

## Class Syllabus – Spring Semester, 114 Academic Year

### Department of Mechanical Engineering, National Chung Cheng University

Course Name: : Machine Shop Practice ( II )				Dept.		ME
				Course Code		4221052-02 4211052-02
Instructors	<b>Hsiang-chiu Wu</b>	Credits	1	Compulsory /Elective	Grade	First year student
EMI	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Course type	<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Humanistic Care Course  <input checked="" type="checkbox"/> Problem-oriented Course  <input checked="" type="checkbox"/> Integrate the curriculum  <input checked="" type="checkbox"/> Internship         </div> <div> <input type="checkbox"/> Competition Special Course  <input checked="" type="checkbox"/> Topic-based courses  <input checked="" type="checkbox"/> Practical courses  <input type="checkbox"/> Other         </div> </div>					
<p>Prerequisites: Machine Shop Practice (I)</p> <p>Class Description :</p> <p>This course serves as a continuation of the previous semester's instruction on traditional machine tools. It is designed to enhance students' ability to independently apply the machining knowledge and practical experience acquired during <b>Factory Internship (I)</b>. Students will be required to independently complete assigned workpieces, adhering to specified dimensional and quality standards.</p> <p>In addition to traditional machining practices, this course introduces students to <b>Computer Numerical Control (CNC) machine tools</b>. Instruction will include both theoretical knowledge and practical demonstrations, using the students' own workpieces from Factory Internship (I) as teaching examples for CNC operation and programming.</p> <p>Through this integrated approach, students will not only develop hands-on experience with CNC machining, but also gain a deeper understanding of its critical role in <b>modern manufacturing and precision engineering</b>.</p> <p>Class Objective :</p> <ul style="list-style-type: none"> <li>Apply traditional machining techniques to complete precision components independently.</li> <li>Interpret technical drawings and specifications to meet required tolerances.</li> <li>Understand the operational principles and basic programming of CNC machine tools.</li> <li>Demonstrate the ability to set up and operate CNC machinery safely and effectively.</li> <li>Recognize the significance of CNC technology in the context of modern manufacturing processes.</li> </ul>						
Textbooks	Instructor-compiled handouts					
An overview of the main points of teaching						
Teaching Materials	<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> PPT  <input checked="" type="checkbox"/> Self-edited textbooks  <input checked="" type="checkbox"/> Self-made instructional videos         </div> <div> <input type="checkbox"/> Course handouts  <input checked="" type="checkbox"/> Teaching Procedures  <input type="checkbox"/> Other         </div> </div>					

Teaching Methods	<input type="checkbox"/> Lectures <input checked="" type="checkbox"/> Oral presentation <input type="checkbox"/> Case studies		<input type="checkbox"/> Group discussion <input type="checkbox"/> Problem-oriented learning <input type="checkbox"/> Other			
Evaluation Tools	<input checked="" type="checkbox"/> Mid-term Exam <input type="checkbox"/> In-class Quiz <input type="checkbox"/> Homework <input type="checkbox"/> Final Report <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Final Exam <input checked="" type="checkbox"/> In-class homework <input type="checkbox"/> Mid-term Report <input type="checkbox"/> Special Report <input type="checkbox"/> Scales			
Teaching Resources	<input checked="" type="checkbox"/> Course website <input type="checkbox"/> Electronic files of textbooks are available for download <input type="checkbox"/> Internship website					
Instructor's Information	Hsiang-chiu Wu 0928911273 houselightnel@gmail.com					
Course Outlines		Teaching Hours				Core Competence
Unit Title	Contents	Lectures	Demo	Practice	Other	
Conventional manual machining	<ul style="list-style-type: none"> <li>Hands-on Manual Lathe Machining</li> <li>Hands-on Manual Milling Machine Machining</li> <li>Hands-on Bench Work</li> <li>Workpiece Machining Practice and Tolerance &amp; Fit</li> </ul>	3		6		B4, B5, B6, B7, B9
CNC Turning Operations	<ul style="list-style-type: none"> <li>Introduction to CNC Lathe Principles and Machine Structure</li> <li>CNC Lathe Programming: Code Explanation and Practical Instruction</li> <li>CNC Lathe Cutting Operations and Key Operating Considerations</li> <li>Hands-on Practice in CNC Lathe Operation</li> </ul>	3	3	12		B4, B5, B6, B7, B9
CNC Milling Operations	<ul style="list-style-type: none"> <li>CNC Milling Machine Basics</li> <li>CNC Milling Programming</li> <li>CNC Milling Operations &amp; Safety</li> <li>CNC Milling Practice</li> </ul>	3	3	12		B4, B5, B6, B7, B9
Achievable Core Competence		Achievable Objective				
B4	Programming & CAD skills	Basic NC programming				
B5	Mechanical & opto-mechatronic design and process planning	Machining process & process planning				
B6	Problem identification, analysis & solving	Lathe/mill/bench work/CNC operation planning & troubleshooting				
B7	Hands-on implementation & innovation	Produce parts to drawing specifications				

B9	Teamwork, communication & project management	Collaborate with teammates on methods & techniques
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### **Core competencies of the University Division**

- B1 Possess the ability of basic engineering mathematics, solid mechanics, heat flow mechanics, automatic control, materials science and opto-mechanical integration engineering practical analysis
- B2 Ability to absorb and integrate cross-domain knowledge
- B3 Ability to perform solid force experiments, heat flow experiments, mechanical project implementation, optoelectronic engineering experiments and analyze data
- B4 Ability to write programming languages and computer-aided design
- B5 Mechanical and opto-electromechanical systems, component design and process planning capabilities
- B6 Ability to identify, analyse and solve professional problems
- B7 Ability to implement and innovate
- B8 Ability to engage in scientific writing and presentations
- B9 Ability to work as a team, communicate effectively and manage the program
- B10 Learn general knowledge and demonstrate the ability of engineering ethics, social responsibility and sustainable development

Weekly teaching plan				
Course Time	Course Location	Grading	Office hour	Teaching quality evaluation method
Friday. 10:00~13:00	Machine Shop R102	1. Midterm Exam: 10% 2. Attendance: 30% 3. Hand-on work: 30% 4. Final Exam: 30%	Friday. 09:00~13:00	Questionnaire
Weeks	Teaching & Homework Progress			Note
1	Preparation Week / Course Overview & Semester Tasks			
2	Introduction to CNC Machine Principles and Machine Structure			
3	CNC Programming: Code Explanation and Practical Instruction			
4	Midterm Exam			
5	Semester Project Implementation / CNC Machining Operations			
6	Semester Project Implementation / CNC Machining Operations			
7	Semester Project Implementation / CNC Machining Operations			
8	Semester Project Implementation / CNC Machining Operations			
9	Semester Project Implementation / CNC Machining Operations			
10	Semester Project Implementation / CNC Machining Operations			
11	Semester Project Implementation / CNC Machining Operations			
12	Semester Project Implementation / CNC Machining Operations			
13	Semester Project Implementation / CNC Machining Operations			
14	Semester Project Implementation / CNC Machining Operations			
15	Semester Project Implementation / CNC Machining Operations			
16	Semester Project Implementation / CNC Machining Operations			
17	Final Exam(Hands-on operations)			
18	Final Exam(Hands-on operations)			

