Basic data of the subject	
Academic Unit:	Faculty of Architecture, Design and Wood Technology
Program:	Design and Construction of Wooden Products
Subject title:	CNC Machines
Study level:	Bachelor
Subject status:	Mandatory
Years of study:	III
Number of hours per week:	3
Value of credits – ECTS:	4
Time / location:	UASF
Lecturer of the subject:	MSc. Bujar Jashari
Contact details:	bujar.jashari@ushaf.net
Subject description:	During the course, students will be able to analyze the elementary dimensions of wood products, make their comparison by raising complex nature problems. They will be able to do basic programming using CNC machine software. They will know how to put in place the necessary data on the ArtCam and Vectric Aspire programs to work from controllers to practical work through the Mach3 program. Apart from these, the possibilities of importing engineering vectors from AutoCad and other programs will be taught, which will be converted to the CNC machine for production process.
Purpose of subject:	The purpose of this subject is to provide the student with general knowledge on the methodology and concepts for designing CNC machines in order to achieve high precision production of modern products. Through this subject, students will develop their skills in product preparation that will go through CNC machine operations, such as Drilling, Milling, Cutting etc.
Expected learning outcomes:	After completion of this module, students will be able to: • Learn main design principles with CNC machines • Improve the performance and reliability of the machine • Design high-precision systems • Program machines for production etc. • Lead the application of the works from

	the starting point to the end of the wood product

Contribution to student workload (which should correspond to the students learning outcomes)			
Activity	**Hours**	**Days/week**	**Total**
Lectures	2	15	30
Theoretical / laboratory exercises	2	15	15
Practical work	5	3	15
Contacts to the Lecturer / Consultations	1	5	5
Field exercises	2	5	10
Tests, student seminars	1		
Home work	2	5	10
Time of self-study (in the library or home)	2	5	10
Final preparation for the exam			
Time spent in assessment (tests, quiz, final exam)	2		2
Projects, presentations, etc.	3	1	3
Total			**100**

Teaching methodology:	Lectures, Teamwork, Lab. work, Practical visits (work)
Assessment methods:	Final exam 50% Project 50%
Literature	
Basic literature:	1. KTH V. Stenberg Student CNC Guide 2. Steve K.& Arthur G. Computer Numerical Control CNC 3. Dr. Tamer M. CNC Hardwer and Tooling Basics

Designed plan of teaching:	
Weeks	**Lecture to be held**
Week 1:	History of Computer Numerical Control (CNC)
Week 2:	Benifits of CNC machines
Week 3:	Required space for developing work with CNC machines

Week 4:	Safety rules for CNC machines
Week 5:	Electrical requirements for normal work in CNC machine
Week 6:	Total management of the process in the CNC machine
Week 7:	Machine tools, knowledge for their selection
Week 8:	CNC Machine Components (Controller, Working Bank, Axles, Cutting Parameters)
Week 9:	Identification of machines based on adjusion of tables in CNC machine (X, Y machines; Pendulum machines)
Week 10:	CNC Machine Software (G-Codes, Post Processors)
Week 11:	The basics of programming
Week 12:	Cartesian system of coordinates
Week 13:	Application of CAD / CAM software, Vectric Aspire, ArtCam, Mach3/4
Week 14:	Application of software work to practical work
Week 15:	Presentation of seminars from students