAC 112 Machining Technology II** 2-12-6  
*Prerequisites: MAC 111*

This course provides additional instruction and practice in the use of precision measuring tools, lathes, milling machines, and grinders. Emphasis is placed on setup and operation of machine tools including the selection and use of work holding devices, speeds, feeds, cutting tools, and coolants. Upon completion, students should be able to perform basic procedures on precision grinders and advanced operations of measuring, layout, drilling, sawing, turning, and milling.

**MAC 113 Machining Technology III** 2-12-6

*Prerequisites: MAC 112*

This course provides an introduction to advanced and special machining operations. Emphasis is placed on working to specified tolerances with special and advanced setups. Upon completion, students should be able to produce a part to specifications.

**MAC 121 Introduction to CNC** 2-0-2

This course introduces the concepts and capabilities of computer numerical control machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to explain operator safety, machine protection, data input, program preparation, and program storage.

**MAC 124 CNC Milling** 1-3-2

This course introduces the manual programming, setup, and operation of CNC machining centers. Topics include programming formats, control functions, program editing, part production, and inspection. Upon completion, students should be able to manufacture simple parts using CNC machining centers.

**MAC 151 Machining Calculations** 1-2-2

This course introduces basic calculations as they relate to machining occupations. Emphasis is placed on basic calculations and their applications in the machine shop. Upon completion, students should be able to perform basic shop calculations.

**MAT 101 Applied Mathematics I** 2-2-3

*Prerequisites: MAT 060, MAT 070, or MAT 080 or appropriate placement test scores*

This course is a comprehensive review of arithmetic with basic algebra designed to meet the needs of certificate and diploma programs. Topics include arithmetic and geometric skills used in measurement, ratio and proportion, exponents and roots, applications of percent, linear equations, formulas, and statistics. Upon completion, students should be able to solve practical problems in their specific areas of study. *This course is intended for certificate and diploma programs.*

**MAT 120 Geometry and Trigonometry** 2-2-3

*Prerequisites: MAT 070, MAT 080, MAT 121, MAT 161, MAT 171, or MAT 175 or appropriate placement test scores*

This course introduces the concepts of plane trigonometry and geometry with emphasis on applications to problem solving. Topics include the basic definitions and properties of plane and solid geometry, area and volume, right triangle trigonometry, and oblique triangles. Upon completion, students should be able to solve applied problems both independently and collaboratively using technology.

**MEC 141 Introduction Mfg Processes** 2-2-3

This course covers the properties and characteristics of manufacturing materials and the processes used to form them. Emphasis is placed on manufacturing materials, heat-treating processes, and manufacturing processes. Upon completion, students should be able to identify physical characteristics of materials and describe processes used to manufacture a part.