STUDY PROGRAMME: FURNITURE AND WOOD ENGINEERING

General information

Study programme title	FURNITURE AND WOOD ENGINEERING
Institution	Faculty of design and technology of furniture and interior - Skopje
Duration of studies / ECTS	4 years / 8 semesters / 240 ECTS
Admission criteria	General conditions: In accordance with the legislation and regulations of the University "Ss. Cyril and Methodius "in Skopje
General and specific competences	The Bachelor of science in design and technologies of furniture and interior – study programme: furniture and wood engineering is professionally involved in the following activities: sawmill wood processing, veneerboards manufacturing, chipboards manufacturing, furniture and interior manufacturing, joinery and carpentry manufacturing, packaging and special wood products, chemical wood processing, wood and wood products trading, furniture design and other wood products interior and exterior.
Academic title acquired with graduation	Bachelor of science in design and technologies of furniture and interior – study programme: furniture and wood engineering

Study programme plan: FURNITURE AND WOOD ENGINEERING

I SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	111	Mathematics	3	2	6
2	112	Descriptive Geometry	3	2	6
3	211	Wood Anatomy	2	2	6
4		Elective course (Group A1)	2	2	6
5		Elective course (Group A1)	2	2	6
			12	**10**	**30**
No.	**Elective course - GROUP A1** (student chooses 2 courses)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	311	Styles and Decoration	2	2	6
2	411	Wood Carving	2	2	6
3	412	Wood Plastification	2	2	6

II SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	221	Chemical Wood Processing	2	2	6
2	121	Technical Properties of Wood	3	2	6
3	122	Technical Mechanics	3	2	6
4		Elective course (Group A2)	2	2	6
5	422	ELECTIVE COURSE - UNIVERSITY LIST	2	2	6
			12	**10**	**30**
No.	**Elective course - GROUP A2** (student chooses 1 course)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	321	Anthropometry and Ergonomics	2	2	6
2	421	Artistic Expression and Plastic Forming	2	2	6

III SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	231	Theory of Wood Cutting	2	2	6
2	531	Machines and Energetics	3	2	6
3	131	Auxiliary Materials	3	2	6
4		Elective course (Group B1)	2	2	6
5	432	ELECTIVE COURSE - UNIVERSITY LIST	2	2	6
			12	**10**	**30**
No.	**Elective course - GROUP B1** (student chooses 1 course)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	431	Wood in Construction	2	2	6
2	331	Engineering Graphics	2	2	6
3	332	Elements of Furniture and Interior Design	2	2	6

IV SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	541	Internal Transport	3	2	6
2	542	Sawmill and primary wood processing technology	3	2	6
3		Elective course (Group B2)	2	2	6
4		Elective course (Group B2)	2	2	6
5	443	ELECTIVE COURSE - UNIVERSITY LIST	2	2	6
			12	**10**	**30**
No.	**Elective course - GROUP B2** (student chooses 2 courses)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	441	Technology of Adhesive Wood Bonding	2	2	6
2	341	Economics	2	2	6
3	442	Management	2	2	6

V SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	151	Elements of wood joints	3	2	6
2	551	Veneers and veneered panels	3	2	6
3	251	Hydro-thermal wood processing	2	2	6
4		Elective course (Group C1)	2	2	6
5		ELECTIVE COURSE - UNIVERSITY LIST	2	2	6
			12	**10**	**30**
No.	**Elective course - GROUP C1** (student chooses 1 course)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	451	Occupational Safety	2	2	6
2	351	Furniture and Interior Design	2	2	6

VI SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	161	Furniture and Interior Construction	3	2	6
2	561	Particle boards and fiberboards	3	2	6
3		Elective course (Group C2)	2	2	6
4		Elective course (Group C2)	2	2	6
5	162	Practical work 1	0	4	6
			10	**12**	**30**
No.	**Elective course - GROUP C2** (student chooses 2 courses)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	461	Doors and windows joinery	2	2	6
2	761	Wood Quality Testing	2	2	6
3	462	Wooden Prefabricated Objects	2	2	6

VII SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	171	Technology of furniture and final products	4	3	6
2	172	Organization of Production	3	2	6
3		Elective course (Group D1)	2	2	6
4		Elective course (Group D1)	2	2	6
5	173	Practical work 2	0	4	6
			11	**13**	**30**
No.	**Elective course - GROUP D1** (student chooses 2 courses)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	471	Production Quality Management	2	2	6
2	472	Marketing	2	2	6
3	473	3D Graphics	2	2	6

VIII SEMESTER

No.	Course		Lessons (weekly)		ECTS
	Code	Subject	Lectures	Exercises	
1	281	Production Preparation	3	2	6
2	181	Manufacturing Processes Design	3	2	6
3	182	Wood Surface Processing	3	2	6
4		Elective course (Group D2)	2	2	6
5	183	Graduate thesys	-	2	6
			11	**10**	**30**
No.	**Elective course - GROUP D2** (student chooses 1 course)		**Lessons (weekly)**		**ECTS**
	Code	**Subject**	**Lectures**	**Exercises**	
1	481	Numerically Controlled Machines	2	2	6
2	482	Technology of Upholstered Furniture	2	2	6
3	483	Project Management	2	2	6

COURSE CONTENTS FOR STUDY PROGRAM:

– FURNITURE AND WOOD ENGINEERING

1. Course title	**3D Graphics**		
2. Code	473		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	IV / 7	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Goran Zlateski		
9. Prerequisites for enrollment of the course	Engineering graphics		

10. Course goals (Competences). The main course goal is gaining knowledge about the basic concepts of three-dimensional (3D) drawing of products.

11. Course outline

Lectures: Introduction to three-dimensional (3D) drawing. Working in 3D - coordinate system. Types of 3D coordinates. Transforming 2D to 3D objects. Basic tools of 3D modeling. Modeling of parts and assemblies of 3D objects. Modification of 3D models. Changing the position of the model (displacement, alignment and rotation). Reproduction of the model (mirror replication and multiple copying). Getting information from the 3D model. Switching between coordinate systems. Views in 3D space. Creation of complex models.

Exercises: Project assignment – drawing 3D objects; students are introduced to the 3D workspace and use basic tools for three-dimensional drawing modeling and of products.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	И. Неделковски	Компјутерска графика (3D моделирање и анимација)	УКЛО – Технички факултет, Битола	2008
2.	R.H.Shih	AutoCAD 2010 Tutorial Second Level: 3D Modeling	Schroff Development Corporation	2010

3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	A. Watt	3D computer Graphics	Pearson Education Limited	2000
2.				
3.				

1. Course title	**Anthropometry and ergonomics**		
2. Code	321		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	I / 2	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Violeta Efremovska		
9. Prerequisites for enrollment of the course	-		

10. Course goals (Competences)
Study of human's body anthropometric measures, which are essential in furniture and interior design. They need to be applied in order to design furniture acoording to the dimensions of the human body, adaptable and convenient as well.

11. Course outline
Meaning of anthropometry and ergonomics. Terms of anthropometry. Sources and types of data. Presentation of data. Percentiles. Dimensions of the human body. Anthropometry of seating. Structural and functional measures, measures at various operating positions. Application of anthropometric measures in the design of furniture in living rooms, dining rooms, facilities for food preparation (kitchen), sleeping rooms, bar counters.

12. Study methods
Lectures,auditory exercises,consultation, project assignment- elaborate, individual self-learning

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Julius Panero, AIA ASID i Martin Zelnik AIA ASID	Antropoloske mere i enterier		1990
2.				
3.				

22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Artistic expression and plastic molding**		
2. Code	421		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	I / 2	**7. Number of ECTS**	6
8. Teacher	Doc. dr. Maja Raunik Kirkov (UKIM- Faculty of Pedagogy-Skopje)		
9. Prerequisites for enrollment of the course	-		

10. Course goals (Competences)

This course aims to develop a visual way of thinking and a sense of space to build the power of perception, to develop creativity among students, which is necessary for creating quality designers. This is achieved through exercises to master the space and the way of view, composition of space etc. Students study the proportions of the human figure with an emphasis on the skeleton construction. They work on the simplification of form and drawing a live model, of course respecting the basic principles of proportion, light, shadow, perspective, line, etc.

11. Course outline

Lectures: Importance and role of the subject, way of viewing space, managing space-format, for composition - composing space-format, for proportion and how to see it, line as mean of expression, depth and distance - perspective, light - shade, surface, architecture of space, proportion of the human figure - anatomy, designing objects (furniture) according to human anatomy, anatomy of the human figure, analysis of the skeleton and movements, human figure in space, making synthesis, simplification of form - stylization.

Exercises: The exercises aim to develop a visual way of thinking and a sense of space to build a powerful perception, to develop creativity of students, which is necessary for creating these images. The subject serves as a preparation for History and Art through the styles that denote the preparation of graphics tasks.

12. Study methods

Lectures, auditory exercises, consultation, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	0 score
	17.2. Classes activities and attendance	20 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1, 15.2. and 16.1.
20. Teaching language	Macedonian

21. Course evaluation method		Internal evaluation and student questionnaires		
22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Marcel Bačić	Likovno mišljenje	Školska knjiga, Zagreb	2004
2.	Miroslav Huzjak	Učimo gledati	Školska knjiga, Zagreb	2002
3.	Marijan Jakubin	Likovni jezik i likovne tehnike	Educa, Zagreb	1999
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Radovan Ivančević	Likovni govor/ Uvod u svijet likovnih umjetnosti	Profil	1997
2.	Jadranka Damjanov	Vizualni jezik i likovna umjetnost	Školska knjiga, Zagreb	1991
3.	Jadranka Damjanov	Likovna umjetnost 1 i 2	Školska knjiga, Zagreb	1970
		http://likovna-kultura.ufzg.unizg.hr/ http://www.moma.org/ http://www.tate.org.uk/		

1. Course title	**Auxiliary materials**		
2. Code	131		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	II / 3	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Konstantin Bahchevandjiev		
9. Prerequisites for enrollment of the course	Technical properties of wood		

10. Course goals (Competences)
Students acquire specialized knowledge about the types and properties of non-wood materials, which, in addition to wood are required for successful design and manufacture of wood products, furniture, joinery and interior.

11. Course outline
Introduction; Technology of water; Technology of fuels; Lubricants; Glass and enamel; Grinding materials; Textile fibers, yarns and fabrics; Leather; Grease and oils; Waxes; Natural resins; Artificial resins (plastic): polyolefin, polyvinyl, polystyrene, acrylic, phenol, amino, polyester, polycarbonate, epoxy, polyurethane, silicone, teflon, synthetic rubbers, elastomers; Solvents and thinners; Dyes and pigments; Materials for discoloration and fulfillment of the wood; Varnishes; Adhesives; Materials for protection of the wood from destructors; Materials for protection the wood from fire.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	35 hours
	16.2 Individual assignments	35 hours
	16.3 Study at home	35 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Бахчеванџиев К.	Познавање на помошни материјали	УКИМ-ШФС-Скопје	2002

2.	Bifl M.	Poznavanje materijala II - nedrvni materijali	Sumarski fakultet - Zagreb	1980
3.	Димитров Д.., Динкова И.	Синтетски материјали за дрвообработваштајата и мебелната промишленост	ЛТУ - Софија	1973

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Kapetanović S.	Hemija drveta i pomočnih materijala	Sarajevo	1972
2.	Николов С., Панајотов П.	Огнозаштита на дрвесината	ЛТУ - Софија	1984
3.	Сениќ Р.	Технологија помиочних материјала	Шумарски факултет - Београд	1962

1. Course title	**Chemical wood processing**			
2. Code	221			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 2	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Goran Zlateski			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
Students gain knowledge about wood chemisrty, ways and methods by which the wood chemically will be processed to semicellulose and cellulose, ways and methods of paper and cardboard manufacturing.

11. Course outline
Lectures: General concepts of chemical wood processing. The significance of the chemical processing of wood material in the modern world. Chemical composition of the wood. Technology for technical cellulose production. Bleaching of cellulose. Technology of paper, card layer. Another application of cellulose (artificial fibers, plastics). Hydrolysis of the wood. Thermal decomposition of the wood. Manufacturing of wood resin. Environmental protection in the chemical wood processing.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	J. Димески	Хемиска преработка на дрвото	УКИМ – Шумарски факултет - Скопје	2011
2.				

3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	J.Legierse	Decoration of Packaging	Pira International Hertordshire	1990
2.	B. Perić	Poznavanje celuloze i papira	Grmeč DD - Beograd	1993
3.	M.Križan	Savremena proizvodnja papira	Mrlješ - Beograd	1997

1. Course title	**Descriptive geometry**			
2. Code	112			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 1	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Vladimir Karanakov			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Learning shapes, their relations and ways of presenting technical drawing.				
11. Course outline Notion of projection, projection types, Cartesian coordinate system, orthogonal and axonometrical projections of various shapes and their proportions. Introduction and application of international standards in the preparation of technical drawing as a universal technical language. Application of technical drawing in various fields of engineering: architecture, urban planning, mechanical engineering, electrical engineering, especially in the interior and in the making of furniture.				
12. Study methods Lectures, graphic exercises, consultation, program tasks, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory		45	
	15.2. Exercises (laboratory, auditory), seminars, team work		30	
16. Other activities	16.1 Project assignments		35	
	16.2 Individual assignments		35	
	16.3 Study at home		35	
17. Assessment methods	17.1. Seminar work / project		10	
	17.2. Classes activities and attendance		10	
	17.3. Tests (Final exam / Partial exams)		80 (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1., 15.2. and 16.1			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Б. Трпковски и други Authoги	Нацртна геометрија за Шумарски факултет	УКИМ-Шумарски факултет, Скопје	1995
2.	Б. Трпковски, В. Каранаков	Збирка задачи по нацртна геометрија	УКИМ-Шумарски факултет, Скопје	2001

1. Course title	**Doors and windows joinery**			
2. Code	461			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 6	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Gjorgi Gruevski			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Acquiring knowledge of the design of various types of joinery and construction of the joinery.				
11. Course outline Lectures: Basic principles of joinery design, designing joinery, weather protection, noise protection, energy efficiency, classification of windows and balcony doors by material of which are manufactured, structural elements of windows and balcony doors, hardware for windows and balcony doors, shutters for windows and balcony doors, hardware for windows and balcony doors shutters, blinds for windows and balcony doors, front doors, garage doors, interior doors, door hardware. Exercises: making elaborate containing design and construction of several types of joinery.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory			30 hours
	15.2. Exercises (laboratory, auditory), elaborate, team work			30 hours
16. Other activities	16.1 Project assignments			40 hours
	16.2 Individual assignments			40 hours
	16.3 Study at home			40 hours
17. Assessment methods	17.1. Classes activities and attendance		30 score	
	17.2. Tests (Final exam / Partial exams)		70 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Тало Груевски	Дрвни конструкции II – Градежна столарија	УКИМ-Шумарски факултет - Скопје	1994
2.				
3.				

22.2. Additional literature

N°	Author	Title	Publisher	Year

1.	Bruno Munari, Pjero Polato, Rinaldo Donceli	STOLARIJA	Narodna knjiga-Beograd	2000
2.	Rade Čokić	Okov građevne stolarije	Tehnička knjiga-Zagreb	1980
3.	Katharina Feuer, Jons Messedat	Door Design	Daab	2007
4.	Jons Messedat	Window Design	Daab	2007

1. Course title	**Economics**			
2. Code	341			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 4	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Zhivka Meloska			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
Introduction to economic laws, determination of the work costs, forming of the prices, as well as respect and practice the basic economic principles - productivity, efficiency and profitability of an enterprise.

11. Course outline
Lectures: Basic concepts, instruments and goals of macroeconomics; Items, goals and quality of enterprise economy; Types of assets in enterprises - basic and working capital; Definition, classification and dynamics of costs in the enterprise; Calculation of costs and prices of products; Results of reproduction; Allocation of funds for salaries; Economic principles of reproduction; Economy - concept, expression and factors affecting its increase; Productivity - definition, measurement and measures to increase; Profitability - definition. Expression and factors.
Exercises: Calculation of fixed assets depreciation; Determination of necessary normative stocks; Calculation of the working costs according on the place of their occurrence and their calculation; Making calculation of costs.

12. Study methods
Lectures, auditory exercises, project assignment, consultation, individual self-learning

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2 x 40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year

1.	Д-р Петар Василев, Д-р Митко Зорбоски	ЕКОНОМИКА , Книга 1,	УКИМ, Шумарски факултет - Скопје	2002
2.	Д-р Петар Василев, Д-р Митко Зорбоски	ЕКОНОМИКА , Книга 2,	УКИМ, Шумарски факултет - Скопје	2002
3.				
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Elements of Furniture and Interior Design**			
2. Code	332			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 3	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Vladimir Karanakov			
9. Prerequisites for enrollment of the course	Descriptive geometry			
10. Course goals (Competences) Introduction to the essential elements of shape and space, as well as principles that affect their organization in our environment.				
11. Course outline Introduction; Basic elements, point, line, plane, volume; Shape; Visual properties of shapes; Dimensional shape transformations: transformation with the addition and subtraction; Articulation of the shape; Defining space with horizontal and vertical elements; Quality of architectural space, degree of closeness, view and light, Space opening.				
12. Study methods Lectures, graphic exercises, consultation, programe tasks, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30	
	15.2 Exercises (laboratory, auditory), seminars, team work		30	
16. Other activities	16.1 Project assignments		40	
	16.2 Individual assignments		40	
	16.3 Study at home		40	
17. Assessment methods	17.1. Seminar work / project		10	
	17.2. Classes activities and attendance		10	
	17.3. Tests (Final exam / Partial exams)		80 (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Ц. Симоновска, В. Каранаков	Елементи на проектирање на мебел и ентериер - Authогизирани предавања	УКИМ-Шумарски факултет - Скопје	2005
2.				
3.				

1. Course title	**Elements of wood joints**			
2. Code	151			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 5	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Gjorgi Gruevski			
9. Prerequisites for enrollment of the course	Descriptive geometry			
10. Course goals (Competences) Students will learn about the basic elements of structural joints, materials from which they are made, static and strength characteristics of the applied constructive joints, types of fixed joints, types of assembly and disassembly joints, various types of furniture hardware, methods of processing with drilling for elements assembling in constructive joints.				
11. Course outline Introduction; Materials and semi-manufactured products used in wood joints; Presentation and labeling of areas and sections of details and structural elements; Division of wood products and wood boards; Names of details elements; Profiles and profile elements; Fasteners; Adhesives used in the furniture construction; Hardware for constructive elements installation; Basic structural joints used in construction of furniture, interior, doors and windows; Assembling and gluing objects of workpieces made of solid wood, boards and veneer by: width, length and thickness; Angled and attached board assembling of elements made of solid wood and boards; Lateral-angular and lateral-attached assembling of elements made of solid wood and plates; Crosslike assembly of structural elements; Details and elements construction made of: solid wood, panels, veneer and layer panels, full and hollow boards; Construction of wooden frames; Tests on compositions strength made of the of solid wood and boards.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory		45 hours	
	15.2 Exercises (laboratory, auditory), елаборат, тимска работа		30 hours	
16. Other activities	16.1 Project assignments		35 hours	
	16.2 Individual assignments		35 hours	
	16.3 Study at home		35 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				
22.1. Mandatory literature				

N°	Author	Title	Publisher	Year
1.	Т.Груевски, Н.Симакоски	Елементи на дрвните конструкции	УКИМ-ШФС-Скопје	2002
2.	Стјепан Ткалец	Конструкције намјештаја	Шумарски факултет - Загреб	1985
3.	Георги Ќучуков	Конструирање на мебели	ЛТУ - Софија	1987
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Милан Потребиќ	Дрвне конструкције I и II	Шумарски факултет - Београд	1985
2.				
3.				

1. Course title	**Engineering graphics**		
2. Code	331		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	II / 3	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Vladimir Koljozov		
9. Prerequisites for enrollment of the course	-		

10. Course goals (Competences)
Introduction to computer applications designed to creating engineering technical documentation and computer applications for computer aided design.

11. Course outline
Lectures:
Introduction to computer systems, operating systems, computer applications for computer aided design. Drawing in two dimensions. Coordinate systems and projections. Presentation of graphic elements. Presentation of point, line, polygon. Presentation of curves. Presentation of geometrical figures. Viewing and editing of drawings. Working with layers, types of lines. Inserting and editing text items. Dimensions. Creating technical drawings and technical documentation.
Exercises: Solving programming tasks using applications for computer-aided design.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1, 15.2. and 16.1.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Р.Ташевски	Инженерска графика	УКИМ-Машински факултет - Скопје	2004

2.	В.Колъозов, З.Трпоски	Практикум за вежби	УКИМ-ФДТМЕ - Скопје	2012
3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Programming and instruction manuals for computer-aided design applications.			
2.				
3.				

1. Course title	**Furniture and interior construction**			
2. Code	161			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 6	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Nacko Simakoski			
9. Prerequisites for enrollment of the course	Furniture and interior design			

10. Course goals (Competences)

Students will study the matter in the field of construction of furniture and interior, familiarization with the materials of which they are made, static and strength characteristics of the applied constructive joints, types of fixed joints, types of assembly and disassembly joints, various types of furniture hardware. Machining of components for assembly in constructive joints for panel and massive furniture.

11. Course outline

The program for this course is divided into 6 chapters, each of which itself represents a certain group of products with its own structure and its own characteristics, divided according to the construction: furniture, tables, chairs, upholstered furniture; beds and all interiors that we encounter in everyday life. Apart from this classification each group of construction products has its own internal classification starting over: Introduction; Key measures of furniture, tables, chairs, upholstered furniture; beds and various interiors. Making all drawings necessary for construction design of each product or interior separately; Dimensioning of each constituent element of design of furniture or furnishings by applying optimal constructive joint.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	35 hours
	16.2 Individual assignments	35 hours
	16.3 Study at home	35 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year

1.	Тало Груевски, Nacko Simakoski	Конструирање на мебел	УКИМ-ШФС-Скопје	2003
2.	Стјепан Ткалец	Конструкције намјештаја	Шумарски факултет - Загреб	1985
3.	Георги Ќучуков	Конструирање на мебели	ЛТУ - Софија	1987
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.	Милан Потребиќ	Дрвне конструкције I и II	Шумарски факултет - Београд	1985
2.				
3.				

1. Course title	**Furniture and interior design**			
2. Code	351			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 5	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Vladimir Karanakov			
9. Prerequisites for enrollment of the course	Elements of Furniture and Interior Design			
10. Course goals (Competences) Introduction to the process of methodological matrix of furniture and interior design.				
11. Course outline Introduction; Definition of conceptual and detailed project; Sitting elements, sitting element capture, design of chair; Lying elements, design of bed; Dining elements, design of dining table; Stotage elements, design of wardrobe; Concept of interior; Capture of apartment; Design of kitchen; Design of bath; Design of object.				
12. Study methods Lectures, graphic exercises, consultation, program tasks, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30	
	15.2 Exercises (laboratory, auditory), seminars, team work		30	
16. Other activities	16.1 Project assignments		40	
	16.2 Individual assignments		40	
	16.3 Study at home		40	
17. Assessment methods	17.1. Seminar work / project		10	
	17.2. Classes activities and attendance		10	
	17.3. Tests (Final exam / Partial exams)		80 (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Ц. Симоновска, В. Каранаков	Елементи на проектирање на мебел и ентериер - Authогизирани предавања	УКИМ-Шумарски факултет - Скопје	2005
2.	J. Каранаков	Елементи на проектирање	Архитектонски факултет Скопје	

1. Course title	**Graduate thesys**			
2. Code	183			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher				
9. Prerequisites for enrollment of the course	Acquired 200 ECTS credits			
10. Course goals (Competences) Acquiring specialized theoretical and practical knowledge of the relevant field.				
11. Course outline The procedure for preparation and presentation of the graduate thesys is regulated by the Act on the application, preparation and public presentation of graduate thesys, adopted by the Teaching Council of the Faculty of Design and Technologies of Furniture and Interior - Skopje.				
12. Study methods Consultation, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	0+2			
15. Teaching activities	15.1. Lectures-theory		0 hours	
	15.2. Mentoring consultation and corrections		30 hours	
16. Other activities	16.1. Individual work, literature and documentation analysis		120 hours	
	16.2. Preparation and technical editing		28 hours	
	16.3. Public presentation		2 hours	
17. Assessment methods	17.1. Consultation and performing tasks		10 score	
	17.2. Content and quality of graduate thesys		70 score	
	17.3. Public presentation		30 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Passed all exams provided by the study program			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.				
2.				

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.				

1. Course title	**Hydro-thermal wood processing**			
2. Code	251			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 5	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Goran Zlateski			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)

The main objective of the course is to introduce students to the importance of wood moisture in design and production of items of furniture and interior made of solid wood.

11. Course outline

Lectures: General importance of moisture in the wood when producing solid wood final products. Forms of moisture in the wood. Movement of moisture in the wood. Methods and procedures for determining the moisture in solid wood. Characteristics of medium for evaporation of moisture from the wood. Devices and modes of wood drying. Management and control of the drying process by using computer technology. Moisture in the wood by the field of use. Thermal sterilization of the wood. Errors in the wood occurring in the drying process and ways for their removal. Steaming of saw lumber. Thermal wood in furniture and interior.

Exercises: Preparing elaborate on the application of methods for determining the quality of dry wood according to European standards.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year

1.	Б. Рабаџиски, Г. Златески	Хидротермичка обработка на дрвото I дел	УКИМ – Шумарски факултет - Скопје	2007
2.				
3.				
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.	C. Scaar	Water in wood	Springer – Verlag, Berlin	1972
2.	R. Keey	Understanding kiln – seasoning for the benefit of industry	University of Canterbury, New Zeland	1998
3.	J. Denig, E.Wengert, W. Simpson	Drying Hardwood Lumber	University of Madison, Wiskonskin, USA	2000

1. Course title	**Internal transport**			
2. Code	541			
3. Study group	FWE			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 4	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Zoran Trposki			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences):
Introducing students to the devices and systems for mechanical and pneumatic transport used in the wood processing industry.

11. Course outline
Introduction; transport assets for discontinued mechanical transport (cranes); transport assets for continuous mechanical transport (conveyors with: band, tiles, combs, rollers, screw conveyors, elevators, vibrating conveyors); storage assets to stabilize the flow of the material; fundamentals of internal transport design; maintaining assets for internal transport; pneumatic transport; pneumatic transport devices; physical properties of air; modes of convection; hydraulic losses in air flow through pipelines; PTD calculation; characteristics of wood particles; speed floating; concentration of the mixture air-wood particles; critical speed for pneumatic transport; pneumatic transport equipment for suction of wood particles; the main parts of PTD.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	50 hours
16. Other activities	16.1 Project assignments	20 hours
	16.2 Individual assignments	15 hours
	16.3 Study at home	50 hours
17. Assessment methods	17.1. Seminar work / project	20 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	70 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 17.1 and 17.2 (min. 15 score)	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Трпоски З., Владимир К.,	Механички транспорт во ДИ - интерна скрипта	УКИМ-ФДТМЕ, Скопје	2010

2.	Трпоски З., Владимир К.,	Пневматски транспорт во ДИ - интерна скрипта	УКИМ-ФДТМЕ, Скопје	2010
3.				
4.				
5.				
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Machines and energetics**			
2. Code	531			
3. Study group	FWE			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 3	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Zoran Trposki			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences): Introducing students to machinery for primary processing and final processing, as well introduction to the fundamentals of power devices and machinery used in the woodworking industry.				
11. Course outline Machines for primary processing and final processing of wood; introducing types according to the processing by sawing, grinding, planing, drilling, turning, routing, milling, pressing, bending, joining, varnishing, applying glue. Students choose one or two machines-representatives of the type which are reviewed in details (dimensions, structural parts, method of processing, execution of main motion and feed, calculation of production characteristics.) Power machines and devices. General; steam boiler, steam boiler fuel, energy efficiency, types of steam boilers, steam boiler equipment; turbines, compressors and fans; asynchronous motors and direct current motors.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory		45 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		50 hours	
16. Other activities	16.1 Project assignments		20 hours	
	16.2 Individual assignments		15 hours	
	16.3 Study at home		50 hours	
17. Assessment methods	17.1. Seminar work / project		20 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		70 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	17.1 and 17.2 (min. 15 score)			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Клинчаров Р., Трпоски З., Колъозов В.,	Машини за примарна преработка на дрвото	Интерна скрипта, ФДТМЕ, Скопје	2004

2.	Трпоски З., Кољозов В.,	Лентовидни пили и нивна употреба во пиланите	Интерна скрипта, ФДТМЕ, Скопје	2011
3.	Клинчаров Р., Трпоски З., Кољозов В.,	Машини за финална обработка на дрвото	Шумарски факултет, Скопје	2002
4.	Клинчаров Р., Трпоски З., Кољозов В.,	Основи на машинство со енергетика	Интерна скрипта, ФДТМЕ, Скопје	2000
5.	Коцев К.	Општа електротехника	Електротехнички факултет, Скопје	1999
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Management**			
2. Code	442			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 4	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Violeta Efremovska			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
The course objective is introducing students to the basic concepts of enterprise management. Studying this matter will introduce students to the basic concepts and stages in the process of management, i.e. at the stage of making business decisions for enterprise development.

11. Course outline
Introduction. Basics of management: levels, principles, functions of management, capabilities manager, management level, general manager, contacts manager, environment. Elements of management: planning, organizing, motivating, coordinating, controlling. Small Business Management. Entrepreneurship.

12. Study methods
Lectures, exercises, consultation, independent work

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 score
	16.3 Study at home	40 score
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Шуклев Б.	Менаџмент	УКИМ-Економски факултет - Скопје	1999
2.	Фити Т. и Василева Марковска В. Милфорд Б.	Претприемништво		1999

3.	Станковиќ Ф. :	Предузетништво		1995
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Manufacturing processes design**			
2. Code	181			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Mira Stankevik Sumanska			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) The aim of this course is to enable students to master the basic elements of design and to apply their knowledge acquired during their studies for the design of production processes.				
11. Course outline Production - process and system; flexible manufacturing; design of flexible manufacturing processes; design of basic manufacturing processes (technological process, project work, organization of jobs in the manufacturing process, design of basic manufacturing processes at work, designing the spatial layout of the workplace, economic design, working conditions at work place); design the spatial layout of production (formation of spatial structure, movement of material, spatial distribution of the financial resources, forming a technological base - layout, calculation of the necessary surfaces, making the technological basis), technological organization of flexible production; systems for decision support in the implementation of new technologies.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory	45 hours		
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours		
16. Other activities	16.1 Project assignments	40 hours		
	16.2 Individual assignments	25 hours		
	16.3 Study at home	40 hours		
17. Assessment methods	17.1. Seminar work / project	10 score		
	17.2. Classes activities and attendance	10 score		
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)		
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)		
	from 51 to 60 score	6 (six) (E)		
	from 61 to 70 score	7 (seven) (D)		
	from 71 to 80 score	8 (eight) (C)		
	from 81 to 90 score	9 (nine) (B)		
	from 91 to 100 score	10 (ten) (A)		
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year

1.	Šuletić Radovan	Projektovanje preduzeća za preradu drveta, Knjiga 2, Proizvodni procesi	Univerzitet u Beogradu, Šumarski fakultet, Beograd	1991
2.	Šuletić Radovan	Fleksibilni proizvodni sistemi u industriji nameštaja	Univerzitet u Beogradu, Šumarski fakultet, Beograd	2001
3.				

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Marketing**			
2. Code	472			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 7	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Zhivka Meloska			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)

The goal of the curriculum in the area of marketing is mastering all activities with respect to satisfying the needs of customers, techniques and ways the new product as soon as possible to reach the consumer, better positioning in the global market, the practice of all promotional activities in order to gain more profits and leadership.

11. Course outline

Lectures: Basic concept and definition of marketing; Development stages of marketing concept; Main components of marketing; Consumption, supply, demand - concept and their basic characteristics; Factors affecting supply, demand and consumption and consumer behavior; Promotion - the types and techniques of promotion; Means and media of economic propaganda; Tools of marketing - product, price, distribution; Stages in the decision-making process when buying; Lifespan of the product; Marketing strategies in the introduction of the product on the market; Basic rules and techniques of international trade in wood and wood products.

Exercises: Making elaborate on the basis of real data taken from enterprises in terms of choice of soooodvetna marketing strategy in the process of introducing a new product; analysis of competition and opportunities for better market positioning; analysis of the life of individual products and marketing strategies for each stage; Analysis of promotional activities and recommendations for the selection.

12. Study methods

Lectures, auditory exercises, project assignment, consultation, individual work.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2 x 40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Живка Мелоска	Маркетинг, интерна скрипта	УКИМ, Шумарски факултет - Скопје	2008
2.				
3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Јаќовски Б.	Маркетинг	Економски факултет, Скопје	1991
2.	KotlerF.	Upravljanje marketingom – analiza, primena I kontrola	Informator,Zagreb	1999
3.				

1. Course title	**Mathematics**			
2. Code	111			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 1	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Gjorgi Markoski (UKIM-PMF)			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) The course objective is to learn the basics of higher mathematics.				
11. Course outline Introduction to set theory; Introducing to set of real numbers, and the usual subsets: integers, whole, rational and irrational numbers; Introduction to the basic functions and basic concepts of mathematical analysis such as limits, continuity, derivative and integral.				
12. Study methods Lectures, auditory exercises, consultation, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory		45 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		0 hours	
	16.2 Individual assignments		50 hours	
	16.3 Study at home		55 hours	
17. Assessment methods	17.1. Seminar work/project		-	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		90 score / (2x45)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	М. Оровчанец	Математика	УКИМ-Шумарски факултет - Скопје	2000
2.	М. Оровчанец, Б. Крстеска	Збирка решени задачи по математика	УКИМ-Шумарски факултет - Скопје	2000
3.				

1. Course title	**Numerically controlled machines**			
2. Code	481			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Vladimir Koljozov			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Introducing students to the fundamentals of NC and CNC machines, programming and basic features of CAD/CAM systems.				
11. Course outline Introduction to Numerical Control and CNC machines. Automation of processes and machinery. Types of numerically controlled machines. Principle of operation of CNC machines. Components of CNC machines. Basic methods of programming of CNC machines. Axes and coordinate systems. Machining centers - types, basic parts and features. Programming of machining centers. Basics of systems for computer aided design and manufacturing - CAD/CAM systems. Exercises: Development of programs for numerically controlled machines.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	В.Колъозов, З.Трпоски	Нумеричко управување на машини - скрипта	УКИМ-Шумарски факултет - Скопје	2007

2.	В.Кољозов, З.Трпоски	Програмирање на CNC машини и дрвообработувачки центри - практикум за вежби	УКИМ-ФДТМЕ-Скопје	2011
3.				

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	J.Stenerson, K.Curran	Computer Numerical Control	Prentice Hall Inc.	1996
2.	Програмски упатства за користење и програмирање на CNC машини			
3.				

1. Course title	**Occupational Safety**			
2. Code	451			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 5	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Violeta Efremovska			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Introducing students and future engineers with the basic principles of the protection of workers in the planning, designing, organizing and execution of production processes in the field of mechanical wood processing as well as design and technology of furniture and interior.				
11. Course outline Introduction, Physiological aspects of labor humanization. Psychological aspects of labor. Mutual adjustment of the worker and the work. Protection of workers in production processes. Legal aspects of protection. Accidents at work. Equipment for personal protection. Ways and means of protection in woodworking facilities.				
12. Study methods Lectures, exercises, consultation, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam				
20. Teaching language	Macedonian			
21. Course evaluation method				
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Брезин Веселин	Охрана на труда во дрвообработването	ЛТУ - Софија	1992
2.	Марковиќ Д.:	Социологија рада		1980

3.	Средства за лична заштита на раду			1979
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Закон за безбедност и здравје			

1. Course title	**Organization of production**			
2. Code	172			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 7	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Violeta Efremovska			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
The study of organizational issues of enterprises. Learning the basic elements of production, methods of organizing the production methods of operation, time of operation, planning of production and forms of organization of production.

11. Course outline
Basic elements of the organization of the production, main factors of production, systems and types of production, production and technological process, job, improvement of material production, study work, factors, methods and types of research, analysis and study of the time of operation, fund-time, recording equipment, timing of operations, standardization, rationalization of work procedures, studies of movements, planning and management of production processes, cycle of production, optimal deadlines, managing inventory, organization of enterprises, establishment of company, transformation, bankruptcy and liquidation, management companies, functions of the enterprise, organization of management.

12. Study methods
Lectures,auditory exercises,consultation, project assignment, individual work.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	45 hours
	16.2 Individual assignments	30 hours
	16.3 Study at home	30 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Зорбоски М.	Организација на дрвноиндустриските ОЗТ	Шумарски факултет-Скопје	1981

2.	Figurik M	Organizacija rada u drvnoj industriji		1967
3.	Vila A	Planirnje proizvodnje i kontrola rokova		1972
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Particle boards and fiberboards**		
2. Code	561		
3. Study group	FWE		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	III / 6	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Borche Iliev		
9. Prerequisites for enrollment of the course	Signature: Wood anatomy / Technical properties of wood		

10. Course goals (Competences)

Introducing students to theoretical foundations and procedures in the production of boards from wood particles, boards from wood fiber, processing of boards surface, as well as methods and standards for testing of physical, mechanical and chemical properties of the boards. Also, students receive basic knowledge about pressed wood products from wood particles, wood-plastic composites, briquettes and pellets.

11. Course outline

Lectures: General terms on the production of wood particle boards. Definition and classification of the wood particle boards. Technological operations and stages in the production of wood particle boards. Raw materials for manufacturing of wood particle boards. Crushing and fragmenting of the raw materials. Binders and additives. Procedures in the production of wood particle boards. Surface processing of wood particle boards. Examining the properties of the wood particle boards and standards. Boards with oriented strand (OSB). General terms for the production of wood fiber boards. Definition and classification of wood fiber boards. Technological operations and stages in the production of wood fiber boards. Raw material for production of wood fiber boards. Fibering of raw material. Binders and additives. Procedures in the production of wood fiber boards. Surface processing of wood fiber boards. Examining the properties of the wood particle boards and standards. Pressed wood products from wood particle board. Wood-plastic composites. Briquetting and peleting of fragmented wood.

Exercises: Solving tasks and problems related to the subject content, development of standards for testing the properties of the boards and other products from wood particles and fibers, laboratory tests on the properties of the boards and checking the acquired knowledge through two partial exams.

12. Study methods

Lectures, auditory exercises, laboratory exercises, consultation, project assignment (seminar work), individual self-learning.

13. Total available fund of hours	6 EKTC × 30 hours = 180 hours	
14. Weekly number of classes	45+30+35+35+35 = 180 hours	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2. Exercises (laboratory, auditory), seminars, team work, field work	30 hours
16. Other activities	16.1. Project assignments (Seminar work)	35 hours
	16.2. Individual assignments	35 hours
	16.3. Study at home	35 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2×40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1, 15.2 and 16.1.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Димески, Ј.	Производи од иситнето дрво I дел	Универзитет “Св. Кирил и Методиј” - Скопје	2003
2.	Димески, Ј., Илиев, Б.	Производи од иситнето дрво II дел - Плочи влакнатици и брикети	Универзитет “Св. Кирил и Методиј” - Скопје Шумарски факултет - Скопје	2007
3.	Димески, Ј., Илиев, Б.	Производи од иситнето дрво I дел -плочи од иверки. Практикум.	Универзитет “Св. Кирил и Методиј” - Скопје Шумарски факултет - Скопје	1993

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Miljković, J.	Kompozitni materijali od usitnjenog drveta – iverice	Naučna kniga - Beograd	1991
2.	Bruči, V., Jambreković, V.	Ploče iverice i vlaknatice	Sveučilište u Zagrebu Šumarski fakultet - Zagreb	1996
3.	Йосифов, Н.	Производство на плочи от дървесни частици	“Земиздат” - София	1975
4.	Дончев, Г.	Производство на плочи от дървесни влакна	“Техника” - София	1982
5.	Miljković, J. Crnogorac, O.	Praktikum za vežbe iz oplemenjivanja ploča	Univerzitet u Beogradu Šumasrki fakultet - Beograd	1998
6.	Klyosov, A.	Wood-Plastic Composite	“Wiley” Publication - USA	2007

1. Course title	**Practical work 1**			
2. Code	162			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 6	**7. Number of ECTS**	6	
8. Teacher				
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Acquire technical and practical knowledge of the relevant area of study program.				
11. Course outline Practical field work in a small or medium enterprise specializing in the study program. Making elaborate report of the practical work.				
12. Study methods Consultation, making elaborate report, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	0+4			
15. Teaching activities	15.1. Lectures-theory		0 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work, fieldwork		60 hours	
16. Other activities	16.1 Consulting for preparation of report		30 hours	
	16.2 Independent work - preparation of report		88 hours	
	16.3 Public presentation of the report		2 hours	
17. Assessment methods	17.1. Practical work activities and attendance		10 score	
	17.2. Consultations activities and attendance		10 score	
	17.3. Final report		80 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.2. and 16.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.		Appropriate documentation of the company where fieldwork is done.		

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.				

1. Course title	**Practical work 2**			
2. Code	173			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 7	**7. Number of ECTS**	6	
8. Teacher				
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Acquire technical and practical knowledge of the relevant area of study program.				
11. Course outline Practical field work in a small or medium enterprise specializing in the study program. Making elaborate report of the practical work.				
12. Study methods Consultation, making elaborate report, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	0+4			
15. Teaching activities	15.1. Lectures-theory		0 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work, fieldwork		60 hours	
16. Other activities	16.1 Consulting for preparation of report		30 hours	
	16.2 Independent work - preparation of report		88 hours	
	16.3 Public presentation of the report		2 hours	
17. Assessment methods	17.1. Practical work activities and attendance		10 score	
	17.2. Consultations activities and attendance		10 score	
	17.3. Final report		80 score	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.2. and 16.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.		Appropriate documentation of the company where fieldwork is done.		

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.				

1. Course title	**Production preparation**			
2. Code	281			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Gjorgi Gruevski			
9. Prerequisites for enrollment of the course	Construction of furniture and interior			

10. Course goals (Competences)

Students learn the subject in the area of preparation and management of production process of furniture and interior. Also, students through this course will build the complete documentation for main and auxiliary material needed to produce a product. They will be introduced in certain diagrams (gantograms etc.), through which they will follow the process and execution of production.

11. Course outline

The program on this subject is divided into two chapters: Technical preparation and operational preparation. The technical preparation is divided into three parts: Constructive, Material and Technological preparation. Through these three parts students will develop the constructive documentation (dimensioning elements, connections, compositions, and more.), material documentation (specifications and quantity of basic and additional materials) and technological documentation, which wil be used to determine the number and order of operations, procedures and operating mode, the number of jobs, machines, tools, transport devices and the time required for preparation of the product. Operational preparation will enable students to learn about the operational planning and preparation of material through the documentation issue, preparing, restoring indented material is done here also making forward planning, calculation of the production cycle, issuing work orders and so on.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), case study, team work	30 hours
16. Other activities	16.1 Project assignments	35 hours
	16.2 Individual assignments	35 hours
	16.3 Study at home	35 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Алтарац Шалом	Студија рада	Шумарски факултет - Загреб	1975
2.	Крстић Драгољуб	Техничка припрема рада у дрвној индустрији за производње, I,II,III и IV дел	Шумарски факултет - Загреб	1961
3.	Фигурић.Младен	Производни сустави у дрвној индустрии	Шумарски факултет - Загреб	1992
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Production quality management**			
2. Code	471			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 7	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Violeta Efremovska			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Introducing students to methods, ways and systems for quality control of production. Acquired knowledge will enable future engineers to implement practical system for quality management.				
11. Course outline Introduction, Development of quality control. Quality management of production, activities in quality management, situation analysis, phases in quality assurance, preconditions for quality assurance, control systems, methods of statistical quality control, economic aspects of quality control, new trends in quality management.				
12. Study methods Lectures,auditory exercises,consultation,решавање задачи,individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Bakija,I	Kontrola kvalitete	Sumarski fakultet - Zagreb	1978
2.	Juran,J. M.,Gryna,F.M	Planiranje i analiza kvaliteta		1947
3.	Zlatkovik,B	Upravljanje kvalitetom		1984

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Project management**			
2. Code	483			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Mira Stankevik Sumanska			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)

The main objective of the course is to enable students to learn basic terminology, methods and techniques of project management. The students will also learn about the basic principles of planning, execution and following of investment projects realization.

11. Course outline

Project - concept and definition; types of projects; management of project; lifespan of the project; life cycle in management projects; project management; organizing the project area; methods and techniques of project management; investment - concept, features and importance; management of investment projects; process of investing - a common methodology; pre-investment study (analysis of development possibilities and capabilities of the investor, market analysis, technological - technical analysis, location, economic - financial analysis); Investment program; Study on implementation of projects; methods for evaluation of investment projects (repayment period, the average rate of return, net present value, profitability index, internal rate of return); risk and investment - concept and types of risks; methods of adjusting the project risk (sensitivity analysis, scenario analysis, adjusting the discount rate risk threshold of profitability).

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180 hours	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Василев Петар	Планирање на инвестициони проекти	УКИМ-Шумарски факултет -Скопје	2004
2.	Šuletić Radovan	Projektovanje preduzeća za preradu drveta, Knjiga 1, Planiranje investicionih projekata	Univerzitet u Beogradu, Šumarski fakultet, Beograd	1991
3.	Šuletić Radovan	Razvojni ciklusi preduzeća za preradu drveta	Univerzitet u Beogradu, Šumarski fakultet, Beograd	2001
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Sawmill and primary wood processing technology**			
2. Code	542			
3. Study group	FWE			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 4	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Branko Rabadziski			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) The aim of this course is to introduce students to the field of sawmill wood processing. More specifically, the storage of raw materials, methods of processing, sawmills plants, plans and programs for sawmill processing, as well as technological schemes of sawmill capacities.				
11. Course outline Sources of raw material for sawmill processing. Transportation of raw materials to processing facilities. Sawmills plants. Position of the sawmill plant. Storage of raw material. Dry storage. Ordering of the dry storage. Wet storage. Combined storage of raw material. Integrated storage. Timber storage. Sawmill building. Working machines and devices for transport at the sawmill facility. Logs processing technology. Processing disposition. Plan and program of sawmill processing. Sawmills assortments. Utilization of raw material. Quantitative utilization. Qualitative utilization. Value utilization. Financial utilization. Technology for secondary processing of sawn timber assortments. Secondary processing of broadleaf species. Secondary processing of coniferous species. Width dispersing of assortments. Classic technological process of processing raw materials. Modern technological processes of processing raw materials. Sawn lumber stock. Storage of sawn timber assortments. Technological processes of sawn lumber stock. Technology of the production of special types of sawn material. Friezes for parquet. Parquet. Wooden pallets. Wooden packaging. Railway sleepers.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	3+2			
15. Teaching activities	15.1. Lectures-theory	45 hours		
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours		
16. Other activities	16.1 Project assignments	35 hours		
	16.2 Individual assignments	35 hours		
	16.3 Study at home	35 hours		
17. Assessment methods	17.1. Seminar work / project	10 score		
	17.2. Classes activities and attendance	10 score		
	17.3. Tests (Final exam / Partial exams)	80 score (2x40)		
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)		
	from 51 to 60 score	6 (six) (E)		
	from 61 to 70 score	7 (seven) (D)		
	from 71 to 80 score	8 (eight) (C)		
	from 81 to 90 score	9 (nine) (B)		
	from 91 to 100 score	10 (ten) (A)		
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Стефановски В., Рабациски Б.	Примарна преработка на дрвото, I дел, Пиланска преработка на дрвото	УКИМ-Шумарски факултет - Скопје	1994
2.	Николиќ М.	Прерада дрвета на пиланама I и II дел	Шумарски факултет - Београд	1983
3.	Благоев Г.	Технология на фасонираните материали и изделия от дъвесина	ЛТУ - Софија	2001
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Styles and decoration**			
2. Code	311			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 1	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Elena Nikoljski Panevski			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) The aim of this course is to introduce students to the history of art, style and decoration.				
11. Course outline Introduction to art history, fine arts, civilization, culture; civilizations of Babylon and Mesopotamia, Egyptian civilization; Civilization of Ancient Greece; Ancient Rome; Byzantium; Byzantium Macedonia; Medieval furniture, Romanesque; Gothic; Renaissance (Italy, France, Tudor, Germany); Baroque (Italy, France, Germany, the Netherlands, Philip IV Spanish era of James I and Charles I, Louis XIII, the English Restoration, Louis IV (William and Mary Anna Stewart, regency style, Kent and early period of George I; Rococo (Italy, Germany, Louis IV, Chippendale, Liege XVIII, American colonial style, a Canadian furniture XVIII); neoclassicism (transitional style, Louis XVI, English neoclassical style, Empire, Regency, bidermaer and restoration, neo-Gothic style, Louis Philippe, Victorian style Napoleon III; art Nouveau (movement "aesthetics" William Morris and the movement "art and craft" America and art Nouveau); XX century - 1900 (De style, Bauhaus, organic design by Frank Lloyd Wright) art Deco (modern Scandinavian style retro style) 1925 - International style (radically modern style, new modernism); contemporary movements (pop style, 60s, 70s, 80s, 90s, post modern functionalism, minimalism - to date).				
12. Study methods Lectures, auditory exercises, consultation, project assignment, independent work				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature скрипта ,,Историја на уметност, стилови и декорација,, од предметниот професор				
22.1. Mandatory literature				

N°	Author	Title	Publisher	Year
1.	Venturi, L.	Histoire de la critique d`art	Flammarion, Paris, France	1969
2.	Savage, G.	Unutrashnja dekoracija, kratak istorijski pregled	Izdavacki zavod, Beograd, Jugoslavija	1975
3.	Doordan, p.D.	Design history:an antology	Cambridge, Massachusets	1995
4.	Leksikografski zavod	Enciklopedija Likovnih umetnosti I (1959), II (1962), III (1964), IV (1966)	Zagreb	

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Akoka, G.et.al.	Decoration	Edilec, Paris, France	1978
2.	Ackerman, J.	Art & Archaeology	Englewood Cliffs, London	1963
3.	Janson, H.W.	Istorija Umetnosti	Beograd, Jugoslavija	1966

1. Course title	**Technical mechanics**		
2. Code	122		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	I / 2	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Nacko Simakoski		
9. Prerequisites for enrollment of the course	-		

10. Course goals (Competences):
Learning of the basic knowledge and explanations in the classical mechanics, which studies the movements of solid objects and the reasons for the movements (the forces), not taking into account the microstructural changes in the matter of the objects, as well as explanations of the fundamental strength of the wood substance that is used as constructive material in structures for furniture and interior.

11. Course outline: Introduction; Goal and division of mechanics; Historical development of the mechanics; Statics of particle; Axioms of mechanics; Force and vector; Projection and coordinates of vector; Scalar product; Vector product; Vector addition of coplanar forces, forces act at one point (analytical and graphical); Equilibrium of a particle; Resolving force into two components that intersect at a common point; Statics of rigid body; Static moment of a force; Varignon's theorem; Vector addition of coplanar forces, forces act at one point; Equilibrium of arbitrary coplanar system of forces; Polygon method and plan of forces; Parallel forces; Anti-parallel forces; Moment of a couple and couple transformation; Reduction of a force and couple coplanar system; Addition of arbitrary coplanar system; Equilibrium of arbitrary coplanar system; Resolving force into two paralel or three arbitrary directions; Centroid of material line; Centroid of part of circular line; Centroid of triangular surface; Centroid of trapezium (analytical); Centroid of trapezium (graphic); Centroid of circular sector, semicircle and circular quadrant; Centroid of circular ring and circular stretch; Centroid of parabola. Friction; Dry friction; Rolling resistance; Rope friction. Simple beams; Definition of load and types of supports; Classification of loads; Static variables: M, T and H diagram; Equilibrium of simple beams; Simple beam loaded with concentrated forces; Simple beam loaded with evenly distributed load; Simple beam loaded with triangular distributed load; Graphic solving of reactions, transverse forces and bending moment in simple beam; Cantilever beam loaded with concentrated forces; Cantilever beam loaded with evenly distributed load; Cantilever beam loaded with triangular distributed load; Beam with overhang; Truss framework (general); Ritter's method; Method of nodes; Culmann's method; Cremona's plan. Influent line of reactions in simple beam; Shear diagram in simple beam; Bending moment diagram in simple beam; Influent line of reactions in cantilever beam; Shear diagram in cantilever beam; Bending moment diagram in cantilever beam. Introduction to strength of materials; Stress and specific strain; An object of strength of materials; Basic assumptions and axioms, External and internal forces, types of loads. Geometric characteristics of flat sections; Static moment of surface; Moments of inertia (general); Axial moment of inertia; Polar moment of inertia; Centrifugal moment of inertia; Steiner's theorem, Change of moments of inertia during axis rotation; Principal axes and moments of inertia; Radius and ellipse of inertia; Moment of inertia of rectangle; Moment of inertia of triangle. Deformation of solids, Axial stress (pressure and tension); Normal and tangential stress in inclined section; Types of stresses; Hooke's Law; Experimental determination of the stresses, strains and diagrams (sigma and epsilon); Stresses in two directions; Graphic determination of stresses; Mohr's circle; Ellipse of stress; Stress and deformation of its own weight; Experimental determination of tension strength of some constructive bonds for making panel elements. Stresses and deformations in clear shear; Experimental determination of the shear strength of some joints that are used for making panel elements. Bending stress; Stress, deformations and deformation in clear bending; Rational cross-section. Experimental determination of the bending strength of the compositions used for making panel elements; Transverse load bending; Normal and tangential stresses;
Dimensioning; Bending strength; Torsion of circular cross-sections; Coil springs; Inclined bending; Eccentric pressure; Core of intersection; Critical force; Dimensioning allowed stresses, Euler, Tetmaer and Omega procedure; Differential equations of elastic line; Elastic line of simple beam loaded with concentrated force and uniformly distributed load.

12. Study methods: Lectures: theoretical instruction with LCD projection; Auditory exercises: making elaborate using catalogs and professional journals; Self-study and preparation of teaching material and exercises; Independent preparation of elaborate 10 tasks;			
13. Total available fund of hours	180 hours		
14. Weekly number of classes	3+2		
15. Teaching activities	15.1. Lectures-theory: Visual theory classes with LCD projector and smart table	45	
	15.2 Exercises (laboratory, auditory), seminars, team work: Auditorial and group work 20-30 students in a group with teamwork for each task	30	
16. Other activities	16.1 Project assignments	30	
	16.2 Individual assignments	60	
	16.3 Study at home	15	
17. Assessment methods	17.1. Seminar work / project	10 score	
	17.2. Classes activities and attendance	10 score	
	17.3. Tests (Final exam / Partial exams)	80 score	
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five)	
	from 51 to 60 score	6 (six) or E	
	from 61 to 70 score	7 (seven) or D	
	from 71 to 80 score	8(eight) or C	
	from 81 to 90 score	9(nine) or B	
	from 91 to 100 score	10(ten) or A	
19. Minimum score for signature and final exam	Signature: min 30 score (classes attendance 8 score, exercises attendance 7 score, activities 5 score, seminar work 10 score)		
20. Teaching language	Macedonian		
21. Course evaluation method	Control and audit in the maintenance of classes and exams by the Dean and other oversight committees.		

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Атанасова-КоцеваЛ.; Симовски В; Аврамов А,	Збирка решени задачи од техничка механика статика,	трето издание., Универзитет Св.“Кирил и Методиј” Скопје	1989
2.	Гугуловски М; Ончевска С.; Сибиновиќ Б; Битраков Д.	Збирка решени задачи по техничка механика - статика,	второ издание., Универзитет Св.“Кирил и Методиј” Скопје	1986
3.	Симакоски Нацко	Техничка механика I и II-дел статика и јакост на материјалите,	(умножени предавања за студентите од Шумарскиот факултет), Скопје	1998

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Gojkovic Milan	Drvene konstrukcije	Naucna kniga, Beograd	1985
2.	Brcic Vlatko	Otpornost materijala	Naucna kniga, Beograd	1978

1. Course title	**Technical properties of wood**			
2. Code	121			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 2	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Mitko Nacevski			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
To introduce students to the errors, the physical and mechanical properties of wood which condition its use value.

11. Course outline
Lectures: Task and development of the subject. Natural wood errors: errors in stem shape, errors in anatomical and histological structure of the wood, cracks in the wood. Errors of wood caused by climate factors. Error caused by fungi, insects and higher plants. Errors caused by man. Basic mathematical-statistical data on wood properties. Aesthetic properties of wood: color, brightness, smell and texture. Physical properties of wood: porosity, density, humidity, resizing, saturation point and other physical properties. Mechanical properties of wood. Hooke's law. Static wood strength: hardness, tension strength, shear strength, compression strength and flexural strength. Dynamic strength of the wood: strength on dynamic impact. Factors that condition variations in mechanical properties of wood.
Exercises: Measuring basic physical and mechanical properties of wood. Mathematical-statistical processing of the measurement data. Solving tasks in the field of physical and mechanical properties of wood.

12. Study methods
Lectures, laboratory exercises , consultation, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	3 + 2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory),	30 hours
16 Other activities	16.1 Project assignments	0 hours
	16.2 Individual assignments	50 hours
	16.3 Study at home	55 hours
17. Assessment methods	17.1. Classes activities and attendance	20 score
	17.2. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five)
	from 51 to 60 score	6 (six)
	from 61 to 70 score	7 (seven)
	from 71 to 80 score	8 (eight)
	from 81 to 90 score	9 (nine)
	from 91 to 100 score	10 (ten)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year

1.	Живоин Георгиевски	Анатомија и технички својства на дрвото – II дел, Технички својства на дрвото	УКИМ-Шумарски факултет - Скопје	1994
2.				
3.				
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Technology of adhesive bonding**			
2. Code	441			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 4	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Konstantin Bahchevandjiev			
9. Prerequisites for enrollment of the course	Technical properties of wood			

10. Course goals (Competences)

Students acquire professional and educational knowledge about the types and properties of non-wood materials, which besides wood, are required for successful designing and manufacturing products of wood industry, furniture, interior and joinery.

11. Course outline

Introduction; Glued structures - glued materials; Adhesives; General; Natural adhesives; Synthetic adhesives; Theories and parameters of gluing; Terminology and definitions; Properties of adhesive layer; Tension of adhesive layer; Impact on: construction of wood, temperature, humidity; Static tensile load and internal stress; Examination of adhesives and adhesive layer; Physical and physico-chemical properties of adhesives; Strength of gluing; Non-destructive methods; Adhesive bonding technology of wood products; Adhesive bonding of: longitudinal extension of wood frames, massive boards, bars and stools, housings, veneer coating and foil coating, bent laminated products, upholstering products, other adhesive bonding.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Backovič M.	Lijepljenje drveta u polju visokofrekfentne električne struje	Masinski fakultet - Sarajevo	1965

2.	Backovič M.	Lijepljenje drveta zagrijavanjem elektrootpornim kontaktnim grijačima	Masinski fakultet - Sarajevo	1968
3.	Backovič M.	Uticajni faktori na proces i kvalitet lijepljenja furnira	Masinski fakultet - Sarajevo	1976

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Бахчеванџиев К.	Познавање на помошни материјали	УКИМ-ШФС-Скопје	2002
2.	Љуљка Б.	Lijepljenje u tehnologiji finalnih proizvoda	Sumarski fakultet - Zagreb	1978
3.				

1. Course title	**Technology of furniture and final products**			
2. Code	171			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 7 (FWE) III / 5 (DFI)	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Konstantin Bahchevandjiev			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)

Study of the general principles of final wood processing, in function of setting the technological processes for the production of furniture, joinery, special products, through processing specific examples.

11. Course outline

Introduction, definition and classification; Structure of manufacturing processes; Tolerances and contact surface; Accuracy of processing; Leveling; Processing basic parts - details. From sawing lumber: cutting, over-measurement, surfacing, width processing, fasteners, holes, profiling, curvilinear processing, bending, turning, threading, rotating bodies, sculpting. From boards: cutting, equalization, veneer details, making covers, veneering, grinding. Compilation of sub-assemblies, frames, boards, adhesive bonding with HF current, assembling metal bonds. Finish sub-assemblies of boards: shaping, edge banding, drilling, anchoring. Final assembly. Technology of solid wood furniture: chair (cut, turned, bent), table, fronts for kitchens cabinets sideboards. Technology of panel furniture: refined, veneered, softforming and postforming. Technology of lamellated wood: panels, blocks, beams. Technology of joinery: window, balcony door, room door, floor and wall coverings. Furniture and carpentry of alternative materials, metal and plastic. Technology of packaging: crate, barrel. Quality control of furniture and joinery: purpose, characteristics, methods for products, labeling.

12. Study methods

Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	4 + 3	
15. Teaching activities	15.1. Lectures-theory	60 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	45 hours
16. Other activities	16.1 Project assignments	25 hours
	16.2 Individual assignments	25 hours
	16.3 Study at home	25 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	20 score
	17.3. Tests (Final exam / Partial exams)	70 score

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Бахчеванџиев К., Стефановски В.	Финална обработка на дрвото	УКИМ-Шумарски факултет - Скопје	1994
2.	Ljuljka B.	Tehnologija proizvodnje namjestaja	SIZ obrazovanja Zagreb	1977
3.				

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Skakic D. Krdzovic A.	Finalna prerada drveta	Sumarski Fak. Beograd	2002
2.	Кавалов А., Русанов Х.	Технологија на мебелите	Издател.кшта БМСофија	1996
3.	Kollmann F.	Princilpes of Wood Science and Tehnology	Springer-Verlag Berlin	1975

1. Course title	**Technology of upholstered furniture**			
2. Code	482			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Konstantin Bahchevandjiev			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
Students will learn the basic techniques and procedures in technology of upholstery and production of upholstered furniture, the use of materials for upholstery production.

11. Course outline
General about upholstered furniture and upholstery technology; Styles of furniture; Quality and standards; Upholstery technology clasification on special procedures; Materials for upholstered furniture technology; Preparation of materials; Technology of upholstered furniture; Properties and quality of materials and finished products; Occupational safety and environment protection.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Илчев, Х.	Раководство по тапицерство и декоратерство	ЛТУ - Софија	1970
2.	Ljuljka, B.	Tehnologija proizvodnje namještaja	Sumarski fakultet - Zagreb	1981

3.	Манев, Т.	Технологија на тапетарството, Интерна скрипта	УКИМ-Шумарски факултет - Скопје	2000
22.2. Additional literature				
N^{o}	Author	Title	Publisher	Year
1.				

1. Course title	**Theory of wood cutting**			
2. Code	231			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 3	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Vladimir Koljozov			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Introducing students to the basic knowledge in wood cutting theory and mechanical wood processing. Also, students are introduced to the structure and parameters of the work tool, its preparation for work, setting up and fixing on the machine.				
11. Course outline Lectures: Basic concepts of wood cutting, determining of cutting processes, elementary cutting blade, basic cutting types, basic cutting directions, cutting kinematics, absolutely sharp and real sharp tool. Dynamics of the cutting process, cutting forces between the cutting tool and the workpiece, specific cutting resistance and specific cutting power in closed and open cutting processes, impact of specific factors on the cutting operation, the formation of cutting chips in various cutting directions. Main processes of wood cutting on saw with set and swaged teeth, processing and calculation of modes in frame saws, band saws and circular saws, milling machines, drills, lathes, grinders. General concept and classification of tools for woodworking, material for making cutting tools, increasing the durability of cutting part of the tool, sharpening work tool individually for each tool with its preparation, sharpening and attaching to the working machine. Exercises: Preparation of a study on the basic methods and processes of cutting and kinematics of cutting, calculation of the cutting processes of frame saw, band saw, circular saw, mill, lathe, drill and grinding.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			

22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Р.Клинчаров, З.Трпоски, В.Кољозов	Теорија на режење на дрвото	УКИМ-Шумарски факултет - Скопје	2000
2.	Р.Клинчаров, З.Трпоски, В.Кољозов	Алат за механичка обработка на дрвото	УКИМ-Шумарски факултет - Скопје	2000
3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Veneers and veneered panels**		
2. Code	551		
3. Study group	FWE		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	III / 5	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Borche Iliev		
9. Prerequisites for enrollment of the course	Signature: Wood anatomy, Technical properties of wood		

10. Course goals (Competences)

Introducing students to theoretical foundations and procedures in the production of veneer, veneer boards, carpentry boards, special kinds veneer boards and other layered wood products. The students will also get acquainted with the methods and standards for testing the physical and mechanical properties of veneered and carpentry boards.

11. Course outline

Lectures: General terms for veneer production. Raw material for production of cut (refined) and peeled (constructive) veneers. Storage of raw material. Protection of raw material. Preparation of raw material for processing into veneers: mechanical preparation, hydro-thermal preparation. Technological systems for producing veneers: system for production of cut veneer, system for production of peeled veneers. Drying of veneers. Finishing cut veneers. Other types of veneers. Veneer panels: definition and clasification. Technological operations in the production of veneer panels. Storage of veneer panels. Using the raw material in manufacturing of veneer plates. Properties of veneer panels: physical, mechanical. Examining the properties of veneer panels and standards. Special types of veneer panels. Carpenter panels: definition and clasification. Standard carpenter panels. Special types carpenter panels. Properties of carpenter panels: physical, mechanical. Examining the properties of carpentry panels and standards. Other layered wood products.

Exercises: Solving tasks and problems related to the subject content, development of standards for testing the properties of the panels, laboratory tests of panels properties and checking the acquired knowledge through two partial exams.

12. Study methods

Lectures, auditory exercises, lab exercises, consultation, project assignment (seminar work), individual self-learning.

13. Total available fund of hours	6 EKTC × 30 hours = 180 hours	
14. Weekly number of classes	45+30+35+35+35 = 180 hours	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2. Exercises (laboratory, auditory), seminars, team work, field work	30 hours
16. Other activities	16.1. Project assignments (seminar work)	35 hours
	16.2. Individual tasks	35 hours
	16.3. Study at home	35 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score (2×40)

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1., 15.2. and 16.1.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires
22. Literature	

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Стефановски, В., Рабаџиски, Б.	Примарна преработка на дрвото II дел - Фурнири и слоевити плочи	Универзитет “Св. Кирил и Методиј” - Скопје Шумарски факултет - Скопје	1994

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Mešić, N.	Furniri, furnirske i stolarske ploče	“Grafika Šaran” - Sarajevo	1998
2.	Nikolić, M.	Furniri i slojevite ploče	“Građevinska knjiga - Beograd	1988
3.	Шишков, И.	Технология на фурнира и слоестата дървесина	“Земиздат” - София	1994

1. Course title	**Wood anatomy**			
2. Code	211			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 1	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Mitko Nacevski			
9. Prerequisites for enrollment of the course				

10. Course goals (Competences)
Students are introduced to the macroscopic, microscopic and submicroscopic structure of wood as the basis of its physical and mechanical properties. Also, students are introduced to the possibility of identification of tree species of economic importance.

11. Course outline
Lectures: Task and development of the subject. Sections which determine macroscopic and microscopic structure of wood. Samples for identification of wood species. Fundamentals of plant systematics. Microscopic structure of the coniferous species wood. Microscopic structure of the broadleaf species wood. Growth of wooden plants. Primary growth. Secondary growth. Establishment of durable items. Microscopic structure of the cell membrane and its properties. Submicroscopic structure of the cell membrane. Annual ring. Impact of the annual ring width on the technical properties of wood. Tilly and resin channels. Sapwood, marrow and mature wood.
Exercises: Microscopic identification of wood from coniferous and broadleaf species.

12. Study methods
Lectures, laboratory exercises , consultation, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory)	30 hours
16. Other activities	16.1 Project assignments	0 hours
	16.2 Individual assignments	60 hours
	16.3 Study at home	60 hours
17. Assessment methods	17.1. Classes activities and attendance	20 score
	17.2. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five)
	from 51 to 60 score	6 (six)
	from 61 to 70 score	7 (seven)
	from 71 to 80 score	8 (eight)
	from 81 to 90 score	9 (nine)
	from 91 to 100 score	10 (ten)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Живоин Георгиевски	Анатомија и технички својства на дрвото – I дел, Анатомија на дрвото	УКИМ-Шумарски факултет - Скопје	1994
2.				

3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Wood carving**			
2. Code	411			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 1	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Konstantin Bahchevandjiev			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
Introduction to basic techniques and procedures in technology of wood carving, production of artistic works by wood carving, protection and preservation of artwork.

11. Course outline
Generally about carving and wood carving, Development of woodcarving and in our country, General data about wood as a raw material for this purpose, Supply and storage of wood, Working space, tools and accessories, Maintenance and sharpening of tools, Preparation and treatment of wood for carving, Types of carvings; Technology of carving; Carving ornaments; Wood-carving and xilografy; Masks and totems; Figurative-decorative plastics; sculpture carving and working with natural figures; Finishing and protection of the carvings; polychromatic variety of colors, gold coating, silver coating; Repair and restoration; Petrification; Work Safety.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours

17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score

18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)

19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.
20. Teaching language	Macedonian
21. Course evaluation method	Internal evaluation and student questionnaires

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Петков. И.	Да се научим на дрворезба	Софија	1988
2.	Ќорнаков. Д.	Македонска резба	Скопје	1988

3.	Шеди. В.	Художествено обработване на дрвото	Софија	1982

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Крстески. З., Крстески. Ј.	Тајните во копаничарството	Битола	2002
2.	Манев. Т.	Резбарство, Интерна скрипта	УКИМ-Шумарски факултет, Скопје	2001
3.				

1. Course title	**Wood in Construction**			
2. Code	431			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	II / 3	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Borche Iliev			
9. Prerequisites for enrollment of the course	Signature in descriptive geometry and technical mechanics			
10. Course goals (Competences) Introducing students to technical wood, its application in the construction of objects, wooden structural elements, wood products and their application in the construction of objects.				
11. Course outline Lectures: Technical wood. Technical properties of wood. Binding means. Connections. Girders. Wooden roof structures, function, classification, forms and construction. Classic wooden roof constructions. Wooden roof truss constructions. Glued laminated wood beams. Sound and thermal protection, fire protection and protection from moisture. Materials for protection against heat, sound, fire and moisture. Application of insulation materials in objects. Wooden deck floor structures and ceilings: function, classification and construction. Wooden floor coverings: marine floors, parquet floors and laminate floors. Lightweight walls: function, classification and construction. Lightweight partition walls made of wood, wood panels, wood-construction panels and plasterboard panels. Windows: function, classification and installation. Interior doors: function, classification and installation. Coating of walls and ceiling surfaces with wooden linings. Low, medium and high wall coating. Hanging ceiling panels. Wooden stairs: function, classification, forms and construction. Design of wooden stairs. Exercises: Solving problems and tasks related to the course content, preparation of graphic exercises from appropriate chapters (project assignments) and checking knowledge acquired through two partial exams.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	6 ECTS × 30 hours = 180 hours			
14. Weekly number of classes	30+30+40+40+40 = 180 hours			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2. Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1. Project assignments		40 hours	
	16.2. Individual assignments		40 hours	
	16.3. Study at home		40 hours	
17. Начин на оценување	17.1. Project assignments		10 score	
	17.2. Classes activities and attendance		10 score	
	17.2. Tests (Final exam / Partial exams)		80 score (2×40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1., 15.2. and 16.1.			

20. Teaching language		Macedonian		
21. Course evaluation method		Internal evaluation and student questionnaires		
22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Илиев, Б., Јакимовска Поповска, В.	Дрвноиндустриско градежништво-Интерна скрипта	УКИМ-Шумарски факултет - Скопје	2009
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Киријас, Т.	Дрвени конструкции	УКИМ - Скопје	1978
2.	Томиќ, Љ., Плљаковски, Д. Филиповски, Љ.	Архитектонски конструкции I дел	УКИМ - Скопје	1985
3.	Gojković, M.	Drvene konstrukcije	Građevinski fakultet - Beograd Naučna knjiga - Beograd	1985

1. Course title	**Wood plastification**			
2. Code	412			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	I / 2	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Branko Rabadziski			
9. Prerequisites for enrollment of the course	-			
10. Course goals (Competences) Students will be introduced to bending the wood by plasticizing using thermal, chemical and mechanical methods. Attention will focus on thermal processing of the raw material in the form of logs in using modern methods and technologies in processing.				
11. Course outline General on thermal wood processing. Wood and heat. Heat changes. Stationary and non-stationary heat changes. Methods of calculating the thermal changes. Temperature changes in the wood when heated. Temperature changes in the phase of cooling. Plastification of the wood. Thermal plastification of the wood. Plastification of wood by steaming. Plastification of logs and prisms. Working technique and equipment for steaming of logs and prisms. Technical and technological analysis of steaming devices. Plastification of sawn timber assortments. Steaming of sawn timber assortments. Devices for steaming of sawn assortments. Methods for plastification of sawn timber assortments. Technical and technological analysis of steamer for sawn timber assortments. Plastification of wood by boiling. Methods and modes for boiling of wood. Devices for boiling of wood. Plastification heat for boiling the wood. Technical and technological analysis of the pool for boiling of wood. Features of plastisized wood. Plastification of wood with electric energy. Plastification of wood with chemicals. Plastification of the wood for bending.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	180 hours			
14. Weekly number of classes	2+2			
15. Teaching activities	15.1. Lectures-theory		30 hours	
	15.2 Exercises (laboratory, auditory), seminars, team work		30 hours	
16. Other activities	16.1 Project assignments		40 hours	
	16.2 Individual assignments		40 hours	
	16.3 Study at home		40 hours	
17. Assessment methods	17.1. Seminar work / project		10 score	
	17.2. Classes activities and attendance		10 score	
	17.3. Tests (Final exam / Partial exams)		80 score (2x40)	
18. Assessment criteria (Score/Grade)	less than 50 score		5 (five) (F)	
	from 51 to 60 score		6 (six) (E)	
	from 61 to 70 score		7 (seven) (D)	
	from 71 to 80 score		8 (eight) (C)	
	from 81 to 90 score		9 (nine) (B)	
	from 91 to 100 score		10 (ten) (A)	
19. Minimum score for signature and final exam	Completed activities 15.1, 15.2 and 16.1.			
20. Teaching language	Macedonian			
21. Course evaluation method	Internal evaluation and student questionnaires			
22. Literature				

22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Б. Рабаџиски, Г. Златески	Хидротермичка обработка на дрвото, II дел – Пластификација на дрвото	УКИМ-ФДТМЕ-Скопје	2012
2.				
3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Wood quality testing**			
2. Code	761			
3. Study group	FWE			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 6	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Mitko Nacevski			
9. Prerequisites for enrollment of the course	-			

10. Course goals (Competences)
Determination of quality levels to form a basis for correct selection of wood species, which will be used to manufacture certain wood or wood-based products, as well as its rational use, which directly affect the success of the production.

11. Course outline
Lectures: Testing the quality of wood in terms of anatomical and technical properties, according to standards for wood and IMRAD organizational structure. Methods for determination of: wood density, wood pressure strength, wood bending strength, wood splitting strength, wood impact strength and wood shear strength. Quality levels: static level, pressure strength level, rigidity level, dynamic level, splitting level, shear level. Wood quality classification and posibilities for use. Factors cause variations in wood quality. Wood quality of species with economic importance.
Exercises: Solving task for determining the quality and use value of the wood.

12. Study methods
Lectures, laboratory exercises , consultation, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	2+2	
15. Teaching activities	15.1. Lectures-theory	30 hours
	15.2 Exercises (laboratory, auditory),	30 hours
16. Other activities	16.1 Project assignments	40 hours
	16.2 Individual assignments	40 hours
	16.3 Study at home	40 hours
17. Assessment methods	17.1. Classes activities and attendance	20 score
	17.2. Tests (Final exam / Partial exams)	80 score (2x40)
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five)
	from 51 to 60 score	6 (six)
	from 61 to 70 score	7 (seven)
	from 71 to 80 score	8 (eight)
	from 81 to 90 score	9 (nine)
	from 91 to 100 score	10 (ten)
19. Minimum score for signature and final exam	Completed activities 15.1 and 15.2	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Живоин Георгиевски	Анатомија и технички својства на дрвото – I дел Анатомија на дрвото, II делТехнички својства на дрвото	УКИМ-Шумарски факултет – Скопје	1994

2.				
3.				
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.				
2.				
3.				

1. Course title	**Wood surface processing**		
2. Code	182		
3. Study group	FWE / DFI		
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje		
5. Level (first, second, third cyclce)	First cycle		
6. Academic year / semester	IV / 8	**7. Number of ECTS**	6
8. Teacher	Prof. dr. Konstantin Bahchevandjiev		
9. Prerequisites for enrollment of the course	-		

10. Course goals (Competences)
Students will learn about the theoretical and practical foundations and procedures in surface processing of the production of furniture and interior, surface preparation and application of materials for surface processing with protective and aesthetic role in the technology of final products of furniture and interior.

11. Course outline
General terms for surface processing of wood; Quality and standards; Wood as a base for surface processing; Test and control of materials before application, during application and after application and their hardening; Materials and methods for preprocessing; Materials and methods for protective and decorative processing; Drying and hardening of applied materials; Machining of hardened materials on wood surfaces; Technological processes in the surface processing of wood; Surface processing of the interior; Surface processing of the exterior; Working conditions and hygienic-technical safety measures.

12. Study methods
Lectures, auditory exercises, consultation, project assignment, individual self-learning.

13. Total available fund of hours	180	
14. Weekly number of classes	3+2	
15. Teaching activities	15.1. Lectures-theory	45 hours
	15.2 Exercises (laboratory, auditory), seminars, team work	30 hours
16. Other activities	16.1 Project assignments	35 hours
	16.2 Individual assignments	35 hours
	16.3 Study at home	35 hours
17. Assessment methods	17.1. Seminar work / project	10 score
	17.2. Classes activities and attendance	10 score
	17.3. Tests (Final exam / Partial exams)	80 score
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)
	from 51 to 60 score	6 (six) (E)
	from 61 to 70 score	7 (seven) (D)
	from 71 to 80 score	8 (eight) (C)
	from 81 to 90 score	9 (nine) (B)
	from 91 to 100 score	10 (ten) (A)
19. Minimum score for signature and final exam	Completed activities 15.1. and 15.2.	
20. Teaching language	Macedonian	
21. Course evaluation method	Internal evaluation and student questionnaires	

22. Literature

22.1. Mandatory literature

N°	Author	Title	Publisher	Year
1.	Jaić, M., Zivanović, R.	Površinska obrada drveta. Svojstva materijala; Kvalitet obrade	Sumarski fakultet - Beograd	1993

2.	Jaić, M., Zivanović-Trbojević, R.	Površinska obrada drveta. Teorijske osnove; Tehnološki procesi	Sumarski fakultet - Beograd	2000
3.	Janković, A.:	Površinska obrada drveta	Sumarski fakultet - Beograd	1975

22.2. Additional literature

N°	Author	Title	Publisher	Year
1.	Ljuljka, B.	Površinska obrada drva	Sumarski fakultet - Zagreb	1990
2.	Т. Манев	Површинска обработка на дрвото, Интерна скрипта	Скопје	1993
3.				

1. Course title	**Wooden prefabricated objects**			
2. Code	462			
3. Study group	FWE / DFI			
4. Organizer of the study program (unit, institute, department)	University Ss. Cyril and Methodius in Skopje Faculty of Design and Technology of Furniture and Interior-Skopje			
5. Level (first, second, third cyclce)	First cycle			
6. Academic year / semester	III / 6	**7. Number of ECTS**	6	
8. Teacher	Prof. dr. Borche Iliev			
9. Prerequisites for enrollment of the course	Signature in descriptive geometry and technical mechanics			
10. Course goals (Competences) Students are introduced to the theoretical foundations and procedures in the construction of wooden prefabricated objects, as well as construction systems of wooden prefabricated objects. Also, students are introduced to the structure and elements of wooden prefabricated buildings.				
11. Course outline Lectures: Basic knowledge on construction of wooden prefabricated objects. Wood and wood materials for construction of wooden prefabricated objects. Non-wood materials in the construction of wooden prefabricated objects. Wooden prefabricated objects: purpose and classification. General requirements of wooden prefabricated objects: functional, technical, economic. Construction of wooden prefabricated objects for living. Structural systems of prefabricated wooden objects. Modern systems. Panel and skeleton systems. Fine-panel system system. Huge-panel system. Physics of wooden structures: sound and thermal protection, fire protection and protection from moisture. Materials for protection against heat, sound, fire and moisture. Application of materials for protection. Construction elements of the objects: foundations, waterproofing, foundation ring, floor construction, floor coverings, walls-external and internal, ceilings (deck floor structures), roof construction. Joints construction-joints details: connecting walls, walls with foundation ring, walls with ceiling. Wooden sustainable construction: sustainable wood, ecological dimension, durability, security and adaptability, economy in energy terms. Exercises: Solving problems and tasks related to the course content, preparation of graphic exercises from appropriate chapters (project assignments) and checking knowledge acquired through two partial exams.				
12. Study methods Lectures, auditory exercises, consultation, project assignment, individual self-learning.				
13. Total available fund of hours	6 ECTS × 30 hours = 180 hours			
14. Weekly number of classes	30+30+40+40+40 = 180 hours			
15. Teaching activities	15.1. Lectures-theory	30 hours		
	15.2. Exercises (laboratory, auditory), seminars, team work	30 hours		
16. Other activities	16.1. Project assignments	40 hours		
	16.2. Individual assignments	40 hours		
	16.3. Study at home	40 hours		
17. Assessment methods	17.1. Project assignments	10 score		
	17.2. Classes activities and attendance	10 score		
	17.2. Tests (Final exam / Partial exams)	80 score (2×40)		
18. Assessment criteria (Score/Grade)	less than 50 score	5 (five) (F)		
	from 51 to 60 score	6 (six) (E)		
	from 61 to 70 score	7 (seven) (D)		
	from 71 to 80 score	8 (eight) (C)		
	from 81 to 90 score	9 (nine) (B)		
	from 91 to 100 score	10 (ten) (A)		
19. Minimum score for signature and final exam	Completed activities 15.1., 15.2. and 16.1.			

20. Teaching language		Macedonian		
21. Course evaluation method		Internal evaluation and student questionnaires		
22. Literature				
22.1. Mandatory literature				
N°	Author	Title	Publisher	Year
1.	Илиев, Б., Јакимовска Поповска, В.	Дрвноиндустриско градежништво-Интерна скрипта	Универзитет “Св. Кирил и Методиј” - Скопје Шумарски факултет - Скопје	2009
22.2. Additional literature				
N°	Author	Title	Publisher	Year
1.	Ivković, V.	Drvene zgrade	ICS - Beograd	1998
2.	Todorović, B.	Konstruktivni elementi drvene zgrade	DGA - Beograd	2001