



Module Catalog Cohort 2009
Fontys Hogeschool voor Techniek en Logistiek
Venlo
Course SOFTWARE ENGINEERING
Summary of all module descriptions

Draft

Purpose

This catalog of modules is a compilation of the short module descriptions that were available for the students of cohort 2009.

The overall course plan is given in the table 0.1 on the next page.

At the moment of compilation the students for which this compilation is applicable, have completed all semesters except the last semester (Graduation project in semester 8).

This programme is applicable for the students with student numbers:

2145561, 2146857, 2140968, 2144641, 2139811, 2147045, 2143636, 2140967, 2152859, 2141231, 2148262, 2155407, 2139448, 2140039, 2152952, 2133563, 2140966, 2143538, 2144182, 2152192, 2128124, 2143387, 2108961, 2139693, 2046379, 2148717, 2156993 and 2145620

Venlo, September 24, 2012.

Table 0.1: Curriculum or course plan

Major Curriculum Software Engineering – Cohort 2009

Semester 1: Foundations of SE - I			Semester 2 : Foundations of SE- II		
<i>Code</i>	<i>Name of Module</i>	<i>EC</i>	<i>Code</i>	<i>Name of Module</i>	<i>EC</i>
PRO1	Programming in Java - 1	6	PRO2	Programming in Java - 2	6
DBS1	Databases	5	SEN1	Software Engineering - 1	3
CSA1	Computer Systems Architecture - 1	6	MOD1	Modelling Techniques - 1	4
MAT1	Mathematics 1	4	MAT2	Mathematics 2	4
PRJ1	Projects 1: ▪ Web Applications ▪ Computer Networks	4 4	PRJ2	Projects 2: ▪ Information System - 1 ▪ Information System - 2 ▪ Communication 2	3 6 1
COM	Communication	1	ENGL	English for software engineers	3
Sums up to 30 EC			Sums up to 30 EC		

Semester 3: Advanced SE topics - I			Semester 4: Advanced SE topics - II		
<i>Code</i>	<i>Name of Module</i>	<i>C</i>	<i>Code</i>	<i>Name of Module</i>	<i>C</i>
PRO3	Concurrent Programming in Java	5	PRO4	Programming in C/C++	5
MOD2	Modelling Techniques - 2	5	CSA2	Operating Systems	5
PRJ3	Projects 3: ▪ Lego (7W) ▪ Lift (7W)	3 3	PRJ4	Projects 4: ▪ .Net Applications (C#) ▪ .Net Distributed Applications	6
MAT3	Algebra	3			
ECO	Economics	3	LINUX	Linux & script languages	4
FND1	Algorithms & data structures	6	FND2	Compilers, scanners & Parsers	5
APPL	Applied research methods	2	SEN2	Software Engineering - 2	5
Sums up to 30 EC			Sums up to 30 EC		

Semester 5 : Work placement/Internship			Semester 6: Minor		
<i>Code</i>	<i>Name of Module</i>	<i>C</i>	<i>Code</i>	<i>Name of Module</i>	<i>C</i>
STAGE	Practical Period 1 (internship)	30	MINOR	Minor (choice)	30
Sums up to 30 EC			Sums up to 30 EC		

Semester 7 : Advanced SE topics - III			Semester 8 : Graduation		
<i>Code</i>	<i>Name of Module</i>	<i>C</i>	<i>Code</i>	<i>Name of Module</i>	<i>C</i>
COM	Communication / job application	2	AFST	Practical Period 2 (graduation)	30
SOFA	Software Factory	18			
CMOD1	Choice Module 1	5			
CMOD2	Choice Module 2	5			
Sums up to 30 EC			Sums up to 30 C		

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1 Semester 1: Foundations I

1.1 Module SE/PRO1

Title	Programming 1: introduction to object-oriented programming			
Code	PRO1			
Credits	6			
Academic year	2004-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	80	20		
Description	<p>This module is an introduction to object-oriented programming (in Java) To implement the concepts presented the programming language Java and the Java developer's kit BlueJ are used. The main topics are: Objects and classes, object interaction, grouping objects in collections, GUI programming (Swing), unit testing, inheritance.</p>			
Literature	Objects First with Java, Barnes & Kölling,			
Classroom language	Native (dutch, german)			

Note: 1 credit = 28 working hours

1.2 Module SE/DBS1

Title	Databases 1			
Code	DBS1			
Credits	5			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	15	35		50
Description	The students get to know the architecture and common tasks of database management systems. The following topics are covered in the course: the relational model, entity-relationship modeling, normalforms, database design, relational tuple calculus, SQL, Oracle PL/SQL, triggers, stored procedures, constraints.			
Literature	Ramez A. Elmasri, Shamkant B. Navathe: „Grundlagen von Datenbanksystemen Bachelorausgabe“, Pearson, ISBN 9783868940121			
	Christoph Allen: „ORACLE – PL / SQL für Einsteiger“, Hanser Verlag, Serie „Authorized Oracle Press Editions“, ISBN3446218017			
Classroom language	German			

Note: 1 credit = 28 working hours

1.3 Module SE/CSA1

Title	Computer Systems Architectures			
Code	CSA1			
Credits	6			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	100			
Description	<p>Theoretical approach of the following subjects: Transmission media, asynchrone communication, modulation and modems Packets, packet switched networks, frames, LAN/WAN-technics, routing, protocols and layers Internet architecture, IP-addresses, IPv6, ARP, ICMP, TCP, UDP FTP, HTTP, DNS and DHCP</p>			
Literature	Douglas E. Comer; Computer Networks and Internets, 4 th Edition; Pearson International Edition, ISBN 0-13-123627-X			
Classroom language	Either Dutch or German			

Note: 1 credit = 28 working hours

1.4 Module SE/MAT1

Title	Mathematics 1			
Code	MAT1			
Credits	4			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	40			60
Description	Basics of set theory. (sets of numbers), propositional logic, order of magnitude, real numbers, fractions, summation and product symbols, binomial forms, binomial theorem, factorials, binomial coefficients, square root, powers, logarithms, quadratic equations, inequalities and modulus.			
Literature	Discrete Mathematics (2 nd edition), Lipschutz (Schaum's Outlines), ISBN 0-07-038045-7			
	Brückenkurs Mathematik (10 Auflage), Bosch (Oldenbourg) ISBN 3-486-25729-3			
Classroom language	German or Dutch			

Note: 1 credit = 28 working hours

1.5 Module SE/PRJ1

Title	Project 1			
Code	PRJ1			
Credits	9			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			70	30
Description	<p>Is divided in 2 subprojects, PRJ11 to PRJ12.</p> <p>PRJ11: Based on a case description the project group (5 students) develop an application based on the GUIDE method. Goal is to implement a prototype of the application graphical interface. In the second part of this project students turn this prototype into a real application based on html, css, php and mysql.</p> <p>PRJ12: Based on a case description, students develop a client server network with one windows server and a number of windows xp clients. Involved technologies are: dhcp, dns, NAT routing, active directory, back up technologies and strategies.</p> <p>In all these project communication is part of the goals, students have to write reports and have to present there way of working and there results in a power point presentation to the lecturers and the peer groups</p>			
Literature	Graphical User Interface Design and Evaluation, D. Redmond- Pyle & A. Moor, Prentice Hall, 1995, ISBN 0-1 3-315193-X			
Classroom language	German or Dutch			

Note: 1 credit = 28 working hours

2 Semester 2: Foundations II

2.1 Module SE/PRO2

Title	Programming 2			
Code	PRO2			
Credits	6			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	15	35		50
Description	<p>Students will gain more insights in Java and how it is applied to practical problems. The following core competences of a software developer are considered: Developing with essential elements of Java, appropriate usage of the programming language, and application of object oriented concepts. Moreover, usage of a professional programming development environment, and the usage of standard libraries is essential. Students will gain basic knowledge of essential features and classes of the Java language. Important concepts will be presented and exercised during practical work in the computer laboratories. The students know how to develop, execute and test within a professional programming environment. The usage of essential libraries is also covered.</p>			
Literature	David Barnes, Michael Kölling: Java lernen mit BlueJ, 2. Auflage, ISBN 3-8273-7152-X			
	Marty Hall, Larry Brown: Core Servlets and Java Server Pages, 2. Auflage, ISBN 3-8272-6954-7			
Classroom language	German			

Note: 1 credit = 28 working hours

2.2 Module SE/SEN1

Title	SEN1 Software Engineering 1			
Code	SEN1_I			
Credits	3			
Academic year	2009			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	40	60		
Description	<p>A practical approach to testing, in particular unit testing. We choose this didactic model to both improve student programming skills as well as the software engineering reasons for using (automated) testing. The module also introduces a few software process aspects and gives practical guidelines to both software creation and version control.</p>			
Literature	Objekt Orientiertes Testen und Testautomatisierung in der Praxis, dPunkt Verlag Heidelberg. ISBN 3-89864-305-0 (for the German class)			
	Object georiendeerd Testen en Testautomatisering in de praktijk. Fontys uitgave. (for the Dutch class)			
Classroom language	Dutch and German			

Note: 1 credit = 28 working hours

2.3 Module SE/MOD1

Title	Object oriented modeling with UML			
Code	MOD1			
Credits	4			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	12.5	75		12.5
Description	<p>Students learn how to use UML and how to design a domain model using UML. Students make a desing and work individually or in a small group, depending on the number of students. This case study starts with a case description and leads to a acceptable class diagram in the first stage of the module. CRC cards are used to obtain the responsibilities for each class. The class diagram has been tested against use case scenario's using sequence diagrams.</p> <p>In the second stage of this module, the design is more implementation oriented. More details are added, state diagrams are used to describe certain classes. Activity diagrams may also be used to get a more complete design. Interaction frames are now introduced in sequence diagrams to show how certain scenario's should be implemented. Important use case scenario's are transformed to concrete test scenario's. Finally a test driven development phase is started. A first implementation in Java is done, based on the test scenario's.</p>			
Literature	Martin Fowler: "UML Distilled", third edition, 2003, Addison Wesley.			
Classroom language	Dutch, English, Germa, as needed.			

Note: 1 credit = 28 working hours

2.4 Module SE/MAT2

Title	Mathematics 2			
Code	MAT2			
Credits	4			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	40			60
Description	Graph theory, principle of structural induction, geometric series, arithmetic series, matrices, linear equations, solving of linear equations with inverse matrix and Cramer's rule, counting and probability theory			
Literature	Discrete Mathematics Lipschutz (Schaum's Outlines) ISBN 0-07-038045-7 (second edition)			
	Brückenkurs Mathematik Bosch (Oldenbourg) ISBN 3-486-25729-3 (10 Auflage)			
Classroom language	German or Dutch			

Note: 1 credit = 28 working hours

2.5 Module SE/PRJ2

Title	Projects 2			
Code	PRJ2			
Credits	10			
Academic year	2009-2010			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			100	
Description	The students apply their knowledge from the database, programming and modeling courses to develop a small web based information system. They work in groups of 4-6 students. In the first half of the project the students create analysis artifacts (user specification, use cases, domain model, prototypes) and design artifacts (class diagrams, sequence diagrams, ER-diagrams). In the second half of the project, the application is developed using Java web technology (servlets and java server pages (JSP), an oracle database and JDBC to access the database from the web application.			
Literature				
Classroom language	German			

Note: 1 credit = 28 working hours

3 Semester 3: SE Topics I

3.1 Module SE/PRO3

Title	PRO3, Concurrency in Java			
Code	PRO3_I			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	60	40		
Description	<p>Our course in software engineering starts with objects first, then moves towards analysis and modeling using UML and stresses testing during implementation. Our focus is to teach our students programming in the large in stead of programming in the small, by learn them to understand the benefits and consequences of large application programming interfaces. To strengthen this understanding we introduce Design Patterns in semester three as a predecessor module to this module. A natural consequence of teaching software engineering in the above way is that we put less focus on the traditional concurrency problem examples but instead focus of the proper use of parallel programming [Lea] and libraries in the Java world. The Java world provides complete and well understood2 memory models an APIs as building blocks for applications with predictable concurrent behavior. The book Java Concurrency in Practice provides just the right practical approach using modern APIs [Brian Goetz].</p>			
Literature	Brian Goetz, et al: Java Concurrency in Practice . Pearson Education, 2006, ISBN 0-321-34960-1			
	Lea, Doug: Concurrent Programming in Java Second Edition. Addison Wesley, 1999, ISBN 0-201-31009-0			
Classroom language	English			

Note: 1 credit = 28 working hours

3.2 Module SE/MOD2

Title	Modeling 2: Reactive systems and patterns			
Code	MOD2_I			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	30	40		30
Description	As an extension to MOD 1 we go into the UML way of modeling behavior with state diagrams. The notation for state diagrams and sequence diagrams is completed and several implementation for state machines are introduced (in Java). The second part deals with the Design patterns by Gamma et al. The student investigates several existing projects or API/packages and describes the patterns found.			
Literature	Head First Design Patterns Eric and Elisabeth Freeman, O'Reilly, ISBN 0-596-00712-4			
Classroom language	English			

Note: 1 credit = 28 working hours

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3.3 Module SE/PRJ3

Title	Projects 3			
Code	PRJ3			
Credits	6			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			80%	20%
Description	<p>This project is sub divided into two parts: PRJ31- LEGO PRJ32 – The elevator control Please refer to the individual descriptions.</p>			
Literature	-			
Classroom language	German, Dutch, English.			

Note: 1 credit = 28 working hours

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3.4 Module SE/PRJ31

Title	PRJ31: Lego Mindstorms robot programming			
Code	PRJ31			
Credits	3			
Academic year	2004-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			100	
Description	<p>This project is an introduction in robot programming. Lego Mindstorms NXTs will be programmed. The programs are developed with Java-Lejos.</p> <p>The main topics are: Sensors, actuators, communication between NXTs (Bluetooth), tasks, implementing robot behavior with the 'behavior control' pattern. In the Robocup tournament teams of students compete against each other.</p>			
Literature	http://lejos.sourceforge.net/nxt/nxj/tutorial/lejosNXJTutorial.pdf			
Classroom language	Deutsch, German			

Note: 1 credit = 28 working hours

3.5 Module SE/PRJ32

Title	PRJ32: Project Elevator in Java			
Code	PRJ32			
Credits	3			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			100	
Description	<p>In this project apply their knowledge on reactive systems (State machines) and design patterns to a simple elevator system.</p> <p>The students work in groups. Each group is provided with a hardware elevator model which can be controlled with a usb adapter connected to a PC. This connection allows multiple elevators per PC and project. The students also build a GUI simulation model in Java Swing. This GUI runs in parallel to the hardware and simulates multi cage strategies.</p>			
Literature	Head First Patterns			
Classroom language	English, Dutch, German			

Note: 1 credit = 28 working hours

3.6 Module SE/MAT3

Title	Mathematics 3			
Code	MAT3			
Credits	3			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	40			60
Description	Set theory, relations, functions and algorithms, counting, complexity of algorithms, graph theory, directed graphs, languages, grammars, finite state automata, finite state machines			
Literature	Discrete Mathematics Lipschutz (Schaum's Outlines) ISBN 0-07-038045-7 (second edition)			
Classroom language	German or Dutch			

Note: 1 credit = 28 working hours

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3.7 Module SE/ECO

Title	Economics for Software Engineers			
Code	ECO			
Credits	3			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	60%	20%		20%
Description	<p>Introduction in economics / business administration.</p> <p>Goals:</p> <ul style="list-style-type: none"> - Getting insight into Business Processes - Understanding what's going on in a company and its external environment - Knowing what it means to start your own company - Knowing which software is used to support Business Processes - A Software Engineer needs to understand the problem domain... <p>Topics:</p> <ul style="list-style-type: none"> - The External Environment of an organization - The Competitive Environment - Organizational structure / culture and behavior - Marketing - Strategic Management - Human Resource Management - Operations Management - Ethics - Logistics - ERP Systems - The Business Plan 			
Literature	<p>R.J.Ebert & R.W.Griffin 2009. <i>Business Essentials</i>. 7th edition, Pearson Education. 7 ISBN: 978-0-13-607338-3</p>			
Classroom language	English			

Note: 1 credit = 28 working hours

3.8 Module SE/FND1

Title	Algorithms and Data Structures			
Code	FND1			
Credits	6			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	20	30	0	50
Description	Elementary course on algorithms and data structures. Content: algorithms and complexity, big O notation; abstract data types and design issues; datastructures array and linked list, queue and stack, binary tree and tree traversals, priority queue; algorithms divide and conquer, sorting insertion, selection, quicksort, heapsort.			
Literature	Robert Sedgewick: Algorithms in Java, Parts 1-4, third Edition.			
Classroom language	Dutch-German-English			

Note: 1 credit = 28 working hours

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4 Semester 4: SE Topics II

4.1 Module SE/PRO4

Title	Programming 3			
Code	PRO4			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	30	40		30
Description	<p>Subject of this course is C/C++ programming and the Qt development frame work. The main topics are: preprocessor macro's, reference and value parameter mechanism, control flow, dynamic memory allocation, structures, arrays, classes, constructors, destructors, inheritance, polymorphism, developing C++ programs based on UML specifications, STL template classes like queues and stacks, Qt dialog based and document view architecture, Qt signal/slot mechanism and event handling, architecture of the Qt frame work, how memory management is done in Qt, thread programming, exception handling, streams, class persistence based on serialization.</p> <p>Students practiced these topics in writing individual there own applications, some examples are: console based text editor (like the old ms-dos ed), dialog based small game, and a CD-information system based on the model/view architecture of Qt</p>			
Literature	Thinking in C++, 2nd ed. Volume 1, Bruce Eckel (=free E-book)			
	Thinking in C++, 2nd ed. Volume 2, Bruce Eckel (=free E-book)			
	Free C/C++ books: http://www.freetechbooks.com/c-c-f3.html			
Classroom language	Dutch, German			

Note: 1 credit = 28 working hours

4.2 Module SE/CSA2

Title	Operating Systems			
Code	CSA 2			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	30	40		30
Description	<p>Subject is a general introduction in the working, background and design of operating systems, topics are: overview of computer systems and operating systems, process control, threads, memory management, virtual memory, scheduling strategies, i/o, filesystems.</p> <p>TODO: JJA: add description practical part for 2011</p> <p>Students practice the theory in practical assignments were they work on a very small educational operating system called Geekos. They implement a loader for a UNIX elf executable, and implement user threads and system calls.</p>			
Literature	Operating Systemen, vierde editie, William Stallings, Pearson Education Benelux, isbn: 90-430-0695-5			
Classroom language	German or Dutch			

Note: 1 credit = 28 working hours

4.3 Module SE/PRJ4

Title	Projects 4			
Code	PRJ4			
Credits	6			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	10		60	30
Description	In this module the Microsoft .Net technology is introduced. Students will gain knowledge of and get some practical experience with client/server architectures in general, the .Net Framework and its architecture, the various application types: Windows Forms, Web Forms, Windows Services, Web Services, Remoting techniques. Students work together in small groups and make assignments on which they are assessed both theoretically and practically.			
Literature	Reader, Walkthrough, Tutorials, several books recommended (buying not compulsory).			
Classroom language	English			

Note: 1 credit = 28 working hours

4.4 Module SE/LINUX

Title	LINUX/ Linux and scripting Languages			
Code	LINUX			
Credits	3			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
		100		90
Description	The Linux course is intended to prepare for the LPIC exam LPI101 and has a few extras on Unix/Linux specifics with scripting languages like awk en (POSIX) regular expressions.			
Literature	LPIC-1 Sicher zur erfolgreichen Linux-Zertifizierung, Lernziele der Version 3.0 Harald Maaßen. Galileo Computing Verlag Bonn. ISBN 978-3-8362-1451-3.			
	* LPI Linux Certification in a Nutshell. S. Pritchard, B. Gomes Pessanha, N. Langfeldt, J. Stanger and J. Dean: O'Reilly Media, Sebastopol, CA 954727, 2006. (ISBN 978-0-596-00528-3)			
Classroom language	English			

Note: 1 credit = 28 working hours

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4.5 Module SE/FND2

Title	XML and JAVA			
Code	FND2			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	20	60		20
Description				
Literature	Processing XML with Java, Elliotte Rusty Harold: http://www.cafeconleche.org/books/xmljava/			
Classroom language	English, if student population is mixed, native language otherwise.			

Note: 1 credit = 28 working hours

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5 Semester 5: Work placement / Internship

5.1 Module SE/STG1

Title	Internship			
Code	STG1			
Credits	30			
Academic year	2011/2012			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
		100		
Description	<p>The student will actually work in a company , foundation or governmental institution for half a year. The student himself has to find a suitable place to do his internship and has to apply for a position. In corporation with the company representative, he or she writes an internship assignment proposal. The company and the assignment proposal have to be approved by one of the lecturers in the university. If the assignment has been approved and the student fulfills all other conditions required to start his or her internship, he or she can start working on his or her internship assignment.</p> <p>A lecturer/counselor from the school will be appointed to the student in order to monitor and guide him in his work and also for judging him or her in the end. The lecturer /counselor will visit the student and the company representative on location on a regular basis.</p> <p>Main objective of this practical semester is to experience the working life in the profession the student is studying for. Another important objective off course is to learn about current working methods, methodologies, practices and technologies.</p>			
Literature	Internship/Graduation manual.			
Classroom language	Not applicable.			

Note: 1 credit = 28 working hours

6 Semester 6: Minor

6.1 Module SE/MINOR

Title	Minor (free choice)			
Code	MINOR			
Credits	30			
Academic year	2011-2012			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
Description	<p>Besides some choice modules the bachelor program was fixed until 2005. The major minor model has been introduced in the academic year 2005-2006 to give the student more choice possibilities in his or her study program. Hence, in 2005 two minors of 30 EC and a major of 180 EC were introduced, that together constituted the bachelor program. In 2008 the second minor has been abandoned for practical reasons. Semester 7 was part of the major again, so the major was 210 EC from that time on, the minor of free choice remained 30 EC. Positioned in semester 6.</p> <p>At the time that two minors were in the bachelor program, we positioned the Software Factory, together with communication and two choice modules as a specializing minor. Reference codes: SOFA, COM3B, CMOD2 and CMOD2.</p> <p>In 2008 this combination returned in semester 7 as part of the major. Minors of free choice are chosen by the student from a catalogue with over 40 different minor programs. However, our students mostly have chosen for the minor Ambient Intelligence and design (reference code: AMID) or the International Business Management (reference code: IBMS). In addition students have chosen for a minor abroad, mostly specializing minors at foreign universities (US, Australia, New Sea land, Norway). Due to the great variety in the minors offered, it is not possible to make general statements concerning contents, literature, classroom language and education type. Most minors are described in so called diploma supplements.</p>			
Literature	Not applicable.			
Classroom language	Not applicable.			

Note: 1 credit = 28 working hours

7 Semester 7: Advanced SE Topics III

7.1 Module SE/COM3

File ../2012-2013/SE/COM3-crop.pdf does not yet exist.

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7.2 Module SE/SOFA

Title	Software Factories			
Code	SOFA			
Credits	18			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
			100%	
Description	<p>“Software factories” is the last project type module in the curriculum. To make it as real life as possible, a real customer is involved. The students work in groups, each group having its own customer and is using product specific technologies. The students take up different project roles which are separately rewarded. The module is concluded with at least one product presentation to the customer and an individual assessment for each student.</p> <p>All documentation is done in English.</p>			
Literature	Sommerville, Software Engineering.			
Classroom language	English, German, Dutch.			

Note: 1 credit = 28 working hours

7.3 Module SE/CMOD1

Title	Choice Module 1			
Code	CMOD1			
Credits	5			
Academic year	2011-2012			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
Description	In 2011-2012 the following choice module was programmed and performed: Reference codes: EMBED			
Literature				
Classroom language				

Note: 1 credit = 28 working hours

Draft

7.4 Module SE/CMOD2

Title	Choice Module 2			
Code	CMOD2			
Credits	5			
Academic year	2011-2012			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
Description	In 2011-2012 the following choice module was programmed and performed: Reference codes: JEE			
Literature				
Classroom language				

Note: 1 credit = 28 working hours

Draft

7.5 Module SE/JEE

Title	Java Enterprise Edition			
Code	CMOD2			
Credits	5			
Academic year	2010-2011			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
	15	35		50
Description	Students gain basic knowledge of essential features and technologies that are part of the Java Enterprise Edition. Important concepts will be presented and exercised during practical work in the computer laboratories. The students know how to develop, execute and test within a professional development environment. The following topics/technologies will be covered within the module: Enterprise Java Beans 3.0, Architectural Patterns, Development and Deployment of JEE Applications, Basic Application Server configuration			
Literature	B. Burke, R. MonsonHaefel: Enterprise JavaBeans 3.0			
	R. Rahman, D. Lane: EJB3 in action			
	JSR EJB 3.0, http://jcp.org/en/jsr/detail?id=220			
Classroom language	English			

Note: 1 credit = 28 working hours

8 Semester 8: Bachelor Project

8.1 Module SE/STG2

Title	Graduation			
Code	STG2			
Credits	30			
Academic year	2012-2013			
Education type	Theory (%)	Practical (%)	Project (%)	Self-study (%)
		100		
Description	<p>The student will actually work in a company , foundation or governmental institution for half a year. The student himself has to find a suitable place to do his graduation assignment and has to apply for a position. In corporation with the company representative, he or she writes an graduation assignment proposal. The company and the assignment proposal have to be approved by one of the lecturers in the university. If the assignment has been approved and the student fulfills all other conditions required to start his or her graduation project, he or she can start.</p> <p>A lecturer/counselor from the school will be appointed to the student in order to monitor and guide him in his work and also for judging him or her in the end. In addition another – independent - representative is appointed to guarantee a certain level of work and an object judging process. The lecturer /counselor will visit the student and the company representative on location on a regular basis.</p> <p>Main objective of this graduation semester is that the student – in a final assessment - proves that he is able to work as a professional in a company or other institution. He or she is encouraged to clearly show all talents and competencies, including reporting and presenting about his or her work. The student has to defend his work in the end for the lecturer / counselor, external representative and company representatives. Another important objective off course is to learn about current working methods, methodologies, practices and technologies.</p>			
Literature	Not applicable.			
Classroom language	Not applicable.			

Note: 1 credit = 28 working hours

