Southern Oklahoma Technology Center  
Career Major MN020054 Syllabus  
NIMS Certified CNC Machine Operator (Entry Level)  
510 hours  

Stephen Hadwin  
e-mail shadwin@sotc.edu  
phone 580.224.8292

+++AM Class will open doors at 7:55am; Monday thru Friday+++  
+++PM Class will open doors at 12:25am; Monday thru Friday+++  

Textbook and Workbook will be supplied by Southern Tech  
Precision Machining Technology + Precision Machining Technology Workbook and Projects Manual.  

If you need accommodations due to a disability, contact your student counselor  
Stone Hall- 580.224.9441

To foster a productive learning environment, the Technology Center requires you to adhere to the Code of Student Conduct which is published in the Student Handbook and website.

Welcome! I am very excited about the opportunity to work with you this year. Believing in your ability to perform well, this Career Major will be academically and personally challenging, yet accomplishable. It is my expectation that you will grow as a learner this year via increased knowledge, hands-on work skills and the ability to think critically, applying and integrating information learned. It is also my hope that you will experience success now and in the future. You can expect this year to be filled with lively discussions, activities, projects and challenging assignments. If you are willing, I will help prepare you to enter the workforce or recognize opportunities when they arise.

SUPPORT IS AVAILABLE!!!  
It is important for you to know that support is available to you. To assist you in meeting with success, I am available each day via in my classroom/office (room 601), email and phone. I want you to reach out to me and let me know how you are doing and how I can help you achieve your goals.

Successful students reach out for help when they need it. You are encouraged to use the following supports that are available to you:  
  • Career Counselors  
  • Academic tutors or classes  
  • Your classmates – forming in-person and on-line study groups are wonderful ways to expand your support system

NIMS Certified CNC Machine Operator (Entry Level) - This career major is aligned with the highly recognized National Institute for Metalworking Skills (NIMS) and prepares students to successfully pass several of the NIMS Level One certification tests. Manual Machining skills learned in this career major include; Measurement, Materials, Safety, Job Planning, Benchwork and Layout using simple hand tools and drill presses. CNC skills that will be obtained include; CNC lathe and CNC mill operations. Upon completion students are prepared to enter the machining industry as entry level CNC Machine operators.
Who can Attend? High School Juniors & Seniors, and Adults

Class Schedule(s)

Morning Class Schedule
Enhancement 8 a.m. – 8:14 a.m.
Adult class time 8 a.m. – 11:00 a.m.
H.S. class time 8:15 a.m. – 11:00 a.m.

Afternoon Class Schedule
Enhancement 12:30 p.m. – 12:44 p.m.
Adult start time 12:30 p.m. – 3:30 p.m.
H.S. start time 12:45 – 3:30 p.m.

Location Southern Oklahoma Technology Center – (Engineering Technology Bldg) Room 602

Instructor Stephen Hadwin
Stephen Hadwin has a B.S. of Industrial Technology from Southern Illinois University of Carbondale. He is also a registered Journeyman Machinist with additional experience as an injection mold maker, tool and die maker and Product Design Engineer. Stephen has been in the manufacturing field since 1976 to present, and has worked in the Automotive, Consumer Electronics, Defense, Machinery, Medical, and Telecommunications industries.

Grade Scale
(Cumulative)
A 90-100
B 80-89
C 70-79
D 60-69
F 0-59
Grade will consist of the following weights
Shop/Lab/Projects = 60%
Class/Exams/Assignments = 40%
Grading will be accessible to you and your parents if you are a H.S. student

Certifications*
(available – based on instructor recommendation)
Measurement, Materials & Safety (NIMS)
Job Planning, Benchwork & Layout (NIMS)
Manual Milling Skills I (NIMS)
Turning Operations: Turning Between Centers (NIMS)
Turning Operations: Turning Chucking Skills (NIMS)
Grinding Skills I (NIMS)
Drill Press Skills I (NIMS)
CNC Turning: Programming Setup & Operations (NIMS)
CNC Milling: Programming Setup & Operations (NIMS)
CNC Turning: Operations (NIMS)
CNC Milling: Operations Precision Machining (NOCTI)

*Registrations and Fees may apply, minimum requirements in grades, attendance and competency will be required prior to taking any (NIMS) credentials

District(s) Served District population is 70,700 based on 2010 census data. School districts served include; Ardmore, Davis, Dickson, Fox, Greenville, Healdton, Lone Grove, Mannsville, Marietta, Plainview, Ringling, Springer, Sulphur, Thackerville, Wilson and Zaneis.
COURSE OUTLINE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>TI01686</td>
<td>Measurement, Materials and Safety</td>
<td>75.00</td>
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<tr>
<td>TI01684</td>
<td>Job Planning, Benchwork and Layout</td>
<td>75.00</td>
</tr>
<tr>
<td>TI01685</td>
<td>Drill Press</td>
<td>30.00</td>
</tr>
<tr>
<td>TI01416</td>
<td>Basic CNC Lathe Operations</td>
<td>60.00</td>
</tr>
<tr>
<td>TI01420</td>
<td>Basic CNC Mill Operations</td>
<td>60.00</td>
</tr>
<tr>
<td>TI00989</td>
<td>CNC Production Applications</td>
<td>60.00</td>
</tr>
<tr>
<td>TI01690</td>
<td>Introduction to CNC Turning</td>
<td>60.00</td>
</tr>
<tr>
<td>TI01693</td>
<td>Introduction to CNC Milling</td>
<td>60.00</td>
</tr>
<tr>
<td>TI00802</td>
<td>Workforce Staging</td>
<td>30.00</td>
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</table>

The above courses will meet career/technical standards or competencies verified by business and industry. You will learn to read, comprehend, and synthesize information from a wide range of sources within this technical field; you will demonstrate mathematical reasoning and procedures, and an understanding of major mathematics concepts that underlie this career field. In addition, you will learn to set and meet goals, even in the face of obstacles and competing pressures, you will learn to prioritize, plan, and manage work to achieve the intended result. Throughout all the training, safe practices and philosophy will be embedded in all aspects. Each course will have its own syllabus for your review.

You may earn college credit from Murray State College - Ardmore, while completing selected approved courses. Courses are approved for college credit through a cooperative alliance. Approved courses can be applied towards the completion of an Associate in Applied Technology Degree from MSC.

You must apply for enrollment EACH SEMESTER at Southern Tech for the courses you will complete that semester for college credit. An enrollment fee of $8 per credit hour will be invoiced by the college in which you are enrolled based on the number of hours you are enrolled that semester. In addition, if you are a high school student you must meet an academic qualifier in order to enroll. Check with me or your Southern Tech Alliance Counselor (580.224.9441) for information on the specific courses available for college credit within each program.

DESCRIPTION OF DESIGN & FABRICATION COURSES INCLUDED IN THIS CAREER MAJOR

**Measurement, Materials and Safety**
This course covers the following: Machine tool math fractions, basic geometry, trigonometry, and metrics; measuring systems both semi-precision and precision along with but not limited to the use of various measuring instruments; quality assurance, process planning and quality control; metal composition and classification and heat treatment of metals; maintenance, lubrication and cutting fluids; general safety guidelines including, tool and equipment identification, usage and operations; manufacturing safety rules and regulations.

**Job Planning, Benchwork and Layout**
In this course you will develop the aptitude to read and understand the significance of drawings, learning the components, symbols, notations and the aspect of geometric dimensioning and tolerance. You will discover how these interwoven workings guide you/the machinist to a finished product by using layout methods, hand tools, saws, offhand grinding and basic hole making operations.
Drill Press
You will learn drill press safety and operation. You will learn to calculate speed and feeds; perform drilling, reaming, tapping and other operations to print specifications.

Basic CNC Lathe Operations
This course covers the basic operation of CNC lathes. Topics covered include safety, set-up, and operation of various CNC machine tools required to manufacture products acceptable to industry standards.

Basic CNC Mill Operations
This course covers the basic operation of CNC milling machines. Topics covered include safety, set-up, and operation of various CNC machine tools required to manufacture products acceptable to industry standards.

CNC Production Applications
Having developed an understanding of theories and procedures of fixturing and tooling for production applications, you will apply this knowledge by completing selected projects within established tolerances. You will use standard, as well as self-designed, fixturing and tooling for production application of the lathe and surface grinder.

Introduction to CNC Turning
This course describes the different types of CNC turning machines. You will learn CNC turning nomenclature and be able to describe the machine axes used for turning. CNC turning tooling, toolholding, and tool mounting devices will be discussed, identified and described. Work holding devices and their varied uses and applications will also be discussed.

Introduction to CNC Milling
This course describes the different types of CNC milling machines. You will learn CNC milling nomenclature and be able to describe the machine axes used for milling. CNC milling tooling, toolholding, and tool mounting devices will be discussed, identified and described. Workholding devices and their varied uses and applications will also be discussed.

Workforce Staging
You will develop and produce a portfolio of work that documents completed activities that help prepare you for the realities of the workplace. Such activities may include (but are not limited to) field trips, job shadowing, guest speakers, resume writing workshops, industry visits and mentor interviews, related job interviews and teacher approved practicum’s.

Nondiscrimination Policy
It is the policy of Southern Oklahoma Technology Center not to discriminate with regard to race, color, religion, gender, national origin, age, marital or veteran status, or disabilities. This policy shall be followed in the operation of its educational programs and activities, recruitment, admissions, employment practices and other educational services. Inquiries concerning application of this policy may be directed to the Human Resources Director, who serves as the Coordinator of Title IX; Section 504; and Americans with Disabilities Act for all campuses, at 12777 N. Rockwell, Oklahoma City, OK 73142-2789, (405) 717-7799
Safety Pledge

One way, the right way, the safety way.
A safe day's work means a full day's pay,
And a chance to prepare for a rainy day.

Machine Shop Safety

Safety Glasses
EVERYONE MUST WEAR SAFETY GLASSES IN THE SHOP.
Even when you're not working on a machine, you must wear safety glasses. A chip from a machine someone else is working on could fly into your eye.

Clothes and Hair
Check your clothes and hair before you walk into the shop. In particular:
IF YOU HAVE LONG HAIR OR A LONG BEARD, TIE IT UP.
If your hair is caught in spinning machinery, it will be pulled out if you're lucky. If you're unlucky, you will be pulled into the machine.
NO LOOSE CLOTHING.
Ties, scarves, loose sleeves, etc. are prohibited
NO GLOVES
REMOVE JEWELERY
WEAR APPROPRIATE SHOES
No open toed sandals. Wear shoes that give a sure footing. If you are working with heavy objects, steel toes are recommended.

Safe Conduct in the Shop
Be aware of what's going on around you. For example, be careful not to bump into someone while they're cutting with the bandsaw (they could lose a finger!).
Concentrate on what you're doing. If you get tired, stop and leave the area.
Don't hurry. If you catch yourself rushing, slow down.
Don't rush speeds and feeds. You'll end up damaging your part, the tools, and maybe the machine itself.
Listen to the machine. If something doesn't sound right, turn the machine off.
Don't let someone else talk you into doing something dangerous.
Don't attempt to measure a part that's moving in a machine.

Machining
IF YOU DON'T KNOW HOW TO DO SOMETHING, ASK! BEFORE YOU START THE MACHINE:

Study the machine. Know which parts move, which are stationary, and which are sharp.
Double check and verify that your work-piece is securely held.
Remove all chuck keys and wrenches before turning on machine.
DO NOT LEAVE MACHINES RUNNING UNATTENDED!

CLEAN UP MACHINES AFTER YOU USE THEM!
A dirty machine is unsafe and uncomfortable to work on.
DO NOT use compressed air to blow machines clean. This endangers people's eyes and can force dirt into machine bearings.
Credentials that are available

The National Institute for Metalworking Skills (NIMS) was formed in 1995 by the metalworking trade associations to develop and maintain globally competitive American workforce. NIMS sets skills standards for the industry, certifies individual skills against the standards and accredits training programs that meet NIMS quality requirements.

NIMS operates under rigorous and highly disciplined processes as the only developer of American National Standards for the nation’s metalworking industry accredited by the American National Standards Institute (ANSI).

Candidate Registration Fee: $40.00
This is a one-time fee, applicable only to individuals seeking a first NIMS Credential. This fee must be paid before an individual is eligible to take any Online Theory Exam.

- NIMS Performance Exam - Level I: FREE!
- NIMS Online Theory Exam - Level I: $35.00 per person

There may be State assistance for credentialing fees. Ask your instructor
Skills USA

**SkillsUSA** is a student organization that every student is a member of here at Southern Oklahoma Technology Center. Its main purpose is to develop student in all professional areas of development, and to prepare student for the world of work. Levels of competition are as followed.

**Regional Level Contest**
Student from schools in our district compete. The top three finishers advance to the state competition.

**State Level Contest**
Top two finishers from the district contest for the secondary students and the top finisher for the post-secondary compete.

**National Level Contest**
The 1st place finisher at the state level competes at the national contest.

**International Level Contest**
The 1st place finisher from the USA advances to the International contest to compete.

**Student Awards**

**National Technical Honors Society**
The National Technical Honor Society is a special organization reserved only for those students that are truly professional in every way. Students must satisfy the following criteria by exhibit high moral standards, a positive attitude, and a positive work ethic. And also maintain a grade of “A” for every quarter and accumulate no more than four absences for the first semester to be eligible.

*SOTCSIP (Policy ED)*
SUPPLIES:
To Be Supplied by Student:

The following items are your responsibility and you are encouraged to bring to class the first day, they are required for class no later than 3 days after your first day of class. Failure to get supplies may prevent you from accessing shop floor

1. Leather shoe or boot. (Steel toed is not required).
2. 6” Dial Calipers (not digital). Can be found locally
   a. Staples – Item # 580558 – General Tools Caliper, Reinfor ced Plastic, 0-6”
   b. Wal-Mart – Item # 75-4850 - Trademark Tools, 6” Dial Vernier Caliper
   c. Sears – Item# 00912811000 – Trademark Tools, 6” Dial Vernier Caliper
3. 6” Pocket Ruler (steel)
   a. Lowes – Item# 186495 – General Tools & Instruments 6” Pocket Ruler
   b. Staples – IHI2745 – KD Tools Ruler 6 inch Pocket Stainless Steel w/Pocket Clip
   c. Sears – Item# 00940822000, Model 641, General Tools 6 in. Flexible Marking Rule
4. 10’ Flexible Tape Measure (Stanley, Kobalt, Lufkin, etc.)
5. Notebook 3-ring Binder 1” wide
6. Paper for Notebook Binder
7. Mechanical Pencil or Pencils w/eraser

Required Protective Clothing for Working in the Shop (See form on page 13)

1. Shoes (see above)
2. Full length Pants (no shorts of any kind)
3. Socks (cover above ankles)
   If you have difficulty locating or getting any item above or if you need assistance, please come see me.

To Be Provided by the School

All items listed below will be supplied by SOTC

1. Safety glasses (will be issued one time by Southern Tech, thereafter you are responsible for safety glasses.)
   a. Safety Glasses (ANSI Z87.1 with side protection and clear lens) Can be found locally see the following;
      i. Staples – Item #333821 - Crews, Inc. Yukon Safety Glasses, Clear Lens
      ii. Lowes – Item # 79801 - 3M Clear Plastic Safety Glasses
      iii. Wal-Mart – Item #001049518 - Chase Ergonomic Clear Lens Sports Frame
      iv. Tractor & Supply – Item #4024925 – Uvex Safety Polysafe Clear Lens
2. Calculator
3. Locker
4. Textbooks
5. Workbooks
6. Materials for Projects
8. Machine(s)
7. Computer Headphones, headset, or ear buds to plug into the desktop computer’s audio jack.
8. Safe work environment
Make Up Policy

If you are absent, it is your responsibility to fill out a “Request for Make Up” forms (see page 12), and turn it into the instructor the same day you return to class. The request form will be given back to you the next day with a list of missed assignments and a required completion date for each assignment. All work not turned in by the completion date will be assigned a “zero” score.

Classroom

♦ Be in the classroom and in an assigned seat when the bell rings.
♦ Be Prepared
♦ Be Attentive
♦ Be Considerate of other classmates
♦ Be Responsible
♦ Be Safe
♦ Be Ready to participate and contribute

The instructor will dismiss the class not the bell.

Students must have a pen or pencil and paper available for each day of class.

Teacher Expectations of Students:

- Be considerate of others at all times.
- Respect property belonging to school and others.
- Do your best work. Be Attentive, Be Aware of your surroundings
- No horseplay.

Students Expectations of the Teacher:

- Provide interesting and useful information; which promotes skills in the manufacturing industry.
- Provide a learning environment that is comfortable, safe, stimulating, free from threat, and generates productive work.
- Provide clear and concise objectives
- Authority and Leadership
- Equal opportunity as an individual and as a group

Locker Responsibilities

- Each student is responsible for keeping his or her locker clean and in order.
- Always lock your locker when you are not using it
- Do not share lockers with other students.
- Provide the instructor a key or combination to your lock
Shop Procedures and Responsibilities

- Shop floor safety test score of 100% before allowed on the shop floor, unless accompanying instructor in a lab activity.
- Prior to operating a machine tool or process, the student must pass the safety test specific to that machine tool or process with a score of 100%.
- All student information forms must be filled out completely before student is allowed to work in the shop.
- Safety glasses must be worn at all times in the shop.
- Proper clothing is required to work in the shop. Shoes, pants. (At no time are shorts permitted in the shop or the classroom).
- Horseplay is unsafe and is never allowed. Anywhere!
- Absolutely no personal projects unless approved by the instructor.
- Shut off machines when leaving your work area.
- Do not waste materials.
- Report any broken equipment or dangerous situations.
- All students are required to stay busy at all times. Standing around is never permitted.
- Use only the material that has been approved by the instructor.
- Nobody is allowed in the classroom or shop floor unless approved by the instructor.
- Wear only proper and safe clothing.
- Be back in classroom no later than five minutes left in class.

Clean Up Duties and Responsibilities

- Cleanup will start no earlier than 20 minutes before time to leave school.
- Clean up machines workstations after use.
- Clean up assigned area and work area that you worked in for that day.
- Put trash and steel in correct locations. (Steel storage racks, trash cans, scrap bins, etc.)
- Do not sweep trash under any of the machines or in corners.
- Return brooms and dust pans to assigned locations when finished.
- The last 45 minutes of every Friday will be set aside for a major shop clean up period.

Projects

- Personal projects are not allowed unless pre-approved by the instructor.
- Projects can only be worked on during times that have been approved by the instructor.
- All materials used in personal projects must be paid for prior to completion.
- Only approved materials can be used for personal projects.
- Personal projects will not be allowed to start until the beginning of the second semester unless approved by the instructor.
Disciplinary Process (Due Process)

- The primary purpose of having rules is to make sure that each student has the opportunity to learn without interference and in a safe environment. If students choose not to follow the rules and procedures given to them by the school and this class, the chart outlines the steps that will be followed to correct this problem.
- Depending on the severity of the violation, the instructor has the right to skip one or more of the due process procedures as he sees fit.

Design & Fabrication (Disciplinary Form)

Student’s Name: 

Course/Instructor: 

Description of Problem: 

| Warning | V | 
|---------|---|---|
| 1st     |   | Verbal Warning |
| 2nd     |   | Design & Fabrication Disciplinary form completed and placed in students file |
| 3rd     |   | Design & Fabrication Disciplinary form completed, parents called and placed in students file |
| 4th     |   | Design & Fabrication Disciplinary form completed, parent/teacher/administrator conference (4th offense may result in dismissal from school) |

If 3rd or 4th Warning, complete the following:

Action taken: 

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Date: ____________ Instructor Signature: ______________________________
Request for Make-Up work/assignments

I, _________________________, am requesting an opportunity to make-up work due to my absence on _______/_____/_____. I understand that this request must be turned in the day I return to class. I also understand that I must complete any make-up work by the completion date assigned by my instructor in Product Development. Any work not turned in by the assigned completion date will result in a “zero” for that activity.

Depending of type of absence, the overall grade may be adjusted by a factor of 0.90 for make-up assignments. An adjustment of 10% may be factored in final score, (example, a graded score of 96 will result in a make-up score of 86.4 (86.4 = .9*96).

Tests missed due to an absence must be made up on the day of returning to class. The instructor reserves the right to administer a different test as a make-up test. Tests not made up on the day of return will result in a “zero” score.

SOTC attendance guidelines may override this form. SOTC expects students to be in attendance for classes, this policy is no different than what an employer will expect. Non-attendance, tardiness, and poor work habits will most likely result in termination at an employer’s business.

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<th>Assignment</th>
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Instructor: ____________________________    Date: ________________

Student: _____________________________
**Dress Code**

Due to the nature of manufacturing processes the student will be exposed to, for safety reasons, the following dress code policy will be followed:

*Shoes or Boots* – Full leather wrap on toes, insoles, heels. Tennis shoes are not acceptable unless they are found on this website - [http://www.safeshoes.com/category/athletic-safety-shoes.htm](http://www.safeshoes.com/category/athletic-safety-shoes.htm)

*Full length pants* – no shorts or exposed ankles, knees or shins. No restriction on shirts (must follow school guidelines), shirts will be tucked into pants, *no loose or baggy clothing* that can get caught in the moving parts of machinery.

*Socks* – must cover above the ankles

*Jewelry* - Rings and wrist bracelets to be removed before entering the shop floor. Necklaces to be tucked inside the shirt, unless they have breakaway safety clasp.

I, ____________________________, acknowledge that the above dress code is mandatory and that I will not be allowed on the manufacturing shop floor without meeting these requirements.

Instructor – Stephen Hadwin, 580.224.8292

As of August 14, 2014
Design & Fabrication

Parent/Guardian and Student Signature Page

This Career Major Syllabus is considered a **contract** between the student, and/or Parent/Guardian and the instructor.

I/We

________________________________________________________________________

________________________________________________________________________

have read and understand the syllabus. Any questions pertaining to the syllabus will be directed to the instructor.

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
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Alternate form of contact for a parent of a High School Student:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Instructor: ___________________________  Date: ___________________________

Signed copies will be provided to student and/or parent/guardian