

# Computer Numerical Control Machine Operations

## Associate of Applied Science Degree

**Program Coordinator:** Johnnie Keene • jkeene@vhcc.edu • 276-739-2455

**Length:** Four semesters (two years)

**Purpose:** In addition to satisfying the needs of those students who enroll for the four-semester program three other groups are served: First, those who have completed the **one-semester Precision Machining career studies certificate and the one-semester Advanced Precision Machining career studies certificate** programs presently being offered; second, graduates of other schools who have completed a comparable one-year program; third, machine tool operators in industry who want to upgrade their skills. The program is designed to provide both theory and shop experiences of an advanced nature in the machining field.

**Occupational Objectives:**

- Machinist
- Tool and Die Maker
- Machine Shop Supervisor
- Inspector
- Computer Numerical Control Operator and Programmer

**Admission Requirements:** Students are required to meet the general requirements of the college as contained in this catalog. Students from other schools or colleges or with appropriate industrial experience should submit transcripts or other documentation for evaluation and advanced placement.

**Program Requirements:** The Computer Numerical Control Machine Operations Curriculum consists of courses in both the machining and general education areas. Instruction will include both concepts of machining and practical applications on machine tools. Each student should consult with his/her counselor and faculty advisor in planning a program and selecting his/her electives. Upon completion of the four-semester program listed on this page, the graduate will be awarded an Associate of Applied Science Degree.

**Track 1: (Day)**

Course Number	Course Title	Lecture Hours	Lab Hours	Credits
<b>First Semester (Fall)</b>				
DRF 161	Blueprint Reading I	1	3	2
SAF 130	Industrial Safety – OSHA 10			
MAC 161	Machine Shop Practices I	2	3	3
MAC 162	Machine Shop Practices II	2	3	3
MAC 116	Machinist’s Handbook	2	0	2
SDV 101	Orientation to College Success	1	0	1
MAC 121	Numerical Control I	1	2	2
MAC 122	Numerical Control II	1	2	2
<b>Total</b>		<b>11</b>	<b>13</b>	<b>16</b>
<b>Second Semester (Spring)</b>				
MAC 111	Machine Trade Theory and Computation I	3	0	3
MAC 150	Introduction to Computer Aided Drafting	2	4	3
MAC 163	Machine Shop Practices I	2	3	3
MAC 164	Machine Shop Practices II	2	3	3
MAC 123	Numerical Control III	2	3	3
MAC 126	Introduction to CNC Programming	2	3	3
<b>Total</b>		<b>13</b>	<b>16</b>	<b>18</b>

Course Number	Course Title	Lecture Hours	Lab Hours	Credits
<b>Third Semester (Fall)</b>				
MAC 127	Advanced CNC Programming	3	0	3
MAC 209	Standards, Measurements and Calculations	3	0	3
ENG 115	Technical Writing	3	0	3
EEE	Social Science Elective <sup>1</sup>	3	0	3
MTH 111	Basic Technical Mathematics	3	0	3
<b>Total</b>		<b>15</b>	<b>0</b>	<b>15</b>
<b>Fourth Semester (Spring)</b>				
MAC 206	Production Machining Techniques	4	6	6
MAC 290	Coordinated Internship or Technical Elective <sup>2</sup>	0-3	0-15	3
EEE	Humanities Elective <sup>3</sup>	3	0	3
PED	Physical Education <sup>4</sup>	0	3	1
EEE	Social Science Elective <sup>1</sup>	3	0	3
<b>Total</b>		<b>10-13</b>	<b>9-24</b>	<b>16</b>
<b>Total Minimum Credits for AAS Degree</b>				<b>65</b>

**Footnotes:**

<sup>1</sup>Students must take 6 credits of social science. Recommended social science courses include ECO 201-202; GEO 210; HIS 101-102; HIS 121-122; PLS 135; PSY 200; SOC 200.

<sup>2</sup>Coordinated Internship: Students are encouraged to take MAC 290 after satisfactory completion of the third semester with approval of Faculty, or a student may take as a technical elective any 3 credit course with course prefix DRF, MAC, MEC, SAF, or WEL.

<sup>3</sup>Students must take 3 credits of humanities. Recommended humanities courses include ART 201, 202; MUS 121, 122; REL 200, 210, 230; CST 130, 151, 152; PHI 101; foreign language or literature.

<sup>4</sup>Students may substitute any HLT course for physical education requirements.

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### Track 2: (Evening)

Course Number	Course Title	Lecture Hours	Lab Hours	Credits
<b>First Semester (Fall)</b>				
MAC 161	Machine Shop Practices I	2	3	3
MAC 121	Numerical Control	1	2	2
SAF 130	Industrial Safety	1	0	1
SDV 101	Orientation to College Success	1	0	1
<b>Total</b>		<b>5</b>	<b>5</b>	<b>7</b>
<b>Second Semester (Spring)</b>				
DRF 161	Blueprint Reading I	1	3	2
MAC 162	Machine Shop Practices II	2	3	3
MAC 116	Machinist Handbook	2	0	2
MAC 122	Numerical Control II	1	2	2
<b>Total</b>		<b>6</b>	<b>8</b>	<b>9</b>
<b>Third Semester (Fall)</b>				
MAC 163	Machine Shop Practices III	2	3	3
MAC 150	Introduction to Computer Aided Manufacturing	2	4	3
MAC 123	Numerical Control III	2	3	3
<b>Total</b>		<b>6</b>	<b>10</b>	<b>9</b>
<b>Fourth Semester (Spring)</b>				
MAC 164	Machine Shop Practices IV	2	3	3
MAC 126	Intro to Computer Numerical Control Programming	2	3	3
MAC 111	Machine Trade Theory & Computation I	3	0	3
<b>Total</b>		<b>7</b>	<b>6</b>	<b>9</b>
<b>Fifth Semester (Summer)</b>				
ENG 115	Technical Writing	3	0	3
MTH 111	Basic Technical Mathematics	3	0	3
EEE	Social Science Elective <sup>1</sup>	3	0	3
MAC 209	Standards, Measurements, and Calculations	3	0	3
<b>Total</b>		<b>12</b>	<b>0</b>	<b>12</b>
<b>Sixth Semester (Fall)</b>				
MAC 206	Production Machining Techniques	4	6	6
MAC 127	Advanced CNC Programming	3	0	3
PED	Physical Education <sup>4</sup>	0	3	1
<b>Total</b>		<b>7</b>	<b>9</b>	<b>10</b>
<b>Seventh Semester (Spring)</b>				
MAC 290	Coordinated Internship or Technical Elective <sup>2</sup>	0-3	0-15	3
EEE	Humanities Elective <sup>3</sup>	3	0	3
EEE	Social Science Elective <sup>1</sup>	3	0	3
<b>Total</b>		<b>6-9</b>	<b>0-15</b>	<b>9</b>
<b>Total Minimum Credits for AAS Degree</b>				<b>65</b>

a student may take as a technical elective any 3 credit course with course prefix DRF, MAC, MEC, SAF, or WEL.

<sup>3</sup>Students must take 3 credits of humanities. Recommended humanities courses include ART 201, 202; MUS 121, 122; REL 200, 210, 230; CST 130, 151, 152; PHI 101; foreign language or literature.

<sup>4</sup>Students may substitute any HLT course for physical education requirements.

#### Footnotes:

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<sup>2</sup>Coordinated Internship: Students are encouraged to take MAC 290 after satisfactory completion of the third semester with approval of Faculty, or