

# Programme Specification Bachelor in Informatics

## Faculty of Information Technology - ITS

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This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes advantage of the learning opportunities that are provided. More detail on the specific learning outcomes, indicative content and the teaching, learning and assessment methods of each module can be found (1) at Informatics Department website (<http://if.its.ac.id>), (2) in the Informatics Department Curriculum, and (3) in the Catalog and Syllabus.

The accuracy of the information contained in this document is reviewed by the University and may be checked within independent review processes undertaken by the Quality Assurance Agency (Pusat Jaminan Mutu, LPMP2KI ITS).

<b>Awarding Institution/Body:</b>	Institut Teknologi Sepuluh Nopember
<b>Teaching Institution:</b>	Institut Teknologi Sepuluh Nopember
<b>Interim Awards and Final Award:</b>	Bachelor in Computer Science
<b>Programme Title</b>	Informatics
<b>Main Field of Study</b>	Computer Science, Mathematics, Statistics, Digital Electronics, Software Engineering, Intelligent Computing and Visualization, and Net-Centric Computing.
<b>Modes of Study</b>	Full-Time Sandwich
<b>Language of Study</b>	Bahasa English
<b>Accreditation</b>	Higher Education National Accreditation Council (BAN-PT), Ministry of Education (Last accreditation in 2011, Score A)

Relevant subject benchmark statements and other external reference points used to inform programme outcomes:

- Higher Education Directorate General, Ministry of Education, Indonesia
- QA Center, ITS
- Guideline from the Association for Computing Machinery (ACM), the core curriculum framework
- IT career analysis from Association of Informatics and Computer University (Asosiasi Perguruan Tinggi Informatika dan Ilmu Komputer, APTIKOM-Indonesia)

### Programme philosophy and aims

The Bachelor in Informatics programme will produce graduates with highly developed skills in producing computer-based solutions for real world problem, who will have the technical and management capability required by employers in a rapidly changing technological landscape. The curriculum considers the guideline from the Association for Computing Machinery (ACM), the core curriculum framework

and IT career analysis from Association of Informatics and Computer University (Asosiasi Perguruan Tinggi Informatika dan Ilmu Komputer, APTIKOM-Indonesia) as well as feedbacks from the stakeholder, especially from the industry. Specialization is by way of pathways, option modules and research-focused group project work, giving students the chance to make an informed choice of their future career direction. The pathways initially available offer specialism in software engineering, intelligent computing and visualization, and net-centric computing.

Employing option modules in the course structure allows topics and themes to be introduced or modified according to changing requirements from industry. The programme has outcomes relating to advanced study and industry awareness, with significant involvement in group-work in assignments and design projects.

These activities will help students develop in areas such as planning and decision making, acting independently, accepting responsibilities, formulating ideas proactively, developing strategies, implementing and executing agreed plans, leading and managing teams, and evaluating achievement against specification. The department has close links with major employers in the region to enhance the students learning experience through case studies, projects and industrial placements.

The aims of the programme are to:

- provide a stimulating and rewarding learning experience by way of scheduled lectures, labs, tutorials, seminars and support for related extra-curricular activity;
- develop knowledge, analytical and practical capability in engineering fundamentals, computer and computing principles, multivariate data analysis, data mining, computational intelligence, discrete system simulation, data warehousing, digital image processing, computer simulation and game, information retrieval, computer vision, nonlinear optimization, robot programming, wireless networks and mobile computing; network securities, distributed systems, inter networks technology, multimedia networks, grid computing, network design and management, compression techniques, computer animation, it audit and it governance, software project management, software verification and validation, software evolution, game development, software patterns and architectures, mobile devices programming, and virtual reality.
- build an understanding of commercial, legal, ethical and environmental factors associated with computer science;
- encourage the development of transferable and key skills applicable to employment and continuing professional development;
- lay a foundation for further study;

Learning Outcomes

1. Understanding and mastering basic principles of computer science
2. Mastering basic concepts and skills of computer programming
3. Having the ability to design and implement systems and integrating hardware and software.
4. Having interpersonal communication skills, teamwork, and managerial
5. Having the ability to utilize, evaluate, and identify the development of computer-based systems
6. Having knowledge in specific advanced computing topic
7. Having the ability to demonstrate an attitude that respect, protect, and improve the professional ethics
8. Having basic research skills

The curriculum is also designed to equip student with the following supporting competencies:

1. Having the ability to deliver ideas both in oral and written presentation
2. Entrepreneurships
3. Mastering English Language both in oral and written presentation

Learning teaching, and assessment methods used Knowledge and understanding are acquired through a variety of methods, including formal lectures, tutorials and other directed independent learning activities and reinforced by laboratory tasks and seminars. Learning resources are made available on staff and module intranet pages, and through the Moodle to permit flexibility in engagement with the materials.

Analytical skills are developed through coursework tasks that encourage creativity and problem solving using a range of systems and technologies relevant to the information technology industry. Practical applications are a key feature of the course and are emphasized in course design and delivery. Learners are assessed both formatively and summatively by a number of methods, the criteria for each module being published within each specified module guide and assignment briefs.

Formative assessment occurs in various ways throughout the programme and may involve feedback from peers, tutors and individual reflection, seminars, coursework exercises and presentations.

Summative assessment may include coursework exercises, examinations (seen and unseen, open- and closed- book), presentations, and practical assignments. Intellectual skills, particularly analytical and problem solving skills, are developed using a range of case-studies and problem / task based learning scenarios.

Assessment of such activities includes practical simulation and design exercises and individual and group projects, in addition to the methods mentioned above. The acquisition of appropriate practical skills is central to the learning strategy of the programme. All technical themes provide weekly timetabled practical laboratory or PC based sessions, supported by lecturing or other technically qualified staff. The content of these sessions evolves as the student progresses through the course from guided tasks to develop basic practical skills in the use of measurement and test equipment and software tools, through exercises to reinforce the understanding of fundamental principles and techniques, to open-ended mini-projects to give experience of practical modelling, simulation and design of complex systems.

Assessment methods include laboratory and design reports, presentations and in-class demonstrations of working hardware and software or simulated designs.

Learners develop research skills in module activities and assessments by undertaking a small group project, and two major projects, one individual and one group-work, and completing a related dissertation.

Transferable/key skills are core to the learning and assessment strategy of the programme. They are pervasive, and are incorporated into modules and assessments as appropriate, e.g. team-working skills are fostered and assessed via group, task-based practical projects.

Learners are encouraged to plan their own work schedules and are required to meet deadlines. Reflection and self-awareness are fostered by keeping logbooks of laboratory and design activity and attending tutor interviews in support of personal Performance

### **Programme structure and requirements, levels, modules, credits and awards.**

The duration of study in Bachelor of Informatics was eight semesters and a total of 144 credit points. The curriculum is continually revised and arranged to suffice the requirement of the development of information technology taking place both in Indonesia and worldwide.

No.	Kode MK	Nama Mata Kuliah (MK)	sks
	Code	Course Title	Credits
<b>SEMESTER I</b>			
1	IG091308	Bahasa Inggris English	2
2	KI091301	Aljabar Linear Linear Algebra	3
3	KI091302	Pemrograman Terstruktur Structured Programming	4
4	KI091303	Sistem dan Teknologi Informasi Information Technology System	2
5	KI091304	Sistem Digital Digital System	4
6	SM091201	Kalkulus 1 Calculus 1	3
<i>Jumlah sks/Total of credits</i>			18
<b>SEMESTER II</b>			
1	IG09130X	Pendidikan Agama Religion Education	2
2	KI091305	Algoritma dan Struktur Data Algorithms and Data Structures	4
3	KI091306	Matematika Diskrit Discrete Mathematics	3
4	KI091307	Organisasi Komputer Computer Organization	3
5	KI091308	Teori Graf dan Otomata Graph and Automation Theory	3
6	SM091202	Kalkulus 2 Calculus 2	3
<i>Jumlah sks/Total of credits</i>			18
<b>SEMESTER III</b>			
1	KI091309	Basis Data	4

Data Base

2	KI091310	Komputasi Numerik Numerical Computing	3
3	KI091311	Pemrograman Berorientasi Objek Object Oriented Programming	4
4	KI091312	Rekayasa Perangkat Lunak Software Engineering	2
5	KI091313	Sistem Operasi Operating System	4
<i>Jumlah sks/Total of credits</i>			20

**SEMESTER IV**

1	IG091307	Bahasa Indonesia Indonesian	2
2	IG091309	Pengantar Ilmu Lingkungan Introduction to Environmental Science	2
3	KI091315	Analisis dan Perancangan Sistem Analysis and Design System	4
4	KI091316	Jaringan Komputer Computer Networks	3
5	KI091317	Pemrograman Web Web Programming	3
<i>Jumlah sks/Total of credits</i>			20

**SEMESTER V**

1	KI091320	Basis Data Lanjut Advanced Database	3
2	KI091321	Grafika Komputer Computer Graphic	3
3	KI091322	Kecerdasan Buatan	3

		Artificial Intelligence	
4	KI091323	Pemrograman Framework J2EE Programming J2EE Framework	3
5	KI091324	Pemrograman Jaringan Network Programming	3
<i>Jumlah sks/Total of credits</i>			18

<b>SEMESTER VI</b>			
1	KI091392	Kerja Praktek Internships	2
2	KI091326	Pemrograman Framework .NET Programming Framework. NET	3
3	KI0913xx	Pilihan Elective	15
<i>Jumlah sks/Total of credits</i>			20

<b>SEMESTER VII</b>			
1	IG091306	Pend Kewarganegaraan Citizenship Education	2
2	KI091327	Sosio dan Etika Socio and Ethics	2
3	KI0913xx	Pilihan Elective	15
<i>Jumlah sks/Total of credits</i>			19

<b>SEMESTER VIII</b>			
1	IG091311	Pengantar Technopreneurship Introduction toTechnopreneurship	2
2	KI0913xx	Pilihan Elective	4

3	KI091391	Tugas Akhir Final Project	5
Jumlah sks/ <i>Total of credits</i>			11

## Mata Kuliah Pilihan

### Elective Courses

BIDANG KEAHLIAN KOMPUTASI CERDAS DAN VISUALISASI			
INTELLIGENT COMPUTING AND VISUALIZATION SPECIALIZE INTEREST			
1	KI091331	Analisis Data Multivariat Multivariate Data Analysis	4
2	KI091332	Data Mining Data Mining	4
3	KI091333	Kecerdasan Komputasional Computational Intelligence	3
4	KI091334	Simulasi Sistem Diskrit Discrete System Simulation	4
5	KI091335	Data Warehousing Data Warehousing	3
6	KI091336	Pengolahan Citra Digital Digital Image Processing	4
7	KI091338	Sistem Temu Kembali Informasi Information Retrieval System	4
8	KI091339	Visi Komputer Computer Vision	4
9	KI091340	Optimasi Nonlinear Nonlinear Optimation	4
10	KI091341	Pemrograman Robot Robotic Programming	4

11	KI091342	Topik Khusus Komputasi Cerdas dan Visualisasi	4
		Special Topics in Intelligent Computing and Visualization	

**BIDANG KEAHLIAN REKAYASA PERANGKAT LUNAK (RPL)**

**SOFTWARE ENGINEERING SPECIALIZE INTEREST**

1	KI091371	Animasi Komputer	4
		Computer Animation	
2	KI091372	Audit Tata Kelola TI	3
		IT Governance Audit	
3	KI091373	Manajemen Proyek Perangkat Lunak	4
		Software Project Management	
4	KI091374	Verifikasi dan Validasi Perangkat Lunak	3
		Software Verification and Validation	
5	KI091375	Evolusi Perangkat Lunak	3
		Software Evolution	
6	KI091376	Pembuatan Game	3
		Game Development	
7	KI091377	Pola dan Arsitektur Perangkat Lunak	4
		Pattern and Software Architecture	
8	KI091378	Topik Khusus Rekayasa Perangkat Lunak	4
		Special Topics in Software Engineering	
9	KI091379	Pemrograman Perangkat Mobile	3
		Programming Mobile Devices	
10	KI091380	Realitas Virtual	3
		Virtual Reality	

**BIDANG KEAHLIAN KOMPUTASI BERBASIS JARINGAN (NCC)**

**NET CENTRIC COMPUTING SPECIALIZE INTEREST**

1	KI091351	Jaringan Nirkabel dan Komputasi Bergerak	4
		Wireless Networks and Mobile Computing	



2	KI091352	Sekuritas Jaringan Network Security	3
3	KI091353	Sistem Terdistribusi Distributed System	4
4	KI091354	Teknologi antar Jaringan Internetwork Technology	4
5	KI091355	Jaringan Multimedia Multimedia Networks	4
6	KI091356	Komputasi Grid Grid Computing	4
7	KI091357	Perancangan dan Manajemen Jaringan Network Design and Management	4
8	KI091358	Teknik Kompresi Compression Technique	4
9	KI091359	Topik Khusus Komputasi Berbasis Jaringan Special Topics in Net Centric Computing	3

### Criteria for admission

Candidates must satisfy the general admissions requirements of the programme, which are as follows:

- High school diploma from the field of natural science.
- Passing the State University National Entrance Test (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), which either the Paper-Based mechanism is called Paper-based State University National Entrance Test (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN or Paper-based ITS Entrance Test (Seleksi Masuk ITS, SMITS).

### Methods for evaluation and enhancement of quality and standards including listening and responding to views of students

The following faculty committees are involved in evaluation and enhancement of quality, standards and student experience: Graduate Programme, Department Advisory Committee, Learning and Teaching Committee, Center for Quality Assurance, and Academic Senate of ITS.

Review and evaluation processes in which students are involved include annual course and module reviews, course review and re-approval events, professional body accreditation visits and external examiner visits. Mechanisms for student input include meetings with course tutors, feedback questionnaires, faculty and university student satisfaction surveys and representation on the faculty committees referred to above.

Contact for Queries

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