MODULE HANDBOOK

MASTER OF INFORMATION SYSTEMS PROGRAM

DEPARTMENT OF INFORMATION SYSTEMS

FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

sistem informasi
fakultas Teknologi Elektro & Informatika Cerdas

ITS Institut Teknologi Sepuluh Nopember

MODULE Handbook

MASTER of INFORMATION SYSTEMS

2018 - 2021

Department of Information Systems
Faculty of Intelligent Electrical & Informatics Technology
Institut Teknologi Sepuluh Nopember

Table of Contents

2018 Curriculum

Course Structure

Master (S2) of Information Systems Program

No	Subject name	Credit(s)
Semester 1		
1	Information Systems and Technology Infrastructure	3
2	Systems Development and Implementation	3
3	Information Systems Management and Operation	3
4	Data and Information Management	3
	Total Credits	*12*
Semester 2		
1	Research Method	2
2	Information Systems Strategic Management	3
3	*Elective course 1*	3
	Total Credits	*8*
Semester 3		
1	*Elective course 2*	3
2	*Elective course 3*	3
3	Seminar / Thesis Proposal	2
	Total Credits	*8*
Semester 4		
1	Thesis	8
	Total Credits	*8*
	Total Credits to Graduate	*36*

Elective Courses

No	Affiliated Laboratory	Name of Elective Course
1	Management of Information Systems	Topics in the e-Government and Smart City Management
2		Topic in Information Systems Audit and Governance
3		Topics in Information Systems and Technology Investment and Productivity
4	Data Acquisition and Information Dissemination	Topics in Database Technology
5		Topics in Data Integration
6		Topics in Semantic Web
7	Data Engineering and Business Intelligence	Topics in Data Mining and Business Analytics
8		Topics in Optimization and Management Science
9		Topics in Decision Support Systems
10	Enterprise System	Topics in Modelling and Simulation Systems
11		Topics in System Dynamics and Its Application in Various Fields
12		Topics in Enterprise Systems
13	Information Technology and System Infrastructure	Topics in Information Technology Architecture for Corporate
14		Topics in System and Network Security
15		Topics in Embedded System Development

IS185101 - Information Systems and Technology Infrastructure

Module Name	**Information Systems and Technology Infrastructure**
Module level	Master Program
Code	IS185101
Semester	1
Contact Person	Dr.Eng. Febriliyan Samopa, S.Kom., M.Kom.
Lecturer	Dr.Eng. Febriliyan Samopa, S.Kom., M.Kom.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 1st semester
Type of teaching, contact hours	Lectures, up to 40 students Practical, up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Identify the most appropriate data and alternative information technology management options based on the organization's information needs. • Able to describe various organizational activities in using information technology to improve the way business activities are structured and carried out. • Designing an integrated communications network, specifying requirements for large-scale network solutions, designing implementation architectures for system solutions and data processing organizations with internal or external resources.
Content	The course objectives are to teach concepts and methods in computer networks, how to manage system complexity of computer networks, and implementation of computer networks as solutions development in information technology infrastructure that is appropriate, environmentally friendly, and socially aligned with the organization's strategy and responsibilities and meets the legal and regulatory requirements and industry standards.
Study and examination requirements and forms of examination	1 Computer Network Principles (Non SCL) 2 Computer Network Principles (Non SCL) 3 Computer Network Principles (Non SCL) 4 Computer Network Principles (Case method) 5 LAN Technology (Non SCL) 6 LAN Technology (Non SCL) 7 LAN Technology (Other SCL method) 8 Middle Term Evaluation (Non SCL) 9 LAN Technology (Other SCL method) 10 WAN & MAN Technology (Non SCL)

	11 WAN & MAN Technology (Non SCL) 12 WAN & MAN Technology (Non SCL) 13 WAN & MAN Technology (Other SCL method) 14 Computer Network Management (Non SCL) 15 Computer Network Management (Non SCL) 16 Final Term Evaluation (Non SCL)
Media employed	MyITS classroom
Reading list	1. Turban, E. & Volonino, L. (2011). Information technology for management. Improving strategic and operational performance. Hoboken, NJ. Wiley Publishing. ISBN: 978-0470-91680-3 2. Henry C. Lucas, Jr., Information Technology for Management, 2009

IS185102 - Systems Development and Implementation

Module Name	**Systems Development and Implementation**
Module level	Master Program
Code	IS185102
Semester	1
Contact Person	Dr. Ir. Aris Tjahyanto, M.Kom.
Lecturer	Dr. Ir. Aris Tjahyanto, M.Kom.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 1st semester
Type of teaching, contact hours	Lectures, up to 40 students Practical, up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Identify, create and manage organizational policies and processes related to data and information management by balancing multidimensional needs such as legal and regulatory requirements, ethical considerations and implications of technology needs, business needs of organizations, data quality and needs to operate in an international environment • Apply an environmentally and socially friendly approach to solution development, purchasing, operations, resource management and other Information Technology practices; ensure safety and avoid health hazards for contract management with outside parties; ensure privacy and integrity guide all IT practices; interpret and comply with legislative requirements. • Identify and evaluate new IS methods and trends, develop innovative domain activity models, make plans to exploit new methods and technologies and new ways to structure and perform organizational activities and estimate the benefits, adverse consequences of implementation. • Integrate iterative stages which include analysis, design, implementation, and operation, develop and implement IT applications that meet user needs • Able to explain theoretical concepts and methods for designing, implementing and implementing systems for use by the organization • Analyze organizational needs and determine how these needs can be addressed with data, information and content management solutions and manage data and information management technologies
Content	Although the software industry has sufficient experience, many of those are still trying to improve the understanding, documentation, and

	management needs of their product. User inaccuracy in defining input, incomplete definition of software requirements, changes in software requirements, and misunderstandings in understanding business needs are the main reasons why many once a less successful software project. System development & implementation courses will provide experience for students to understand best practice methods and methods in define and document software requirements, generate designs from existing requirements, implement and manage system releases indirectly. Students are expected to be able to make documentation of software requirements according to existing software project problems, following best practice guidelines in the process, and implement them. For this reason, the learning method used is by delivering projects in groups to understand business needs and realize the correct software requirements according to these best practices. Students can produce software requirements and design documentation and device release management software that can later be used to understand the technique and be able to compete in the world of work and can be better prepared to solve real problems in the world of work.
Study and examination requirements and forms of examination	1 User identification and needs (Case method) 2 Visual requirements (Team-based project) 3 Use-Case Diagram (Case method) 4 Data Flow Diagram (Case method) 5 Risk management in software project (Case method) 6 Process modeling and improvement (Team-based project) 7 Data Model (Case method) 8 Use-case Realization (Case method) 9 Class Diagram (Case method) 10 From Design to Code (Case method) 11 Software Prototyping (Case method) 12 Business Rules & Integrity Constraint (Case method) 13 User Interface (Case method) 14 Implementation & Maintenance (Case method) 15 Integrasi & Testing (Case method) 16 Final Project (Team-based project)
Media employed	MyITS classroom
Reading list	1. Karl Wiegers, Software Requirements, Microsoft Press; 3 edition, 2013 2. Rambaugh, J., M. Blaha, W,. et al, Object Oriented Modeling and Design, Prentice-Hall, 1991. (chapters 3 & 4) 3. Christine B. Tayntor, Successful Packaged Software Implementation, Auerback Publications

IS185103 - Informations Systems Management and Operations

Module Name	**Information Systems Management and Operations**
Module level	Master Program
Code	IS185103
Semester	1
Contact Person	Tony Dwi Susanto, S.T., M.T., Ph.D. (ITIL, COBIT, TOGAF)
Lecturer	Tony Dwi Susanto, S.T., M.T., Ph.D. (ITIL, COBIT, TOGAF)
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 1st semester
Type of teaching, contact hours	1. Lectures, up to 40 students, 7 weeks lectures. 2. Project, up to 40 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students are able to explain concepts and practices in IT Service Management and implement them on variety cases. • Students are able to make IT Project Plan and use IT Project management Tools
Content	Information System Management and Operations course includes competencies that enable students to have the ability to manage the process of developing and operating information system and services from the planning stage to continuous improvement.
Study and examination requirements and forms of examination	• In-class exercises • Assignment 1 and 2 • Mid-term and final examination • Group project
Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com)
Reading list	1. ITIL Foundation – ITIL 4 Edition, Axelos, 2019. 2. Tony Dwi Susanto, Sukses Mengelola Layanan Teknologi Informasi & Kiat Lulus Ujian Sertifikasi ITIL Foundation, AISINDO, 2017 3. Jan Van Bon et.al., Foundation of IT Service Management based on ITIL V3, Van Haren Publishing,2007 4. Robb A, Effective IT Service Management, Springer Verlag, 2007 5. ITIL For Dummies, Peter Farenden, 2012 6. Kathy Schwalbe, Information Technology Project Management, Cengage Learning, 2016. 7. The Project Management Body of Knowledge (PMBOK), PMP, 2017. 8. The ITIL 2011 Series Books, the Office of Government Commerce (OGC).

IS185104 - Data and Information Management

Module Name	**Data and Information Management**
Module level	Master Program
Code	IS185104
Semester	1
Contact Person	Prof. Ir. Arif Djunaidy, M.Sc., Ph.D.
Lecturer	Prof. Ir. Arif Djunaidy, M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 1st semester
Type of teaching, contact hours	Lectures, up to 40 students Practical, up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Able to describe theoretical concepts and methods of managing structured and unstructured data as well as in-depth information in processes that can improve the organization's ability to achieve its goals. • Analyze organizational needs and determine how these needs can be addressed with data, information and content management solutions and manage data and information management technologies. • Identify, create and manage organizational policies and processes related to data and information management by balancing multidimensional needs such as legal and regulatory requirements, ethical considerations and implications of technology needs, business needs of organizations, data quality and needs to operate in an international environment.
Content	This course provides knowledge and understanding of the main techniques and methodologies for database analysis and design and how these techniques and methodologies can be used practically in conceptual, logical, and physical design of database applications, data warehousing & multidimensional analysis. , and big data & analytics.
Study and examination requirements and forms of examination	1 Explanation of Learning Plans and Introduction to Database Management Systems Sistem (Non SCL) 2 Information Systems Planning and Database Design Process (Non SCL) 3 Fact Finding Techniques (Non SCL)

	4 Conceptual Database Design using Entity Relationship (ER) and Enhanced Entity Relationship (EER) Model (Non SCL) 5 Conceptual Database Design using Entity Relationship (ER) Enhanced Entity Relationship (EER) Model (Continued) (Non SCL) 6 Conceptual Database Design using Entity Relationship (ER) and Enhanced Entity Relationship (EER) Model (Continued) (Non SCL) 7 Relational Data Model (Non SCL) 8 Logical Database Design through Mapping ER and EER Model sinto Relational Database (Non SCL) 9 Mid-semester Evaluation (Non SCL) 10 Logical Design Improvements using Functional Dependencies and Data Normalization (Non SCL) 11 Logical Design Improvements using Functional Dependencies and Data Normalization (Continued) (Non SCL) 12 Physical Database Design: Data Storage File Organization and Access Methods (Non SCL) 13 Physical Database Design: Design Improvements through Tuning, Indexing, Database Design and Queries (Non SCL) 14 Introduction to Data Warehouse (Non SCL) 15 Introduction to Big Data (Non SCL) 16 Final Semester Evaluation (Non SCL)
Media employed	MyITS classroom
Reading list	1 Elmasri, Ramez, and Shamkant B. Navathe. Fundamentals of database systems. 7th Edition. Pearson, 2016. 2 Ramakrishnan, R. and Gehrke, J., 2000. Database management systems. McGraw Hill.

IS185201 - Research Method

Module Name	**Research Method**
Module level	Master Program
Code	IS185201
Semester	2
Contact Person	Tony Dwi Susanto
Lecturer	Tony Dwi Susanto
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 2nd semester
Type of teaching, contact hours	Lectures, up to 40 students Practical, up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students are able to describe and apply appropriate types of information systems research methods, whether quantitative, qualitative, action research, modeling, or other statistical techniques in research on the diffusion, development, and use of information technology as well as the application of information and management. • Students are able to apply the right methods in accordance with the research topic in the form of research proposal, thesis, and scientific publication.
Content	This course provides guideline for students to conduct research using relevant research methods in information systems. Students will learn principles in quantitative and qualitative research to gain deeper understanding on: reviewing the literature, observing phenomena, extracting and processing data, formulating results, as well as how to contribute in developing science and knowledge. One of the main goal of this course is to ensure students can write thesis proposal and conduct scientific research.
Study and examination requirements and forms of examination	• In-class exercises • Quiz • Assignment • Mid-term examination • Final examination
Media employed	LCD, whiteboard, websites (MyITS classroom, google scholar, scopus.com).
Reading list	1. Bernard, Russell H. Social Research Methods: Qualitative and Quantitative Approaches. 2. John Lofland and Lyn Lofland, Analyzing Social Settings: A Guide to Qualitative Observation and Analysis, 4th edition

	3. John W. Creswell, Qualitative Inquiry & Research Design, Choosing Among Five Approaches, Sage Publication 4. Scientific articles related to research method

IS185202 - Information Systems Strategic Management

Module Name	**Information Systems Strategic Management**
Module level	Master Program
Code	IS185202
Semester	2
Contact Person	Dr. Mudjahidin, S.T., M.T.
Lecturer	Dr. Mudjahidin, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 2nd semester
Type of teaching, contact hours	Lectures, up to 40 students Practical, up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Explain the concept of IT solution development • Analyzing the complexity of information systems and technology • Align information systems and technology with the organization's business strategy
Content	Information Systems Strategic Management includes competencies that enable graduates to have the ability to formulate Information System strategic policies that support the organization's business strategy, through the use of analytical tools and techniques for developing Information Systems (IS) strategic plans.
Study and examination requirements and forms of examination	1 Introduction of MSSI topic (Non SCL) 2 Presentation and discussion of MSSI theory/concept (Other SCL method) 3 Presentation and discussion of MSSI theory/concept (Other SCL method) 4 Presentation and discussion of MSSI theories and concepts. MSSI video creation for Social Media (Other SCL method) 5 Presentation and discussion of MSSI theory/concept; Presentation of recent issues from MSSI articles (Other SCL method) 6 Presentation and discussion of MSSI theory/concept. Presentation of recent issues from MSSI articles (Other SCL method) 7 Presentation and discussion of MSSI theory/concept. Presentation of recent issues from MSSI articles (Other SCL method) 8 Presentation and discussion of MSSI theory/concept. Develop MSSI documents on Organization/Company case (Other SCL method)

	9 Presentation and discussion of MSSI theory/concept. Develop MSSI documents on Organization/Company case (Other SCL method) 10 Writing research proposals related to MSSI; Writing article related to MSSI documents (Case method) 11 Writing research proposals related to MSSI; Writing article related to MSSI documents (Case method) 12 Development project of MSSI process model on Organization/Company (Team-based project) 13 Development project of MSSI process model on Organization/Company (Team-based project) 14 Writing article related to MSSI process model; Submission of intellectual property rights related to the MSSI process model (Team-based project) 15 Writing article related to MSSI process model; Submission of intellectual property rights related to the MSSI process model (Team-based project) 16 Resume and feedback of MSSI learning oprocess (Non SCL)
Media employed	MyITS classroom
Reading list	1. John Ward, Strategic Planning for Information Systems, John-Wiley, 2002 2. Anita Cassidy, A Practical Guide to Information Systems Strategic Planning, Second Edition 2nd Edition, 2006. 3. Clive Finkelstein, An Introduction to Information Engineering: From Strategic Planning to Information Systems, 2014. 4. Joe Peppard and John Ward, The Strategic Management of Information Systems: Building a Digital Strategy, 2016.

IS185301 - Seminar/Thesis Proposal

Module Name	**Seminar/Thesis Proposal**
Module level	Master Program
Code	IS185301
Semester	3
Contact Person	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Lecturer	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 3rd semester
Type of teaching, contact hours	The study assignment (literature review and write proposal) and supervised research activity, 1 semester, 2 SKS Seminars, 100 minutes
Workload	1. Supervised research activity: 170 minutes x 2 SKS per week 2. Writing report
Credit points	2 credit points (sks).
Requirements according to the examination regulations	A student must have presented his/her Thesis Proposal and submitted a revised version of the final Thesis Proposal
Mandatory prerequisites	A student minimum must be at the 2nd Semester
Module objectives/intended learning outcomes	• Students are able to identify the Novelty & Contribution for Knowledge & Practice of the research plan • Students are able to develop and to write State-of-the-Art of the Research plan • Students are able to define and formulate Research Method fit for the Research plan • Students are able to present the Research Proposal well
Content	In this course, students will study and implement an early stage in conducting a research and development, i. e. preparing research and development proposal. Students learn to do literature review, developstate-of-the-art of a research and development, identify knowledge gap, novelty, & contribution of the research and development, write a Thesis proposal and present it.
Study and examination requirements and forms of examination	• Observation from Supervisor • Thesis Proposal Seminar • Thesis Proposal Report
Media employed	LCD, whiteboard, websites (MyITS classroom, google scholar, scopus.com).
Reading list	Guidelines for Writing Thesis & Thesis Proposal, Master of Information Systems, ITS,

IS185401 - Thesis

Module Name	**Thesis**
Module level	Master Program
Code	IS185401
Semester	4
Contact Person	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Lecturer	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Language	Bahasa Indonesia
Relation to curriculum	Master Program, compulsory course, 4th semester
Type of teaching, contact hours	Supervised research activity, 1 semester, 8 SKS Seminars, 100 minutes
Workload	1. Supervised research activity: 170 minutes x 8 SKS per week 2. Writing report
Credit points	8 credit points (sks).
Requirements according to the examination regulations	A student must have presented his/her Thesis, submitted a revised version of the final Thesis report, and published an international publication
Mandatory prerequisites	A student must have passed the Thesis Proposal course.
Module objectives/intended learning outcomes	• Students are able to identify the Novelty & Contribution for Knowledge & Practice of the research or development plan, develop State-of-the-Artof the Thesis Research. • Students are able to implement a correct Research Method for his/her research. • Students are able to write a Thesis Report and present it well • Students are able to publish an international publication of his/her Thesis
Content	In this course, students will conduct a research and development. Students learn to do literature review, develop state-of-the-art of a research, identify knowledge gap, novelty, & contribution of the research and development, identify and implement correct research and development method, write a Thesis report and present it,and publish an international publication.
Study and examination requirements and forms of examination	• Observation from Supervisor • Thesis Seminar • Thesis Report • Publication
Media employed	LCD, whiteboard, websites (MyITS classroom, google scholar, scopus.com).
Reading list	Guidelines for Writing Thesis & Thesis Proposal, Master of Information Systems, ITS,

IS185901 - Topics in E-Government and Smart City Management

Module Name	**Topics in E-Government and Smart City Management**
Module level	Master Program
Code	IS185901
Semester	Elective course, 3rd semester
Contact Person	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Lecturer	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, 2nd or 3rd semester, Information System Management Laboratory
Type of teaching, contact hours	1. Lectures, up to 20 students, 7 weeks lectures. 2. Project, up to 20 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students are able to create e-Government and Smart City Masterplans • Students are able to conduct a literature review of e-Government and Smart City research and fine the knowledge gap as a potential thesis topic
Content	Management of e-Government and Smart City course includes competencies that enable students to have the ability to understand and manage the success factors (enablers) for the success of e-Government and Smart City, as well as discover research potentials on e-government and Smart City topics. Here are more details on the course contents: • Definition, Concept, Motivation, Purpose of e-Government & Smart City • Enterprise Architecture & e-Government & Smart City domains • Problems/Barriers of e-Government & Smart City • e-Government & Smart City Masterplan • Government Business Process & Government Resource Planning • City anatomy & City development process • Technological innovation for various dimensions of Smart City • Project Management & e-Government Change Management • Lessons learned: cases of success & failure of e-Government & Smart City in Indonesia and around the world • e-Government & Smart City Research: existing vs. Knowledge Gaps
Study and examination requirements and forms of examination	• In-class exercises • Quiz 1 and 2 • Assignment 1, 2, 3 • Mid-term and final examination • Group project

Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com)
Reading list	1. Anthony Alexander, Alisha Nguyen, Living in Smart Cities – Innovation & Sustainability, World Scientific Publishing Co., 2018. 2. Lazar Rusu & Guinluigi Viscusi, Information Technology Governance in Public Organizations: Theory and Practice, Springer, 2017. 3. Darrel M. West, Digital Government, Princeton University Press, 2005. 4. Arpan Kumar Kar and P. Vigneswara Ilavarasan, Digital Nations – Smart Cities, Innovation, & Sustainability, Springer, 2017.

IS185902 - Topics in Information Systems Audit and Governance

Module Name	**Topics in Information Systems Audit and Governance**
Module level	Master Program
Code	IS185902
Semester	Elective course
Contact Person	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Lecturer	Tony Dwi Susanto, S.T., M.T., Ph.D (ITIL, COBIT, TOGAF)
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Information System Management Laboratory
Type of teaching, contact hours	Lectures, up to 20 students Practical, up to 20 students, 100 minutes Seminars, up to 20 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks)
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to implement audit, business continuity and information systems assurance concepts and methods. • Graduates will be able to describe concepts and methods to manage the complexity of information systems and technologies and fitting these with the organization's strategy. • Graduates will be able to apply concepts and methods to develop, maintain, and consistently improve organization performance while providing appropriate information systems, services, and infrastructure. • Graduates will be able to implement concepts and methods to develop and implement long-term plans for designing, delivering, and using organizational information. • Graduates will be able to understand concept and methods systems implementation and the deployment of systems to organizational use. • Graduates will be able to develope policy and standard for business continuity, information assurance, planning and implementing risk management, trust, security and safety, as well as disaster recovery and information protection. • Graduates will be able to identify and apply a formal approach to EA development, performing the multistage process of developing an EA, identifying the EA change needs, and applying them to the EA. • Graduates will be able to identify and evaluate new IS methods and trends; develop innovative domain activity models; develop a plan to exploit new and emerging methods and technologies and new ways of structuring and performing organization activities as well as estimating the benefits, negative consequences of their implementation.

	• Graduates will be able to apply professional management skills to design and manage an effective IS, ensure operational efficiency and effectiveness in service delivery, govern IS project management principles and manage information systems use. • Graduates will be able to analyze the effect and impact of IS on industries, firms, and institutions; create and manage the oversight mechanisms by which an organization evaluates, directs, and monitors organizational IT and establish practices for minimizing environmental impacts and planning for long-term firm viability.
Content	Information Systems Governance and Audit include competencies that enable graduates to have the ability to direct, design, implement, monitor, and evaluate (audit) information systems and technology in organizations, as well as discover research potentials on IS governance and auditing topics.
Study and examination requirements and forms of examination	1 Introduction (Other SCL method) 2 Dimension of Governance (Other SCL method) 3 Audit vs Governance (Case method) 4 Governance and Audit, in practice (Case method) 5 Discussion 1: The latest Topics of Governance and Audit (Case method) 6 Discussion 2: The latest Topics of Governance and Audit (Case method) 7 Discussion 3: The latest Topics of Governance and Audit (Case method) 8 Mid Test Evaluation (Case method) 9 Guest Lecture (Other SCL method) 10 Systematic Literature Review 1: Topic Selection for Tesis Plan (Case method) 11 Systematic Literature Review 2: Finding the Sources and Selection (Case method) 12 Systematic Literature Review 3: Writing Style (Case method) 13 Systematic Literature Review 4: Research Method (Case method) 14 Systematic Literature Review 5: Citation Methods (Case method) 15 Systematic Literature Review 6: Discussion Section (Case method) 16 Systematic Literature Review 7: Submission (Case method)
Media employed	LCD, whiteboard, websites (MyITS classroom)
Reading list	1. ISACA, Certified in the Governance of Enterprise IT (CGEIT) Review Manual, ISACA, 2017. 2. ISACA, Certified Information Systems Auditor (CISA), ISACA, 2017. 3. Gerard Blokdyk, Corporate governance of information technology, the Art of Service 2017 4. Robert Moeller, Executive's Guide to IT Governance: Improving Systems Processes with Service Management, COBIT, and ITIL, Wiley Corporate, 2013. 5. Various international journals and articles related to IS/IT Governance and IS/IT Audit topics.

IS185903 - Topics in Information Systems and Technology Investment and Productivity

Module Name	**Topics in Information Systems and Technology Investment and Productivity**
Module-level	Master Program
Code	IS185903
Semester	Elective course, 3rd semester
Contact Person	Dr. Apol Pribadi Subriadi, S.T., M.T.
Lecturer	Dr. Apol Pribadi Subriadi, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, 3rd semester, Information System Management Laboratory
Type of teaching, contact hours	Lectures, up to 40 students Practical (Final Project), up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 (three) credit points
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to understand IS/IT investment and productivity • Graduates will be able to calculate the economic value of IS/IT, taking into consideration tangible and intangible costs and benefits • Graduates will be able to develop documents to articulate the business case for investments in IS/IT
Content	We may often hear about *how an increase in technology does not necessarily bring an increase in productivity.* Robert Solow, the Nobel Laureate economist, has seen the pattern: "We see computers everywhere except in the productivity statistics." This situation reflects a productivity paradox showing a condition where productivity will eventually reach a plateau, even with advances in technology. The term "productivity paradox" became popularized after being termed by Erik Brynjolfsson, an MIT professor at the MIT Sloan School of Management and the MIT Center for Digital Business Director. He argued that there does not seem to be a direct, measurable correlation between improvements in IT and improvements in output. We can approach this situation by reflecting on how productive output is measured and tracked, e.g., by understanding tangible-intangible and direct-indirect analysis of IS/IT investment. This course explores the IS/IT investment method and how to analyze IS/IT productivity. Students can get experience in applying financial and

	non-financial methods related to IS/IT investment. In order to achieve this objective, the teaching method includes literature reviews on the IS/IT investment and productivity paradox, seminars through class discussion and lectures, and practical by writing a research proposal related to the topic.
Study and examination requirements and forms of examination	1 Introduction to the Subject (Other SCL method) 2 Concept of Paradox Productivity of Information Technology (Case method) 3 Information Economics (Case method) 4 Productivity Function (Case method) 5 Estimation of Software Prices (Case method) 6 Free Topic Discussion 1 (Case method) 7 Free Topic Discussion 2 (Case method) 8 Mid Test (Case method) 9 Systematic Literature Review 1: Topic Selection (Case method) 10 Systematic Literarture Review 2: Sources Selection (Case method) 11 Systematic Literarture Review 3: Sortir Method (Inclusion/Exclusion) (Case method) 12 Systematic Literature Review 4: Writing Style (Case method) 13 Systematic Literature Review 5: Research Method (Case method) 14 Systematic Literature Review 6: Citation Methods (Case method) 15 Systematic Literature Review 7: Discussion Section (Case method) 16 Systematic Literature Review 8: Submission (Case method)
Media employed	LCD, whiteboard, course websites (MyITS classroom), Zoom
Reading list	6. **Schniederjans, Marc J., Hamaker, Jamie L., Schniederjans, Ashlyn M.** (2010). Information Technology Investment: Decision-Making Methodology second edition, World Scientific Publishing Company. Singapore: World Scientific Publishing. 7. **Farrell, J., Shapiro, C., Varian, H. R., Farrell, A. P. o. C. J.** (2004). The economics of information technology: an introduction. United Kingdom: Cambridge University Press. 8. **Parker, Marilyn M & Benson, Robert J.** (1990). Information Economics: Linking Business Performance to Information Technology. Prentice-Hall College Div.

IS185904 - Topics in Database Technology

Module Name	**Topics in Database Technology**
Module-level	Master Program
Code	IS185904
Semester	Elective course, 3rd semester
Contact Person	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Lecturer	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, 3rd semester, Data Acquisition and Information Dissemination Laboratory
Type of teaching, contact hours	Lectures, up to 40 students Practical (Final Project), up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 (three) credit points
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to identify the data relation basic concept and object-oriented database systems • Graduates will be able to develop database management systems
Content	A relational database refers to a type of database storing and providing access to data points linked to one another. The relational model provides a basis to build a relational database. A table that represents the relational model consists of rows recording a unique ID called the key. It also consists of columns holding attributes of the data that have a value to enable the relationships among data points. The relational database has been among the top choices in database management systems. It is currently evolved into NoSQL concepts, which will be discussed mainly in this course.
Study and examination requirements and forms of examination	• In-class exercises (Class Discussion) • Assignment (Individual's Project) • Mid-term examination (Written Test) • Final examination (Group's Project)
Media employed	LCD, whiteboard, course websites (MyITS classroom), Zoom
Reading list	1. **Pal, Summit**. (2016). SQL on Big Data: Technology, Architecture, and Innovation (1st Ed.). USA: Apress. 2. Robinson, Ian, Webber, Jim, Eifrem, Emil. (2015). **Graph Databases: New Opportunities for Connected Data** (2nd Ed.). USA: O'Reilly Media, Inc. 3. Sadalage, Pramod J., Fowler, Martin. (2012). **NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence** (1st Ed.). USA: Addison-Wesley Professional.

IS185905 - Topics in Data Integration

Module Name	**Topics in Data Integration**
Module-level	Master Program
Code	IS185905
Semester	Elective course, 3rd semester
Contact Person	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Lecturer	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, 3rd semester, Data Acquisition and Information Dissemination Laboratory
Type of teaching, contact hours	Lectures, up to 40 students Practical (Final Project), up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 (three) credit points
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to identify the data relation basic concept and object-oriented database systems • Graduates will be able to develop database management systems
Content	Data integration has been a challenge for architecting an enterprise system. Integrating data across organizational entities has become more complex when multiple inputs occur when undertaking activities related to the organization's business process. The data integration technique has become a critical success to enable public data access in a web context, e.g., product comparison portal, location-based mash-up, and data search engine. This course introduces a technique to integrate and clean up data from large data sources.
Study and examination requirements and forms of examination	• In-class exercises (Class Discussion) • Assignment (Individual's Project) • Mid-term examination (Written Test) • Final examination (Group's Project)
Media employed	LCD, whiteboard, course websites (MyITS classroom), Zoom
Reading list	Doan, AnHai, Halevy, Alon, Ives, Zachary. (2012). **Principles of Data Integration** (1st Ed.). USA: Morgan Kaufmann Publishers Inc.

IS185906 - Topics in Semantic Web

Module Name	**Topics in Semantic Web**
Module-level	Master Program
Code	IS185906
Semester	Elective course, 3rd semester
Contact Person	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Lecturer	Nur Aini Rakhmawati, S.Kom., M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, 3rd semester, Data Acquisition and Information Dissemination Laboratory
Type of teaching, contact hours	Lectures, up to 40 students Practical (Final Project), up to 40 students, 100 minutes Seminars, up to 40 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 (three) credit points
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to understand the basic concept of Semantic Web and Linked Data • Graduates will be able to identify Ontology Reasoning • Graduates will be able to visualize data using Semantic Web
Content	Data plays an essential role in everyday life. It enables us to understand the current situation better, predict future patterns, or even make better decisions. However, not all data is accessible due to various technological landscapes and ownerships. The Linked Data revolutionizes how we utilize data by identifying, accessing, integrating, and accessing data. This course introduces the basic concept of Linked Data technology and the Ontology Reasoning approach.
Study and examination requirements and forms of examination	• In-class exercises (Class Discussion) • Assignment (Individual's Project) • Mid-term examination (Written Test) • Final examination (Group's Project)
Media employed	LCD, whiteboard, course websites (MyITS classroom), Zoom
Reading list	1. Hitzler, Pascal, Krötzsch, Markus, Rudolph, Sebastian. (2009). **Foundations of Semantic Web Technologies**. Chapman & Hall/CRC. 2. Antoniou, van Harmelen. (2004). **A Semantic Web Primer**. MIT Press 3. Berners-Lee, Tim, Hendler, James, Lassila, Ora. (2001). **The Semantic Web**. *Scientific American, 284 (5), pp. 34-43.*

IS185907 - Topics in Data Mining and Business Analytics

Module Name	**Topics in Data Mining and Business Analytics**
Module level	Master Program
Code	IS185907
Semester	Elective course
Contact Person	Prof. Ir. Arif Djunaidy, M.Sc., PhD
Lecturer	Prof. Ir. Arif Djunaidy, M.Sc., PhD
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Data Engineering and Business Intelligence (RDIB) Laboratory
Type of teaching, contact hours	Lectures, up to 20 students Practical, up to 20 students, 100 minutes Seminars, up to 20 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks)
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Graduates will be able to analyze the needs of an organization and determine how those needs can be best addressed with data, information, and content management solutions. • Graduates will be able to identify, create, and manage organizational policies and processes related to data and information management by balancing multidimensional requirements, such as legal and regulatory requirements, ethical considerations and implications of technology decisions, organizational business requirements, data quality issues, and requirements of operating in an international environment.
Content	The rapid development of data collection and data storage technology have led organizations and businesses to accumulate enormous amounts of data. On the other hand, the process of extracting useful information for organizations has shown tough challenges. Various traditional tools and techniques for analyzing data cannot even be used because of the large data size available. In this context, the nature of non-traditional data means that traditional techniques cannot even be used even though the size of the data analyzed is relatively small. In other cases, the problem to be answered cannot be solved using existing data analysis techniques, and thus new methods need to be developed to solve the problem. Data mining is the process of automatically finding useful information in extensive data repositories. Data mining techniques are used to explore large databases to find new sound patterns that were previously very difficult to find. Data mining is a technology that combines traditional data analysis methods with complex algorithms to process huge data. Data mining also opens up exciting opportunities to explore and analyze new types of data as well as to analyze old data types using new ways.

Study and examination requirements and forms of examination	1 Introductions, lesson plans, refresh material on the basis of classification and clustering (Non SCL) 2 Explanation of various basic and derived classification techniques taken from several scientific papers that have been determined (Other SCL method) 3 Learning Evaluation I: Explanation of various basic and derived classification techniques taken from several scientific papers that have been determined (Other SCL method) 4 Explanation of various basic and derived clustering techniques taken from several scientific papers that have been determined (Other SCL method) 5 Learning Evaluation II: Explanation of various basic and derived clustering techniques taken from several scientific papers that have been determined (Other SCL method) 6 Intelligence and design phase of conducting research (Team-based project) 7 Choice and implementation phase of conducting research (Team-based project) 8 Learning Evaluation III: writing research into a scientific article (Team-based project) 9 Neural networks and fundamentals of deep learning (Non SCL) 10 Activation functions, optimizers, loss function, and neural network on structured data (Non SCL) 11 Introduction to image data, Improving the neural network impelementation, and convolution neural network (Non SCL) 12 Learning Evaluation IV: Creation and presentation of systematic literature review (SLR) for deep learning network and implementation of deep learning algorithms in solving real cases (Non SCL) 13 Introduction to ensemble models: basic ensemble techniques and advanced esnemble techniques (Non SCL) 14 Adaptive boosting, gradient boosting machine, extreme gradient boosting machine, dan light gradient boosting machine (Non SCL) 15 Stacking, Blending, dan Super Learner (Non SCL) 16 Learning Evaluation V: Preparation and presentation of systematic literature review (SLR) for ensemble learning and implementation of ensemble learning algorithms in solving real cases (Non SCL)
Media employed	LCD, whiteboard, websites (MyITS classroom)
Reading list	1. Pang-Ning Tan, Michael Steinbach, and Vipun Kumar, “introduction to Data Mining”, Pearson, Addsion-Wesley, 2006. 2. Jiawei Han, Micheline Kamber, and Jian Pei, “Data Mining: Concepts and Techniques”, Third edition, Elsevier, 2016. 3. Luis Torgo, "Data Mining with R: Learning with Case Studies", CRC Press, (e-book), 2011. 4. Yanchang Zao, "R and Data Mining: Examples and Case Studies", Published by Elsevier, (e-book), 2013. 5. Various international journal articles related to data mining, knowlegde and data engineering, text mining, dan data science topics.

IS185908 - Topics in Optimization and Management Science

Module Name	**Topics in Optimization and Management Science**
Module level	Master Program
Code	IS185908
Semester	Elective Course
Contact Person	Ahmad Mukhlason, S.Kom., M.Sc., Ph.D.
Lecturer	Ahmad Mukhlason, S.Kom., M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Data engineering and business intelligence (RDIB) Laboratory
Type of teaching, contact hours	1. Lectures, up to 10 students, 7 weeks lectures. 2. Project, up to 10 students, 7 weeks of literature study + research article writing
Workload	4. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 5. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Describe concepts and methods to manage the complexity of information systems and technologies and fitting these with the organization's strategy. • Identify, create, and manage organizational policies and processes related to data and information management by balancing multidimensional requirements, such as legal and regulatory requirements, ethical considerations and implications of technology decisions, organizational business requirements, data quality issues, and requirements of operating in an international environment.
Content	In this course, students will learn the theory of complexity of a problem (real-world problems) from a computational point of view. Furthermore, students will learn some heuristics algorithms and approximation algorithms to solve real-world problems with a high level of complexity, skills for combinatoric optimization problems.
Study and examination requirements and forms of examination	17 Introduction: Optimization Problem and Heuristic Approach (Other SCL method: Discussion, Presentation) 18 Local Search Algorithms (Case method) 19 Simulated Anneling Algorithms (Case method) 20 Algorithm: Threshold Acceptance – Iterated Local Search Algorithms (Case method) 21 Algorithm: Neighbourhood Search – Guided Local Search Algorithm (Case method) 22 Tabu Search Algorithm (Case method) 23 Genetic Algoritm (Case method) 24 Mid-term test 25 Scatter Search Algorithm (Case method)

	26 Grasp Algorithm (Case method) 27 Nature inspired Algorithm: Ant Colony Algorithms (Team-based project) 28 Nature inspired algorithms: Particle Swarm Optimization (Team-based project) 29 Final project milestone 1 (Team-based project) 30 Final project milestone 2 (Team-based project) 31 Final project milestone 3 (Team-based project) 32 Final project presentation (Team-based project)
Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. Burke, Edmund K., and Graham Kendall. Search methodologies. Springer Science Business Media, Incorporated, 2005. 2. Papadimitriou, C.H. and Steiglitz, K. Combinatorial optimization: algorithms and complexity. Courier Corporation. 1998.

IS185909 - Topics in Decision Support Systems

Module Name	**Topics in Decision Support Systems**
Module level	Postgraduate
Code	IS185909
Semester	Elective course
Contact Person	Faizal Mahananto, S.Kom., M.Eng., Ph.D.
Lecturer	Faizal Mahananto, S.Kom., M.Eng., Ph.D.
Language	Bahasa Indonesia English
Relation to curriculum	Master Program, elective course, Data Engineering and Business Intelligence (RDIB) Laboratory
Type of teaching, contact hours	Lectures, up to 20 students Practical, up to 20 students, 100 minutes Project, up to 20 students, 100 minutes Seminars, up to 20 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students are able to understand by explaining various decision support systems approaches to solve specific problems • Students are able to identify Simon's model and decision support systems components • Students are able to produce solutions for decision support problems in scientific papers into a system or software library. • Students are able to use various methods to solve decision support problems appropriately in particular problems • Students are able to propose and make documentation related to the latest topics regarding the development of decision support system methods for specific problems
Content	The decision support systems course will provide students with experience to understand the business needs of information for decision making and how that information is processed from existing raw data. In addition, students are also directed to create a system that can be used to process data into information. Students can use methods that have been studied in the first year of study so that it can be applied to real problems. For this reason, the learning method used is to give projects in groups to analyze problems and find a solution by recommending the right method to solve the problem. In addition, students are also directed to create a system that represents the solution. The material of this course is the basis of decision theory, computerized decisions, data analysis problems with certain methods and their implementation. Students can produce a work of a decision support system that can be used by them as a portfolio and provision to excel in the competition in the real world. In addition,

	students also get views on the topic of decision support systems in a certain field. Here are more details on the course contents: 1. Decision Making and Decision Support System (DSS), 2. The Concept of Decision Making, 3. Identification of Simon's Model, 4. Identify DSS Components, 5. Implementation of Data Mining for DSS 6. Implementation of predictive analytics for DSS
Study and examination requirements and forms of examination	1 Introduction to Topic on DSS (Non SCL) 2 Electronic Medical Records: Analytics' Best Hope (Other SCL method) 3 Open-Source EMR and Decision Management Systems (Other SCL method) 4 Evidence-Based Medicine (Other SCL method) 5 ICD-10 (Other SCL method) 6 "Meaningful Use" – The New Buzzword in Medicine (Other SCL method) 7 Lean Hospital Examples (Other SCL method) 8 Personalized Medicine (Other SCL method) 9 Patient-Directed Health Care (Other SCL method) 10 Evaluation (Case method) 11 MIMIC III - Dataset for EMR (Non SCL) 12 DSS Design for EBM using MIMIC III dataset (Team-based project) 13 DSS Design for disease prediction using MIMIC III dataset (Team-based project) 14 DSS Design for medicines prediction using MIMIC III dataset (Team-based project) 15 DSS Design for caregiver performance monitoring using MIMIC III dataset (Team-based project) 16 Project presentation (Team-based project)
Media employed	ITS classroom
Reading list	Turban, Aronson, and Liang. Decision Support Systems and Intelligent Systems, Seventh Edition. Linda A. Winters-Miner, et.al, Practical Predictive Analytics and Decisioning Systems for Medicine, Elsevier.

IS185910 - Topics in Modelling and Simulation Systems

Module Name	**Topics in Modelling and Simulation Systems**
Module level	Master Program
Code	IS185910
Semester	Elective Course
Contact Person	Prof. Erma Suryani, ST., MT., Ph.D.
Lecturer	Prof. Erma Suryani, ST., MT., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Enterprise System (SE) Laboratory
Type of teaching, contact hours	Lectures, up to 10 students, 10 weeks of lectures Project, up to 10 students, 4 weeks of case study + report writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 2. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks)
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Explain the concept of developing IT solutions • Describe the concept of design and implementation for the strategic objectives of the organization • Able to explain strategic planning
Content	Topics in Modelling and Simulation Systems include competencies that enable graduates to have the ability to formulate, model, and simulate discrete and continuous systems to analyze policies and strategies to regulate and improve organizational performance.
Study and examination requirements and forms of examination	1 System Basic Concept (Non SCL) 2 Basic Concepts of System Modeling (Other SCL method) 3 Basic Concepts of Simulation Model (Other SCL method) 4 Basic Concepts of Discrete Simulation (Other SCL method) 5 Several Approaches In Discrete Simulation (Other SCL method) 6 The Basic Concept of Simulation With Arena (Other SCL method) 7 Examples of Simulation Models Using Arena (Team-based project) 8 Midterm Examination (Other SCL method) 9 System Dynamics Simulation Model Development (Team-based project) 10 System dynamics model formulation (Team-based project) 11 Analysis of Model Simulation Results (Team-based project) 12 Model Validation (Team-based project) 13 Basic Concepts of Scenario Model (Non SCL) 14 The Dvelopment of Scenario Structure and Parameter Scenario (Team-based project) 15 Final Project Presentation (Team-based project) 16 Final Examination(Other SCL method)

Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. **Research articles** related to “modelling and simulation.” 2. **Hague, P.,** Forecasting & Scenario Planning, B2B International, 2010 3. **Barlas, Y.,** Multiple tests for validation of system dynamics type of simulation models, European Journal of Operational Research 42 (1999) pp. 59-87.

IS185911 - Topics in System Dynamics and Its Application in Various Fields

Module Name	**Topics in System Dynamics and Its Application in Various Fields**
Module level	Postgraduate
Code	IS185911
Semester	Elective Course
Contact Person	Prof. Erma Suryani, ST., MT., Ph.D.
Lecturer	Prof. Erma Suryani, ST., MT., Ph.D.
Language	Bahasa Indonesia English
Relation to curriculum	Master Program, elective, Enterprise System (SE) Laboratory
Type of teaching, contact hours	Lectures, up to 20 students Practical, up to 20 students, 100 minutes Project, up to 20 students, 100 minutes Seminars, up to 20 students, 100 minutes
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students are able to plan and develop dynamic system models • Students are able to simulate dynamic system models • Students are able to analyze the behavior of complex system models • Students are able to develop complex and dynamic system model scenarios
Content	**Fundamentals of modeling and simulation:** Modeling process, Definition of simulation, Benefits of simulation, Process of working on simulation, Advantages and disadvantages of simulation model, Classification of simulation model; **System Complexity:** Resistance Policy, Feedback, Multi Loop System Dynamics, Dynamic Complexity, Bounded Rationality, Simulation Essence; **The basic concepts of the simulation system:** The basic structure of the Simulation model, Simulation steps; **System Dynamics Modeling:** System dynamic simulation model, Characteristics of system dynamic model, Stages of system dynamic model development, Variable of system dynamic model; **Tools for System Thinking :** Causal Loop Diagram, Stock and Flow Diagram, Ventana Simulation; **Project Dynamics:** Modeling Decision Making, Modeling Human Behavior, Modeling Supply Chain Management; **Model Validation:** Basic Concepts of Validation; Types of Validation, Validation Steps, Error Rate Percentage (E1), Error Variance Percentage (E2); **Scenario Model:** Scenario structure; Parameter scenarios, Sensitivity analysis; Prediction models.
Study and examination requirements and forms of examination	1 Basic Concepts of System (Non SCL) 2 Basic Concepts of System Modeling (Other SCL method) 3 Basic Concepts of Simulation Model (Other SCL method)

	4 System Dynamics Simulation Model and Its Characteristics (Other SCL method) 5 System Dynamics Model Development Steps (Other SCL method) 6 System Dynamics Model Variable (Other SCL method) 7 Causal Loop Diagram and Stock and Flow Diagram (Other SCL method) 8 Midterm Examination (Other SCL method) 9 Ventana Simulation Software (Other SCL method) 10 Modelling Decision Making - Project 1 (Team-based project) 11 Modelling Supply Chain Management - Project 2 (Team-based project) 12 Model Validation (Team-based project) 13 Scenario Structure and Scenario Parameter Model (Team-based project) 14 Sensitivity Analysis and Prediction model (Other SCL method) 15 Final Project Presentation (Team-based project) 16 Final Examination (Other SCL method)
Media employed	ITS classroom
Reading list	**John D. Sterman**, Business Dynamics, Systems Thinking and Modeling for a Complex World, 2000. **Ernest Doebelin ,** System Dynamics: Modeling, Analysis, Simulation, Design, 2017. **Barlas, Y.,**Multiple tests for validation of system dynamics type of simulation models, European Journal of Operational Research 42 (1999) pp. 59-87. **Erma Suryani**, Pemodelan dan Simulasi, Graha Ilmu, 2005. **Erma Suryani**, System Dynamics Framework, 2012.

IS185912 - Topics in Enterprise Systems

Module Name	**Topics in Enterprise Systems**
Module level	Master Program
Code	IS185912
Semester	Elective Course
Contact Person	Mahendrawathi Er., ST., M.Sc., Ph.D.
Lecturer	Mahendrawathi Er., ST., M.Sc., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Enterprise System (SE) Laboratory
Type of teaching, contact hours	1. Lectures, up to 10 students, 7 weeks lectures. 2. Project, up to 10 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. 2. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Able to describe various organizational activities in using information technology to improve the way business activities are structured and carried out. • Identifying and evaluating new IS methods and trends, developing innovative domain activity models, making plans to exploit new methods and technologies and new ways of structuring and conducting organizational activities, and estimating the benefits and adverse consequences of implementation.
Content	Nowadays, organizations need information systems and technology to provide accurate, fast data, and information to support their business processes. ERP, a software package with a single database to automate various cross-functional business processes, has become a standard for organizations in various industrial fields. On the other hand, ERP is a complex system, and its implementation involves enormous resources. Therefore, understanding the software's business processes and capabilities is needed to configure and implement it to provide value to the organization. This course will provide students with knowledge of best practices in corporate resource planning business processes and experience in configuring, operating, and running ERP software implementation projects.
Study and examination requirements and forms of examination	a. • Course plan • Evolution and historical role of information systems driving system integration and ES Main Library: [1], [2] (Non SCL) b. • History of Business Process Management o Definition o Origin and history o Development of BPM • How does BPM relate to other fields • Business Process Components • BPM lifecycle (Other SCL method)

	c. Literature in BPM Adoption (Team-based project) d. • Process identification context • Definition of process architecture • Business Process Reference Model • Business Process Maturity Model • BPM vs. ERP (Other SCL method) e. • System Development Life Cycle • ERP Implementation Life Cycle • Project management • Project roles and responsibilities • ERP Components • Database requirements • ERP implementation organization and approach • ERP implementation example (Other SCL method) f. • Definition and scope of Supply Chain Management • SCM and CRM processes • Digital business in support of SCM (Other SCL method) g. • Definition and scope of Customer Relationship Management • CRM processes • Digital business in support of CRM (Other SCL method) h. Mid term Examination (Case method) i. How to do a structured literture review Current literature in Enterprise Systems (Other SCL method) j. Search strategy, implementation of inclusion and exclusion, and assessing literature Current literature in Enterprise System (Other SCL method) k. Search strategy, implementation of inclusion and exclusion Current literature in Enterprise Systems (Other SCL method l. Assess the literature (Other SCL method) m. Conducting studies, codification and synthesis of literature (Other SCL method) n. Conducting studies, codification and synthesis of literature (Other SCL method) o. Writing a scientific paper on SLR (Other SCL method) p. Presentation of SLR (Other SCL method)
Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. ER, M., Business Process Management, in press. 2. Brocke, J. V. and Schmiedel, T., BPM – Driving Innovation in a Digital World, Springer, 2015. 3. Dumas, M., La Rosa, M., Mendling, J. & Reijers, H. A, Fundamentals of Business Process Management, Springer, 2013. 4. Motiwalla, Luvai dan Thompson, Jeffrey, Enterprise Systems for Management (2nd Edition), Pearson Education Limited, Essex, 2014. 5. Giachetti, Ronald. E., Design of Enterprise Systems: Theory, Architecture, and Methods, CRC Press, Taylor and Francis Group, Boca Raton, 2010.

IS185913 - Topics in Information Technology Architecture for Corporate

Module Name	**Topics in Information Technology Architecture for Corporate**
Module level	Master Program
Code	IS185913
Semester	Elective Course, 3rd semester
Contact Person	Dr. Bambang Setiawan, S.Kom., M.T.
Lecturer	Dr. Bambang Setiawan, S.Kom., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Information technology and system infrastructure (IKTI) Laboratory
Type of teaching, contact hours	1. Lectures, up to 10 students, 7 weeks lectures. 2. Project, up to 10 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Describe concepts and methods to manage the complexity of information systems and technologies and fitting these with the organization's strategy. • Identifying and applying a formal approach to Enterprise Architect development, performing the multistage process of developing an Enterprise Architect, identifying the Enterprise Architect change needs, and applying them to the Enterprise Architect.
Content	*The description should clearly indicate the weighting of the content and the level.* Topics in Information Technology Architecture for Corporate is designed to cover competencies that enable graduates to become designers and developers of IT architectures that are most optimal to be applied to the various types of companies (enterprises).
Study and examination requirements and forms of examination	1 EA implementation theory and concepts (Non SCL) 2 Enterprise Architecture Planning (EAP) (Non SCL) 3 The Perspective Centric Approach (Zachman Framework) (Non SCL) 4 The Standardization Centric Approach (FEA Framework) (Non SCL) 5 The Capability Centric Approach (VRF/SIP Framework) (Non SCL) 6 The Process Centric Approach (TOGAF) (Non SCL) 7 Review paper comparison of EA Framework (Other SCL method: in-class exercise)

	8 Mid-term test (Non SCL) 9 Review of EA implementation research (Other SCL method: in-class exercise) 10 Review of EA implementation research (Other SCL method: in-class exercise) 11 *Case study: Design EA with TOGAF Case study: Design EA with TOGAF* (Team-based project) 12 Business Architecture (Team-based project) 13 Data Architecture (Team-based project) 14 Application Architecture (Team-based project) 15 Technical Architecture (Team-based project) 16 Final exam: Final report of EA design (Other SCL method: Presentation)
Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. Steven H. Spewak (1193), Enterprise Architecture Planning: Developing a Blueprint for Data, Applications, and Technology 2nd Edition, Wiley. 2. Danny Greefhorst (2011), Architecture Principles: The Cornerstones of Enterprise Architecture (The Enterprise Engineering Series), Spriger. 3. Scott A. Bernard (2012), An Introduction to Enterprise Architecture 3rd Edition, AuthorHouse. 4. Jeanne W. Ross (2006), Enterprise Architecture as Strategy: Creating a Foundation for Business Execution, Harvard Business Review Press. 5. Daniel Minoli (2018), Enterprise Architecture A to Z: Frameworks, Business Process Modeling, SOA, and Infrastructure Technology 2nd Edition, Auerbach Publications. 6. Jaap Schekkerman (2008), Enterprise Architecture Good Practices Guide: How to Manage the Enterprise Architecture Practice, Trafford Publishing. 7. Jaap Schekkerman (2003), How to Survive in the Jungle of Enterprise Architecture Frameworks: Creating or Choosing an Enterprise Architecture Framework 2nd Edition, Trafford Publishing. 8. Marc Lankhorst (2017), Enterprise Architecture at Work: Modelling, Communication and Analysis (The Enterprise Engineering Series) 4th Edition, Springer. 9. Stefan Bente (2012), Collaborative Enterprise Architecture: Enriching EA with Lean, Agile, and Enterprise 2.0 practices, Morgan Kaufmann.

IS185914 - Topics in System and Network Security

Module Name	**Topics in System and Network Security**
Module level	Master Program
Code	IS185914
Semester	Elective Course
Contact Person	Dr. Bambang Setiawan, S.Kom., M.T.
Lecturer	Dr. Bambang Setiawan, S.Kom., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Information technology and system infrastructure (IKTI) Laboratory
Type of teaching, contact hours	1. Lectures, up to 10 students, 7 weeks lectures. 2. Project, up to 10 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Understanding the content of state of art policy and standard for business continuity, information assurance, planning and implementing risk management, trust, security and safety, as well as disaster recovery and information protection. • Developing a proposal of Implementation of concept and environmentally and socially sustainable IT solutions that are aligned with the responsibilities of organizations as well as in compliance with legislative and regulatoryrequirements and industry standards with a small case study scenario.
Content	By the increasing of interconnections in global networks, a smooth communications and computing operation become an importance aspect. One of the way is to secure the existing systems and networks. In an effort to secure existing systems and networks, organizations need to anticipate and manage matters relating to information security that may arise. On the other hand, repeated incidents such as the presence of viruses and successful attacks by hackers clearly demonstrate the weakness of information technology and require to increase the level of system security. To increase the level of system security, it requires a complete understanding of the security in Software Development Life Cycle (SDLC), what roles and personnel are needed, a comprehensive system security plan, environmental and internal security, as well as the formal legal and professional ethics.
Study and examination requirements and forms of examination	• In-class exercises • Quiz 1 and 2 • Assignment 1, 2, 3 • Mid-term and final examination • Group project

Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. Whitman, ME and Mattord, HJ. Principles of Information Security, 4th ed., Thomson Courses Technology. 2007. 2. Harold F. Tipton, Mick Krause, Information Security Management Handbook, Auerbach Publication, 2007. 3. Ronald L. Krutz dan Russell D. Vines, The CISSP Prep Guide: Mastering the Ten Domains of Computer Security, John Wiley&Sons, 2001. 4. Ronald L. Krutz and Russell Dean Vines, The CISM Prep Guide: Mastering the Five Domains of Information Security Management, John Wiley & Sons, Canada, 2003.

IS185915 - Topics in Embedded System Development

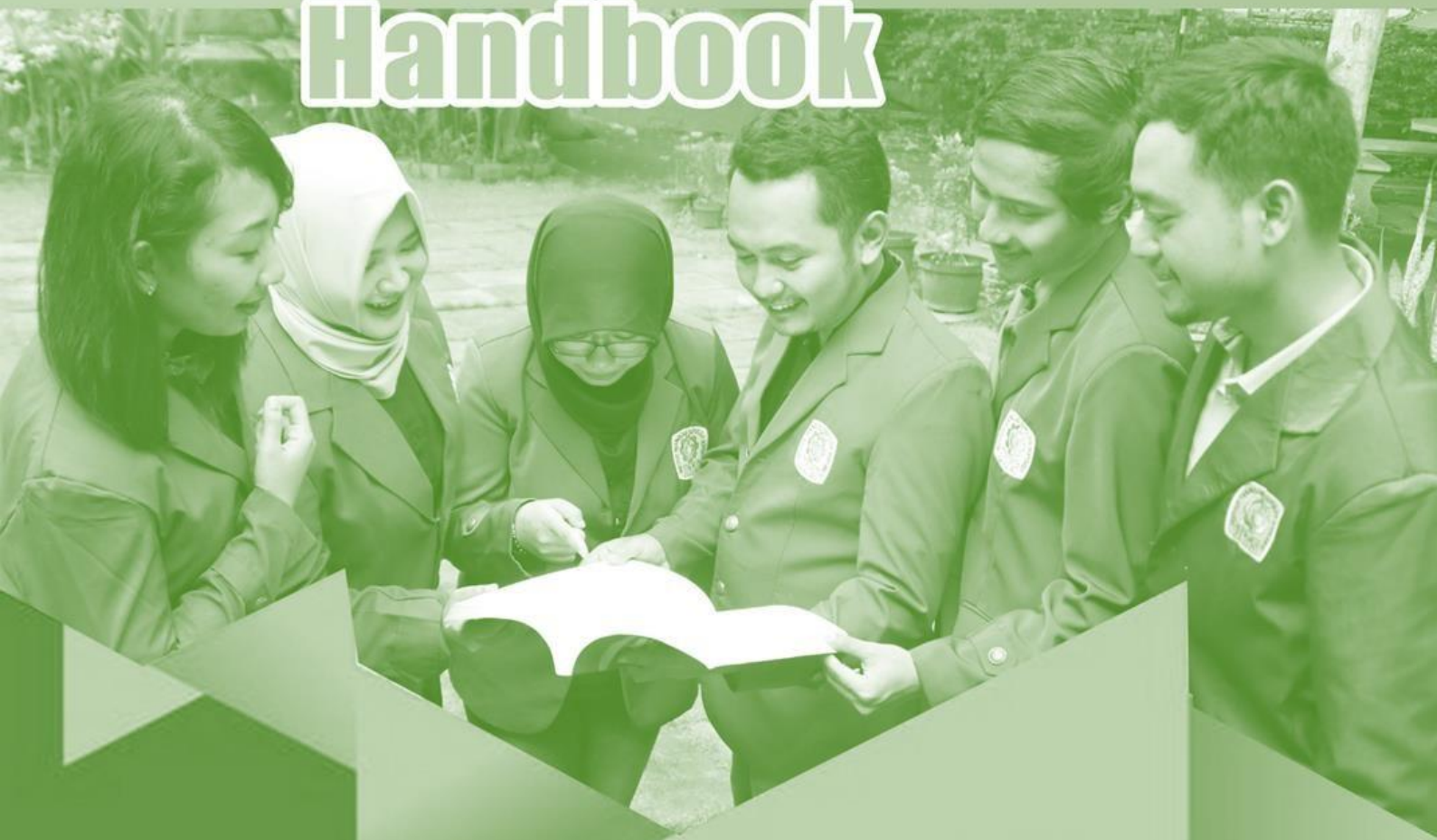
Module Name	**Topics in Embedded System Development**
Module level	Master Program
Code	IS185915
Semester	Elective Course, 3rd semester
Contact Person	Dr.*Eng.* Febriliyan Samopa, *S.Kom., M.Kom.*
Lecturer	Dr.*Eng.* Febriliyan Samopa, *S.Kom., M.Kom.*
Language	Bahasa Indonesia
Relation to curriculum	Master Program, elective course, Information technology and system infrastructure (IKTI) Laboratory
Type of teaching, contact hours	1. Lectures, up to 10 students, 7 weeks lectures. 2. Project, up to 10 students, 7 weeks of literature study + research article writing
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Structured study: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Module objectives/intended learning outcomes	• Students have knowledge about the basic functions, structure, concepts and applications of embedded systems. • To learn the method of designing and program an Embedded Systems for real time applications. • Develop familiarity with tools used to develop in an embedded environment.
Content	*The description should clearly indicate the weighting of the content and the level.* This course covers competence that make students able to be designer and developer for various systems that controlled by information technology in limited device which is also embedded in those systems
Study and examination requirements and forms of examination	1 Basic concept and design of embedded system (Non SCL) 2 Basic concept and design of embedded system (Non SCL) 3 Basic concept and design of embedded system (Non SCL) 4 Basic concept and design of embedded system (Non SCL) 5 Design and development low performance embedded system (Team-based project) 6 Design and development low performance embedded system (Team-based project) 7 Design and development low performance embedded system (Team-based project) 8 Design and development low performance embedded system (Team-based project) 9 Design and development high performance embedded system (Team-based project)

	10 Design and development high performance embedded system (Team-based project) 11 Design and development high performance embedded system (Team-based project) 12 Design and development high performance embedded system (Team-based project) 13 Research topics in embedded system (Team-based project) 14 Research topics in embedded system (Team-based project) 15 Research topics in embedded system (Team-based project) 16 Research topics in embedded system (Team-based project)
Media employed	LCD, whiteboard, websites (itsdaring.id; google classroom; ITS classroom, google scholar, scopus.com).
Reading list	1. Wayne Wolf, "Computers as Components-principles of Embedded Computer system Design", 1st edition, Elseveir, 2009. 2. Labrosse, "Embedding system building blocks", 2rd edition, CMP Publishers, 2007. 3. Kenneth J. Ayala and Thomson, "The 8051 Microcontroller", 3rd edition, Thompson Delmar, Learning, 2008. 4. Frank Vahid, Tony Givargis and John Wiley, "Embedded System Design, Microcontrollers", 3rd edition, Pearson Education, 2008. 5. Michael J. Pont, "Embedded C", Addison Wesley, 2002.

sistem informasi
fakultas Teknologi Elektro & Informatika Cerdas

ITS
Institut Teknologi Sepuluh Nopember

MODULE Handbook



MASTER of INFORMATION SYSTEMS

2018 - 2021

Department of Information Systems
Faculty of Intelligent Electrical & Informatics Technology
Institut Teknologi Sepuluh Nopember