

Dear Bachelor and Master students,

In this document you will find a survey of the Bachelor and Master curriculum Computing Science of Academic year 2013-2014. Changes have been marked in various colors, as follows:

Courses marked in **green**: replacement courses

Courses marked in **blue**: courses that are taught in a different semester or block than last year

Below you will find the survey of the Bachelor curriculum. The information on the Master curriculum starts on page 5.

Bachelor curriculum 2013-2014

General remarks on the Bachelor programme:

In the Biomedical Computing track and the Business Computing track there will be some replacement courses:

Biomedical Computing track (BMC):

Neurobiologie replacing Introductie Neurowetenschappen

Business Computing track (BUS):

Business Intelligence (bachelor) replacing Data en processen

Marketing BDK replacing Marketing bedrijfskunde

Architectuur en infrastructuur replacing Organization and management of software project teams

N.B.: Please note that the curriculum of the year in which you have started, will remain your curriculum for the entire 3-year programme, unless a course that you still have to pass, has been replaced by another course. (See above).

So for instance: if you have already passed the course “Data en Processen”, then you do NOT have to take the course “**Business Intelligence**”. But if you still have to pass the course “Organization and management of software project teams”, then you should replace that course with “**Architectuur en Infrastructuur**”.

See also the tables on the following three pages.

Table 1: **Bachelor Computing science**

Year	Semester	Course	Course code
1	semester Ia	Imperative Programming	INBIMP-09
1	semester Ia	Introduction to Computing Science	INBOI-08
1	semester Ia	Introduction to Artificial Intelligence and Cognitive Science	KIB.ORKI03
1	semester Ib	Introduction to Logic	KIB.ILOG03
1	semester Ib	Introduction to Biomedical Computing or Autonomous Systems	INBIBC-10 or KIB.AS03
1	semester Ib	Calculus for AI and CS	WICALKI-11
1	semester IIa	Algorithms and Data structures in C	INBADC-09
1	semester IIa	Computer Architecture and Networks	INBCAN-08
1	semester IIa	Discrete Structures	INBDS-08
1	semester IIb	Program Correctness	INBPC-08
1	semester IIb	Object-Oriented Programming	INBOGP-08
1	semester IIb	Linear Algebra for AI and CS	WILAICL-09
2	semester Ia	Functioneel Programmeren	INBFP-08
2	semester Ia	Statistiek	WISTAKI-07
2	semester Ia	Gevorderd Objectgeoriënteerd Programmeren	INBGOP-09
2	semester Ib	Signalen & Systemen	KIB.SENS12
2	semester Ib	Software Analyse & Ontwerp	INBSASO-09
2	semester Ib	Inleiding Informatiesystemen	INBIIS-08
2	semester IIa	Software Engineering I	INBSE1-08
2	semester IIa	Gevorderde Algoritmen & Datastructuren	INBGAD-10
2	semester IIa	IT-beroepspraktijk	INBITB-08
2	semester IIb	Software Engineering II	INBSE2-08
2	semester IIb	Parallel Computing	INBPAR-08
2	semester IIb	Talen & Automaten	INBTA-08
3	semester Ia	Broadening minor in another field of study (30 EC) OR Computing Science minor (30 EC) with the following courses: Software Requirements Engineering	INBSRE-08
		Information Security	INBSEC-08
		Introduction to Intelligent Systems	INBINTS-08
	semester Ib	Software Quality Assurance & Testing	INBSQT-08
	semester Ib	Kennisrepresentatie & Redeneren	INBKR-08
	semester Ib	Operating Systems	INBOS-08
	semester IIa	Net Computing	INBNC-08
	semester IIa	Computer Graphics	INBCG-08
	semester IIa	Vertalerbouw	INBVB-08
3	semester IIb	Bachelor project (15 ECTS)	INBPROJ-08

Table 2: **Biomedical Computing track.**

Bold courses marked with ^[BMC] are mandatory for the Biomedical Computing track.

Year	Semester	Course	Course code
1	semester Ia	Imperative Programming	INBIMP-09
1	semester Ia	Introduction to Computing Science	INBOI-08
1	semester Ia	Introduction to Artificial Intelligence and Cognitive Science	KIB.ORKI03
1	semester Ib	Introduction to Logic	KIB.ILOG03
1	semester Ib	Introduction to Biomedical Computing ^[BMC]	INBIBC-10
1	semester Ib	Calculus for AI and CS	WICALKI-11
1	semester IIa	Algorithms and Datastructures in C	INBADC-09
1	semester IIa	Computer Architecture and Networks	INBCAN-08
1	semester IIa	Discrete Structures	INBDS-08
1	semester IIb	Bioinformatics ^[BMC]	WLP10B21
1	semester IIb	Object-Oriented Programming	INBOGP-08
1	semester IIb	Linear Algebra for AI and CS	WILAICL-09
2	semester Ia	Functioneel Programmeren	INBFP-08
2	semester Ia	Statistiek	WISTAKI-07
2	semester Ia	Gevorderd Objectgeoriënteerd Programmeren	INBGOP-09
2	semester Ib	Signalen & Systemen	KIB.SENS12
2	semester Ib	Software Analyse & Ontwerp	INBSASO-09
2	semester Ib	Inleiding Informatiesystemen	INBIIS-08
2	semester IIa	Software Engineering I	INBSE1-08
2	semester IIa	Gevorderde Algoritmen & Datastructuren	INBGAD-10
2	semester IIa	IT-beroepspraktijk	INBITB-08
2	semester IIb	Software Engineering II	INBSE2-08
2	semester IIb	Parallel Computing	INBPAP-08
2	semester IIb	Beeldvormende technieken ^[BMC]	WLB07050
3	semester Ia	Broadening minor in another field of study (25 EC) AND the compulsory BMC course Neurobiologie OR Computing Science minor (30 EC) with the following courses: Neurobiologie ^[BMC] (compulsory BMC course) and two of the following three courses:	WLB07086
3	semester Ia	Software Requirements Engineering	INBSRE-08
3	semester Ia	Information Security	INBSEC-08
3	semester Ia	Introduction to Intelligent Systems	INBINTS-08
3	semester Ib	Software Quality Assurance & Testing	INBSQT-08
3	semester Ib	Kennisrepresentatie & Redeneren	INBKR-08
3	semester Ib	Operating Systems	INBOS-08
3	semester IIa	Net Computing	INBNC-08
3	semester IIa	Computer Graphics	INBCG-08
3	semester IIa	Vertalerbouw	INBVB-08
3	semester IIb	Bachelor project Biomedical Computing ^[BMC] (15 ECTS)	INBPROJ-08

Table 3: **Business Computing track**

Bold courses marked with ^[BUS] are mandatory for the Business Computing track

Year	Semester	Course	Course code
1	semester Ia	Imperative Programming	INBIMP-09
1	semester Ia	Introduction to Computing Science	INBOI-08
1	semester Ia	Introduction to Artificial Intelligence and Cognitive Science	KIB.ORKI03
1	semester Ib	Introduction to Logic	KIB.ILOG03
1	semester Ib	Introduction to Biomedical Computing or Autonomous Systems	INBIBC-10 or KIB.AS03
1	semester Ib	Calculus for AI and CS	WICALKI-11
1	semester IIa	Algorithms and Datastructures in C	INBADC-09
1	semester IIa	Discrete Structures	INBDS-08
1	semester IIa	Business Intelligence (bachelor) ^[BUS]	EBB032A05
1	semester IIb	Program Correctness	INBPC-08
1	semester IIb	Object-Oriented Programming	INBOGP-08
1	semester IIb	Linear Algebra for AI and CS	WILAICL-09
2	semester Ia	Marketing BDK ^[BUS]	EBP027A05
2	semester Ia	Statistiek	WISTAKI-07
2	semester Ia	Gevorderd Objectgeoriënteerd Programmeren	INBGOP-09
2	semester Ib	Signalen & Systemen	KIB.SENS12
2	semester Ib	Software Analyse & Ontwerp	INBSASO-09
2	semester Ib	Inleiding Informatiesystemen	INBIIS-08
2	semester IIa	Software Engineering I	INBSE1-08
2	semester IIa	Gevorderde Algoritmen & Datastructuren	INBGAD-10
2	semester IIa	IT-beroepspraktijk	INBITB-08
2	semester IIb	Software Engineering II	INBSE2-08
2	semester IIb	Parallel Computing	INBPAR-08
2	semester IIb	Management of Product Innovation ^[BUS]	EBB652B05
3	Broadening minor in another field of study (25 EC) AND the compulsory BUS course Architectuur en Infrastructuur OR Computing Science minor (30 EC) with the following courses:		
	semester Ia	Software Requirements Engineering	INBSRE-08
	semester Ia	Information Security	INBSEC-08
	semester Ia	Introduction to Intelligent Systems	INBINTS-08
	semester Ib	Architectuur en infrastructuur ^[BUS] (compulsory BUS course) and two of the following three courses:	EBB665A05
	Semester Ib	Operating Systems	INBOS-08
	semester Ib	Software Quality Assurance & Testing	INBSQT-08
	semester Ib	Kennisrepresentatie en Redeneren	INBKR-08
	semester IIa	Net Computing	INBNC-08
	semester IIa	Computer Graphics	INBCG-08
	semester IIa	Vertalerbouw	INBVB-08
3	semester IIb	Bachelor project Business Computing ^[BUS] (15 ECTS)	INBPROJ-08

Master curriculum Computing Science:Table 5: Master specialization: **Intelligent Systems**

Year	Semester	Course	Course code	ECTS
1	semester Ia	Web and Cloud Computing	INMWCC-12	5
1	semester Ia	Machine Learning	KIM.ML09	5
1	semester Ia	Pattern Recognition	INMPR-08	5
1	semester Ib	Image Processing	INMIP-08	5
1	semester Ib	Neural Networks	INMNN-08	5
1	semester Ib	Automated Reasoning	INMAR-08	5
1	semester IIa	Student colloquium CS	INMCOL-08	5
1	semester IIa	Multi-Agent Systems	KIM.MAS03	5
1	semester IIa	Computer Vision	INMCV-08	5
1	semester IIb	In-company or Research Internship (CS)	INSTAGE15	15
2	semester Ia	Optional module		5
2	semester Ia	Optional module		5
2	semester Ia	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester IIa and IIb	Master Thesis	INMAFST-08	30

Table 6: Master specialization: **Computational Science and Visualisation**

Year	Semester	Course	Course code	ECTS
1	semester Ia	Web and Cloud Computing	INMWCC-12	5
1	semester Ia	Geometric Algorithms	INMGA-08	5
1	semester Ia	Modelling & Simulation	INMMS-08	5
1	semester Ib	Image Processing	INMIP-08	5
1	semester Ib	Scientific Visualisation	INMSV-08	5
1	semester Ib	Introduction Computational Science	INMICS-08	5
1	semester IIa	Student colloquium CS	INMCOL-08	5
1	semester IIa	Advanced Computer Graphics	INMACG-08	5
1	semester IIa	Computer Vision	INMCV-08	5
1	semester IIb	In-company or Research Internship (CS)	INSTAGE15	15
2	semester Ia	Optional module		5
2	semester Ia	Optional module		5
2	semester Ia	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester IIa and IIb	Master Thesis	INMAFST-08	30

Table 7: Master specialization: **Software Engineering and Distributed Systems**

Year	Semester	Course	Course code	ECTS
1	semester Ia	Web and Cloud Computing	INMWCC-12	5
1	semester Ia	Software Architecture ^[IEM]	INMSA-08	5
1	semester Ia	Software Maintenance & Evolution	INMSME-08	5
1	semester Ib	Image Processing	INMIP-08	5
1	semester Ib	Optional module		5
1	semester Ib	Software Patterns	INMSP-08	5
1	semester IIa	Student colloquium CS	INMCOL-08	5
1	Semester IIa	Optional module		5
1	semester IIa	Ubiquitous Computing ^[IEM]	INMUBC-09	5
1	semester IIb	In-company or Research Internship (CS)	INSTAGE15	15
2	semester Ia	Distributed Systems ^[IEM]	INMDSY-08	5
2	semester Ia	Optional module		5
2	semester Ia	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester Ib	Optional module		5
2	semester IIa and IIb	Master Thesis	INMAFST-08	30

Optional modules (total of 30 EC):

15 EC can be chosen freely from any **Master courses** taught at the University (for the Master specialization Software Engineering and Distributed Systems 20 EC can be chosen freely).

15 EC are guided choice courses, which means that you have to choose three courses from the list of guided choice courses belonging to your Master specialization, see below:

Table 8: Guided choice courses **Intelligent Systems**

Semester	Course	Course code	ECTS
semester Ia	Modelling & Simulation	INMMS-08	5
semester Ia	Robotics*	KIM.ROB03	5
semester Ib	Computational Semantics	LIX021M05	5
semester Ib	Cognitive Modeling: basic principles and methods	KIM.CMB11	5
semester Ib	Scientific Visualisation	INMSV-08	5
semester Ib	Statistical signal processing (MSc)	STMASP-12	5
semester Ib	Robotics**	TBROB-12	5
semester Ib	Dynamic Logic	INMDL-08	5
semester IIa	Natural Language Processing	LIX001M05	5
semester IIa	Ubiquitous Computing	INMUBC-09	5
semester IIa	Business Intelligence	TBBI05E	5
semester IIb	Handwriting Recognition	KIM.SCHR03	5

*Robotics (KIM.ROB03) requires prior knowledge: Cognitive Robotics (contact study advisor Artificial Intelligence in advance if you want to take this course)

**Robotics (TBROB-12) requires prior physics knowledge

Tabel 9: Guided choice courses **Computational Science and Visualisation**

Semester	Course	Course code	ECTS
semester Ia	Pattern Recognition	INMPR-08	5
semester Ia	Computational Physics	NACP-11	5
semester Ia	Machine Learning	KIM.ML09	5
semester Ib	Problemsolving with Mathematica	WIPOM-08	5
semester Ib	Neural Networks	INMNN-08	5
semester Ib	Statistical signal processing (MSc)	STMASP-12	5
semester Ib	Self-organisation of social systems	MLBI0801	5
semester Ib	Cognitive Modeling: basic principles and methods	KIM.CMB11	5
semester IIa	Numerical Mathematics 2	WINM2-08	5
semester IIb	Numerical Mathematics 1	WINM1-07	5

Table 10: Guided choice courses **Software Engineering and Distributed Systems**

Semester	Course	Course code	ECTS
semester Ia	Pattern Recognition	INMPR-08	5
semester Ia	Machine Learning	KIM.ML09	5
semester Ib	Scientific Visualisation	INMSV-08	5
semester Ib	Robotics*	TBROB-12	5
semester IIa	Advanced Software Architecture	INMASA-10	5
semester IIa	Business Intelligence	TBBI05E	5
semester IIb	Systems Engineering	TBSE05E	5
semester IIb	Sustainable and Integrated Inf. Systems	EBM630B05	5

*Robotics (TBROB-12) requires prior physics knowledge

N.B.: Please note that after the coming academic year, a few master courses will not be taught each year, but **in alternating years**, see the table below.

Course	Taught in 2013-2014	Taught in 2014-2015	Taught in 2015-2016
Geometric Algorithms	YES	YES	NO
Ubiquitous Computing	YES	NO	YES
Modeling and Simulation	YES	YES	NO
Introd. to Computational Science	YES	NO	YES