

Course Structure Diagram 2016-17
Master of Science (MSc) in Molecular Medicine
2 years, 120 ECTS credits
(students starting their studies in autumn 2016)

Year/Semester

2 / Spring	Pro gradu -thesis 20 ECTS cr	Optional studies 10 ECTS cr	
2 / Autumn	Pro Gradu experimental work 28 ECTS cr	Optional studies 2 ECTS cr	
1 / Spring	Obligatory studies 6 ECTS cr	Language and Comm. Studies 5 ECTS cr	Optional studies 19 ECTS cr
1 / Autumn	Obligatory studies 12 ECTS cr	Optional studies 18 ECTS cr	

Code	Entities, courses, part of courses and scope	1st year		2nd year	
		autumn	spring	autumn	spring
	Obligatory Studies (69 ECTS credits)				
744620S	Protein chemistry II, 3 ECTS cr	3			
744621S	Molecular biology II, 3 ECTS cr	3			
902154Y	Scientific communication for biochemists , 5 ECTS		5		
744617S	Orientation to Research Work and and	6	6		
744624S	Orientation to Biochemical Work, Total 12-20 ECTS cr				
743694S	Pro gradu experimental work in molecular and cellular biology, 28 ECTS cr			28	
743695S	Pro gradu thesis in molecular and cellular biology, 20 ECTS cr				20
740672S	Maturity test (M.Sc. degree), 0 ECTS cr				
	Total ECTS credits (Obligatory Studies)	12	11	28	20
	Optional Studies (a minimum of 3 of these courses must be taken)				
743655S	Systems biology 4 ECTS cr, autumn				
743657S	Tumor cell biology 3 ECTS cr, spring		3		3
743662S	Extracellular matrix 5 ECTS cr, spring		5		
743663S	Developmental biology, stem cells and tissue engineering 5 ECTS cr, spring		5		
743664S	Hypoxia response pathway – molecular mechanisms and medical applications, 5 ECTS cr, autumn	5			
743665S	Molecular, cell biological and genetic aspects of diseases 5 ECTS cr, autumn	5			
	Other Optional studies				
747608S	Biochemical methodologies II, 8 ECTS cr, 1st autumn				
744618S	Dissertation 18 ECTS cr				
743661S	Virology 3 ECTS cr, spring				3
747614S	Macromolecular x-ray crystallography, 5 ECTS, spring				
747613S	In silico methodologies in biochemistry and molecular medicine 5 ECTS cr, autumn	5			
744625S	Scientific presentation 1-2 ECTS cr			1	
743660S	Introduction to Immunology 3 ECTS cr, autumn	3			
740381A	Biochemical and biomedical Innovation, 2-5 ECTS cr				
743696S	Final examination in molecular and cellular biology 9 ECTS cr				
744623S	Yeast genetics 3-6 ECTS cr, spring		6		
300002M	Advanced Information Skills (Science and Technology library Tellus) 1 ECTS cr			1	
747611S	Biochemistry of protein folding 3 ECTS cr, spring				
488321S	Bioreactor technology (Bioprocess Engineering Laboratory) 5 ECTS cr, autumn				
488305S	Advanced course for biotechnology (Bioprocess Engineering Laboratory), 5 ECTS cr, spring				
756625S	Genetic transformation of plants (Dept. of Biology) 4 ECTS cr, autumn				

756627S	Plant hormones (Dept. of Biology) 4 ECTS cr, spring				
580402S	Biomedical Imaging Methods (Institute of Biomedicine), 1-5 ECTS cr				1
040911S	Using animals in research - carrying out procedures, 3 ECTS cr				3
	Any other courses listed in any MSc line in biochemistry				
	Total ECTS credits (Optional studies)	18	19	2	10
	Optional studies at any university (0-15 ECTS credits)				
	Up to 15 ECTS credits of courses can be taken from other suitable courses taught at any university. Also courses given by research units eg. Biocenter Oulu will be accepted. Courses must be connected to biochemistry or logically support some aspect of it and be at an appropriate level. The content of the courses must not be too similar to other courses which have counted towards the students BSc degree or towards their MSc. In all cases Amanuensis Jari Heikkinen should be contacted to confirm acceptance / suitability. We would advise that this is done before the course is taken, especially in the case of courses taken from universities outside Finland. A list of previously accepted courses can be found on the teaching pages of the faculty web pages, please consults this list before contacting Amanuensis Jari Heikkinen.				
	Total ECTS credits/ Semester	30	30	30	30
	Total ECTS credits / Academic Years		60		60
	Total of ECTS credits /Master's Degree				120

Course Structure Diagram 2016-17

Master of Science (MSc) in Protein Science and Biotechnology

2 years, 120 ECTS credits

(Students starting their studies in autumn 2016)

Year/Semester

2 / Spring	Pro gradu -thesis 20 ECTS cr		Optional studies 10 ECTS cr
2 / Autumn	Pro Gradu experimental work 28 ECTS cr		Optional studies 2 ECTS cr
1 / Spring	Obligatory studies 6 ECTS cr	Language and Comm. Studies 5 ECTS cr	Optional studies 19 ECTS cr
1 / Autumn	Obligatory studies 20 ECTS cr		Optional studies 10 ECTS cr

Code	Entities, courses, part of courses and scope	1st year		2nd year	
		autumn	spring	autumn	spring
	Obligatory Studies (77 ECTS credits)				
744620S	Protein chemistry II, 3 ECTS cr	3			
744621S	Molecular biology II, 3 ECTS cr	3			
902154Y	Scientific communication for biochemists , 5 ECTS		5		
747608S	Biochemical methodologies II, 8 ECTS cr, 1st autumn	8			
744617S	Orientation to Research Work and/or	6	6		
744624S	Orientation to Biochemical Work, Total 12-20 ECTS cr				
747691S	Pro gradu experimental work in protein science and biotechnology 28 ECTS cr			28	
747692S	Pro gradu thesis in protein science and biotechnology, 20 ECTS cr				20
740672S	Maturity test (M.Sc. degree), 0 ECTS cr				
	Total ECTS credits (Obligatory Studies)	20	11	28	20

Optional Studies (a minimum of 3 of these courses must be taken)					
747611S	Biochemistry of protein folding 3 ECTS cr, spring		3		
744619S	Systems biology 4 ECTS cr, autumn				
747615S	Introduction to structure-based drug discovery 5 ECTS cr, spring		5		
747614S	Macromolecular x-ray crystallography, 5 ECTS, spring		5		
747606S	Structural enzymology 3 ECTS cr, autumn				
747613S	In silico methodologies in biochemistry and molecular medicine 5 ECTS cr, autumn	5			
Other Optional studies					
744618S	Dissertation 18 ECTS cr				
744625S	Scientific presentation 1-2 ECTS cr			1	
747693S	Final examination in protein science and biotechnology 9 ECTS cr				
744623S	Yeast genetics 3-6 ECTS cr, spring				6
743657S	Tumor cell biology 3 ECTS cr, spring		3		
743662S	Extracellular matrix 5 ECTS cr				
743663S	Developmental biology, stem cells and tissue engineering 5 ECTS cr				
743664S	Hypoxia response pathway – molecular mechanisms and medical applications, 5 ECTS cr				
743661S	Virology 3 ECTS cr, spring		3		
743660S	Introduction to Immunology 3 ECTS cr, autumn				
740381A	Biochemical and biomedical Innovation, 2-5 ECTS cr				
300002M	Advanced Information Skills (Science and Technology library Tellus) 1 ECTS cr			1	
488321S	Bioreactor technology (Bioprocess Engineering Laboratory) 5 ECTS cr, autumn	5			
488305S	Advanced course for biotechnology (Bioprocess Engineering Laboratory), 5 ECTS cr, spring				
580402S	Biomedical Imaging Methods (Institute of Biomedicine), 1-5 ECTS cr				1
040911S	Using animals in research - carrying out procedures, 3 ECTS cr				3
	Any other courses listed in any MSc line in biochemistry				
	Total ECTS credits (Optional studies)	10	19	2	10
Optional studies at any university (0-15 ECTS credits)					
	Up to 15 ECTS credits of courses can be taken from other suitable courses taught at any university. Also courses given by research units eg. Biocenter Oulu will be accepted. Courses must be connected to biochemistry or logically support some aspect of it and be at an appropriate level. The content of the courses must not be too similar to other courses which have counted towards the students BSc degree or towards their MSc. In all cases Amanuensis Jari Heikkinen should be contacted to confirm acceptance / suitability. We would advise that this is done before the course is taken, especially in the case of courses taken from universities outside Finland. A list of previously accepted courses can be found on the teaching pages of the faculty web pages, please consults this list before contacting Amanuensis Jari Heikkinen.				
	Total ECTS credits / Term	30	30	30	30
	Total ECTS credits / Academic Year		60		60
	Total of ECTS credits / Master's Degree				120