

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 – Manufacturing Process

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

#### Project Coordinator

Dr.Loai Dabbour  
Al-Zaytoonah University of Jordan (ZUJ)  
Airport Street  
Tel: +062 6 4291511 Ext. 112 / Fax: +962 6 4291432  
Email: [HANDS@zuj.edu.jo](mailto:HANDS@zuj.edu.jo)  
Project website: <https://www.zuj.edu.jo/HA>



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

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

MANUFACTURING PROCESS, 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):

Introduction to manufacturing-g; Fundamental properties of materials, Forming and shaping processes, such as carving, sculpting, rolling, forging, extrusion, drawing, sheet metal forming, powder metallurgy; Fundamentals of machining, machining processes, machine tool materials and advanced machining processes Metal casting fundamentals and metal casting processes; Joining processes; Surface technology.

### 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. Developing proficiency in specific manufacturing techniques, such as carving, sculpting, casting, forging, etc.
3. Cultivating the ability to troubleshoot and overcome challenges encountered during the manufacturing process, such as material limitations, tool malfunctions, or design flaws.
4. Developing skills on Fundamentals of metal forming
5. Understanding different materials used in crafts, including wood, metal, ceramics, textiles, etc., and their properties.

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

## STUDENT PERFORMANCE CRITERIA:

### Based on HANDS Learning Outcomes:

- LO12: Explore creative expression and innovation within traditional craft design. This involve experimentation with materials, techniques, and forms to create contemporary interpretations of traditional crafts.
- LO18: Knowledge of the materials traditionally used in crafts, including their properties, sourcing, preparation, and appropriate usage. This involve 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

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

### COURSE CONTENT:

Week #	Topic	Type	Grading
W1	Introduction to Materials: Overview of commonly used materials in crafts such as wood, metal, ceramics, glass, and fibers.		
W2	Properties of different materials including strength, flexibility, texture, and suitability for various crafting processes.		
W3	Safety procedures for using tools and equipment, including proper handling, maintenance, and personal protective equipment		
	Identification and explanation of tools and equipment: i.e. CNC, Lazer, Electric oven, saws, equipment		
W4	Assignments and projects that allow students to apply learned techniques and concepts to manufacturing process	Project 1	Total 20%
W5	Fundamentals of metal forming		
W6	Machining		
W7	Manufacturing techniques such as carving, sculpting		
W8	Assignments and projects that allow students to apply learned techniques and concepts to manufacturing process	Project 2	Total 20%
W9	Molding, casting, forging		
W10	Powder Metallurgy		
W11	Welding		
W12	Surface Technology		
W13	Assignments and projects that allow students to apply learned techniques and concepts to manufacturing process	Project 2	Total 20%
W14	Designing and prototyping a new product using CAD (Computer-Aided Design) software. Utilizing 3D printing or CNC machining to produce prototypes.		
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.			

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

### 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:	4	8	20%
2	Project # 2:	8	13	20%
3	Project # 3:	13	15	20%
<b>TOTAL</b>				<b>60%</b>
3	Final Exam, class work and Assignments			40%
<b>TOTAL</b>				<b>100%</b>

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

### REFERENCES:

- References:**
- Manufacturing Engineering and Technology, Serope Kalpakjian, Steven R. Schmid, 7th Edition, Prentice Hall, 2011.
- 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.

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

### List of Suggested Projects in Accordance with HANDS LOs

Week	Project / Task	points
2-3	<p><b>Project 1: Forging a decorative object such as candle holders using CNC techniques.</b></p> <p><b>Using equipment at HANDS workshops</b>  <b>Lecture 1: Metal forging</b>  <b>Project follow up</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analyzing case studies,</li> <li><input type="checkbox"/> Build 3D model</li> </ul> <p>Composition, Sequence of Experiences, construction of 3D object</p>	
2-3	<p><b>Project 2: Fabricating a metal jewelry piece using laser machines, sawing, filing, and polishing.</b></p> <p><b>Using equipment at HANDS workshops</b>  <b>Lecture 1: laser machine properties</b>  <b>Project follow up</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analyzing case studies,</li> <li><input type="checkbox"/> Build 3D model</li> </ul> <p>Composition, Sequence of Experiences, construction of 3D object</p>	
2-3	<p><b>Project 3: Casting metal sculptures using casting process, exploring mold-making and metal finishing techniques.</b></p> <p><b>Using equipment at HANDS workshops</b>  <b>Lecture 1: casting, forging</b>  <b>Project follow up</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analyzing case studies,</li> <li><input type="checkbox"/> Build 3D model</li> </ul> <p>Composition, Sequence of Experiences, construction of 3D object</p>	
2-3	<p><b>Project 4: Product Design and Prototyping:</b></p> <p><b>Using equipment at HANDS workshops</b>  Description of Project 4: Designing and prototyping a new product using CAD (Computer-Aided Design) software.  Utilizing 3D printing or CNC machining to produce prototypes.  <b>Project follow up</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analyzing case studies,</li> <li><input type="checkbox"/> Build 3D model</li> </ul> <p>Composition, Sequence of Experiences, construction of 3D object</p>	

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

2-3	<p><b>Project 5: Plastic Injection Molding: Using equipment at HANDS workshops</b></p> <p>Description of Project 5: Designing molds for plastic parts using CAD software. Operating injection molding machines to produce plastic components.</p> <p><b>Project follow up</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> define colour procedures</li> <li><input type="checkbox"/> apply the glazing</li> </ul> <p>Composition, Sequence of Experiences, construction of glazed object</p>	
-----	--	--