PEDOMAN PENDIDIKAN
TAHUN AKADEMIK 2017/2018

FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM MALANG

BAB IX

JURUSAN TEKNIK INFORMATIKA

1. **INTRODUCTION**

    Jurusan Teknik Informatika (Computer Science Department), Faculty of Science & Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang organizes undergraduate study (S-1) majoring in Computer Science based on a Decree of the Ministry of National Education No 05/MPN/HK/1004 dated on 23 January 2004 and a Decree of Directorate General of Islamic Department No DJ.II/54/2005 dated on 28 March 2005. Based on a Decree of Indonesia's National Accreditaion Board for Higher Education (Badan Akreditasi Nasional Perguruan Tinggi / BAN-PT) No 057/SK/BAN-PT/Akred/S/II/2014 dated on 14 February 2014, Jurusan Teknik Informatika has been awarded B (good) accreditaion level.

    Jurusan Teknik Informatika aims to produce high qualied human resources and technology that are capable of developing and deploying Information Technology based on the values of Islam originated from Al-Qur'an and Al-Hadits. Learning materials for undergraduate study at Jurusan Teknik Informatika consist of several group of subjects i.e. Computer Science and universities subjects. The materials of Computer Science subjects compose more than 77% of learning activities which cover class courses, practicum or laboratory practices, and small research activities as a part of student final project. Experties developed in Jurusan Teknik Informatika include object oriented programming, software engineering, databases, information system, computer network, computer vision, pattern recognition, artificial intelligence & soft computing, decision support & recommender system, natural language processing, data mining & warehousing, web & mobile computing, enterprise resource planning, automation & robotics, and game programming. The students are also equipped with the capability to recognize and deploy the values of Al-Qur'an and Al-Hadits in order to enrich the development of Information Technology. In this department, the values of Al-Qur'an and Al-Hadits become the basic moral values for all civic academics.

2. **VISION**

    Being a world class Computer Science Department in 2030 for the provision of higher education and research in the area of Intelligence and Software Engineering based on Islamic values in order to drive society advancement.

3. **MISSION**

    The misions of Jurusan Teknik Informatika UIN Maulana Malik Ibrahim Malang are as follows:
    a. To organize higher education in Computer Science for the area of Intelligence and Software Engineering, and to internalize the value of Ulul Albab.
    b. To develop high quality researches in the area of Intelligence and Software Engineering which extend the frontiers of knowledge in Computer Science as well as to contribute on solving global issues based on Islamic values.
    c. To conduct transfer technology through the development and deployment of research products for society advancement.

4. **OBJECTIVES**

    The main objective of Jurusan Teknik Informatika UIN Maulana Malik Ibrahim Malang is to produce human resources in Computer Science and to create useful Information Technology that have characteristics as follows:
    a. Obedient to Islamic principles, state constitution, and professional law.
    b. Useful, effective and efficient.
    c. Convey the value of truth and endurance (patience).

Specific objectives of Jurusan Teknik Informatika UIN Maulana Malik Ibrahim Malang are as follows:
a. To produce Computer Science scholars who have good hardskill and softskill, i.e. that are able to compete globally, having deep spirituality, strong Islamic faith, and good moral values.
b. To produce well reputed scientific works in Computer Science.

5. TARGETS & STRATEGIES

Visi	Misi	Tujuan	Sasaran	Rencana Strategis
Pada tahun 2030 menjadi program studi berkelas dunia dalam penyelenggaraan pendidikan tinggi dan penelitian Informatika bidang Intelligence dan Software Engineering berbasis nilai-nilai Islam yang mampu mendorong kemajuan masyarakat.	Menyelenggarakan pendidikan tinggi Informatika bidang Intelligence dan SE serta menginternalisasi nilai-nilai ulul albab. Mengembangkan penelitian yang mampu memperluas keilmuan Informatika bidang Intelligence dan SE atau yang berkontribusi dalam memecahkan masalah global berbasis nilai-nilai Islam. Melaksanakan transfer teknologi melalui pengembangan dan penyebaran hasil-hasil penelitian untuk mencapai kemajuan masyarakat.	Menghasilkan Sarjana Informatika yang memiliki hardskill dan softskill yang baik, yaitu mampu berkompetisi secara global, memiliki kedalaman spiritual dan kekokohan aqidah, serta berakhlak mulia.	Kurikulum memenuhi standar nasional dan internasional terbaru	Workshop dan evaluasi kurikulum secara berkala
			Memiliki kecukupan jumlah laboratorium	Memperbanyak teaching lab dan research lab
			Memiliki kecukupan jumlah kelas	Memperbanyak ruang kelas
			Sistem pembelajaran memiliki mekanisme yang teratur dan baik	Mengembangkan sistem : • Perwalian • Proses Belajar Mengajar • Ujian • PKL • Skripsi • Yudisium • Evaluasi Kinerja Dosen
			Meningkatkan atmosfer akademik	• Meningkatkan jumlah penyelenggaraan forum ilmiah internal skala nasional dan internasional • Mengikuti forum ilmiah external skala nasional dan internasional • Membina komunitas mahasiswa • Meningkatkan prestasi mahasiswa • Meningkatkan research mahasiswa • Memperkecil rasio dosen/mhsw • Meningkatkan rasio keketatan input mhsw • Memperpendek lama waktu studi • Memperpendek masa tunggu lulusan
			Meningkatkan nilai akreditasi	Meningkatkan nilai akreditasi BAN-PT
			Meningkatkan jumlah dan kualifikasi dosen	Meningkatkan jumlah dosen S2, S3 danProfessor
		Menghasilkan karya ilmiah Informatika bereputasi baik.	Meningkatkan kuantitas dan kualitas publikasi ilmiah	Meningkatkan jumlah publikasi ilmiah pada journal bereputasi dan proceedings Scopus / IEEE Explore / IOP, serta meningkatkan jumlah citasi
			Meningkatkan jumlah HAKI	Melakukan workshop dan pendaftaran HAKI
			Mencapai prestasi lainnya	Meningkatkan prestasi ilmiah skala nasional dan Internasional

6. GRADUATE PROFILE

a. Graduate profiles of Jurusan Teknik Informatika are as follows:

No	Graduate Profiles	Competences
1	Software Developer	• Able to build computer algorithm and computer program. • Able to develop computer application and computer system based on the technology of intelligent, vision, visualization and modeling. • Able to develop computer application and computer system based on the technology of object-oriented, distributed and multiplatform.
2	IS Engineer	• Able to build computer algorithm and computer program. • Able to analyze and fulfill organization requirements through the development of information system.
3	Game & Multimedia Developer	• Able to build computer algorithm and computer program. • Able to develop creative game and simulation based on immersive and intelligent technology.
4	Researcher & Academician	• Able to solve global issues through scientific approach by utilizing the power of computing which is inspired by Al-Qur'an and Al-Hadits.

b. The above graduate profiles are achieved by acquiring the following skills:

No	Competences	Specific Skills
1	Able to build computer algorithm and computer program.	• Capabilities to design, develop and analyse computer algorithm and programming (KK1). • Capabilities to develop computer application and computer system based on software engineering (KK2).
2	Able to build computer application and computer system based on the technology of intelligent, vision, visualization and modeling.	• Capabilities to design, develop and analyse computer application and computer system based on the technology of intelligent, vision, computer visualization and computer modeling (KK3).
3	Able to build computer application and computer system based on the technology of object-oriented, distributed and multiplatform.	• Capabilities to design, develop and analyse computer application and computer system based on the technology of object-oriented, distributed and multiplatform (KK4).
4	Able to analyze and fulfill organization requirements through the development of information system.	• Capabilities to analyse and fulfill organization requirement by developing information system (KK5).
5	Able to build creative game and simulation based on immersive and intelligent technology.	• Capabilites to design and develop computer game and computer simulation based on the principle of creative, immersive and intelligent (KK6).
6	Able to solve global issues through scientific approach by utilizing the power of computing which is inspired by Al-Qur'an and Al-Hadits.	• Capabilities to employ research methodology, to utilize the power of computing, and to use the value of Al-Qur'an and Al-Hadits in order to solve global issues (KK7).

c. The required materials for learning activities are given as follows:

No	Learning Meterials	Specific Skills						
		KK 1	KK 2	KK 3	KK 4	KK 5	KK 6	KK 7
1	Computer algorithm & computer programming (BK1)	✓	✓	✓	✓	✓	✓	✓
2	Software engineering (BK2)		✓			✓		✓
3	Math & statistic (BK3)			✓				✓
4	Computer system & network (BK4)			✓	✓			✓
5	Intelligent system, computer vision, computer visualization & modeling (BK5)			✓			✓	✓
6	Object-oriented programming, distributed system & multiplatform programming (BK6)				✓			✓
7	Database, information system, & organizing organizarion resources and requirements (BK7)					✓		✓
8	Game & multimedia development (BK8)						✓	✓
9	Research methodology (BK9)							✓
10	Al-Qur'an dan Al-Hadits (BK10)							✓
11	Optimalization of computing resources (BK11)							✓

7. CURRICULUM

a. STRUCTURE OF CURRICULUM

Total credit of the curriculum of Jurusan Teknik Informatika is 151 credits (SKS) that consists of:
- University subjects (Mata Kuliah Pengembangan Kepribadian / MPK): 34 credits (SKS).
- Core subjects in computer science that are composed by:
    a. Compulsory subjects : 105 credits (SKS).
    b. Optional subjects: 24 credits (SKS). The students are required to take minimal 12 credits out of 24.

Curriculum Structure of Jurusan Teknik Informatika

NO	CODE	NAME	SKS	1	2	3	4	5	6	7	A	COMPULSORY	OPTIONAL	SD	ISE	GMD	RA	PREREQ
		CLASS SUBJECTS					SEMESTER					GROUP		PROFILE				
UNIVERSITY SUBJECTS / MATA KULIAH PENGEMBANGAN KEPRIBADIAN (MPK)																		
1	1700101	Pancasila	2	2								2						
2	1700102	Kewarganegaraan	2	2														
3	1700103	Bahasa Indonesia	2	2								2						
4	1400103	Bahasa Inggris I	3			3						3						
5	1400104	Bahasa Inggris II	3				3					3						1400103
6	1400107	Filsafat Ilmu	2		2							2						
7	1400108	Studi al-Qur'an dan al-Hadits	2				2					2						Ma'had
8	1400109	Studi Fiqh	2		2							2						Ma'had
9	1400110	Teosofi	2				2					2						
10	1400111	Sejarah Peradaban Islam	2			2						2						
11	1400112	Bahasa Arab (Maharat al-Istima' I)	1	1								1						
12	1400114	Bahasa Arab (Maharat al-Kalam' I)	2	2								2						
13	1400115	Bahasa Arab (Maharat al-Qira'ah I)	2	2								2						
14	1400113	Bahasa Arab (Maharat al-Kitabah I)	1	1								1						
15	1400116	Bahasa Arab (Maharat al-Istima' II)	1		1							1						
16	1400118	Bahasa Arab (Maharat al-Kalam' II)	2		2							2						
17	1400119	Bahasa Arab (Maharat al-Qira'ah II)	2		2							2						
18	1400117	Bahasa Arab (Maharat al-Kitabah II)	1		1							1						
		Total	34	12	6	9	7	0	0	0	0	34						
COMPULSORY CORE SUBJECTS																		
1	1565001	Foundation of Computing	2	2								2		2	2	2	2	
2	1565002	Calculus	3	3								3		3	3	3	3	
3	1565003	Algorithm & Programming 1	3	3								3		3	3	3	3	
4	1565004	Discrete Mathematics	3		3							3		3	3	3	3	
5	1565005	Linear Algebra	2		2							2		2	2	2	2	
6	1565006	Data Structure	3		3							3		3	3	3	3	1565003
7	1565007	Algorithm & Programming 2	2		2							2		2	2	2	2	1565003
8	1565008	Digital Electronic	3		3							3		3	3	3	3	
9	1565009	Statistics	2			2						2		2	2	2	2	
10	1565010	Object Oriented Programming	3			3						3		3	3	3	3	1565007
11	1565011	Database	3			3						3		3	3	3	3	1565006
12	1565012	Computer System	3			3						3		3	3	3	3	1565008
13	1565013	Numerical Methods	2				2					2		2	2	2	2	1565009

No	Code	Course Name																Prerequisite
14	1565014	Web Programming	3				3					3		3	3	3	3	1565010
15	1565015	Software Engineering	3				3					3		3	3	3	3	1565010
16	1565016	Computer Graphic	2				2					2		2	2	2	2	1565010
17	1565017	Computer Network	3				3					3		3	3	3	3	1565012
18	1565018	Artificial Intelligence	3					3				3		3	3	3	3	1565004
19	1565019	Computer Vision	3					3				3		3	3	3	3	1565004
20	1565020	Mobile Programming	2				2					2		2	2	2	2	1565010
21	1565021	Information System	3				3					3		3	3	3	3	1565011 1565015
22	1565022	Multimedia & Game Programming	3				3					3		3	3	3	3	1565016
23	1565023	Distributed System & Security	3				3					3		3	3	3	3	1565017
24	1565024	Research Methodology	2					2				2		2	2	2	2	
25	1565025	Geographical Information System	2					2				2		2	2	2	2	
26	1565026	Operation Research	2					2				2		2	2	2	2	
27	1565027	Human Computer Interaction	3					3				3		3	3	3	3	
28	1565028	Operating System	3					3				3		3	3	3	3	
29	1565029	Technopreneurship	2						2			2		2	2	2	2	
30	1565030	Project Management	2						2			2		2	2	2	2	
31	1565031	Algorithm & Programming 1 Practicum	1	1								1		1	1	1	1	
32	1565032	Data Structure Practicum	1		1							1		1	1	1	1	
33	1565033	Digital Electronic Practicum	1		1							1		1	1	1	1	
34	1565034	Object Oriented Programming Practicum	1			1						1		1	1	1	1	
35	1565035	Mobile Programming Practicum	1				1					1		1	1	1	1	
36	1565036	Database Practicum	1		1							1		1	1	1	1	
37	1565037	Computer System Practicum	1		1							1		1	1	1	1	
38	1565038	Web Programming Practicum	1				1					1		1	1	1	1	
39	1565039	Software Engineering Practicum	1				1					1		1	1	1	1	
40	1565040	Information System Practicum	1				1					1		1	1	1	1	
41	1565041	Computer Graphic Practicum	1			1						1		1	1	1	1	
42	1565042	Computer Network Practicum	1			1						1		1	1	1	1	
43	1565043	Multimedia & Game Programming Practicum	1				1					1		1	1	1	1	
44	1565044	Distributed System & Security Practicum	1				1					1		1	1	1	1	
45	1565045	Geographical Information System Practicum	1					1				1		1	1	1	1	

No	Code	Subject	Credit	1	2	3	4	5	6	7	8							Prerequisite
46	1565046	Internship (PKLI)	4								4	4		4	4	4	4	>=100 sks
47	1565047	Research Proposal Seminar	2								2	2		2	2	2	2	1565046
48	1565048	Undergraduate Thesis	6								6	6		6	6	6	6	1565047
		Total	**105**	9	15	14	17	21	13	4	12	105		105	105	105	105	
OPTIONAL SUBJECTS – COMPUTER SCIENCE																		
1	1565049	Soft Computing (Optional Subject 1)	3						3				3	3			3	1565018
2	1565050	Visualization & Modeling (Optional Subject 2)	3							3			3	3			3	1565019
		Total	**6**	0	0	0	0	0	3	3	0		6	6			6	
OPTIONAL SUBJECTS – SOFTWARE ENGINEERING																		
1	1565051	Software Quality (Optional Subject 1)	3						3				3	3	3			1565015
2	1565052	Software Management (Optional Subject 2)	3							3			3	3	3			1565015
		Total	**6**	0	0	0	0	0	3	3	0		6	6	6			
OPTIONAL SUBJECTS – INFORMATION SYSTEM																		
1	1565053	Enterprise Architecture (Optional Subject 1)	3						3				3	3	3			1565021
2	1565054	IT Governance (Optional Subject 2)	3							3			3	3	3			1565021
		Total	**6**	0	0	0	0	0	3	3	0		6	6	6			
OPTIONAL SUBJECTS – MULTIMEDIA																		
1	1565055	Scenario Design (Optional Subject 1)	3						3				3	3		3		1565022
2	1565056	Creative Game & Animation (Optional Subject 2)	3							3			3	3		3		1565022
		Total	**6**	0	0	0	0	0	3	3	0		6	6		6		
	TOTAL CREDITS		**151**	21	21	23	24	21	19	10	12	139	24	129	117	111	111	

Curriculum Structure of Jurusan Teknik Informatika per Semester

DESCRIPTION	S1 (21 SKS)	S2 (21 SKS)	S3 (23 SKS)	S4 (24 SKS)	S5 (21 SKS)	S6 (23 SKS)	S7 (12 SKS)	S8 (6 SKS)
UNIVERSITY SUBJECTS	Basic Culture & Social Science (2) Pancasila (2) B. Indonesia (2) Arabic (6)	Arabic (6)	Filsafat Ilmu (2) Study Fiqih (2) History of Islam Civilization (2) English I (3)	Study Al-Qur'an & Al-Hadits (2) Teosofi (2) English II (3)				
CORE KNOWLEDGE (COMPULSORY)	1 Foundation of Computing (2) 2 Calculus (3) 3 Algorithm & Programming 1 + P (3+1)	1 Discrete Math (3) 2 Linear Alg (2) 3 Data Structure + P (3+1) 4 Alg & Prog 2 (2) 5 Digital & Electronic + P (3+1)	4 Statistic (2) 5 OOP + P (3+1) 6 Database + Lab (3+1) 7 Computer System + P (3+1)	6 Numerical Methods (2) 7 Web Prog + P (3+1) 8 Soft Eng + P (3+1) 9 Computer Graphic + P (2+1) 10 Computer Network + P (3+1)	8 AI (3) 9 Comp Vision (3) 10 Mobile Programming + P (2+1) 11 Information System + P (3+1) f 12 Multimedia & Game Prog + P (3+1) 13 Distributed Syst & Security + P (3+1)	11 Research Methodology (2) 12 Operation Research (2) 13 Human Computer Interaction (3) 14 GIS + P (2+1) 15 O/S (3) Internship / PKLI (4)	14 Technopreneurship (2) 15 Project Management (2) Research Proposal Seminar (2)	Undergraduate Thesis (6)
CORE KNOWLEDGE (OPTIONAL)					SOFT COMPUTING (3) SOFTWARE QUALITY (3) ENTERPRISE ARCHITECTURE (3) SCENARIO DESIGN (3) ISU SOSIAL & PRAKTEK PROFESIONAL (3)		VISUALIZATION & MODELING (3) SOFTWARE MANAGEMENT (3) IT GOVERNANCE (3) CREATIVE GAME & ANIMATION (3) KEAMANAN JARINGAN (3)	

NOTE: Students are required to take 2 optional subjects (written in UPPERCASE) out of 4 offered from each semester
Core knowledge of odd semester consists of 19 subjects and 8 practicums, while even semester consists of 19 subjects and 7 practicums.

b. DISTRIBUTION OF SUBJECTS PER SEMESTER

SEMESTER I

No	Code	Subjects Name	SKS	Prerequisite
1	1400101	Pancasila	2	-
2	1700102	Kewarganegaraan	2	-
3	1700103	Bahasa Indonesia	2	-
4	1400112	Bahasa Arab (Maharat al-Istima' I)	1	-
5	1400114	Bahasa Arab (Maharat al-Kalam' I)	2	-
6	1400115	Bahasa Arab (Maharat al-Qira'ah I)	2	-
7	1400113	Bahasa Arab (Maharat al-Kitabah I)	1	-
8	1565001	Foundation of Computing	2	-
9	1565002	Calculus	3	-
10	1565003	Algorithm & Programming 1	3	-
11	1565031	Algorithm & Programming 1 Practicum	1	-
		T o t a l	21	

SEMESTER II

No	Code	Subjects Name	SKS	Prerequisite
1	1400116	Bahasa Arab (Maharat al-Istima' II)	1	-
2	1400118	Bahasa Arab (Maharat al-Kalam' II)	2	-
3	1400119	Bahasa Arab (Maharat al-Qira'ah II)	2	-
4	1400117	Bahasa Arab (Maharat al-Kitabah II)	1	-
5	1565004	Discrete Mathematics	3	-
6	1565005	Linear Algebra	2	-
7	1565006	Data Structure	3	1565003
8	1565007	Algorithm & Programming 2	2	1565003
9	1565008	Digital Electronic	3	-
10	1565032	Data Structure Practicum	1	-
11	1565033	Digital Electronic Practicum	1	-
		T o t a l	21	

SEMESTER III

No	Code	Subjects Name	SKS	Prerequisite
1	1400107	Filsafat Ilmu	2	-
2	1400109	Studi Fiqh	2	Ma'had
3	1400111	Sejarah Peradaban Islam	2	-
4	1400103	Bahasa Inggris I	3	-
5	1565009	Statistics	2	-
6	1565010	Object Oriented Programming	3	1565007
7	1565011	Database	3	1565006
8	1565012	Computer System	3	1565008
9	1565034	Object Oriented Programming Practicum	1	-
10	1565036	Database Practicum	1	-
11	1565037	Computer System Practicum	1	-
		T o t a l	23	

SEMESTER IV

No	Code	Subjects Name	SKS	Prerequisite
1	1400108	Studi al-Qur'an dan al-Hadits	2	Ma'had
2	1400110	Teosofi	2	-
3	1400104	Bahasa Inggris II	3	-
4	1565013	Numerical Methods	2	1565009
5	1565014	Web Programming	3	1565010
6	1565015	Software Engineering	3	1565010
7	1565016	Computer Graphic	2	1565010
8	1565017	Computer Network	3	1565012
9	1565038	Web Programming Practicum	1	-
10	1565039	Software Engineering Practicum	1	-
11	1565041	Computer Graphic Practicum	1	-
12	1565042	Computer Network Practicum	1	-
		T o t a l	24	

SEMESTER V

No	Code	Subjects Name	SKS	Prerequisite
1	1565018	Artificial Intelligence	3	1565004
2	1565019	Computer Vision	3	1565004
3	1565020	Mobile Programming	2	1565010
4	1565021	Information System	3	1565011 1565015
5	1565022	Multimedia & Game Programming	3	1565016
6	1565023	Distributed System & Security	3	1565017
7	1565035	Mobile Programming Practicum	1	-
8	1565040	Information System Practicum	1	-
9	1565043	Multimedia & Game Programming Practicum	1	-
10	1565044	Distributed System Practicum	1	-
		T o t a l	21	

SEMESTER VI

No	Code	Subjects Name	SKS	Prerequisite
1	1565024	Research Methodology	2	-
2	1565025	Geographical Information System	2	-
3	1565026	Operation Research	2	-
4	1565027	Human Computer Interaction	3	-
5	1565028	Operating System	3	-
6	1565045	Geographical Information System Practicum	1	-
7	1565049	SOFT COMPUTING (OPT SUBJ 1)*	3	1565018
8	1565051	SOFTWARE QUALITY (OPT SUBJ 1)*	3	1565015
9	1565053	ENTERPRISE ARCHITECTURE (OPT SUBJ 1)*	3	1565021
10	1565055	SCENARIO DESIGN (OPT SUBJ 1)*	3	1565022
11	1565057	ISU SOSIAL & PRAKTEK PROFESIONAL (OPT SUBJ 1)	3	-
12	1565046	Internship (PKLI)	2	Student has collected credits (SKS) >= 100 sks
		T o t a l	23	

(OPT SUBJ 1)* = Optional Subject 1, each student is required to take 2 subjects out of 5 subjects offered

SEMESTER VII

No	Code	Subjects Name	SKS	Prerequisite
1	1565029	Technopreneurship	2	-
2	1565030	Project Management	2	-
3	1565050	VISUALIZATION & MODELING (OPT SUBJ 2)*	3	1565019
4	1565052	SOFTWARE MANAGEMENT (OPT SUBJ 2)*	3	1565015
5	1565054	IT GOVERNANCE (OPT SUBJ 2)*	3	1565021
6	1565056	CREATIVE GAME & ANIMATION (OPT SUBJ 2)*	3	1565022
7	1565059	KEAMANAN JARINGAN (OPT SUBJ 2)	3	-
8	1565047	Seminar Research Proposal	2	1565024 (Research methodology) 1565046 (Internship / PKLI)
		T o t a l	12	

(OPT SUBJ 2)* = Optional Subject 2, each student is required to take 2 subjects out of 5 subjects offered

SEMESTER VIII

No	Code	Subjects Name	SKS	Prerequisite
1	1565048	Undergraduate Thesis (Skripsi)	6	1565047 (Seminar Proposal) Comprehensive Exam (Ujian Komprehensif)
		T o t a l	6	

Descriptions:
1. All prerequisite subjects must previously be programmed and have been inserted in UIN MALIKI Academic System (SIAKAD / siakad.uin-malang.ac.id) before programming the subject of interest. Students need to provide academic transcript (Kartu Hasil Studi/KHS) to demonstrate their eligibility to program any subject with prerequisities.
2. Comprehensive Exam (Ujian Komprehensif) is organized by Jurusan Teknik Informatika through a schedule set further, usually in monthly basis. Student is required to register through the administration of Jurusan Teknik Informatika to join with Comprehensive Exam (Ujian Komprehensif). Please consult to HELPDESK for prerequisites.

c. COURSE SYLLABUS

i. CORE SUBJECTS : COMPULSORY

SUBJECT NAME   : FOUNDATION OF COMPUTNG (1565001)
CREDIT   : 2 SKS
PREREQUISITE   : -
Objective
▪ Students are able to explain the curricula of computing based on national and international standards.
▪ Students are able to explain the benefit of the regulation and certification in computing.
▪ Students are able to explain basic data processing in computer, its benefits & weaknesses, and the development of computer technology.
▪ Students are able to explain the specialization of computing and to identify their technological trends.
Learning Material
▪ Computing Curricula: Computer Science, Computer Engineering, Software Engineering, Information System, Information Technology.
▪ APTIKOM, KKNI, IT Regulation & Certification.
▪ Nature of data: continous, discrete & digital.
▪ Basic of microprosessor & computer technology.
▪ Basic of data processing, computer application and computer system: information system, intelligent system, distributed system, etc.
References
▪ IEEE/ACM Computing & Computer Science Curricula, SWEBOK, KKNI.
▪ Sanders : Computer *Concept and Application*, McGraw-Hill, New York, 1987.
▪ A.Y. Motgomery, P.L Juliff, & I.J. Lynch : *Introduction to Computer Science*, Prentice-Hall, 1986.
▪ I.Ayres : *The Essence of Profesional Issues in Computing*, Prentice Hall 1999.
▪ Reamer, F. G : *Boundary issues in social work: Managing dual relationships*, 2003.

SUBJECT NAME   : CALCULUS (1565002)
CREDIT   : 3 SKS
PREREQUISITE   : -
Objective
▪ Students are able to identify the characteristic of continuous data.
▪ Students are able to process continuous data and to find the solution for continuous signal.
Learning Material
▪ Functions & models
▪ Limits & derivatives
▪ Differentiation rules
▪ Applications of differentitation
▪ Integral & its applications
▪ Differential equations
▪ Infinite sequences & series
References
▪ Dosen-dosen Matematika FMIPA-ITS, *Matematika I*
▪ Soehardjo, *Matematika I*, 1994
▪ Purcell, E.J : *Calculus with Analytic Geometry*, 4th edition, Prentice Hall Inc., 1984
▪ Boyce, W.E and R.C DiPrima, *Calculus*

SUBJECT NAME   : ALGORITHM & PROGRAMMING 1 (1565003) + PRACTICUM (1565031)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : -
Objective
▪ Students are able to understand the logic of computer programming.

- Students are able to develop flowchart and pseudocode.
- Students are able to program computer based on procedural approach using C++ programming language.

Learning Material
- History oof computer programming
- Logic of computer programming
- Notation & flowchart
- Programming syntax
- Data type & variable
- Conditional & Iteration (looping): block structure & nested
- Procedure & function, recursive
- Pseudocode
- Study case: Searching & Sorting

References
- Schneider, G. Michael : *Advanced Programming and Problem Solving*, Second Edition John Wiley & Sons, Inc, 1987
- E.M. Reingold, R.N. Reingold : *Pascal algorithms : an Introduction to Programming*, Little Brown, 1990
- J.P. Tremblay, R.B. Bunt : *An Introduction to Computer Science : An Algoritms*, McGraw-Hill, 1990
- Rinaldi Munir & Leoni Lidya : *Algoritma dan Pemrograman*, Informatika Bandung, 1998

SUBJECT NAME   : DISCRETE MATHEMATICS (1565004)
CREDIT   : 3 SKS
PREREQUISITE   : -
Objective
- Students are able to explain the nature & the importance of discrete data.
- Students are able to perform operation and to find solution on discrete data.
- Students are able to perform algorithm analysis.

Learning Material
- Boolean algebra & logical statements
- Set theory
- Ordered structure: tuples, lists, string & languages, relations, counting tuples
- Graph & tree
- Function: injection & surjection, bijection & inverses, pigeonhole principle, simple ciphers, hash functions, countability
- Analysis techniques: algorithm analysis, finding closed forms, counting discrete probability, permutation, combination, rates of growth (Big Theta, Litle O, Big O, Big Omega)

References
- Hein JL : *Discrete Mathematics 2nd Ed.* Jones & Bartlett Publishers, 2003
- Liu : *Element of Diskrete Mathematics*, McGraw-Hill Book Co., 1986
- Hirschfelder and J. Hirschfelder : *Introduction to Disrete Mathematics*, Brooks/Cole Publishing Co., 1981
- Prather : *Discrete Mathematical Structures for Computer Science*, Hougton Mifflin, 1976
- Mc Alister : *Discrete Mathematical in Computer Science*, Prentice-Hall, 1977

SUBJECT NAME   : LINEAR ALGEBRA (1565005)
CREDIT   : 2 SKS
PREREQUISITE   : -
Objective
- Students are able to explain the nature of linear data.
- Students are able to perform operation & to find solution on linear data.

Learning Material
- Linear equation
- Matrix & Vector
- Eigen value & eigen vector

References
- Anton Howard : *Aljabar Linier Elementer*, Penerbit Erlangga, Jakarta, 1990

- Lipshutz, Seymour : *Theory and Problems of Liniear Algebra*, Mc. Graw-Hill Book Company, 1989

SUBJECT NAME   : DATA STRUCTURE (1565006) + PRACTICUM (1565032)
CREDIT   : 3 SKS + 1SKS
PREREQUISITE   : ALGORITHM & PROGRAMMING 1

Objective
- Students are able to explain the cahracteristic of data & the mechanism to store data.
- Students are able to perform operation on data structure.

Learning Material
- Data type: bit, byte, boolean, character, integer, real.
- Structure of data storage: array, record, set, stack, queue, heap, linked list, graph & tree.
- Structure of tree: binary tree, AVL-tree, B-tree, R-tree
- Graph traversal: breadth-first & depth-first.
- Memory management & garbage collection.
- Searching & sorting.

References
- Tanenbaum, M.J. Augenstein : *Data Structures Using Pascal*, Prentice-Hall, 1986.
- Kruse : *Data Structures and Program Design*, Prentice-Hall, 1984
- Reingold, W.J Hansen : *Data Structures in Pascal*, Little Brown & Co., 1985
- Horowitz, S. Sahni : *Fundamentals of Data Structures*, Computer Science Press, 1976.

SUBJECT NAME   : ALGORITHM & PROGRAMMING 2 (1565007)
CREDIT   : 2 SKS
PREREQUISITE   : ALGORITHM & PROGRAMMING 1

Objective
- Students are able to develop flowchart & pseudocode for abstract & complex cases.
- Students are able to develop computer program based on the flowchart & pseudocode for abstract & complex cases.

Learning Material
- Flowchart & pseudocode.
- Searching: binary search, depth-first, breadth-first, topological sort, backtracking.
- Divide & conquer.
- Sorting & selection.
- Greedy algorithms & Hill climbing.
- Brute force.
- Analysis of algorithms.

References
- Johnsonbaugh R &Schaefer M : *Algorithms*. Pearson Education, 2004.
- E. M. Reingold, R.N. Reingold : *Pascalgorithms : an Introductionto Programming*, Little Brown.
- J.P. Tremblay, R.B. Bunt : *An Introduction to Computer Science : An Algorithmic*, McGraw-Hill

SUBJECT NAME   : DIGITAL ELECTRONIC (1565008) + PRACTICUM (1565033)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : -

Objective
- Students are able to develop flowchart & pseudocode for abstract & complex cases.
- Students are able to develop computer program based on the flowchart & pseudocode for abstract & complex cases.

Learning Material
- Binary notation, decimal & hexadecimal
- Logic gates: AND OR XOR etc
- Karnaugh map
- Flip-flop
- Decoder & encoder
- Multiplexer & demultiplexer
- Integrated Circuit: TTL & CMOS

- Clocking

References
- Budiono Mismail : *Dasar-dasar rangkaian logika digital.* Bandung: Penerbit ITB. 1998.
- Muchlas : *Rangkaian Digital.* Yogyakarta: Penerbit Gava Media. 2005.
- William Kleitz : *Digital Electronics: a practical approach.* Englewood Cliffs: Prentice-Hall. 1987.
- Mano, M. Morris : *Digital Design.* Englewood Cliffs: Prentice-Hall. 1984.

SUBJECT NAME : STATISTICS (1565009)
CREDIT   : 2 SKS
PREREQUISITE : -
Objective
- Students are able to explain descriptive statistics & the concept of probablities.
- Students are able to extract the features of data & its distribution.
- Students are able to perform data analysis.

Learning Material
- Descriptive statistics: data visualization (tabulation & graph), central tendency (mean, median, quartile), dispersion & skewness (standard deviation, variance).
- Probability & distribution : dicrete & continue (normal/Gaussian, poisson, binomial, etc).
- Sampling & population.
- Parameter estimation.
- Hypothesis tests.
- Analysis of variance.
- Correlation analysis.
- Regression.

References
- Mason RD, Lind DA & Marchal WG : *Statistics an Introduction 5th Ed.* Brooks/Cole Publishing Company, 1998.
- Walpole, R.E and R.H. Myers : *Probability and Statistics for Scientist and Engineers,* Callier MacMillan, 1978
- Ang, A.H.S and W.H Tang : *Probability Concepts in Engeneering Planning and Design* Vol. 1, John Wiley, 1975
- Bhrattachharya, Gauri, and R.A. Johnsons : *Statistical Concept and Methods,* John Wiley, 1977.

SUBJECT NAME : OBJECT ORIENTED PROGRAMMING (1565010) + PRACTICUM (1565034)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE : ALGORITHM & PROGRAMMING 2
Objective
- Students are able to explain the advantage of object-oriented programming.
- Students are able to explain the components composing object-oriented program.
- Students are able to develop computer program based on object-oriented approach using Java programming language.

Learning Material
- Operator & constant.
- Data type & variable
- Object, class & constructor.
- Control flow: looping & branching, conditional.
- Encapsulation, overriding, inheritance & polymorphism.
- Interface, abstraction & packages.
- Exception handling.

References
- Johnsonbaugh R &Schaefer M : *Algorithms.* Pearson Education, 2004.
- Stroustroup, Bjarne, *Programming Language,* 2 ed, Addison-Wesley, 1991
- E. Balagurusamy, *OOP with C++,* McGraw-Hill Co Ltd, 1995
- H.M Deitel & P.J Deitel, *C++ How To Program,* Prentice-Hall, 1994
- Herbert Schildt : *Using Turbo C++,* Osbon, McGraw-Hill, 199x

SUBJECT NAME   : DATABASE (1565011) + PRACTICUM (1565036)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : DATA STRUCTURE

Objective
- Students are able to explain the concept & architecture of DBMS.
- Students are able to develop relational data model & ERD.
- Students are able to perform query on database using SQL & perform database normalization.
- Students are able to install, perform operation & administer database.

Learning Material
- Concept & architecture of DBMS.
- Data model: hierarchical, relational, network.
- SQL & query.
- Normalization.
- Concurency, back up & recovery.
- Security: authorization, access control & privileges.
- Entity Relationships Diagram.

References
- Abraham Silberschatz, Henry F. Korth, S. Sudarshan : *Database System Concepts, Fourth Edition,* McGraw-Hill, 2001.
- Cohen, Daniel, : *Introduction to Computer Theory*, Wiley, New York, 1986.
- Korth, Henry F, : *Database System Concepts*, McGraw-Hill International, USA, 1991.
- Korth and Silberschatz : *Database Systems Concepts*, Prentice-Hall, 1986.
- Elmasri and S.B. Navathe : *Fundamentals of Database Systems*, The Benjamin/Cummings Publishing, 1989.
- Atre : Database : *Structured Techniques for Design, Performance, and Management*, Wiley, 1980.
- Jeffrey D. Ullman: *Principles of Database and Knowledge-Base Systems, Volume 2*, W H Freeman, 1999.
- Raghu Ramakrishnan dan Johannes Gehrke : *Data Management Systems, Second Edition*, McGraw Hill, 1999.
- A.F Cardenas : Database Management Systems, Allyn & Bascon, Boston, Mass., 1979.
- Lyon : Database Administrator, John Willey & Sons, 1977.
- G. Wiederhold : Database Design, McGraw-Hill, 1977.
- J.D Ulman : Principles of Database System, Computer Science Press, 1980.

SUBJECT NAME   : COMPUTER SYSTEM (1565012) + PRACTICUM (1565037)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : DIGITAL ELECTRONIC

Objective
- Students are able to explain the concept of microprocessor system & the architecture of computer.
- Students are able to build & develop microprocessor system & computer system.

Learning Material
- Microprocessor : ALU, registry, address bus, data bus, interrupt, reset.
- Microprocessor system: memory, I/O, address decoder, clocking system, interfacing, bootstrap.
- Microcontroller system.
- Computer system : boot loader, memory management, interupt & intercept.
- Assembly language.
- Paralel & serial communication : PPI, RS232.
- Embedded system.

References
- Hammacher, V. Carl : *Organisasi Komputer*, Penerbit Erlangga, Jakarta, 1993.
- A.S, Tanenbaumm, : *Structured Computer Organization*, Prentice Hall, 1990.
- Mano : *Computer Syatems Architecture*, 2nd/ed, Prentice-Hall, 1982.
- Hayes : *Computer Architecture and Organization*, 2nd/ed, McGraw-Hill, 1989.

SUBJECT NAME : NUMERICAL METHODS (1565013)
CREDIT : 2 SKS
PREREQUISITE : STATISTICS
Objective
- Students are able to explain the importance of numerical methods compared to analytical approach.
- Students are able to perform computation & to find solution from a set of data based on numerical methods.
- Students are able to implement numerical methods using computer program.

Learning Material
- Numerical methods vs analytical approach : numerical error.
- Empirical function : linear & non linear function (polinomial, logaritmik, exponential, etc).
- Transcendental algebraic equations : bisection, iteration, Regula-Falsi, Newton-Raphson.
- Interpolation : Newton, Lagrange, Cubic spline.
- Curve fitting.
- Simultaneous algebraic equations : Gauss elimination, Gauss-Jordan, matrix invertion, Gauss-Seidel.
- Eigen values.
- Differentiation & integration : Stirling, Newton-Cotes, Trapezoidal, Romberg, Simpson.
- Differential equation : Taylor, Picard, Euler. Runge-Kutta, Predictor-Corrector.

References
- Conte and Carl de Boor : *Elementary Numerical Analysis : An Algorthmic Approach*, McGraw-Hill, 1980.
- Chapra and R.P Canale : *Numerical Methods for Engineers*, McGraw-Hill, 1985.

SUBJECT NAME : WEB PROGRAMMING (1565014) + PRACTICUM (1565038)
CREDIT : 3 SKS + 1 SKS
PREREQUISITE : OBJECT-ORIENTED PROGRAMMING
Objective
- Students are able to explain the concept of web technology & web application.
- Students are able to build & develop active web application.

Learning Material
- HTML, XML, CSS.
- PHP & framework.
- Java Script & framework.

References
- Kadir, Abdul. HML, CSS, dan PHP
- Nurhasyim,. HTML dan CSS
- Pranata, Antony. Panduan Pemrograman Java Script
- Intro To Java Script For Non Programmer
- Johnson , Marc. JavaScript Manual of Style
- Kadir, Abdul. Web dinamis dengan PHP
- Saether, Stig Bakken. PHP Manual

SUBJECT NAME : SOFTWARE ENGINEERING (1565015) + PRACTICUM (1565039)
CREDIT : 3 SKS + 1 SKS
PREREQUISITE : OBJECT-ORIENTED PROGRAMMING
Objective
- Students are able to explain the life cycle of software.
- Students are able to perform requirement analysis.
- Students are able to model, design, develop, testing, & maintain software based on the principle of software engineering.
- Students are able to propose software engineering project.

Learning Material
- Software development life cycle.
- Software development model : waterfall, UML, DFD.
- Requirement analysis & software specification.

- Software design: process, data, object-oriented design.
- Software development process : prototyping, extreme programming, user experience.
- Software testing & maintenance.
- Software quality assurance & IT audit.
- Software evolution.
- Software project proposal.

References
- Pressman : *Software Engineering : A Practioner's Approach*, 3rd/ed, McGraw-Hill, 1992
- Fairley : *Software Engineering Concepts*, McGraw-Hill, 1985
- Whitten, L.D. Bentley & V.M. Barlow : *Systems Analysis and Design Methods*, 2nd/ed, Irwin Inc., 1989.

SUBJECT NAME   : COMPUTER GRAPHIC (1565016) + PRACTICUM (1565041)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : OBJECT-ORIENTED PROGRAMMING
Objective
- Students are able to explain the mechanism to model real object in computer graphic.
- Students are able to draw & move (change the view angle of) real object using computer program.
- Students are able to develop animation and computer graphic application using computer program.

Learning Material
- Drawing & texturing basic shapes.
- Modeling complex object : polygonal modeling, procedural modeling.
- Moving objects & view angle : geometric transformation.
- Rendering.
- Animation.

References
- Hariyanto, Bambang.2003.*Esensi-esensi Bahasa Pemrograman Java.*Bandung: Informatika.
- Dwi, Didik Prasetyo.2004.*Tip dan Trik Pemrograman Java.*Jakarta: Elex Media Komputindo.
- Sanjaya, Ridwan.2003. *Membuat Aplikasi Windows Multiplatform dengan Java GUI.* Jakarta: Elex Media Komputindo.

SUBJECT NAME   : COMPUTER NETWORK (1565017) + PRACTICUM (1565042)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : COMPUTER SYSTEM
Objective
- Students are able to model any technology of computer network based on OSI layer.
- Students are able to install, build, develop & administer computer network (LAN & WAN).

Learning Material
- Internet layer vs OSI layer.
- Circuit switch vs packet switch.
- Network device : hub, switch, router.
- Physical layer : cable, optic, frequency, distortion & noise.
- Data link layer : ethernet, ATM, PPP, frame relay, switching, wireless, TDMA, CDMA, FDMA, MAC, ARP & RARP.
- Network layer : IP & ICMP, subnetting, supernetting, routing, virtual network.
- Transport layer : TCP & UDP.
- WAN architecture : public & private network, firewalling, DNS, mail server, web server.
- Monitoring & administering network.

References
- Stallings: *Data and Computer Communications*, 3rd/ed. Maxwell MacMilan, 1991.
- Tanenbaum : *Computer Networks*, 2nd/ed, Prentice-Hall, 1989.
- Bersekas, R.Gallager : *Data Networks*, 2nd/ed, Prentice-Hall, 1992.
- William Stallings & Richard Van Slyke, *Business Data Communications*, 3rd edition, Prentice Hall International Inc, 1997.

SUBJECT NAME : ARTIFICIAL INTELLIGENCE (1565018)
CREDIT : 3 SKS
PREREQUISITE : DISCRETE MATHEMATICS

Objective
- Students are able to explain the concept of artificial intelligence & its methods.
- Students are able develop intelligent computer application based on artificial intelligence.

Learning Material
- Heuristic: reasoning, past experience
- Hill climbing, forward chaining, backward chaining
- Expert system: rule-based, case-based
- Neural network
- Fuzzy logic
- Genetic algorithm, rough set

References
- Patrick H. Winston : *Artificial Intelligence*, Addison-Wesley, 1992.
- Ramamoorthy, B.W. Wah : *Artificial Intelligence Processing*, John Wiley & Sons, 1990.
- Rolsto : *Principles of Artificial Intelligence and Expert Systems Development*, McGraw-Hill, 1988.
- Turban, E : *Decision Support and Expert Systems*, MacMillan Publishing Co., 1993

SUBJECT NAME : COMPUTER VISION (1565019)
CREDIT : 3 SKS
PREREQUISITE : DISCRETE MATHEMATICS

Objective
- Students are able to explain the concept of computer vision.
- Students are able to recognize the metric for visual data analysis.
- Students are able to extract features obtained from visual data.
- Students are able to develop methods to enhance the presentation of visual data.
- Students are able to develop methods to analyse and understand the content of visual data.
- Students are able to develop computer application in the field of computer vision.

Learning Material
- Image processing vs computer vision.
- Image & video acquisition : lenses system & sensor.
- Metrics : pixel, intensity, colour, contrast, frequency, resolution.
- Enhancement : noise, convolution, filter, morphology, gradient, thresholding, registration, projection.
- Feature extraction : edge, shape, texture, centroid, moment, distance, volume, pattern.
- Analysis & understanding : template matching, pattern recognition, accuracy & precision.
- Object modeling : polygonal & procedural modeling, geometric transformation.
- Application : spatial system, medical imaging, biometric.

References
- Baxes, GA : *Digital Image Processing*, John Wiley & Sons, 1994.
- Pratt : *Digital Image Processing*, New York : John Wiley & Sons, 1991
- Gonzales P. Wintz : *Digital Image Processing*, Reading, Massachusetts, Addison-Wesley, 1987.
- Pavlidis : *Algorithms for Graphics and Image Processing*, Computer Science Press, 1982

SUBJECT NAME : MOBILE PROGRAMMING (1565020) + PRACTICUM (1565035)
CREDIT : 2 SKS + 1 SKS
PREREQUISITE : OBJECT-ORIENTED PROGRAMMING

Objective
- Students are able to explain mobile technology based on Android and iOS.
- Students are able to develop & deploy mobile application based on Android & iOS.

Learning Material
- Android vs iOS.
- Java micro edition.

- Android application development: software specification (Android Studio), hardware type, layout & XML, Internet application, API, Android library.
- iOS application development: software specification (Xcode IDE & compatible OS), hardware specification, layout design, coding, library.
- Mobile applications deployment.

References
- J. Schiller, *Mobile Communications*, Addison-Wesley, 2000.
- C. Perkins, *Mobile IP: Design Principles and Practices*, Addison-Wesley, 1998.

SUBJECT NAME   : INFORMATION SYSTEM (1565021) + PRACTICUM (1565040)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : DATABASE, SOFTWARE ENGINEERING

Objective
- Students are able to perform assessments for organization requirements.
- Students are able to design, model, develop & evaluate information system to fulfil organization needs.
- Students are able to design, model & develop information system as a part of enterprise resource planning.

Learning Material
- Introduction to Business Process.
- Requirement engineering.
- Standrad operating procedure (SOP) development.
- Information system design (Physical and logical, documentation and data flow)
- Information system modeling (DFD, ERD (conceptual & physical data model), UML, use-case diagram).
- Information system implementation & development.
- Information system evaluation (Black box & white box testing).
- Introduction to enterprise resource planning (ERP).

References
- Mc Leod Jr, Raymond : *Management Information Systems*, Edition 4 th, MacMilan Pub 1996
- Lucas, Jr : *The Analysis, Design, and Implementation of Information System*, 1992
- Senn : *Analysis & Design of Information System*, McGraw-Hill, 1986.

SUBJECT NAME   : MULTIMEDIA & GAME PROGRAMMING (1565022) + PRACTICUM (1565043)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : COMPUTER GRAPHIC

Objective
- Students are able to explain the concept of multimedia programming & game tachnology.
- Students are able to design & develop game application.

Learning Material
- Basic of scenario design.
- Gaming object: obstacle, entity, bonus & score.
- Non player character.
- Intelligence behaviour: FSM & MSM.

References
- Borko F. 2009. Handbook of Multimedia for Digital Entertainment and Arts. Springer.

SUBJECT NAME   : DISTRIBUTED SYSTEM & SECURITY (1565023) + PRACTICUM (1565044)
CREDIT   : 3 SKS + 1 SKS
PREREQUISITE   : COMPUTER NETWORK

Objective
- Students are able to explain the concept of distributed system.
- Students are able to explain the concept of secure system.
- Students are able to develop the application of distributed system.
- Students are able to develop application to support secure system.

Learning Material
- OSI layer 4, 5, 6, 7.
- Thread & process management.
- SOCKET & client-server.
- Java RMI.
- Remote Procedure Call.
- CORBA.
- Security : authentication, access control, authorization, encryption, public & private key.
- Network security : intrusion detection, network monitor, firewalling, spoofing.
- Web security : SQL injection, brute force.

References
- V. Kumar, A. Grama, A. Gupta, dan G. Karypis : *Introduction to Parallel Computing : Design and Analysis of Algorithms*, The Benyamin Publishing Company, 1994.
- Foster : *Design and Building Parallel Programs*, Addison-Wesley, 1994.
- MCGraw-Hill-2001, *Network Security Secrets and Solutions.*
- Wiley, 2004, *Handbook Discovering and Exploiting Security Holes.*
- Andrew S. Tanenbaum, Maarten S., *Distributed Systems : Principles & Paradigms*, http://www.cs.vu.nl/~ast/books/ds1/powerpoint.html
- George Coulories, Jean Dollimore, *Distributed Systems : Concepts & Design, 3th Edition*, Addison Wesley, http://www.cdk3.net/iq/
- Distributed Systems Course Material, http://www.cs.bham.ac.uk/~mzk/courses/DistSys/
- Crichlow, Joel, *The Essence of Distributed Systems*, Prentice Hall, 2000
- Colouris, G., Dollimore, J., Kindberg, T., *Distributed Systems : Concept and Design*, Addison Wesley, 3rd ed., 2001
- Hughes, C., Hughes, T., *Parallel and Distributed Programming Using C++*, Prentice Hall, 2003

SUBJECT NAME : RESEARCH METHODOLOGY (1565024)
CREDIT : 2 SKS
PREREQUISITE : -
Objective
- Students are able to explain the concept of research methodology.
- Students are able to elaborate the existence of research problem.
- Students are able to identify research question, research objective & the scope of research.
- Students are able to develop literature review.
- Students are able to derive good scientific references.
- Students are able to develop research methodology.
- Students are able to write & document research proposal & research report.

Learning Material
- The nature of research & scientific approach.
- Type of research : exploratory, constructive & empirical.
- Research approach : quantitative vs qualitative.
- Problem to research, research question, objective & scope.
- Literature review, state of the art & references.
- Research design & research procedure.
- Data sources, acquisition & collection.
- Research instruments.
- Methods to analyse data : system development, experiment & discussion.
- Framework : theoretical, conceptual & operational.
- Preliminary result.
- Developing abstract, keywords, conclusion & title.

References
- Babbie : *Survey Research Methods*, 1973
- Sutrino Hadi : *Metodologi Research*, 1979

SUBJECT NAME : GEOGRAPHICAL INFORMATION SYSTEM (1565025) + PRACTICUM (1565045)
CREDIT : 2 SKS + 1 SKS
PREREQUISITE : -
Objective
- Students are able to explain the concept of GIS.
- Students are able to recognize components composing GIS application and how to obtain them through Internet.
- Students are able to develop Web GIS application.

Learning Material
- Digital map.
- Coordinate system, Datum & projection.
- Type of data: spatial (raster & vector), tabular.
- Database.
- Digitazion & image registration.
- Overlaying.
- WebGIS.
- Remote sensing & satellite photo.
- Spatial analysis.

References
- Jeffrey Star, John Estes, *Geographical Information System : An introduction*, Prentice Hall, 1990.
- Michael N. Demers, *Fundamentals of Geographical Information System*, John Wiley & Sons, 1996.

SUBJECT NAME : OPERATION RESEARCH (1565026)
CREDIT : 2 SKS
PREREQUISITE : -
Objective
- Students are able to explain the concept of operation research / management science.
- Students are able to select the best decision from available alternatives in industrial system.
- Students are able to develop computer application for decision making.

Learning Material
- Linear programming : Break event point, simplex method.
- Transportation problem.
- Network problem.
- Game theory.
- Decision analysis.
- Markov chains.
- Queuing theory.
- Inventory theory.
- Forecasting.

References
- Ravindran AR. 2007. Operations Research and Management Science Handbook. CRC Press.
- Hiller FS & Lieberman GJ. 2001. Introduction to Operations Research 7th Ed. McGraw-Hill.

SUBJECT NAME : HUMAN COMPUTER INTERACTION (1565027)
CREDIT : 3 SKS
PREREQUISITE : -
Objective
- Students are able to explain the concept of man-machine interaction.
- Students are able to identify any components composing man-machine interaction.
- Students are able to develop ergonomic interfacing, navigation & dialog to support computer application.

Learning Material
- The concept of man-machine interaction and ergonomics design.
- Interfacing design & development
- Navigation & dialog design & development.

- Efficiency, user friendly & usability.

References
- Dix, A J & JE Finlay, : *Human Computer Interaction*, Prentice Hall, 1993
- Christine Faulkner, *The Essence of Human Computer Interaction*, Prentice Hall.

SUBJECT NAME   : OPERATING SYSTEM (1565028)
CREDIT   : 3 SKS
PREREQUISITE   : -

Objective
- Students are able to explain the concept of operating system.
- Students are able to identify components composing operating system.
- Students are able to administer operating system.
- Students are able to build network devices using open source O/S.

Learning Material
- Architecture of operating system : kernel, thread, system call, shell, user & machine.
- File system.
- Process scheduling.
- Memory management.
- Device driver.
- Storage system & back up management.
- Security system & access control.
- Shell programming.
- Open source & development of network devices (router, firewall)

References
- Tanenbaum : *Modern Operating System*, Prentice-Hall, 1992.
- Stalling, William, : *Operating Systems*, 2 nd edition, 1995.

SUBJECT NAME   : TECHNOPRENEURSHIP (1565029)
CREDIT   : 2 SKS
PREREQUISITE   : -

Objective
- Students are able to explain the importance of technopreneurship for technology deployment.
- Students are able to identify the requirements to develop technopreneurship.
- Students are able to develop technopreneurship.

Learning Material
- Business plan.
- Business proposal.
- Feasibility & profitability study.
- Cost estimation & break event point.
- Banking system & interest rate.
- Product deployment & marketting.

References
- Peter F. Drucker : *Innovation and Entrepreneurship*, Practice and Principles, Heinemann, 1985.
- David Radin : *Building a SuccessfulSoftware* Business, O'Reilly & Associates, 1994.
- Thomas W. Zimmerer and Norman M. Scarborough : *Entrepreneurship and New Venture Formation*, Pearson Education POD, 1995.

SUBJECT NAME   : PROJECT MANAGEMENT (1565030)
CREDIT   : 2 SKS
PREREQUISITE   : -

Objective
- Students are able to explain the concept & the importance of project management.
- Students are able to identify the requirements to conduct project management.
- Students are able to manage IT project.

Learning Material
- Project elements & the concept of management.

- Project planning : scope definition, activities planning & sequencing, resource planning, time estimation, scheduling, cost estimation, budget development.
- Risk & opportunities management.
- Project management tools & techniques.
- Project evaluation, feasibility study & profitability analisys.
- Network optimation.
- Learning curve analysis & documentation.
- Control IT selection (ISO, ITIL, COBIT).

References
- Doss George M., McDermott Susan: Project Management Handbook, Prentice Hall, 2000.

SUBJECT NAME   : INTERNSHIP / PKLI (1565046)
CREDIT   : 4 SKS
PREREQUISITE   : Student has collected >= 100 credits (SKS)
Objective
- Students are able to identify the problem of external organization and to propose the solution.
- Students are able to develop & deploy IT application to solve external organizarion problem.

Learning Material
- Fulfilling all required documents to formally corresponding with external organization of interest.
- Minimal one month activities in the external organization to develop, maintain or deploy IT system, application or infrastructure. This activities is supervised by external supervisor from the external organization.
- Writing final report of Internship and consulting to internal supervisor.
- Join with KKM LP2M UIN MALIKI Malang.

Description
- Students need to consult to HELPDESK to take Internship program, and to recognize any required documents.
- At least one month activities in external organization is required to fulfill Intership program. The activities depend on the condition and the need of each organization. However developing IT system or application must be included in the activities.
- Students need to develop report at the end of Internship program, and consult to internal supervisor by presenting the report.
- Evaluation mark of Internship programs are provided by three parties i.e. internal supervisor (lecturer from Jurusan Teknik Informatika which is appointed to supervise the student), supervisor from external organization, and LP2M UIN MALIKI Malang. Here LP2M organizes a program namely KKM (Kuliah Kerja Mahasiswa) that become compulsory program for all student of UIN MALIKI Malang. Therefore students require to join with this program in order to have evaluation mark from LP2M. Final mark is concluded by averaging the evaluation marks obtained from internal supervisor, external supervisor, and LP2M.

References
- Pedoman Praktik Kerja Lapangan Integratif (PKLI) Fakultas Sains dan Teknologi Universitas Islam Negeri Maulana Malik Ibrahim Malang, 2012.
- Pedoman Pelaksanaan PKLI Jurusan Teknik Informatika UIN MALIKI Malang, 2013.

SUBJECT NAME   : SEMINAR RESEARCH PROPOSAL (1565047)
CREDIT   : 2 SKS
PREREQUISITE   : RESEARCH METHODOLOGY & INTERNSHIP (PKLI)
Objective
- Students are able to communicate their research topic & material to appointed supervisors.
- Students are able to formulate appropriate method/theory/approach/rule in order to answer research questions.
- Students are able to write proposal for undergraduate thesis (skripsi).
- Students are able to present and defend their proposal in front of a group of examiner.

Learning Material
- Consulting research material to supervisor.
- Identifying research problem and formulating research question & scope.

- Formulating appropriate method/theory/approach/rule to answer research question.
- Developing literature review, research methodology & references.
- Developing research proposal for undergraduate thesis.
- Presenting & defending research proposal in front of a group of examiner.

References
- Prosedur Mutu Skripsi Jurusan Teknik Informatika UIN MALIKI Malang No. Un.03.6.5/PP.00.9/005/2014.

SUBJECT NAME   : UNDERGRADUATE THESIS / SKRIPSI (1565048)
CREDIT   : 6 SKS
PREREQUISITE   : SEMINAR RESEARCH PROPOSAL & UJIAN KOMPREHENSIF

Objective
- Students are able to communicate their research progress to appointed supervisors.
- Students are able to formulate, implement & test appropriate method/theory/approach/rule in order to answer research questions.
- Students are able to write undergraduate thesis (skripsi) & scientific paper.
- Students are able to present and defend undergraduate thesis (skripsi) in front of a group of examiner.

Learning Material
- Consulting research progress to supervisor.
- Identifying research problem and formulating research question & scope.
- Formulating, implementing & testing appropriate method/theory/approach/rule to answer research questions.
- Developing literature review, research methodology, conclusion & references.
- Developing undergraduate thesis (skripsi) & writing scientific paper.
- Presenting & defending undergraduate thesis (skripsi) in front of a group of examiner.

References
- Prosedur Mutu Skripsi Jurusan Teknik Informatika UIN MALIKI Malang No. Un.03.6.5/PP.00.9/005/2014.

ii.   CORE SUBJECTS : OPTIONAL

SUBJECT NAME   : SOFT COMPUTING (1565049)
CREDIT   : 3 SKS
PREREQUISITE   : ARTIFICIAL INTELLIGENCE

Objective
- Students are able to explain the concept of soft computing vs hard computing.
- Students are able to explain the application of statistics & artificial intelligence for soft computing.
- Students are able to develop computer application based on soft computing.

Learning Material
- Soft computing vs hard computing
- Soft computing vs machine learning
- Neural network
- Fuzzy logic
- Genetic algorithm, rough set
- Student assignment

References
- Patrick H. Winston : *Artificial Intelligence*, Addison-Wesley, 1992.
- Ramamoorthy, B.W. Wah : *Artificial Intelligence Processing*, John Wiley & Sons, 1990.
- Rolsto : *Principles of Artificial Intelligence and Expert Systems Development*, McGraw-Hill, 1988.
- Turban, E : *Decision Support and Expert Systems*, MacMillan Publishing Co., 1993

SUBJECT NAME   : VISUALIZATION & MODELING (1565050)
CREDIT   : 3 SKS
PREREQUISITE   : COMPUTER VISION
Objective
- Students are able to explain the concept of visualization & modeling.
- Students are able to develop computer application for visualizing data and modeling any running system.

Learning Material
- Data visualization
- 2D & 3D modeling
- Spatial modeling
- Computer modeling
- Student assignment

References
- Ward M, Grinstein G & Keim D : *Interactive Data Visualization: Foundation, Techniques & Applications.* AK Peters, 2010.

SUBJECT NAME   : SOFTWARE QUALITY (1565051)
CREDIT   : 3 SKS
PREREQUISITE   : SOFTWARE ENGINEERING
Objective
- Students are able to explain the concept of software quality.
- Students are able to perform software quality assurance.

Learning Material
- Requirement analysis
- Software quality assurance
- Standard for quality assurance
- Student assignment

References
- Pressman : *Software Engineering : A Practioner's Approach*, 3rd/ed, McGraw-Hill, 1992
- Fairley : *Software Engineering Concepts*, McGraw-Hill, 1985
- Whitten, L.D. Bentley & V.M. Barlow : *Systems Analysis and Design Methods*, 2nd/ed, Irwin Inc., 1989.

SUBJECT NAME   : SOFTWARE MANAGEMENT (1565052)
CREDIT   : 3 SKS
PREREQUISITE   : SOFTWARE ENGINEERING
Objective
- Students are able to explain the concept of software management.
- Students are able to manage software development.

Learning Material
- Managing software design, development & evaluation
- Managing resources
- Framework for management
- Student assignment

References
- Pressman : *Software Engineering : A Practioner's Approach*, 3rd/ed, McGraw-Hill, 1992
- Fairley : *Software Engineering Concepts*, McGraw-Hill, 1985
- Whitten, L.D. Bentley & V.M. Barlow : *Systems Analysis and Design Methods*, 2nd/ed, Irwin Inc., 1989.

SUBJECT NAME   : ENTERPRISE ARCHITECTURE (1565053)
CREDIT   : 3 SKS
PREREQUISITE   : INFORMATION SYSTEM
Objective
- Students are able to explain the concept of enterprise architecture.
- Students are able to develop computer application based on enterprise architecture.

Learning Material
- ERP
- SOA & ROA
- Middle ware
- Distributed architecture : database & system
- Student assignment

References
- Bernus P, Nemes L & Schmidt G. 2003. Handbook on enterprise architecture. Springer.
- Saha P. 2007. Handbook of enterprise systems architecture in practice. IGI Global.

SUBJECT NAME   : IT GOVERNANCE (1565054)
CREDIT   : 3 SKS
PREREQUISITE   : INFORMATION SYSTEM
Objective
- Students are able to explain the concept of IT governance.
- Students are able to govern IT system based on available standards.

Learning Material
- ITIL
- TOGAF
- COBIT
- Student assignment

References
- Calder A. 2014. IT Governance Today – A Practitioner's Handbook. IT Governance Ltd.
- Calder A & Watkins S. 2012. IT Governance: An International guide to Data Security and ISO27001/ISO27002. Kogan Page Publishers.

SUBJECT NAME   : SCENARIO DESIGN (1565055)
CREDIT   : 3 SKS
PREREQUISITE   : MULTIMEDIA & GAME PROGRAMMING
Objective
- Students are able to explain the concept of soft computing vs hard computing.
- Students are able to explain the application of statistics & artificial intelligence for soft computing.
- Students are able to develop computer application based on soft computing.

Learning Material
- Scenario & story board
- Scenario design
- Scenario generation : static, dynamic & automatic
- Scenario evaluation
- Student assignment

References
- Hartog C. 2009. Scenario design for serious gaming. Delft University of Technology: Master Thesis.
- Marsh T. 2010. Activity-based scenario design, development, and assessment in serious games. IGI Global.
- Dorosh M. 2016. Scenario designer's handbook 2nd ed. Tacticalwargamer.com.
- ProActive. Production of creative game-based learning scenarios, handbook for teachers. Lifelong learning programme, Education & Culture DG.

SUBJECT NAME : CREATIVE GAME & ANIMATION (1565056)
CREDIT : 3 SKS
PREREQUISITE : MULTIMEDIA & GAME PROGRAMMING
Objective
- Students are able to explain the concept of soft computing vs hard computing.
- Students are able to explain the application of statistics & artificial intelligence for soft computing.
- Students are able to develop computer application based on soft computing.

Learning Material
- Concept of creative & immersive
- Creative game design
- Sensor system development
- Integrating sensor system & game environment
- Calibration & game performance evaluation
- Student assignment

References
- Hartog C. 2009. Scenario design for serious gaming. Delft University of Technology: Master Thesis.
- Marsh T. 2010. Activity-based scenario design, development, and assessment in serious games. IGI Global.
- Dorosh M. 2016. Scenario designer's handbook 2nd ed. Tacticalwargamer.com.
- ProActive. Production of creative game-based learning scenarios, handbook for teachers. Lifelong learning programme, Education & Culture DG.

iii.   UNIVERSITY SUBJECTS

MATA KULIAH : Pancasila (1700101) : MPK : 2 SKS
PRASYARAT : -
Tujuan
Memiliki pengetahuan kewarganegaraan (*civic knowledge*), memiliki kecakapan kewargaan (*civic skill*), memiliki sikap kewargaan (*civic dispotition*), berpartisipasi sebagai warga Negara (*civic participation*), serta keberadaban (*smart and good citizen*)
Materi Kuliah
Makna pendidikan kewargaan dalam kehidupan individu, bermasyarakat, berbangsa dan bernegara. Konsep umum ideologi negara, ideologi Pancasila dan hubungannya dengan ideologi agama Islam penerapannya dalam kehidupannya sehari-hari. Konsep identitas nasional dan mampu bersikap, berperilaku sebagai warga negara yang beridentitas nasional dalam kehidupan sehari-hari. Konsep negara dan kewarganegaraan, dalam kehidupan berbangsa maupun bernegara. Makna konstitusi negara dalam kehidupan berbangsa dan bernegara. Hubungan antara negara dan agama (Islam) dalam kehidupan berbangsa dan bernegara di Indonesia. Konsep masyarakat madani (*civil society*) dan penerapan moralitas akademik sebagai masyarakat yang berkeadaban (*good society*). Konsep dan makna demokrasi dalam kehidupan di Indonesia. Konsep HAM sebagai wujud aktualisasinya dalam kehidupan bermasyarakat. Konsep otonomi daerah di Indonesia
Pustaka:
- Kumpulan Buku Penataran P4
- Darji Darmodiharjo, *Pancasila Sumber dari Segala Sumber Hukum*, Malang : UNIBRAW
- Lembaga Pertahanan Nasional, *Ketahanan Nasional*, Jakarta, Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Politik dan Strategi Nasional*, Jakarta : Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Politik dan Strategi Pertahanan dan Keamanan Nasional*, Jakarta, Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Sistem Pertahanan Keamanan Rakyat Semesta*, Jakarta, Lemhanas, 1982

MATA KULIAH : Kewarganegaraan (1700102) : MPK : 2 SKS
PRASYARAT : -
Tujuan
Memiliki pengetahuan kewarganegaraan (*civic knowledge*), memiliki kecakapan kewargaan (*civic skill*), memiliki sikap kewargaan (*civic dispotition*), berpartisipasi sebagai warga Negara (*civic participation*), serta keberadaban (*smart and good citizen*)
Materi Kuliah
Makna pendidikan kewargaan dalam kehidupan individu, bermasyarakat, berbangsa dan bernegara. Konsep umum ideologi negara, ideologi Pancasila dan hubungannya dengan ideologi agama Islam penerapannya dalam kehidupannya sehari-hari. Konsep identitas nasional dan mampu bersikap, berperilaku sebagai warga negara yang beridentitas nasional dalam kehidupan sehari-hari. Konsep negara dan kewarganegaraan, dalam kehidupan berbangsa maupun bernegara. Makna konstitusi negara dalam kehidupan berbangsa dan bernegara. Hubungan antara negara dan agama (Islam) dalam kehidupan berbangsa dan bernegara di Indonesia. Konsep masyarakat madani (*civil society*) dan penerapan moralitas akademik sebagai masyarakat yang berkeadaban (*good society*). Konsep dan makna demokrasi dalam kehidupan di Indonesia. Konsep HAM sebagai wujud aktualisasinya dalam kehidupan bermasyarakat. Konsep otonomi daerah di Indonesia
Pustaka:
- Kumpulan Buku Penataran P4
- Darji Darmodiharjo, *Pancasila Sumber dari Segala Sumber Hukum*, Malang : UNIBRAW
- Lembaga Pertahanan Nasional, *Ketahanan Nasional*, Jakarta, Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Politik dan Strategi Nasional*, Jakarta : Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Politik dan Strategi Pertahanan dan Keamanan Nasional*, Jakarta, Lemhanas, 1978
- Lembaga Pertahanan Nasional, *Sistem Pertahanan Keamanan Rakyat Semesta*, Jakarta, Lemhanas, 1982

MATA KULIAH : BAHASA INDONESIA (1700103) : MPK : 2 SKS
PRASYARAT : -
Tujuan
Mampu menggunakan Bahasa Indonesia dg baik dan benar baik lisan maupun tertulis
Materi Kuliah
Bahasa Indonesia sebagai media komunikasi, pemakaian Ejaan bahasa Indonesia yang disempurnakan, bentuk dan pilihan kata/diksi, kalimat Bahasa Indonesia, paragraf dalam Bahasa Indonesia dan menyusun karya ilmiah
Pustaka
- Depdikbud, 1997, *Pedoman Umum Ejaan Bahasa Indonesia yang Disempurnakan*, Pusat Pembinaan dan Pengembangan Bahasa, Jakarta;
- Depdikbud, 1993, *Tata Bahasa Baku Bahasa Indonesia*, Pusat Pembinaan dan Pengembangan Bahasa, Jakarta;
- Sugono, D., 1994, *Berbahasa Indonesia dengan Benar*, Puspa Swara, Jakarta

MATA KULIAH : BAHASA INGGRIS I (1400103) : MPK : 3 SKS
PRASYARAT : -
Tujuan
Membekali mahasiswa kemampuan Bahasa Inggris yang berorientasi pada akademik, khususnya agar mahasiswa dapat memahami textbook.
Materi Kuliah
Membenahi pengetahuan tentang grammar, memperkaya vocabulary dan memahami idioms dan usage; Latihan-latihan reading dan pronounciation; Writing
Pustaka
- Alexander, L.G., *First Things : An Integrated Course for Beginner; Practise and Progress : An Integrated Course for Pre-Intermediet Student; Developing Skills: An Integrated Course for Intermediet Student; Fluency in English: An Integrated Course for Advance;*
- Macella, Frank, *Modern English: A Practical Reference Guide*

MATA KULIAH   : BAHASA INGGRIS II (1400104) : MPK : 3 SKS
PRASYARAT   : BAHASA INGGRIS I
Tujuan
Mahasiswa dapat memahami isi wacana dalam Bahasa Inggris terutama yang menyangkut bidang sain dan teknologi (80%), serta dapat memahami bahasa Inggris lisan untuk bidang yang sama (20%).
Materi Kuliah
Pengenalan dan pemakaian kosa kata terutama yang menyangkut bidang dan teknologi. Struktur dan gramatika yang mendukung pemahaman Bahasa Inggris untuk sain dan teknologi. Pemahaman isi wacana serta praktikum di Practicumoratorium bahasa untuk latihan listening comprehension dan reproduction
Pustaka
- Tim R Pengajar Bahasa Inggris ITS, *Selected English Reader for Scientific and Engineering Studies.*
- Balitho, A. R. & Sandler, P.L : *Study English for Science*
- Bransnett, Clive : English for Eng.
- E wer, J.R. and Lattore, G.A Course in Basic Scientific English

MATA KULIAH   : STUDI AL-QUR`AN DAN AL-HADITS (1400108) : MPK : 2 SKS
PRASYARAT   : Ma'had
Tujuan
Memiliki kemampuan dasar dalam memahami al-Qur'an melalui pembahasan yang tercakup dalam Ulum Al- Qur'an dan Ilmu Tafsir. Lebih khusus mahasiswa mampu menggunakan kajian ilmu al-Qur'an untuk mengembangkan keahlian keilmuan sains. Selain itu untuk mengetahui dan memahami dengan baik pentingnya pengetahuan Ulum al-Hadits, khususnya kedudukan dan fungsi Hadits (sunnah), sejarah Hadits dan Ulum al-Hadits, penelitian sanad dan matan Hadits, kualitas dan kehujjahan Hadits, kitab-kitab yang menghimpun Hadits dan Ulum al-Hadits dan tata cara penelusuran sumber Hadits pada kitab-kitab Hadits. Lebih khusus mahasiswa mampu menggunakan kajian ilmu al-Hadits untuk mengembangkan keahlian keilmuan sains.
Materi Kuliah
Pengertian Al-Qur'an, cara Al-Qur`an diwahyukan Hikmah Al-Qur`an diturunkan berangsur-angsur dan kedudukan Al-Qur`an; Setting Turunnya al-Qur'an: Asbab al-Nuzul (pengertian, ungkapan, tipologi dan urgensi), Al-Makky dan al-Madany (pengertian, klasifikasi, karakteristik dan urgensinya); I'jaz al-Qur'an :Pengertian dan ragam, Aspek-aspek kemu'jizatan al-Qur'an, kemu'jizatan al-Qur'an di alam; Problematika Tafsir al-Qur'an : pengertian, macam-macam dan urgensi mempelajarinya; Alwan al-Tafsir (Corak dan karakter tafsir) : fiqhi, falsafi, 'ilmi, shufi-isyari, adabi dan ijtima'I) ; Tokoh-tokoh mufassir dan kitab-kitab tafsir ; Aplikasi metodologi penafsiran ayat-ayat yang berkaitan dengan alam khususnya sains dalam al-Qur'an. Hadits dan hubungannya dengan al-Qur'an, Hadits Qudsi, Pengertian Kedudukan dan Fungsi Hadits; Sejarah Perkembangan Hadits ; pada masa, Nabi, Shahabat, Tabi'in dan Tabi'i at-Tabi'in. Kodifikasi Hadits meliputi : Pengumpulan, Penulisan dan Pembukuan Hadits; Mushthalahat fi al-Hadits: Sanad, Isnad, Musnad, Matan, Rawi. Hadits ditinjau dari Kuantitasnya: Mutawatir, Ahad danKehujjahannya. Hadits ditinjau dari Kualitasnya : Hadits Shahih, Hadits Hasan, Hadits Dla'if dan bagian-bagiannya, Al-Musytarak baina ash-Shahih wa al-Hasan wa adl-Dla'if; Hadits Maudlu': Pengetian Hadits Maudlu'. Sebab-sebab timbulnya Hadits Maudlu'.Hukum meriwayatkan Hadits Maudlu';Kritik Keshahihan Sanad & Matan Hadits: Kritik Keshahihan Sanad. Kritik Keshahihan Matan; Mengenal Macam-Macam Kitab Hadits & Biografi Muhaddits : Mengenal Macam-Macam Kitab Hadits. Mengenal Biografi Muhaddits; Takhrij al-Hadits: Teori Takhrij. Praktek Takhrij; Metode pemahaman Hadits melalui pendekatan historis, antropologis, sosiologis & filosofis; Aplikasi metodologi penafsiran hadits yg berkaitan dg sains.
Pustaka
Manna' Khalil al-Qathan, *Mabahits fi 'Ulum al-Qur'an*; Al-Suyuthi, *al-Itqan fi 'Ulum al-Qur'an*; Al-Zarqani, *Manahil al-'Irfan*; Al-Zarkasyi, *al-Burhan fi 'Ulum al-Qur'an*; Ahmad von Denffer, Ulum al-Qur'an : *an Introduction to the Sciences of al-Qur'an*;   W. Montgomerry Watt, Pengantar Studi Qur'an. Ajjad Khatib, Muhammad, Ushul al-Hadits, Ulumuhu wa Mushthalahuh; Shubhi Shalih, Ulum al-Hadits wa Mushthalahuh; HM. Syuhudi Ismail, Kaidah Kesahihan Sanad Hadits; TM. Hasbi ash-Shiddiqi, Sejarah dan Pengantar Ilmu Hadits; Abu Muhammad Abd. Muhdi, Metode Takhrij

Hadits, alih bahasa Syed Aqil Bin Husain al-Munawwar; HM. Syuhudi Ismail, Ilmu Hadits (Pengantar, Sejarah dan Istilah); HM. Syuhudi Ismail, Cara Praktis Mencari Hadits; TM. Hasbi ash-Shiddiqi, Pokok-Pokok Ilmu Dirayah Hadits.

MATA KULIAH : STUDI FQIH (1400109) : MPK : 2 SKS
PRASYARAT : -

Tujuan

Mempunyai pemahaman tentang fiqh secara global dan mampu memahami kontribusi sains dalam pembahasan fiqh kontemporer.

Materi Kuliah

Pengertian Fiqh, Obyek, Ruang Lingkup Kajian, dan Kegunaan Fiqh; Sejarah Pembentukan dan Perkembangan Fiqh; Komposisi Fiqh: Dalil (Argumen), Istidlal (Argumentasi), Natijah Hukum; Pembidangan Fiqh: al-Ibadat, al-Ahwal al-Syakhshiyyah, al-Mu'amalat al-Madaniyyah, al-Maliyyah wa al-Iqtishadiyyah, al-'Uqubat, al-Murafa'at, al-Dusturiyyah, al-Dawliyyah; Metode Kajian Fiqh: Kajian Diskriptif Fiqh Madzhab Tertentu Kajian Diskriptif Fiqh Berbagai Madzhab, Kajian Analitis Fiqh Madzab Tertentu, Kajian Analitis Fiqh Berbagai Madzhab; Kajian Perbandingan Madzhab-madzhab Fiqh, Kajian Verifikatif Masalah-masalah Fiqh Kontemporer seperti :Inseminasi dan in vitro vertilasi (kawin dan bayi tabung); Donor dan pencangkokan anggota/organ tubuh kepada orang yang memerlukan; Bedah mayat untuk penelitian: Perubahan kelamin, Homo seksual dan lesbian. Kloning dalam berbagai perspektif, Batasan kehalalan makanan, minuman, obat dan kosmetika menurut kadar kimia, mikrobiologi dan sifat fisik; Madzhab-madzhab Fiqh: Madzhab Sunniy dan Madzhab Syi'iy; Dalil-dalil Fiqh: Dalil-dalil yang Disepakati, dan Dalil-dalil yang Diperselisihkan; Pengetahuan-pengetahuan yang Diperlukan untuk Menentukan; Hukum Fiqh: Bahasa Arab, Ulum al-Quran, Ayat al-Ahkam Ulum al-Hadits, Ahadits al-Ahkam, Ushul al-Fiqh, al-Qawa'id al-Fiqhiyyah,Sains

Pustaka

Hasan Ahmad Khathib: *al-Fiqh al-uqaran*; Fathiy al-Darainiy: *al-Fiqh al-Islamiy; al-Muqaran Ma'a al-Madzahib*; Muhammad Abu Zahrah: *Tarikh al-Madzahib al-Islamiyyah*; Wahbah Zuhailiy: *al-Fiqh al-Islamiy wa Adillatuh*; Noel.J. Coulson: *A History of Islamic Law*; Hasbi ash-Shiddieqy: *Pengantar Hukum Islam*; Dr. Yusuf Musa : Al madkhal li dirasati al fiqhi al Islamy; Mustafa A. Zarqa' : Al fiqh al Islamy fitsaubihi al jadid; Mahmud syalthout : al fatawa; Muhammad Abduh : Tafsir al manar; Masfuk Zuhdi, *Masail Fiqhiyah*, Yusuf al-Qardawi, Fatawa Mu'ashira' Muhammad Atha' Mudzar, *Fatwa-fatwa Majelis Ulama Indonesia*; Ibnu Taimiyah, *Majmu' Fatawa.*

MATA KULIAH : TEOSOFI (1400110) : MPK : 2 SKS
PRASYARAT : -

Tujuan

Memperluas cakrawala berfikir mahasiswa agar terhindar dari fanatisme aliran. Memperkenalkan, menjelaskan dan membandingkan konsep-konsep aliran Kalam. Memahami, menghayati dan mengamalkan berbagai nilai aqidah Islamiyah dalam berbagai aspek kehidupan. Memahami kontribusi pemahaman sains dalam aqidah. Selain itu menjelaskan konsep-konsep dasar dalam akhlaq dan tasawuf; Memahami hubungan antara akhlaq dan tasawuf; Memahami berbagai pemikiran tasawuf dan tokoh-tokohnya; Menerapkan akhlaq dan tasawuf dalam berbagai aspek kehidupan.

Materi Kuliah

Pendahuluan: pengertian Ilmu Kalam. Latar belakang timbulnya Ilmu Kalam. Aliran-aliran dalam Ilmu Kalam: Jabbariyah. Qadariyah. Mu'tazilah. Asy'ariyah. Maturidiyah; Perbandingan konsep pemikiran dalam Ilmu Kalam; Pemikiran Kalam ulama' modern; Aqidah Islamiyah: Pengertian dasar tentang iman, kufur dan nifaq; Manifestasi aqidah Islamiyah dalam berbagai aspek kehidupan: Kebudayaan. Ekonomi. Politik. Akhlaq: Pengertian epistemologi dan terminologi: Kriteria penilaian baik dan buruk : Konsep aliran dalam ilmu akhlaq: Pendorong terjadinya perbuatan; Kesadaran berbuat; Tasawuf: Pengertian, sumber-sumber tasawuf, hubungan tasawuf dan akhlaq; Pembagian tasawuf,tokoh-tokoh dan pemikirannya; Maqomat dan Ahwal. Berbagai macam aliran Thoriqot di Indonesia; Penerapan Tasawuf dalam berbagai aspek kehidupan.

Pustaka

Harun Nasution, Mitisisme dalam Islam. Ahmad Muhammad Subhi, Al Falsafah Al 'Aqliyah fi Al Fikri Al Islami. Ibnu Maskawih, Tahdzib Al Akhlaq. Mansur Ali Rojab, Ta'ammulat fi al Falsafah al

Ahkhlaq. Ir. Poedjowidjatno, Etika, Filsafat Tingkah laku. Murtadlo Muthohari, Filsafat Akhlaq. Al Ghozali, Ihya' 'Ulumuddin juz: 3, 4. Al Qusyairi, Al Risalah al Qusyairiyah. Ibnu 'Athoillah, Al Hikam. Ibnu 'Arobi, Fushushu al Hikam. Al KaPracticumadzi, At Ta'arruf.

Harun Nasution, Theologi Islam, Aliran-aliran, Sejarah, Anlisis perbandingan; Harun Nasution, Akal, Wahyu dala Islam; Harun Masution, Islam ditinjau dari berbagai aspek, jilid II; Sulaiman Al Aqrosy, 'Aqidah fillah; Al Imam Asy'ari, Al Ibanah 'an Ushuli Al Diyanah; Al Baghdadi, Al Farqu Baina Al Firoq; Al Asy'ari, Al Madkhol fi 'Ilmi Al Kalam; Al Syahrostani, Al Milal Wa Al Nihal.

MATA KULIAH   : SEJARAH PERADABAN ISLAM (11400111) : MPK : 2 SKS
PRASYARAT   : -
Tujuan
Mengetahui dan memahami sejarah dan peradaban Islam pereode klasik: Masa Nabi, Khulafaurrosyidin, Umayyah (Timur dan Barat),Abbasiyah, dinasti-dinasti kecil pada masa Abbasiyah dan periode tengah serta negara bangsa periode modern. Lebih khusus, mahasiswa dapat memahami sejarah perkembangan sains dalam peradaban Islam dan kontribusi Islam pada perkembangan sains modern.
Materi Kuliah
Pengantar: Sejarah peradaban Islam sebagai ilmu pengetahuan. Dasar-dasar peradaban Islam. Pereodesasi perkembangan peradaban Islam; Arab Pra Islam: Sistem politik dan kemasyaraktan. Sistem kepercayan dan kebudataan; Masa Nabi: Fase Makkah: Sistem Da'wah. Fase Madinah: Pembentukan sistem sosial , kemasyarakatan, politik, militer, da'wah, ekonomi dan sumber keuangan negara; Masa Khulafa Al Rosyidun: Fsaqifah Bani Sa'idah. Sistem politik, Pemerintahan dan Bentuk negara. Sistem Penggantian Keepala Negara. Kholifah, Amir Al Mu'minin dan Imam. Masa Abu Bakar Al Shiddiq dan Umar bin Al Khoththob. Fase Usman bin Affan dan Ali bin Abi Tholib; Masa Umayyah Timur: Kebijakan dan orientasi politik. Keduukan Amir Al Mu'minin. Tali ikatan persatuan masyarakat (politik dan ekonomi). Sistem sosial (Arab dan Mawali). Sistem militer. Sistem Fiskal. Interregnum Umar bin Abd Al Aziz. Pembangunan peradaban. Sistem peradilan. Perkembangan intelektual, bahasa dan sastra Arab. Sistem penggantian kepala negara (monarchi). Pemberontakan: Al Mukhtar ibnu nUbaid dan Abdullah ibn Zubair. Keruntuhan Umayyah Timur. Islam di Andalusia. Perkembangan politik. Gerakan pembebasan. Masa keamiran. Masa kekholifahan: Perkembangan peradaban. Perkembangan intelektual, sains dan tehnologi, astronomi, Masa Abbasiyah; Dinasti-dinasti kecil pada zaman Abbasiyah. Tiga kerajaan besar pada zaman pertengahan: Dinasti Umayyah, Syafawiyah, dan Maghol (di India). Perang Salib dan Invasi Mongol. Islam di Asia Tenggara (Indonesia).
Pustaka
▪ Hasan Ibrahim Hasan, *Sejarah dan Kebudayaan Islam*, Yogyakarta: Penerbit Kora Kembang, 1989.
▪ Badri Yatim, *Sejarah peradaban Islam*, Jakarta: Rajawali Press, 1996.
▪ SaPracticumy, *Sejarah Kebudayaan Islam*. Hamka, *Sejarah Umat Islam*, Jilid I, II, dan IV, Jakarta: Bulan Bintang, 1981.
▪ Ahmad Amin, Fajr Al Islam, Kairo: Maktabah Al Nahdhol al Mishriyah.

MATA KULIAH   : MAHARAT AL-KITABAH I (1400113) : MPK : 1 SKS
PRASYARAT   : -
Tujuan
Mampu menulis kata-kata dan kalimat bahasa arab dengan baik dan benar, menyusun kalimat mengikuti pola tertentu, memperluas kalimat, menyusun alenia, dan membuat ringkasan.
Materi Kuliah
Kumpulan kosa kata pilihan, Kumpulan kalimat dan ungkapan pilihan, Beberapa teks bacaan pilihan, Menyusun alenia, Membuat ringkasan
Pustaka
Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah

MATA KULIAH   : MAHARAT AL-KITABAH II (1400117) : MPK : 1 SKS
PRASYARAT   : MAHARAT AL-KITABAH I
Tujuan

Mampu mengungkapkan gagasannya secara tertulis dalam bahasa Arab yang benar, karangan pokok-pokok pikiran tentang suatu topik, membuat karangan

Materi Kuliah

Pengungkapan tertulis bebas (*ta'bir tahriry hurr*), Membuat karangan dengan bantuan kunci-kunci pertanyaan, Menyusun pokok-pokok pikiran, Menyusun karangan terbimbing, Menyusun karangan bebas

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah

MATA KULIAH   : MAHARAT AL-QIRA`AH I (1400115) : MPK : 2 SKS
PRASYARAT   : -

Tujuan

Mampu membaca tulisan dan bacaan arab berharakat dengan mudah dan benar; Mahasiswa mampu memahami pokok pikiran secara global; Mengenal beberapa istilah keagamaan dalam bahasa arab; Membaca teks arab berharakat terbatas ; Memahami isi bacaan secara global.

Materi Kuliah

Kumpulan teks dialog pilihan; Kumpulan teks cerita sederhana pilihan; Kumpulan cerita keagamaan pilihan; Kumpulan artikel keagamaan pilihan

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah

MATA KULIAH   : MAHARAT AL-QIRA`AH II (1400119) : MPK : 2 SKS
PRASYARAT   : MAHARAT AL-QIRA`AH I

Tujuan

Mampu membaca teks arab tanpa harakat secara benar, menganalisis teks secara gramatikal, memahami isi bacaan secara terperinci, mencari data, pemikiran, dan gagasan dari kitab-kitab *turats* dan kitab-kitab *Mu'ashirah* tanpa ada kendala gramatika, membaca teks-teks arab secara kritis dan analitis

Materi Kuliah

Kumpulan teks-teks keagamaan klasik pilihan; Kumpulan teks-teks keagamaan; kontemporer pilihan; Kumpulan bacaan pilihan dari kitab-kitab *Turats*; Kumpulan bacaan pilihan dari kitab-kitab *Mu'ashirah*

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah

MATA KULIAH   : MAHARAT AL-KALAM I (1400114) : MPK : 2 SKS
PRASYARAT   : -

Tujuan

Memiliki kemampuan dasar berbicara dalam bahasa arab sehari-hari dengan mudah dan benar; Memahami isi percakapan dasar bahasa arab; Mahasiswa mengenal gramatika dasar bahasa arab secara fungsional; Merespon pesan/perintah yang di dengar dengan benar; Melakukan percakapan umum sehari-hari dalam berbagai kesempatan; Memberikan komentar sederhana dengan menggunakan bahasa arab

Materi Kuliah

Ungkapan-ungkapan salam, penghormatan dan basa basi pergaulan; Percakapan dasar dengan menggunakan pola-pola tertentu; Ta'bir safawi (ungkapan lisan) terbimbing; Percakapan di beberapa tempat umum seperti: di kelas, di kampus, di masjid, dan lain-lain Serial cerita bergambar; Statemen-statemen tentang suatu fenomena sosial keagamaan

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah; Majalah dan koran berbahasa Arab

MATA KULIAH   : MAHARAT AL-KALAM II (1400118) : MPK : 2 SKS
PRASYARAT   : MAHARAT AL-KALAM I

Tujuan

Mampu melakukan dialog bebas; Menangkap makna test yang di dengar secara rinci; Mengemukakan ide, gagasan, dan pemikiran, dengan baik dan benar; Mendiskusikan artikel-artikel keagamaan dengan bahasa arab; Menjelaskan gagasan-gagasan yang ada pada artikel dan buku dengan menggunakan bahasa arab yang benar.

Materi Kuliah

Kumpulan teks temu wicara; Kumpulan teks dialog dan diskusi; Kumpulan artikel-artikel keagamaan pilihan; Buku-buku keagamaan pilihan

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah; Majalah dan koran berbahasa Arab

MATA KULIAH : MAHARAT AL-ISTIMA`I (1400112) : MPK : 1 SKS
PRASYARAT : -

Tujuan

Memahami isi percakapan dasar bahasa arab dan mengenal gramatika dasar bahasa arab secara fungsional

Materi Kuliah

Ungkapan-ungkapan salam, penghormatan, dan basa basi pergaulan; Percakapan dasar dengan menggunakan pola-pola tertentu; Percakapan di beberapa tempat umum seperti: di kelas, di kampus di masjid, di lapangan dan lain-lain; Serial cerita; Statemen-statemen tentang suatu fenomena sosial keagamaan

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah; Majalah dan koran berbahasa Arab

MATA KULIAH : MAHARAT AL-ISTIMA`II (1400118) : MPK : 1 SKS
PRASYARAT : MAHARAT AL-ISTIMA`I

Tujuan

Menangkap makna teks yang didengar secara rinci dan menangkap pidato-pidato yang disampaikan oleh shohibul lughoh.

Materi Kuliah

Rekaman-rekaman kaset temu wicara dan cerita-cerita pendek; Rekaman video tentang dialog dan diskusi; Drama dan film yang disiarkan stasiun TV Timur Tengah

Pustaka

Al Arabiyah Lin Nasyi'in; Al Mawad Al Mukhtarah; Majalah dan koran berbahasa Arab

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