

ERASMUS+ PROGRAMME Project Number: 610238-EPP-1-2019-1-JOEPPKA2-CBHE-JP

Project Title: traditional craft Heritage training, design and marketing in Jordan and Syria

Course Outline

Module 5 – Engineering Workshops

Authors	Training and Technical Group (TTG) Scientific and Supervising Committee (SC)
WP Number	WP5 / DEVELOPMENT Make traditional crafts skills competency development an integrated part in Teaching
WP Leader	UNIFI
Course Offered by	ZUJ, TU, ABU
Total number of pages	6

Project Coordinator

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Al-Zaytoonah
University of
Jordan



The University of Jordan



Jordan University of
Science and
Technology



The Hashemite University



Karmeh Design Studio



Tishreen
University



جامعة
المنارة
Manara University



Al-Baath University



World University Service
of the Mediterranean



Blue Room Innovation



CESIE



Università degli Studi di
Firenze



Università degli
Studi Guglielmo
Marconi



Technische Hochschule
Ostwestfalen-Lippe

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ENGINEERING WORKSHOPS, COURSE SYLLABUS					
Course Code		Course Title	MANUFACTURING PROCESS	Cr.hr. ECTS	3 6
Class Room		Time			
		Semester			
Instructor(s)			Email:		Phone:
Office Hours	As assigned in instructors schedules on the system & in front of their offices doors				

COURSE DESCRIPTION: (ACCORDING TO THE CURRICULUM):

The course is designed to introduce students to fundamental engineering workshops principles and practices through hands-on projects and activities. The course aims to develop practical skills in design, fabrication, assembly, and testing across multiple engineering disciplines. Through a series of structured workshops and projects, students will gain experience in: basic process in welding, metal cutting process such as milling and lathe using CNC machine, and various tools, machines and methods used in Carpentry shop.

COURSE OBJECTIVE:

The objectives of this course are to help students:

1. Learning how to safely and effectively use various tools and equipment required for different manufacturing processes, such as saws, drills, lathes, kilns, etc.
2. To familiarize students with basic engineering tools, equipment, and techniques used in design and fabrication processes
3. Basic process in welding
4. Metal cutting process such as milling and lathe using CNC machine
5. Various tools, machines and methods used in Carpentry shop

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STUDENT PERFORMANCE CRITERIA:

Based on HANDS Learning Outcomes:

- LO3: Apply traditional craft skills through hands-on training sessions or workshops, demonstrating proficiency in selected techniques.
- LO5: Critically assess the role of technology in preserving, promoting, and innovating traditional craft practices.
- LO18: Knowledge of the materials traditionally used in crafts, including their properties, sourcing, preparation, and appropriate usage. This involves understanding natural materials like clay, wood, fibers, or metals, as well as any modern substitutes or adaptations.
- LO19: Apply traditional design principles to the manufacturing processes, ensuring that design work reflects the aesthetic and functional qualities inherent in traditional craft objects. This includes considerations of form, function, ornamentation, and cultural symbolism.
- LO21: Optimizing manufacturing processes for efficiency and productivity. This includes streamlining workflows, minimizing waste, and maximizing output without compromising quality.

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COURSE CONTENT:

Week #	Topic	Type	Grading
W1	Safety procedures for using tools and equipment, including proper handling, maintenance, and personal protective equipment		
W2	Introduction to Materials: Understanding different materials used in crafts, including wood, metal, and their properties.		
W3	Identification and explanation of tools and equipment: i.e. Identification and explanation of tools and equipment used in crafting, including hand tools (e.g., chisels, hammers, saws), power tools (e.g., drills, sanders, routers), and specialized equipment (e.g., NC, Lazer, Electric oven, saws).		
W4			
W5	Welding Metals: Basic process in welding.		
W6	CNC Machine		
W7	Assignments and projects that allow students to apply learned techniques and concepts to manufacturing process	Project 1	Total 30%
W8	Metal Cutting: Metal cutting process such as milling and lathe using CNC machine.		
W9	Carpentry: Various tools, machines and methods used in Carpentry shop.		
W10	Manufacturing techniques such as carving, sculpting		
W11	Assignments and projects that allow students to apply learned techniques and concepts to manufacturing process	Project 2	Total 30%
W12			
W13	Designing and prototyping a new product using CAD (Computer-Aided Design) software. Utilizing 3D printing or CNC machining to produce prototypes.		
W14			
W15	Final submission for Projects and discussion students to demonstrate their skills, creativity, and craftsmanship developed throughout the course.		
* For each project: the specific schedule is within the project description.			

GRADING:

- Grading will be based on class work and participation, and projects, assignments and quizzes. 60% of your total grade is the accumulation of grades earned on projects divided by two main projects, in addition to the final project (40%) as follow:

No.	Type	Start Week	Submit. Week	Weight
1	Project # 1:	7	10	30%
2	Project # 2:	10	15	30%
			TOTAL	60%
3	Final Exam, class work and Assignments			40%
			TOTAL	100%

- All lectures and project demonstrations take place at the beginning of the class time and will not be repeated. When you are absent or late it is your responsibility to get the missed work from your classmate.

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- **Portfolio and Documentation of Design Work:** Students are required to document all studio work in Digital copies of design work.

REFERENCES:

- **References:**
- Engineering Workshop, Lindsay way, 1st edition, Oxford University Press, USA.
- Introduction to Welding engineering, Strahl, Richard A, 1st edition, Kendall Hunt Publishing.
- Carpentry and construction, Mark R Miller, 3rd edition, McGraw-Hill Professional.
- Model Engineering: A guide to Model Workshop Practice, Henry Greenly, 1st edition , Merchant Books
- **Handouts:** To be introduced and handed to the students as needed.

ATTENDANCE POLICY:

Attendance policy:

- Attendance will be checked at each class and the university regulations will be strictly followed for student exceeding the maximum rate of absences.
- Late attendance will be considered as an absence.
- Late submissions will not be considered.
- Submissions without follow up with the direct instructor will not be evaluated.

CHEATING POLICY:

Cheating is not tolerated and against the university rules. Cheating will result in failing the course and reporting the incident to the dean of the college of architecture and design.

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List of Suggested Projects in Accordance with HANDS LOs

Week	Project / Task	points
2-4	<p>Project 1: Woodworking Projects: using CNC techniques.</p> <p>Using equipment at HANDS workshops Building a simple wooden furniture piece such as a stool, bench, or side table using joinery techniques like mortise and Tenon, dovetail, or box joints.</p> <p>Project follow up</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyzing case studies, <input type="checkbox"/> Build 3D model, Composition, Sequence of Experiences, construction of 3D object 	
2-4	<p>Project 2: Woodworking Projects: using CNC techniques.</p> <p>Using equipment at HANDS workshops Carving a decorative relief panel or sculpture from a block of wood, exploring different carving tools and techniques.</p> <p>Project follow up</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyzing case studies, <input type="checkbox"/> Build 3D model, Composition, Sequence of Experiences, construction of 3D object 	
2-3	<p>Project 3: Ceramics Projects:</p> <p>Using equipment at HANDS workshops Decorating ceramic pieces with surface treatments such as glazing, graffito, carving, or underglaze painting.</p> <p>Project follow up</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyzing case studies, <input type="checkbox"/> Build 3D model <p>Composition, Sequence of Experiences, construction of 3D object</p>	
2-3	<p>Project 2: Woodworking Projects: using CNC techniques.</p> <p>Using equipment at HANDS workshops Joinery Box: Design and construct a small box using different joinery techniques such as dovetail, finger joints, or box joints. Students will learn precision cutting, assembly, and finishing techniques.</p> <p>Project follow up</p>	

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	<input type="checkbox"/> Analyzing case studies, <input type="checkbox"/> Build 3D model, Composition, Sequence of Experiences, construction of 3D object	
2-3	<p>Project 5: Plastic Injection Molding: Using equipment at HANDS workshops Designing molds for plastic parts using CAD software. Operating injection molding machines to produce plastic components.</p> <p>Project follow up</p> <input type="checkbox"/> define colour procedures <input type="checkbox"/> apply the glazing Composition, Sequence of Experiences, construction of glazed object	