

UNIVERSITY OF ZAGREB
FACULTY OF FORESTRY AND WOOD TECHNOLOGY

THE CURRICULUM FOR THE
DOCTORAL STUDY PROGRAMME OF
FORESTRY AND WOOD TECHNOLOGY
FOR THE ACADEMIC YEAR 2020/2021

Zagreb, October 2020

1. NAME OF THE DOCTORAL STUDY PROGRAMME

FORESTRY AND WOOD TECHNOLOGY

2. INSTITUTION OFFERING THE DOCTORAL STUDY PROGRAMME

UNIVERSITY OF ZAGREB, FACULTY OF FORESTRY AND WOOD TECHNOLOGY

3. NAME OF THE INSTITUTION DELIVERING THE STUDY PROGRAMME

UNIVERSITY OF ZAGREB, FACULTY OF FORESTRY AND WOOD TECHNOLOGY

4. HEAD OF THE DOCTORAL STUDY PROGRAMME

PROFESSOR RUŽICA BELJO LUČIĆ, PhD (rbeljo@sumfak.hr, 01/23 52 430)

5. COORDINATOR FOR FORESTRY

PROFESSOR JURA ČAVLOVIĆ, PhD (jcavlovic@sumfak.hr, 01/23 52 501)

6. COORDINATOR FOR WOOD TECHNOLOGY

ASSISTANT PROFESSOR, ANDREJA PIRC-BARČIĆ, PhD (apirc@sumfak.hr, 01/23 52 567)

7. STUDENT OFFICE

DANIJELA PIRŠLJIN BUNJEVČEVIĆ, LLB (dpirsljin@sumfak.hr, 01/23 52 400)

8. SCIENTIFIC AREA AND FIELDS

Scientific area: Biotechnical sciences

Scientific fields: Forestry

Wood technology

9. DURATION OF THE DOCTORAL STUDY PROGRAMME

3 years

10. NUMBER OF COMPULSORY COURSES

2 courses

11. NUMBER OF ELECTIVE MODULES/COURSES

23 modules and 85 elective courses

12. DESCRIPTION OF THE ORGANISATION OF THE DOCTORAL STUDY PROGRAMME

The study programme consists of organised classes and practical work (in the form of scientific research). The maximum course load may not exceed 20% of the total study program load expressed in ECTS credits.

The study program is designed such that in the first semester, all enrolled students attain knowledge from the compulsory methodology courses (first credit group), while in the second and third semesters, students select their elective module and elective courses (second credit group) in agreement with their study advisor or mentor based on the scientific activity and field of scientific research. During their studies, students must engage in scientific activity, which is awarded credits based on defined criteria (third credit group).

During their studies, students must earn a total of 36 ECTS credits in classes from the first and second credit groups (compulsory courses, elective modules and elective courses) and at least 144 ECTS credits

from the third credit group (scientific papers, scientific activities, and preparing the doctoral dissertation).

1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester
Compulsory courses 8 ECTS	Elective module 14 ECTS	Elective courses 14 ECTS	Conducting research, writing scientific papers, scientific activities, preparation of the doctoral dissertation 144 ECTS		
Conducting research, scientific activities, scientific papers					

Instead of the elective courses in the proposed study programme, students may also enrol in courses from other doctoral study programmes.

The overall doctoral study program is delivered in the form of lectures, exercises, conducting research, writing seminar papers, and publishing scientific and professional papers.

Classes are held in blocks by courses, after which the student may sit the examination. If fewer than five students are enrolled in a course, lectures are held in the form of consultations and the practical part of the course is held in groups based on the number of enrolled students.

13. POSSIBILITY OF DELIVERING THE DOCTORAL STUDY PROGRAMME IN ENGLISH

If required, the entire doctoral study programme may be delivered in English.

14. LECTURE SCHEDULE FOR THE ACADEMIC YEAR 2020/2021

14.1 First credit group – Methodological courses (compulsory)

No. (Code)	Course	Course load, hours				ECTS credits
		Hours (total)	Lectures	Exercises	Seminar	
1. (DS1)	METHODS OF SCIENTIFIC RESEARCH WORK (Prof. Jozo Franjić, PhD, Prof. Ružica Beljo Lučić, PhD)	20	5	10	5	4
2. (DS2)	EXPERIMENTAL DESIGN AND STATISTICAL MODELLING (Prof. Anamarija Jazbec, PhD, Assistant Prof. Mislav Vedriš, PhD)	20	5	10	5	4

14.2 Second credit group – Professional courses (elective modules)

No (Code)	Elective module	Course load				ECTS
		Hours (Total)	Lectures	Exercises	Seminar	
	SILVICULTURE					
3. (DSU5)	SILVICULTURE OF NATURAL STANDS (Academician Prof. Igor Anić, PhD, Associate Prof. Stjepan Mikac, PhD)	32	12	14	6	7
4. (DSU4)	FOREST ESTABLISHMENT (Prof. Milan Oršanić, PhD, Assistant Prof. Damir Drvodelić, PhD)	32	12	14	6	7
	ENHANCING FOREST TREES					
5. (DSU3)	ENHANCING FOREST TREES (Prof. Davorin Kajba, PhD, Prof. Saša Bogdan, PhD)	24	5	14	5	7
6. (DSU2)	APPLIED DENDROLOGY (Prof. Marilena Idžojtić, PhD, Assistant Prof. Igor Poljak, PhD)	30	12	8	10	7
	FOREST VEGETATION AND HABITATS					
7. (DSU9)	APPLIED FOREST PHYTOCENOLOGY (Prof. Dario Baričević, PhD, Prof. Joso Vukelić, PhD, <i>professor emeritus</i>)	28	10	10	8	7
8. (DSU15)	HABITAT-PLANT INTERACTIONS IN FORESTRY (Prof. Jozo Franjić, PhD, Prof. Nikola Pernar, PhD, Prof. Ivica Tikvić, PhD, Prof. Željko Škvorc, PhD)	30	12	12	6	7
	FOREST REVITALISATION AND RECLAIMING DEGRADED HABITATS					

9. (DSU6)	SILVICULTURAL PROCEDURES IN DEGRADED FOREST CONDITIONS (Academician Prof. Igor Anić, PhD, Prof. Ivica Tikvić, PhD)	24	10	8	6	7
10. (DSU8)	REVITALIZATION AFTER FOREST FIRES (Prof. Željko Španjol, PhD, Assistant Prof. Roman Rosavec, PhD)	24	8	10	6	7
	FOREST SOILS					
11. (DSU12)	SOIL CLASSIFICATION SYSTEMS (Prof. Nikola Pernar, PhD, Associate Prof Darko Bakšić, PhD)	30	10	10	10	7
12. (DSU14)	COLLOIDAL COMPLEXES AND SOIL CHEMISTRY (Prof. Nikola Pernar, PhD, Associate Prof. Darko Bakšić, PhD)	26	8	10	8	7
	HUNTING MANAGEMENT					
13. (DSU18)	NEW FINDINGS ON BREEDING GAME ANIMALS IN THE WILD (Prof. Marijan Grubešić, PhD, Assistant Prof Kristijan Tomljanović, PhD)	32	10	12	10	7
14. (DSU21)	VALIDATING HABITATS FOR GAME ANIMAL BREEDING (Prof. Marijan Grubešić, PhD, Assistant Prof. Kristijan Tomljanović, PhD)	26	10	10	6	7
	URBAN FORESTRY					
15. (DSZ2)	DENDROFLORA IN SHAPING SPACE (Prof. Marilena Idžojtić, PhD, Assistant Prof. Igor Poljak, PhD)	24	7	10	7	7
16. (DSZ23)	METHODS AND MODELS FOR DETERMINING FOREST VALUE (Associate Prof. Stjepan Posavec, PhD)	24	6	4	14	7

	NATURE CONSERVATION					
17. (DSZ6)	INTEGRAL PROTECTED AREA MANAGEMENT (Prof. Ivan Martinić, PhD)	24	6	8	10	7
18. (DSZ22)	CONSERVING AND PROTECTING BIOLOGICAL AND LANDSCAPE DIVERSITY (Prof. Željko Španjol, PhD, Associate Prof. Damir Barčić, PhD)	24	6	4	14	7
	FOREST MANAGEMENT					
19. (DSZ8)	MULTIPURPOSE MODELS AND SUSTAINABLE MANAGEMENT PLANNING FOR REGULAR AND SELECTION FORESTS (Prof. Jura Čavlović, PhD, Assistant Prof. Krunoslav Teslak, PhD)	24	6	12	6	7
20. (DSZ9)	MODELLING GROWTH AND INCREDMENT YIELD OF FOREST TREE SPECIES AND STANDS (Prof. Mario Božić, PhD, Assistant Prof. Ernest Goršić, PhD)	24	6	12	6	7
	REMOTE SENSING AND GIS IN FORESTRY					
21. (DSZ14)	ASSESSING FOREST CONDITION USING REMOTE SENSING METHODS (Prof. Renata Pernar, PhD)	24	6	14	4	7
22. (DSZ12)	USE OF REMOTE SENSING AND GIS IN MAPPING AND MODELLING (Prof. Renata Pernar, PhD, Associate Prof. Ante Seletković, PhD)	24	6	14	4	7
	DETRIMENTAL ZOOBIOTIC FACTORS IN FOREST PROTECTION					
23. (DSZ4)	FLUCTUATIONS OF FOREST INSECT POPULATIONS (Assistant Prof. Milivoj Franjević, PhD)	24	6	6	12	7

24. (DSZ3)	DYNAMICS OF SMALL RODENT POPULATIONS (Prof. Josip Margaletić, PhD, Assistant Prof. Marko Vucelja, PhD)	30	5	5	20	7
	TREE PATHOLOGY AND RESISTENCE SELECTION					
25. (DSZ5)	FUNGAL DISEASES OF TREE BARK (Prof. Danko Diminić, PhD)	28	7	14	7	7
26. (DSZ10)	PRESERVING GENETIC DIVERSITY OF FOREST TREES (Prof. Davorin Kajba, PhD)	24	5	14	5	7
	WOOD HARVESTING SYSTEMS					
27. (DST2)	RATIONALISATION OF WOOD HARVESTING WORKS (Prof. Željko Zečić, PhD, Assistant Prof. Dinko Vusić, PhD)	24	6	6	12	7
28. (DST5)	TOP WOOD HARVESTING TECHNOLOGIES (Prof. Tomislav Poršinsky, PhD, Prof. Karl Stampfer, PhD)	24	6	6	12	7
	FOREST TRANSPORT INFRASTRUCTURE					
29. (DST9)	OPTIMIZING FOREST TRANSPORT INFRASTRUCTURE (Prof. Tibor Pentek, PhD, Prof. Karl Stampfer, PhD)	24	6	6	10	7
30. (DST11)	COMPUTER DESIGN OF FOREST ROADS (Prof. Tibor Pentek, PhD, Assistant Prof. Ivica Papa, PhD)	24	8	8	8	7
	FORESTRY TECHNIQUES					
31. (DST18)	TECHNICAL AND ENVIRONMENTAL SUITABILITY OF FORESTRY MACHINERY (Prof. Marijan Šušnjar, PhD, Assistant Prof. Zdravko Pandur, PhD)	24	6	6	12	7

32. (DST19)	ERGONOMY IN FORESTRY (Prof. Marijan Šušnjar, PhD)	24	6	8	10	7
	ORGANISATION AND MANAGEMENT IN FORESTRY					
33. (DST14)	FORESTRY MANAGEMENT (Prof. Ivan Martinić, PhD, Prof. Mario Šporčić, PhD)	24	8	6	10	7
34. (DST15)	CORPORATE MANAGEMENT (Associate Prof. Stjepan Posavec, PhD)	24	8		16	7
	WOOD SCIENCE					
35. (DDT 201)	ANATOMIC STRUCTURE OF WOOD (Prof. Jelena Trajković, PhD, Associate Prof. Bogoslav Šefc, PhD)	35	15	10	10	7
36. (DDT 202)	VALUATION AND USE OF WOOD (Prof. Tomislav Sinković, PhD)	35	15	10	10	7
	WOOD MODIFICATION					
37. (DDT 203)	MODIFICATIONS OF SOLID WOOD (Associate Prof. Marin Hasan, PhD)	35	15	10	10	7
38. (DDT 204)	MODIFICATION AND SURFACE DURABILITY OF WOOD (Prof. Hrvoje Turkulin, PhD, Prof. Vlatka Jirouš-Rajković, PhD)	35	15	10	10	7
	THEORY OF MECHANICAL WOOD PROCESSING					
39. (DDT 205)	THEORY OF WOOD CUTTING (Prof. Ružica Beljo Lučić, PhD, Associate Prof. Igor Đukić, PhD)	35	15	10	10	7
40. (DDT 206)	ENERGY ANALYSIS OF WOOD PROCESSING (Assistant Prof. Branimir Šafran, PhD)	35	15	10	10	7
	HYDROTHERMAL WOOD PROCESSING					

41. (DDT 207)	KINETICS, MODELLING AND OPTIMISATION OF HYDROTHERMAL PROCESSES (Prof. Stjepan Pervan, PhD, Assistant Prof. Miljenko Klarić, PhD)	35	15	10	10	7
42. (DDT 208)	COLORIMETRY AND HISTOCHEMISTRY OF WOOD IN HYDROTHERMAL PROCESSES (Prof. Stjepan Pervan, PhD, Assistant Prof. Miljenko Klarić, PhD)	35	15	10	10	7
	COMPOSITE WOOD MATERIALS					
43. (DDT 209)	FINE-STRUCTURE WOOD COMPOSITES (Prof. Vladimir Jambreković, PhD, Assistant Prof. Nikola Španić, PhD)	35	15	10	10	7
44. (DDT 210)	STRUCTURAL ANALYSIS OF LAYERED WOOD COMPOSITES (Prof. Mladen Brezović, PhD, Associate Prof. Jaroslav Kljak, PhD)	35	15	10	10	7
	DEVELOPMENT OF WOOD CONSTRUCTIONS					
45. (DDT 211)	CONSTRUCTING THEORY (Prof. Ivica Grbac, PhD <i>professor emeritus</i> , Associate Prof. Ivica Župčić, PhD)	35	25	-	10	7
46. (DDT 212)	ERGONOMY RESEARCH (Prof. Ivica Grbac, PhD <i>professor emeritus</i>)	35	15	10	10	7
	THEORY OF PRODUCTION					
47. (DDT 213)	THEORY OF INDUSTRIAL PRODUCTION (Prof. Denis Jelačić, PhD, Assistant Prof. Andreja Pirc- Barčić, PhD)	35	25	-	10	7
48. (DDT 214)	DYNAMIC MODELLING OF PRODUCTION SYSTEMS (Prof. Tomislav Grladinović, PhD)	35	25	-	10	7

14.3 Second credit group – Professional courses (elective)

No (Code)	Course	Course load				ECTS
		Hours (Total)	Lectures	Exercises	Seminar	
49. (DS3)	REMOTE SENSING AND GIS IN FORESTRY (Prof. Renata Pernar, PhD)	24	10	10	4	7
50. (DSU1)	PHYSIOLOGY OF FRUIT-BEARING FOREST TREES (Prof. Željko Škvorc, PhD, Prof. Jozo Franjić, PhD)	24	10	6	8	7
51. (DSU7)	FOREST FIRE ISSUES (Prof. Željko Španjol, PhD, Associate Prof. Damir Barčić, PhD, Assistant Prof. Roman Rosavec, PhD)	26	10	8	8	7
52. (DSU10)	WETLAND AND FLOODPLAIN FORESTS (Prof. Joso Vukelić, PhD, <i>professor emeritus</i> , Academician Prof. Igor Anić, PhD)	24	10	6	8	7
53. (DSU11)	SUBALPINE FOREST ECOSYSTEMS (Prof. Milan Oršanić, PhD, Prof. Joso Vukelić, PhD, <i>professor emeritus</i>)	26	10	8	8	7
54. (DSU13)	SOIL ORGANIC MATTER (Prof. Nikola Pernar, PhD, Associate Prof. Darko Bakšić, PhD)	26	8	10	8	7
55. (DSU17)	ZOOGEOGRAPHY AND ZOOECOLOGY (Prof. Josip Margaletić, PhD, Assistant Prof. Marko Vucelja, PhD)	26	8	10	8	7
56. (DSU19)	NEW FINDINGS IN THE FARM BREEDING OF GAME ANIMALS (Prof. Marijan Grubešić, PhD, Assistant Prof. Kristijan Tomljanović, PhD)	26	10	8	8	7

57. (DSU20)	ANALYSIS AND ASSESSMENT OF ANIMAL POPULATIONS (Prof. Krešimir Krapinec, PhD)	26	10	10	6	7
58. (DSU22)	INFECTIOUS AND INVASIVE GAME ANIMAL DISEASES (Prof. Zdravko Janicki, PhD)	30	10	12	8	7
59. (DSZ1)	BIOLOGICAL AND BIOTECHNICAL METHODS TO COMBAT BARK BEETLE (Prof. Boris Hrašovec, PhD)	24	6	8	10	7
60. (DSZ7)	MYCOSIS OF TREE NEEDLES AND LEAVES (Prof. Danko Diminić, PhD)	28	7	14	7	7
61. (DSZ11)	PERIODIC INVENTORY OF FORESTS AND FOREST AREAS (Prof. Mario Božić, PhD)	24	6	12	6	7
62. (DSZ13)	PRINCIPLES AND METHODS OF PLANT TAXONOMY (Prof. Jozo Franjić, PhD, Prof. Željko Škvorc, PhD)	24	6	8	10	7
63. (DSZ15)	COMPONENTS OF MANAGING SPECIAL PURPOSE FORESTS (Prof. Jura Čavlović, PhD, Assistant Prof. Krunoslav Teslak, PhD)	24	6	12	6	7
64. (DSZ16)	SMALL RODENTS AS ZOOZOSIS RESERVOIRS (Prof. Josip Margaletić, PhD, Assistant Prof. Marko Vucelja, PhD)	30	5	5	20	7
65. (DSZ17)	TAXONOMY OF INTRASPECIES DIFFERENTIATION (Prof. Jozo Franjić, PhD, Prof. Željko Škvorc, PhD)	24	6	8	10	7
66. (DSZ18)	PLANT PROTECTION IN URBAN AREAS (Prof. Danko Diminić, PhD)	24	6	6	12	7
67. (DSZ19)	SILVICULTURE IN SPECIAL PURPOSE FORESTS (Prof. Milan Oršanić, PhD, Academician Prof. Igor Anić, PhD)	24	7	10	7	7

68. (DSZ20)	PROTECTED NATURAL VALUES (Prof. Željko Španjol, PhD, Assistant Prof. Daniel Krstonošić, PhD, Associate Prof. Damir Barčić, PhD)	24	6	4	14	7
69. (DSZ21)	SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION (Prof. Željko Španjol, PhD, Prof. Ivica Tikvić, PhD)	24	6	8	10	7
70. (DST1)	WORK AND TIME STUDY (Prof. Željko Zečić, PhD, Assistant Prof. Dinko Vusić, PhD)	24	6	8	10	7
71. (DST3)	MANAGING FORESTRY OPERATIONS (Prof. Željko Zečić, PhD, Assistant Prof. Dinko Vusić, PhD)	24	6	4	14	7
72. (DST4)	CALCULATING WOOD HARVESTING COSTS (Prof. Tomislav Poršinsky, PhD, Assistant Prof. Andreja Đuka, PhD)	24	6	6	12	7
73. (DST6)	FOREST PRODUCTS TRADE (Prof. Željko Zečić, PhD, Assistant Prof. Dinko Vusić, PhD)	24	8	8	8	7
74. (DST8)	WOOD HARVESTING AND THE FOREST ENVIRONMENT (Prof. Tomislav Poršinsky, PhD, Assistant Prof. Andreja Đuka, PhD)	24	8	8	8	7
75. (DST10)	PRIMARY AND SECONDARY FOREST OPENINGS (Assistant Prof. Hrvoje Nevečerel, PhD)	24	6	8	10	7
76. (DST12)	TECHNIQUES AND TECHNOLOGY IN BUILDING FOREST ROADS (Prof. Tibor Pentek, PhD)	24	8	6	10	7
77. (DST13)	PROMINENT PROPERTIES OF WOOD (Prof. Tomislav Sinković, PhD)	24	8	8	8	7

78. (DST17)	MEASUREMENT TECHNIQUES ON FORESTRY MACHINERY (Prof. Marijan Šušnjar, PhD, Assistant Prof. Zdravko Pandur, PhD)	24	6	8	10	7
79. (DST16)	BUSINESS ETHICS (Prof. Mario Šporčić, PhD, Assistant Prof. Matija Landekić, PhD)	24	12		12	7
80. (DDT 301)	QUANTITATIVE RESEARCH METHODS (Assistant Prof. Azra Tafro, PhD)	35	15	20	-	7
81. (DDT 302)	CHEMICAL ANALYSIS OF WOOD COMPOSITION (Associate Prof. Alan Antonović, PhD)	35	15	20	-	7
82. (DDT 303)	RESEARCH OF ADHESION AND ADHESIVES IN GLUING WOOD (Associate Prof. Goran Mihulja, PhD)	35	15	20	-	7
83. (DDT 304)	OPTIMIZATION METHODS FOR LAYERED WOOD (Prof. Mladen Brezović, PhD)	35	20	15	-	7
84. (DDT 305)	WOOD-PLASTIC COMPOSITES (Prof. Vladimir Jambreković, PhD, Assistant Prof. Nikola Španić, PhD)	35	20	15	-	7
85. (DDT 306)	THEORY OF WOOD PRODUCT DESIGN DEVELOPMENT (Prof. Boris Ljuljka, PhD, <i>professor emeritus</i> , Assistant Professor Danijela Domljan, PhD)	30	30	-	-	7
86. (DDT 307)	METHODS TO OPTIMISE THE USE OF RAW WOOD MATERIALS (Assistant Prof. Josip Ištvančić, PhD)	35	20	15	-	7
87. (DDT 308)	CHANGES TO WOOD PROPERTIES (Prof. Tomislav Sinković, PhD)	35	15	20	-	7

14.4 Third credit group

	Scientific activities and scientific papers	ECTS credits
1.	Managing a scientific project (for young scientists)	20
2.	Participation in a domestic scientific project	5
3.	Participation in an international scientific project	10
4.	Publication of a scientific paper in an A1 group journal	35 (A*), 15 (C*)
5.	Publication of a scientific paper in an A2 group journal	20 (A), 10 (C)
6.	Presentation at an international scientific conference (A3 group)	15 (A), 5 (C)
7.	Poster at an international scientific conference	10 (A), 4 (C)
8.	Presentation at a domestic scientific conference	8 (A), 3 (C)
9.	Poster at a domestic scientific conference	6 (A), 2 (C)
10.	Other papers (based on assessment of the head of doctoral studies)	0-10
11.	Defence of the topic of the doctoral dissertation	10
12.	Patents, books or book chapters (based on the assessment of the head of doctoral studies)	0-15
13.	Drafting the doctoral dissertation	30
14.	Awards, recognition, etc. (based on the assessment of the head of doctoral studies)	0-10
15.	Scientific training abroad (up to 1 month)	10
16.	Scientific training abroad (from 1 to 3 months)	20
17.	Scientific training abroad (longer than 3 months)	30
18.	Participation in classes (course /semester)	5

Instructions for applying the table for the third credit group:

a) * A – main author, C – co-author

b) A scientific paper of a doctoral candidate written in a global language and published in a highly ranked journal (A1 group), where the candidate is the first or main author, will be granted 35 ECTS credits for each such paper, and where the candidate is a co-author will be granted 15 ECTS credits for each paper. If the doctoral candidate published a paper in one of the most prestigious publications, such as *Science* or *Nature* or an equivalent in the biotechnical field, the study leader will award an additional 10 ECTS credits in item 14. Awards, recognitions, etc.