

List of Courses Bachelor of Informatics

Course Objectives:

Preparing graduates with knowledge, skills and competencies in the field of information technology, especially in information technology infrastructure and the application systems development.

Outcomes:

Graduates of this program will have competencies for corporate solutions or working independently based on computer science and information technology.

No	1 st Semester	Credits
1	Basic Computer Security	3
2	Database System	3
3	Statistics and Probability	3
4	Algorithm and Programming (Lab)	3
5	Calculus	3
6	English I	3
7	Religion	2
<i>Total</i>		<i>20</i>

No	2 nd Semester	Credits
1	Data Structure	3
2	Practical of Algorithm and Data Structure (Lab)	3
3	Linear Algebra	3
4	Database System Design	3
5	CCNA R&S 1	3
6	Computer Architecture and Organization	3
7	English II	3
<i>Total</i>		<i>21</i>

No	3 rd Semester	Credits
1	Indonesian Language	2
2	Software Engineering	3
3	Cryptography and Steganography	3
4	Operating System	3
5	Advanced Algorithm	3
6	Object Oriented Analysis	3
7	Web Programming(Lab)	3
8	Programming PL/SQL (Lab)	3
Total		23

No	4 th Semester	Credits
1	Entrepreneurship I	3
2	Object Oriented Programming (Lab)	3
3	Web Enterprise Programming (Lab)	3
4	Capita Selecta	3
5	Departments Compulsory Course*	9
Departments Compulsory Course Network Specialist		
	Practical of Networks Operating Systems (Lab)	3
	CCNA R&S 2 (Lab)	3
	CCNA R&S 3 (Lab)	3
Departments Compulsory Course Data Solution Specialist		
	Rapid Application System Development	3
	Introduction to Database Administrator (Lab)	3
	Data Warehouse OLAP	3
Total		21

No	5 th Semester	Credits
1	Entrepreneurship II	3
2	Neural Networks Artificial Intelligence	3
3	Introduction to Cloud Computing	3
4	Mobile Programming Android (Lab)	3
5	Departments Compulsory Course*	9
Departments Compulsory Course Network Specialist		
	CCNA R&S 4 (Lab)	3
	Server Configuration and Multi Server	3
	Computer Network Security(Lab)	3
Departments Compulsory Course Data Solution Specialist		
	Introduction to Disaster Recovery Plan (DRP) and Business Continuity Plan (BCP)	3
	Project Management	3
	Introduction to Data Mining	3

<i>Total</i>	<i>21</i>
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No	6 th Semester	Credits
1	Civics	2
2	Entrepreneurship III	3
3	Smart Web Programming (Lab)	3
4	Research Methodology for Information Technology	3
5	Multimedia System	3
6	IT Governance	3
7	Departments Compulsory Course*	3
	Departments Compulsory Course Network Specialist	
	Network Administrator Security System	3
	Departments Compulsory Course Data Solution Specialist	
	Advanced Data Mining	3
	<i>Total</i>	<i>20</i>

No	7 th Semester	Credits
1	Pancasila (Indonesia Philosophy)	2
2	Ethics of UMB	2
3	Internship	3
4	Departments Option Course*	6
	Departments Option Course Data Solution Specialist	
	Machine Learning	3
	Image Processing	3
	Departments Option Course Network Specialist	
	VOIP Network *	3
	Parallel and Distributed Computing	3
	Departments Option Course All Specialist	
	2D/3D Modelling*	3
	University Option Course	
	English III	3
	Faculty Option Course	
	Information Retrieval *	3
	Enterprise Resource Planning (Lab)	3
	<i>Total</i>	<i>13</i>

No	8 th Semester	Credits
1	Thesis	6
	Faculty Option Course*	
2	Mobile Programming IOS (Lab) *	3
	<i>Total</i>	<i>6/12</i>

<i>Total Credits</i>	<i>145</i>
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Course Description for The Bachelor of Computer Science

in

Informatics

Faculty of Computer Science

1 st SEMESTER	
Subjects	Competency
Basic Computer Security	Basic Computer Security Course provides materials related to the basic security that must be owned by a user for data and information to be safe. This course discuss about Operating System Security, Security System with Anti-Virus, Data Encryption, Backup and Disaster Recovery, Internet Security, Online Transaction, e-mail transaction, Social Media, and Mobile Device.
Database System	Able to develop the system by planning, analyzing, designing, implementing, testing, and maintaining the system to produce a relevant, accurate, and appropriate solution according to user needs. Having knowledge of tools, pre-processing, processing and post-processing of data by analyzing, modeling problems and implementing appropriate solutions related to intelligent system-based data processing to deliver an intelligent, adaptable, effective, secure and optimized intelligent system.
Statistic and Probability	Statistics and Probability subject is a compulsory course in Informatics Department on International Class Program with 3 credit. This course discusses the definition of statistics and statistics type, the centralizing dimension and the data spread, the opportunity of an event, the opportunity distribution, the random variables, the parameter estimation, and the hypothesis test, as well as the regression and correlation.
Algorithm and Programming (Lab)	Algorithm and Programming is a course that focuses on strategy in solving a problem and using algorithm in a programming language to describe problem solving. This course introduces the basic foundation of programming, data type, selection, iteration and function.
Calculus	Calculus subject is a compulsory course in Informatics Department on International Class Program with 3 credit. This course study of algorithms to perform calculus computing, especially number operations, on computers. This assessment is often the most fundamental part of engineering and computational matters, such as digital image processing and signal, functional computing, optimization, area, and many other domains. There are software that rely heavily on developing, analyzing, and implementing state-of-the-art algorithms to solve Calculus problems.
English I	<ul style="list-style-type: none"> • Students are able to communicate in English (orally and in writing) in common business contexts and comprehend business-related reading materials. • Students achieve a TOEIC score between 450-550.
Religion	Students can explain their religious concepts. and able to make it as a

	source of values and guidelines as well as a foundation of thinking and behaving in applying science and profession under their control and become "intellectual capital" that faithful and devoted to Allah, Islamic morals and personality.
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2 st SEMESTER	
Subjects	Competency
Data Structure	This course studies the data structures in constructing an algorithm and program.
Practical of Algorithm and Data Structure (Lab)	This course is a practicum course that uses C ++ programming language. This course discusses the data structure in arranging an algorithm and program.
Linear Algebra	Linear Algebra, Numerical linear algebra is an algorithm for assessment doing linear algebra computing, especially matrix operation, on the computer. This assessment is often the most fundamental part of engineering and computational matters, such as image and signal processing, financial computing, data mining, bioinformatics, and many other spheres. There are software that rely heavily on the development, analysis, and application of state of the art algorithms to solve linear algebra problems.
Database System Design	This course provides an understanding of the database and also the experience for students in building and managing the database. Consists of the basic concepts of database, Data Modelling, Normalization Techniques, Scheme and sub-scheme of database, etc.
CCNA R&S 1	In CCNA R & S 1 discusses the OSI Layer from first to seventh layer, in addition to this material, will be discussed the basics of subnetting.
Computer Architecture and Organization	<ul style="list-style-type: none"> • Students are able to communicate in English (orally and in writing) in common business contexts and comprehend business-related reading materials. • Students achieve a TOEIC score between 450-550.
English II	<ul style="list-style-type: none"> • Students are able to communicate in English (orally and in writing) in common business contexts and to comprehend business-related reading materials. • Students achieve 550 of TOEIC score.

3 st SEMESTER	
Subjects	Competency
Indonesian Language	<ul style="list-style-type: none"> • Able to speak Indonesian language orally was good and true. • Able to write scientific papers by meet the rules of the applicable scientific writing. • Able to comply with the norms of Indonesian language and the enhanced Spelling. • Able to increase the effective speed reading (KEM) so that an adequate level. • Able to understand the message and information exactly and not miscommunication who delivered by communicators. • Able to translate ideas, thoughts and opinions into the form of a

	<p>sentence that is effective and easy to understand.</p> <ul style="list-style-type: none"> • Able to writing the formal letter / cover letter effectively, completely and communicative. • Able to present papers in an interesting and effective. • Able to write citations, footnotes and references correctly.
Software Engineering	<p>Software Engineering Course is a course that teaches and applies various methodologies, techniques and workflows and kakas needed to transform the problem statement submitted by the customer into a software system ready to be used by the end user. This course integrates various knowledge about the process of making software in the previous semesters so that students have complete and complete knowledge about software engineering process.</p>
Cryptography and Steganography	<p>Criptography and Stegnography course is a course that mix math with advanced algorithm which will be used for information security that In form of image or text as well. This course discuss cryptography terminology and steganography as well. Core of this course is algorithm creation and programming application creation for cryptography and Stegnography. This course discuss in detail about symmetrical criptography and message insertion on an image as well.</p>
Operating System	<p>Provide Basic Knowledge of Operating System on computer, usability, parts types and function of operating system.</p>
Advanced Algorithm	<p>Student knowing and understanding concept of algorithm in selection, looping, sorting, and searching processes. From those algorithm student able to develop into application making.</p>
Object Oriented Analysis	<p>Analisis and Object-Oriented Design Course is a course that teaches the technique of analyzing and designing software system type information system, with object oriented approach and by using diagram / model of Unified Modeling Language (UML) which consists of Use Case Diagram, Use Case Description, Activity Diagram, Conceptual Class Diagram, Sequence Diagram and Class Diagram Software and integration of one of the object relational mapping (ORM) framework in various UML model, Hibernate framework.</p>
Web Programming(Lab)	<p>Web Programming 1 course is a course that teach introduction on HTML and Web Based language program, for client-side programming (JavaScript) and Server-Side Programming(PHP) as well.</p>
Programming PL/SQL	<p>Practical courses that teach relational database creation and practice the basics of query (SQL Fundamentals) in the database using Oracle.</p>

4st SEMESTER	
Subjects	Competency
Entrepreneurship I	<ul style="list-style-type: none"> • Able to create a business plan, determine of the business and get the experience of business management. • Able to control the business simple, knowing and applying the marketing management, human resource and financial management, have a view of the potential of entrepreneurship as an option for the future.
Object Oriented Programming (Lab)	<p>The Object-Oriented Programming Course is a course that teaches the Techniques of making desktop applications of different types of</p>

	information systems in the Java Programming Language and built applications can manipulate data in a database by integrating the Hibernate Framework and the use of MySQL Database Server for data storage. This course also teaches 2D graphics displaying techniques, 2D graphics animation and sound producing. Lectures are held in computer labs with the help of Eclipse / NetBeans software, Java Development Toolkit version 1.7, MySQL Database Server and Visual Paradigm Trial Edition.
Web Enterprise Programming (Lab)	In teaching and learning activities in this course discussed about making Web applications using Framework. Web application framework is a software framework designed to support dynamic web development, web applications and web services. Web-based programming framework is based on the concept of OOP (Object Oriented Programming).
Capita Selecta	Capita Selecta course contains a variety of materials about the latest technology and information systems, including about big data, start-up business, wireless networking and others.
Departments Compulsory Course*	
Departments Compulsory Course <i>Network Specialist</i>	
Practical of Networks Operating Systems (Lab)	This course is a practical course about the network operating system, which provides materials related to the installation and configuration of the Linux network operating system Ubuntu 14.04.
CCNA R&S 2 (Lab)	In CCNA R & S 2 it discusses the devices on layer 2 (Switch) and layer 3 (Router), in this material also given a view in configuring and understanding and also using a device and troubleshoot device.
CCNA R&S 3 (Lab)	The CCNA R & S 3 discusses the devices on layer 2 (Swich) and layer 3 (Router), and discusses dynamic routing protocols EIGRP and OSPF on a network.
Departments Compulsory Course <i>Data Solution Specialist</i>	
Rapid Application System Development	Concept that was born out of frustration with the waterfall software design approach which too often resulted in products that were out of date or inefficient by the time they were actually released.
Introduction to Database Administrator (Lab)	Database administration is a practical course that includes Installation, configuration and tuning a database, administering servers and server groups, managing and optimizing schema, tables, indexes, and views, creating logins, configuring permissions, assigning roles and performing other essential security tasks.
Data Warehouse OLAP	This course focuses on Data Warehouse (DW) & OLAP and its application for the following purposes: Business Intelligence & Strategic Decision Making. Learner topics include user req gathering, DW architecture, DW dimensional modeling design, DW database physical design, extraction strategy, transformation and loading for BI and DSS.

5st SEMESTER	
Subjects	Competency
Entrepreneurship II	<ul style="list-style-type: none"> • Able to create a business plan, determine of the business and get the experience of business management. • Able to control the business simple, knowing and applying the marketing management, human resource and financial management,

	have a view of the potential of entrepreneurship as an option for the future.
Neural Networks Artificial Intelligence	Learn about artificial neural networks and how they're being used for machine learning, as applied to speech and object recognition, image segmentation, modeling language and human motion, etc. We'll emphasize both the basic algorithms and the practical tricks needed to get them to work well.
Introduction to Cloud Computing	The rapid development of Cloud Computing offers the shared use of resources on computer networks, servers, storage, software, and applications. This technology provides a wide range of distributed and parallel services remotely and can run on multiple devices. Technological collaboration used from the information process is outsourced up to the external use of the data center.
Mobile Programming Android (Lab)	Understand the installation of the SDK and application settings Understand the parameters and characters used in Java Understanding the creation and use of objects and methods on Java.
Departments Compulsory Course*	
Departments Compulsory Course <i>Network Specialist</i>	
CCNA R&S 4 (Lab)	In CCNA R & S 4 is about the WAN both from point to point protocol (ppp) and security in the network with ACL, in addition to the current material has been updated namely added BGP module and BGP configuration, as well as security in vlan attack, DHCP attack and other network security so that students are provided with reality in the world of security and network today.
Server Configuration and Multi Server	To understand how to install in a multi-server environment, it is useful to understand the architecture and how to operate a multi-server environment.
Computer Network Security(Lab)	This Course provides an understanding about subject material as follows; Modern Network Security Threats, Securing Network Devices, Authentication, Authorization, and Accounting, Implementing Firewall Technologies , Implementing Intrusion Prevention, Securing the Local Area Network, Implementing Virtual Private Networks, Managing a Secure Network.
Departments Compulsory Course <i>Data Solution Specialist</i>	
Introduction to Disaster Recovery Plan (DRP) and Business Continuity Plan (BCP)	The business continuity planning (BCP) and disaster recovery planning (DRP) domain addresses the preparation, processes, and practices required to ensure the preservation of the business in the face of major disruptions to normal business operations. BCP and DRP involve the identification, selection, implementation, testing, and updating of processes and specific actions necessary to prudently protect critical business processes from the effects of major system and network disruptions and to ensure the timely restoration of business operations if significant disruptions occur.
Project Management	This course provides students with knowledge and skills about software project management: components, methodologies, tools, risks, and resources to keep in mind.
Introduction to Data Mining	Introduction to Data Mining Course contains of materials on data and data processing techniques to obtain patterns that can utilized to provide solutions in the dially problems.

6 st SEMESTER	
Subjects	Competency
Civics	Students are able to understand about the urgency of civic education in college, the state and the system of government in several countries and in Indonesia, the national identity, the meaning of democracy, develop democratic attitudes, rights and obligations of citizens, sensitive to the problems and implementation of the existing rule of environment's law, human rights, geography, population and environment in Indonesia, the concept of National Resilience in solving the problems that arise in society, understand the relationship between state and religion and its problems, recognize the model of regional autonomy and the principles of good governance.
Entrepreneurship III	Students are able to manage the well business in the field of science, make bankable financial statements, provide added value to the product and increase the amount of revenue significantly.
Smart Web Programming (Lab)	Smart Web is course that teach about how the introduction to smart web technolog using semantic web, ontology, and tools.
Research Methodology for Information Technology	Research Methodology discuss about how research will be conduct.
Multimedia System	The main purpose of this course is to equip with various capabilities in building multimedia system through understanding the concept of sub-system of preparation. Lectures will begin with the provision of knowledge about the basics of Multimedia, such as definitions, types of multimedia, applications, including the initial description of the material to be provided during the lecture. Furthermore, students will be provided with knowledge of the general description of the production process of multimedia content, including the types of resources required, whether software, hardware. students are introduced to the types of multimedia data compression and its formats, whether for text, sound, audio / music, static images and moving images using applications that are commonly used in the industrial world.
IT Governance	IT Governance course provide knowledge and ability to students about IT Governance and other knowledge related. The subjects are as follows: Basic Concept of IT G, Components of IT G, IT G Framework and also case study, implementation and assesment IT G in the organization.
Departments Compulsory Course*	
Departments Compulsory Course <i>Network Specialist</i>	
Network Administrator Security System	This course evaluate network security in defensif modes so student have the abality in network administration security system.
Departments Compulsory Course <i>Data Solution Specialist</i>	
Advanced Data Mining	Advance Data Mining contains material to applied and develop data mining technique in order to make solutions about problems that exist in day-to-day life.

7 st SEMESTER	
Subjects	Competency
Pancasila (Indonesia)	Students are able to analyze problems in the life of society, nation and

Philosophy)	state through intellectual responsibility by preserving the values of Pancasila in the reality of life.
Ethics of UMB	<ul style="list-style-type: none"> • Being able to dig in and maximize potential • Being able to identify the characters and personalities that are tough and are able to apply them in order to become a human resources professional.
Internship	This Job Training subject requires students to undertake apprenticeships in companies / industries in which the work areas are done is related to the field of IT work as the implementation of lecture material that has been studied and train ability communicate and coordinate in field work.
Departments Option Course*	
Departments Option Course <i>Data Solution Specialist</i>	
Machine Learning	This introductory course gives an overview of many concepts, techniques, and algorithms in machine learning, beginning with topics such as classification and linear regression and ending up with more recent topics such as boosting, support vector machines, hidden Markov models, and Bayesian networks.
Image Processing	This course of image processing discusses various concepts and techniques of image processing, tools used and implementation of image processing in the form of applications.
Departments Option Course <i>Network Specialist</i>	
VOIP Network *	Methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol (IP) networks, such as the Internet.
Parallel and Distributed Computing	A selection of topics from the following: the challenges faced in constructing parallel and distributed applications, including testing, debugging and performance evaluation. Various implementation techniques, paradigms, architectures and programming languages including: Flynn's taxonomy, MPI, MapReduce, OpenMP, GPGPU, concurrency and multi-threading.
Departments Option Course <i>All Specialist</i>	
2D/3D Modelling*	After following this course, students are expected to understand and be able to explain the process of making a model that represents real world objects, both two-dimensional objects and three-dimensional objects. Students are also expected to implement their knowledge in a way to make the various object models using 2D/3D modeling assistive applications.
University Option Course	
English III	<ul style="list-style-type: none"> • Students are able to communicate in English (orally and in writing) in common business contexts and comprehend business-related reading materials. • Students achieve a TOEIC score between 450-550
Faculty Option Course	
Information Retrieval *	This course studies procedures and methods for rediscovering stored information from relevant sources or collection of sources of information sought or required. With the action of indexing, searching, recalling. Students will learn text data processing techniques to rediscover information on text-shaped data. Lecture courses cover preliminary processing, feature extraction, calculation of text similarity

	level according to query input, and display search results. Advanced discussion is the technique of relevance feedback, classification and clustering of text to help users in search. Students will design, analyze and apply methods of information retrieval systems on real issues either independently or teamwork.
Enterprise Resource Planning (Lab)	The lecturing courses on enterprise resources planning, ERP technology used in detail, development in the business world, ERP products on the world market and products used in the Indonesian market. Know the SAP product as one form of ERP, understand the modules used by the SAP system. Understand the relationship between the modules in SAP system.

8 st SEMESTER	
Subjects	Competency
Thesis	
Faculty Option Course*	
Mobile Programming IOS (Lab) *	In this course, we present Apple's approach to mobile app design and development, as reflected in the design of the iOS platform, the Model-View-Controller (MVC) paradigm and iOS's various high and low-level frameworks. Objective-C, the native programming language for iOS, is exposed and explained step-by-step.