

## International Green Chemistry and Bioproduction Educational Programme

<b>Plant Physiology</b>					
<u>Code</u>	<u>Course</u>	<u>cr</u>	<u>Semester</u>	<u>Prerequisites</u>	<u>Note</u>
<b>Compulsory to all</b>					
756625S	Genetically Transformed Plants/Kasvien geneettinen transformaatio	4	autumn	752345A Basics of Plant Physiology (lectures)	every other year (2012)
752688S	Plant Micropropagation/Kasvien solukkoviljelyn perusteet	5	autumn	--	
<b>Compulsory only in plant physiology</b>					
752695S	Seminar: From Raw Material to Product	4	any time		
750615S	Practical training/Harjoittelu	5	any time		
756602S	Master's thesis/ Pro gradu -tutkielma	40	any time		
752699S	Final examination/Loppukuulustelu	10	any time		at the end of studies
750632S	Maturity exam/Kypsyysnäyte	0	any time		at the end of studies
<b>Optional / Compulsory studies, open for all vikebi-students</b>					
756618S	Secondary Metabolism of Plants/Kasvien sekundaarimetabolia	4	spring	752345A Basics of Plant Physiology	odd years (2013), also as a book examination
756615S	Physiology of Forest Trees/Metsäpuiden fysiologia	4	spring	755337 Basic Course in Plant Morphology	
756626S	Stress Physiology of Plants/Kasvien stressifysiologia	4	spring	752345A Basics of Plant Physiology	every other year (2014)
752682S	Advanced Molecular Plant Physiology/Molekulaarisen kasvibiologian jatkok.	4-9	autumn	752345A Basics of Plant Physiology	every other year (2013)
756627S	Plant hormones/Kasvihormonit	4	spring	752345A Basics of Plant Physiology	every other year (2013)
752691S	Special Course in Plant Physiology	4			arranged occasionally
<b>Possible bridge studies</b>					
750121P	Cell Biology/Solubiologia	5	autumn	--	partly as a book examination
752337A	Basic Course in Plant Morphology/Kasvimorfologia	2-3	autumn	--	partly as a book examination
752345A	Basics in Functional Plant Biology/Funktionaalisen kasvibiologian perusteet	4-9	spring	750121 Cell Biology	partly as a book examination
756332A	Plant Developmental Biology/Kasvien kehitysbiologia	4	spring	755337 Basic Course in Plant Morphology	also as a book examination

<b>Chemistry</b>					
<b>Code</b>	<b>Course</b>	<b>cr</b>	<b>Semester</b>	<b>Prerequisites</b>	<b>Note</b>
<b>Compulsory to all</b>					
780353A	Inorganic Chemistry I/Epäorgaaninen kemia I	6	spring	780114P Yleinen ja epäorgaaninen kemia I, 780115P Yleinen ja epäorgaaninen kemia II	
780389A	Organic Chemistry I/Orgaaninen kemia I	6	autumn	780103P Introduction to Organic Chemistry	
<b>Compulsory only in chemistry</b>					
780690S	Seminar: From Raw Material to Product	4	any time		
782631S	Physical Chemistry II/Fysikaalinen kemia II	4	spring	780347A Physical Chemistry I	
780670S	Special Course: Research Project/Tutkimusprojekti	5	spring/autumn		
78x601S	Master's thesis/Pro gradu -tutkielma	38	any time		
78x600S	Final examination of the orientation area/Loppukuulustelu	7	any time		at the end of studies
780699S	Maturity test/Kypsyysnäyte	0	any time		at the end of studies
781642S	Inorganic Chemistry II/Epäorgaaninen kemia II	4	spring	780353A Inorganic Chemistry I	
783643S	Organic Chemistry II/Orgaaninen kemia II	4	autumn	780389A Organic Chemistry I	
<b>Optional / Compulsory studies, open for all vikebi-students</b>					
780372A	Basic Principles of Green Chemistry /Vihreän kemian perusteet	4	spring		
781640S	Sampling and Sample Preparation/Näytteenotto ja näytteenkäsittely	4	spring	Bachelor level studies in the field	every other year (2013)
782634S	Chemistry in Industrial Applications/Kemian teolliset sovellutukset	3	spring	780347A Physical Chemistry I	every other year
783627S	Chemistry of Natural Substances I/Luonnonainekemia I	3	autumn	780389A Organic Chemistry I	every other year (2013)
783642S	Synthetic Methods in Green Chemistry/Vihreän kemian synteessimenetelmiä	4	spring/autumn	780389A Organic Chemistry I	every other year (2013)
781631S	Statistical Methods in Analytical Chemistry/Analyyttisen kemian tilastollisia menetelmiä	4	autumn	Bachelor level studies in the field	every other year (2013)
781645S	Chemistry of Ash of Solid Fuels/Kiinteiden polttoaineiden tuhkan kemiaa	3	spring	780353A Inorganic Chemistry I	every other year (2013)
781611S	Solid State Chemistry/Kiinteän olomuodon kemia	3	autumn	780347A Physical Chemistry I (and 780353A Inorganic Chemistry I)	every other year (2012)
783605S	Survey of Literature/Kirjallisuustutkielma	9	any time	Bachelor level studies in the field	
<b>Possible bridge studies (some courses can be organized as a book examination)</b>					
780114P	Yleinen ja epäorgaaninen kemia I	6	autumn	--	
780115P	Yleinen ja epäorgaaninen kemia II	6	autumn	--	
780347A	Physical Chemistry I/Fysikaalinen kemia I	6	spring	--	
780111P	Introduction to Analytical Chemistry/Johdatus analyyttiseen kemiaan	4	spring	--	
780109P	Basic Principles in Chemistry/Kemian perusteet	4	autumn	--	
780103P	Introduction to Organic Chemistry/Johdatus orgaaniseen kemiaan	6	autumn-spring	--	
780330A-01	Laboratory Course I in Inorganic Chemistry/Epäorgaanisen kemian laboratorioharjoitukset (1.osa)	2	spring		
780329A	Laboratory Course I in Organic Chemistry/Orgaanisen kemian laboratorioharj. I	4	autumn		
780328A	Instrumental Analysis/Instrumenttialalytiikka	5	autumn		
780379A	Literature of Chemistry and Information Retrieval/Kemian kirjallisuus ja viestintä	2	autumn	--	

<b>Production Management</b>					
<b>Code</b>	<b>Course</b>	<b>cr</b>	<b>Semester</b>	<b>Prerequisites</b>	<b>Note</b>
<b>Compulsory to all</b>					
555340S	Technology Management/Teknologiajohtaminen	4	autumn	555240A Basic Course in Product Development	
555386S	Seminar in Project Management/Projektijohtamisen seminaari	3	autumn	--	3 cr
<b>Compulsory only in production management (*open also for other vikebi-students)</b>					
555327S	Seminar: From Raw Material to Product	4	any time		
555320S	Strategic Management/Strateginen johtaminen*	5	autumn	555322S Production Management	
555321S	Risk Management/Riskien hallinta*	3	autumn	--	
555380S	Quality Management/Laatujohtaminen*	5	spring	555281A Basic Course of Quality Management	
555311S	Practical training/Harjoittelu	5	any time		
555xxxS	Master's thesis/Diplomityö	30	any time		
<b>Optional studies (*open for all vikebi-students)</b>					
555322S	Production Management/Tuotannon johtaminen*	3	spring	555223A Introduction to Production Control and 555224A Methods of Production Management and Logistics	
555323S	Purchase Management/Ostamisen hallinta*	3	autumn	555224A Methods of Production Management and Logistics	
555324S	Advanced Supply Chain Management/Tilaus-toimitusketjun johtaminen*	3	spring	555224A Methods of Production Management and Logistics	
555325S	Human Resources Management/Henkilöstöjohtaminen*	3	spring	--	
555341S	Productivity and Performance Management/Tuottavuuden ja suorituskyvyn hallinta*	3	spring	555340S Technology Management	
555346S	Advanced Course in Technology Management/Teknologiajohtamisen jatkokurssi*	5	spring	555340S Technology Management, 555321S Risk Management and 555320S Strategic Management	
555326S	Research Project in Production Management/Tuotannon johtamisen erikoistyö*	5	autumn/spring	Bachelor level studies in the field	
555327S	Seminar in Production Management/Tuotannon johtamisen seminaari*	5	autumn	Bachelor level studies in the field	
<b>Possible bridge studies</b>					
555240A	Basic Course in Product Development/Tuotekehityksen perusteet	3	autumn	--	
555281A	Basic Course of Quality Management/Laadun peruskurssi	5	spring	--	
555282A	Project Management/ Projektinhallinta	4	spring	Recommended 555141A Basic Course in Project Planning or equivalent knowledge	
555224A	Methods of Production Management and Logistics/Tuotannon ja logistiikan menetelmät	4	autumn	555223A Introduction to Production Control	
555223A	Introduction to Production Control/Tuotannon ohjauksen perusteet	3	autumn-spring	555220P Basic Course in Industrial Engineering and Management and 555221P Introduction to Production	
555220P	Basic Course in Industrial Engineering and Management/Teollisuustalouden peruskurssi	3	autumn	--	
555221P	Introduction to Production/Tuotannollisen toiminnan peruskurssi	2	spring	555220P Basic Course in Industrial Engineering and Management and 555280P Basic Course of Project Management	

Periods 1-3 in autumn, periods 4-6 in spring

<b>Environmental Engineering</b>					
<b>Code</b>	<b>Course</b>	<b>cr</b>	<b>Semester</b>	<b>Prerequisites</b>	<b>Note</b>
<b>Compulsory to all</b>					
488302A	Basics of Biotechnology/Biotekniikan perusteet	5	4-5	knowledge of bridge studies*	
477309S	Environmental and Process Catalysis/Katalyyysi prosessi- ja ympäristötekniologia	5	2	knowledge of bridge studies*	
<b>Compulsory only in environmental engineering</b>					
488xxxA	Seminar: From Raw Material to Product	4	any time		
477310S	Advanced Catalytic Processes/Uudet katalyyttisten prosessien sovellukset	5	2	477309S Environmental and Process Catalysis	every other year
488003A	Practical training/Harjoittelu	5	any time		
740148A	Biomolecules	5	autumn/spring	--	Dep. of Biochemistry
740149A	Metabolism I/Aineenvaihdunta I	4	spring	740148A Biomolecules	Dep. of Biochemistry
48899xS	Master's thesis/Diplomityö	30	any time		
<b>Optional studies, open only for vikebi-students in environmental engineering</b>					
477208S	Biorefineries/Biojalostamot	3	4		every other year
477311S	Advanced Separation Processes/Uudet erotustekniikan sovellukset	4	6		every even years
477504S	Process optimization/Prosessien optimointi	4	4	--	
477506S	Modelling and Control of Biotechnological Processes/Bioteknisten prosessien mallit ja säätö	5	1	477501A Process Control Engineering I	
488304S	Bioreactor technology/Bioreaktoritekniikka	6	1	Bachelor level studies in the field	
488305S	Advanced Course for Biotechnology/Biotekniikan jatkokurssi	5	2-3	Basics of Biotechnology, Bioreactor Technology	
488306S	Applied microbiology/Soveltava mikrobiologia	7	1-3	Bachelor level studies in the field	
488307S	Bioprocess Engineering/Bioprosessitekniikka	7	4-6	Bachelor level studies in the field	
<b>Possible bridge studies</b>					
477011P	Introduction to Process Engineering/Prosessi- ja ympäristötekniikan perusta I	5	1-3	--	
488011P	Introduction to Environmental Engineering/Ympäristötekniikan perusta	5	5-6	--	also as a book examination
488301A	Microbiology/Mikrobiologia	5	1-2	488011P Introduction to Environmental Engineering	
555220P	Basic Course in Industrial Engineering and Management/Teollisuustalouden peruskurssi	3	1-3	--	Dep. Industrial Engineer. and Management
031010P	Calculus I/Matematiikan peruskurssi I	5	1-3	--	Dep. of Mathematics
031017P	Differential Equations/Differentiaaliyhtälöt	4	4-6	031010P Calculus I or equivalent studies	
031019P	Matrix Algebra/Matriisialgebra	3, 5	1-3	--	
031021P	Probability and Mathematical Statistics/Tilastomatematiikka	5	4-6	031010P Calculus I or equivalent studies	
031022P	Numerical Analysis/Numeeriset menetelmät	5	4-6	031010P Calculus I, 031017P Differential	

				Equations, 031019P Matrix Algebra	
477012P	Introduction to Automation Engineering/Automaatiotekniikan perusta	5	4-5	--	
477201A	Material and Energy Balances/Taselaskenta	5	1-2	477 011P Introduction to Process Engineering	
477401A	Thermodynamic Equilibria/Termodynaamiset tasapainot	5	2	477 011P Introduction to Process Engineering	
477202A	Reactor Analysis/Reaktorianalyysi	4	3	477201 Material and Energy Balances, 477401A Thermodynamic Equilibria	
477203A	Process Design/Prosessisuunnittelu	5	4-5	477202A Reactor Analysis, 477304A Separation Processes, 477012P Introduction to Automation Engineering	
477301A	Momentum Transfer/Liikkeensiirto	3	4	031017P Differential Equations	
477302A	Heat Transfer/Lämmönsiirto	4	5	--	
477303A	Mass Transfer/Aineensiirto	3	1	477302A Heat Transfer	
477304A	Separation Processes/Erotusprosessit	5	1-2	477301A Momentum Transfer, 477302A Heat Transfer, 477303A Mass Transfer	
477501A	Process Control Engineering I/Prosessien säätötekniikka I	5	3	477201 Material and Energy Balances, 477302A Heat Transfer, 477303A Mass Transfer	
761101P	Basic Mechanics/Perusmekaniikka	4	autumn	--	