

Big Data Analytics

Module name	Big Data Analytics		
Module level	Master		
Code	COMP8035041		
Courses (if applicable)	Big Data Analytics		
Semester	2		
Contact person	Dr. Sani Muhamad Isa, S.Si., M.Kom.		
Lecturer	Andry Chowanda, Yaya Heryadi, Amalia Zahra, Sani Muhamad Isa, Antoni Wibowo, Suharjito, Spits Warnars Harco Leslie Hendric, Devi Fitriana, Edy Irwansyah, Lili Ayu Wulandhari.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation, Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Understand market and business drivers for big data, big data landscape, characteristics, and how it will impact to business	-
	CLO-2	Identify big data issue to analyze, explain how to collect, store, and organize data using big data solution and recognize different data elements in everyday life problems also select the right data model and operation to suit data characteristics	LObj 3.1
	CLO-3	Design, develop, and evaluate an end-to-end analytics solution combining large-scale data storage and processing frameworks	-
	CLO-4	Design an approach to leverage data using the steps in the machine learning process and analyze big data	LObj 3.1

		problem using scalable machine learning algorithm	
	CLO-5	Design model for a problem into graph database and perform analytical over the graph in scallable manner	-
	CLO-6	Build effective visual representation to provide better insight from big data	-
Content	Study underlying principles of storage and processing massive collections of data, typical of today's Big Data systems. The topics covered will include techiques and paradigms for querying and processing massive data sets (MapReduce, Hadoop, SQL for data analytics, stream processing), fundamentals of scalable data storage (NoSQL data bases such as MongoDB, Cassandra, HBase), working with dynamic web data (data acquisition, data formats), elements of cloud computing, and applications to real world data analytics and data mining problems (sentiment analysis, social network mining)		
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 35% final exam, 65% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass		
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.		
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments		
Reading List	<ul style="list-style-type: none"> - Loshin, D. (2013). Big data analytics: from strategic planning to enterprise integration with tools, techniques, NoSQL, and graph. (th). Elsevier. ISBN: 9780124173194. - Ankam, V. (2016). Big Data Analytics. (th). Packt Publishing Ltd. ISBN: 978-1568989792. - Simon, P. (2014). The Visual Organization: Data Visualization, Big Data, and the Quest for Better Decisions. (th). John Wiley & Sons ISBN: 9781118794388. 		

Services Oriented Architecture

Module name	Services Oriented Architecture		
Module level	Graduate		
Code	COMP8036041		
Courses (if applicable)	Services Oriented Architecture		
Semester	2		
Contact person	Abba Suganda Girsang, PhD		
Lecturer	Abba Suganda Girsang, Ditdit Nugeraha Utama, Suryadi Liawatimena, Ahmad Nurul Fajar, Zulfany Erlisa Rasjid		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation , Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activites, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Propose concept and necessary of service oriented architecture	-
	CLO-2	Design and Implement Service Architecture	-
	CLO-3	Design concept of Integration	-
	CLO-4	Propose SOA Security	LObj 6.2
	CLO-5	Analysis application Service Architecture	-

Content	The course will give an in-depth description of Service Oriented Architecture (SOA), and how to manage system development and monitoring using SOA technology.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 30% final exam, 70% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Thomas Erl. (2005). Service-Oriented Architecture: Concepts, Technology, and Design. (th). Prentice Hall Publisher. ISBN:. - David Marco. (2007). Universal Meta Data Models. (th). Wiley. ISBN: 0-471-08177-9. - Erick Marks. (2006). Service-Oriented Architecture Governance for the Services Driven Enterprise. (th). John Wiley. ISBN:. - Martin Keenet. (2009). Patterns: Implementation SOA Using an Enterprise Service Bus. (th). RedBooks. ISBN:. - Mike Rosen. (2008). Applied SOA: Service-Oriented Architecture and Design Strategies. (th). John Wiley & Sons. ISBN:. - Paul C. Brown. (2007). Succeeding with SOA: Realizing Business Value through Total Architecture. (th). Addison Wesley Professional. ISBN: 13: 978-0-321-5. - Setrag Khoshafian. (2007). Service Oriented Enterprise. (th). Aurbach Publications. ISBN:. - Thomas Erl. (2017). Service-Oriented Architecture: Analysis and Design for Services and Microservices. (th). Publisher Prentice Hall. ISBN:. - Tom Gao. (2007). The Complete Reference to Professional SOA with Visual Studio 2005 (C# and VB 2005).NET 3.0. (th). Tech Master. ISBN: 1-847-99835-6.

IT Strategic Planning & Enterprise Architecture

Module name	IT Strategic Planning & Enterprise Architecture		
Module level	Master		
Code	COMP8037041		
Courses (if applicable)	IT Strategic Planning & Enterprise Architecture		
Semester	3		
Contact person	Abba Suganda Girsang, ST, MCs, PhD		
Lecturer	Suharjito, Abba Suganda Girsang, Haryono Soeparno, Nico Surantha, Ariadi Nugroho, Fredy Purnomo, Ditdit Nugeraha Utama.		
Language	Bahasa		
Relation to curriculum	compulsory, 3rd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Lecture), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Choose and Design IS/IT Strategy tools and techniques	LObj 4.1
	CLO-2	Measure and Manage business IS/IT strategy	LObj 4.2
	CLO-3	Evaluate IS/IT Strategy	-
	CLO-4	Understanding the concept enterprise architecture for organization / enterprise	-
	CLO-5	Analysis some models and framework in enterprise architecture.	LObj 4.3
	CLO-6	Modelling and Implement enterprise architecture in on organization/enterprise	-

Content	This course intends to model and develop strategic planning for IS/IT in a company / organization. Moreover, it also give foundation foundational enterprise architecture (EA) as a concept and practice. It explores the analysis, design, implementation, evaluation and management of enterprise IT solutions.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 30% final exam, 70% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Ward, J dan Pepard, J.. (2004). Strategic Planning for Information System,. (3rdth). John Wiley & Sons. England. ISBN:. - Daniel Ebner. (2014). Formal and Informal Strategic Planning: The Interdependency between Organization, Performance and Strategic Planning. (th). Gebler Verlag. ISBN:. - Desfray, P, and Raymond, G. (2014). Modeling enterprise architecture with TOGAF: A practical guide using UML and BPMN. (th). Morgan Kaufmann. ISBN:. - Girish P. Jakhotiya. (2013). SPEM (Strategic Planning, Execution, and Measurement) CRC. (th). Taylor & Francis Group. ISBN:. - Hakan B,. (2016). Systematic Strategic planning a comprehensive framework for implementation controland-evaluation. (th). Taylor & Francis Group. ISBN:. - Lankhorst, M, et al. (2013). Enterprise Architecture at Work Modelling, Communication and Analysis,. (th). Springer. ISBN:. - Schekkerman,. (2008). Enterprise Architecture Good Practices Guide: How to Manage the Enterprise Architecture. (th). Trafford. ISBN:. - Schekkerman, J.. (2004). How to Survive in the Jungle of Enterprise Architecture Frameworks: Creating or Choosing an Enterprise Architecture Framework. (th). Trafford. ISBN:. - Scott A. B. (2012). An Introduction to Enterprise Architecture. (th). AuthorHouse. ISBN:. - Tozer, Edwin. E.. (1996). Strategic IS/IT Planning. (th). Butterworth-Heinemann. USA. ISBN:.

Internet of Things (IoT)

Module name	Internet of Things (IoT)		
Module level	Master		
Code	COMP8041041		
Courses (if applicable)	Internet of Things (IoT)		
Semester	1		
Contact person	Dr.rer.nat. Ditdit Nugeraha Utama, S.Kom, MMSI		
Lecturer	Abba Suganda Girsang, Amalia Zahra, Suryadi Liawatimena, Alexander Agung Santoso Gunawan, Nico Surantha, Michael Baskara Laksana Adi Siek, Rojali.		
Language	Bahasa		
Relation to curriculum	compulsory, 1st semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Lecture, Practice Activities , Presentation), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activites, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Define concept and application Internet of things in organization, companies and industries.	LObj 1.1
	CLO-2	Applied Cloud Computing Service in organization, companies and industries.	-
	CLO-3	Applied microcontroller and sensor in system.	LObj 3.3
	CLO-4	Analyse the visualization of internet of things.	LObj 1.1, LObj 3.3
	CLO-5	Design architecture network for internet of thing	-

Content	This course gives a foundation about data collection, connectivity, and analysis of information collected by computers everywhere. It will give a fundamental concept and practical application including the components, tools, and analysis in the core of internet of things menjadi This course gives a foundation about data collection, connectivity, and analysis of information collected by computers everywhere. It will give a fundamental concept and practical application including the components, tools, and analysis in the core of internet of things. Also, the connected material “cloud technology” and “sensor” are discussed in the course. By the end of the course, the knowledge and skills necessary to design and implement the own IoT solutions are considered; and also skill and knowledge to tackle the challenges of the rapidly evolving IoT landscape is delivered.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Colin Dow, Perry Lea. (2019). Mastering IOT: Build modern IoT solutions that secure and monitor your IoT infrastructure. (th). Packt Publishing. ISBN:. - Anna Hac. (2011). Wireless Sensor Network Designs. (th). Wiley. ISBN:. - Aujla et al. (2022). Internet of Things: Software Defined Internet of Everything. (th). Springer. ISBN:. - Colin Dow. (2018). Internet of Things Programming Projects_ Build modern IoT solutions with the Raspberry Pi 3 and Python. (th). Packt Publishing. ISBN:. - Manoj R. Thakur. (2018). NodeMCU ESP8266 Communication Methods and Protocols : Programming with Arduino IDE. (th). Amazon Media EU. ISBN:. - Perry Lea. (2018). Internet of Things for Architects. (th). Packt Publishing. ISBN:. - Rajesh Singh, Anita Gehlot, Lovi Raj Gupta, Bhupendra Singh, Mahendra Swain. (2019). Internet Of things With Raspberry Pi And Arduino. (th). CRC Press Taylor & Francis Group. ISBN:. - Rudra et al. (2022). Futuristic Research Trends and Applications of Internet of Things. (th). CRC Press. ISBN:. - Uchit Vyas. (2015). Mastering AWS Development: Develop and migrate your enterprise application to the Amazon Web Services platform. (th). Packt Publishing. ISBN:.

IT Risk Management and Audit

Module name	IT Risk Management and Audit		
Module level	Master		
Code	COMP8042041		
Courses (if applicable)	IT Risk Management and Audit		
Semester	1		
Contact person	Benfano Soewito, M.Sc., Ph.D		
Lecturer	Agung Trisetyarso, Benfano Soewito, Antoni Wibowo, Hadi Syahrial, Ditdit Nugeraha Utama, Agus Widodo, Yulyani Arifin.		
Language	Bahasa		
Relation to curriculum	compulsory, 1st semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Discussion, Lecture, Observation , Practice in Laboratory, project), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Describe the fundamental concept of IT Risk Management and Auditing, and know its various frameworks/techniques of them.	LObj 2.1, LObj 4.1
	CLO-2	Describe the characteristics of various techniques of IT Risk Management and Auditing and understand how each of them works.	LObj 2.2, LObj 4.2
	CLO-3	Apply relevant frameworks/ techniques of IT Risk Management and Auditing according to individual cases/problems and perform evaluation.	LObj 2.1, LObj 4.1
	CLO-4	Analyse the results obtained from frameworks/ techniques of IT Risk Management and Auditing from several perspectives and able to	LObj 2.2, LObj 4.2

		provide suggestions to improve the system performance.	
	CLO-5	Propose business continuity plan and IT auditing that can mitigate the IT infrastructure disruptions.	LObj 4.3
Content	<p>Information technology (IT) is no longer a tucked away department with little impact on day-to-day affairs. It is big business that's involved in almost every sector of the economy, and therefore carries some major risks. IT has become so integrated into our personal and professional lives that it touches upon almost everything we do. Due to its expansive influence, it is essential to talk about risk management and audit in IT. IT risk management is the application of risk management methods to information technology to manage the risks inherent in that space, while IT audit is an examination of the management controls within an IT infrastructure. This course will provide a comprehensive suite of knowledge of assessing IT Risk Management and Audit through policies and procedures development, thorough understanding of basic and applications of IT Risk Management and Audit. Principles and frameworks for risk and audit as part of IT risk management and audit will be discussed. As currently IT infrastructure is strategic for business sustainability and growth, disaster recovery plan is gaining importance in business entity. Besides, business continuity aspects will be discussed as the infrastructure disruption will have severe impact to the operations of the company. Therefore, a strong knowledge of IT risk management and audit should be part of IT professionals and management team.</p>		
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass		
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.		
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments		
Reading List	<ul style="list-style-type: none"> - Whitman, M.E., Mattoro, H.J. (2021). Principles of Incident Response and Disaster Recovery. (th).. ISBN:. - Blokdijs G., Engle C., J Brewster J.. (2008). Complete Risk Management Toolkit Guide for Information Technology Processes and Systems. (th).. ISBN:. - Kouns J. and Minoli D.. (2010). Information Technology Risk Management in Enterprise Environments_ A Review of Industry Practices and a Practical Guide to Risk Management Teams. (th).. ISBN:. - Nelson. (2008). Guide To Computer Forensics and Investigations. (3th). Cengage Learning Asia Pte Ltd. ISBN:. - Slay, Jill and Andy Koronios. (2006). Security and Risk Management. (th). John Wiley & Sons, Inc. ISBN:. - Ashenden J. A. D.. (2005). Risk Management For Computer Security. Protecting Your Network and Information Assets. (th). Elsevier Butterworth-Heinemann. ISBN:. - Crouhy M., Galai D., Mark R. (2001). Risk Management. (th).. ISBN:. - Davis C. and Schiller M.. (2011). IT Auditing Using Controls to Protect Information Assets. (th).. ISBN:. - Engemann K. J.. (2011). Business Continuity and Risk Management: Essentials of Organizational Resilience. (th).. ISBN:. 		

	<p>- Pritchard C. L.. (2015). Risk management concepts and guidance. (th).. ISBN:.</p>
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Machine Learning

Module name	Machine Learning		
Module level	Master		
Code	COMP8043041		
Courses (if applicable)	Machine Learning		
Semester	1		
Contact person	Amalia Zahra, S.Kom., Ph.D.		
Lecturer	Amalia Zahra, Lili Ayu Wulandhari, Andry Chowanda, Derwin Suhartono, Antoni Wibowo, Haryono Soeparno, Bambang Heru Iswanto.		
Language	Bahasa		
Relation to curriculum	compulsory, 1st semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Discussion, Lecture, Listening to texts/conversation, Observation , Practice Activities , Question and Answer), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Able to explain the fundamental concept of Machine Learning and its various techniques/algorithms.	-
	CLO-2	Describe the characteristics of various Machine Learning algorithms and understand how each of them works, including the mathematical principles underlying the algorithms.	-
	CLO-3	Apply relevant Machine Learning algorithms according to individual cases/problems and perform evaluation.	-
	CLO-4	Analyse the results obtained from Machine Learning experiments from several perspectives	LObj 5.1
	CLO-5	Able to propose suggestions to improve the system performance	LObj 5.1

Content	<p>In the last decade, Information Technology has evolved rapidly. There are many tasks that required a lot of human intervention back then can currently be performed automatically by a machine. The machine learns to find specific patterns from data by itself. Human only provides an algorithm that is suitable for the task. By executing the algorithm, the machine builds several models representing such patterns. The process of building the models are known as Machine Learning, and it is part of a wider area called Artificial Intelligence. The models are then used to perform some specific tasks. Assisted by a computer, a large amount of data can be processed more easily and quickly. A deep analysis can then be carried out upon the outcome to support decision making in a company/organization. To achieve that purpose, this course will discuss the fundamental concept of machine learning and various machine learning techniques/algorithms covering all aspects from data preprocessing to evaluation and analysis. Understanding this course will help students enormously in preparing themselves for more advanced course offered next term, which is Deep Learning and Its Application.</p>
Study and examination requirements and forms of examination	<p>The final grade in the module is composed of 0% performance on midterm exams, 35% final exam, 65% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass</p>
Media employed	<p>LCD, LED Projector, PTZ Camera, whiteboards, and websites.</p>
Assessments and Evaluation	<p>One final exam (100 minutes), short computer-based quizzes, take-home written assignments</p>
Reading List	<ul style="list-style-type: none"> - Mohri, M., Rostamizadeh, A., & Talwalkar, A.. (2018). Foundations of machine learning. (-th). MIT press. ISBN: - Alpaydin, E.. (2020). Introduction to machine learning. (-th). MIT press. ISBN: - Bishop, C. M. (2006). Pattern recognition and machine learning. (-th). springer. ISBN: - Borisov, V., Leemann, T., Seßler, K., Haug, J., Pawelczyk, M., & Kasneci, G.. (2022). Deep neural networks and tabular data: A survey. (-th). IEEE Transactions on Neural Networks and Learning Systems.. ISBN: - Brownlee, Jason.. (2016). Machine learning algorithms from scratch with python. (-th). (n.p.): Machine Learning Mastery. ISBN: - Gopal, M. (2019). Applied machine learning. (-th). McGraw-Hill Education. ISBN: - Gurney, K.. (2018). An introduction to neural networks. (-th). CRC press. ISBN: - Kang, J., Ullah, Z., & Gwak, J. (2021). MRI-based brain tumor classification using ensemble of deep features and machine learning classifiers. (-th). Sensors, 21(6), 2222. ISBN: - Lee, K., Laskin, M., Srinivas, A., & Abbeel, P. (2021).). Sunrise: A simple unified framework for ensemble learning in deep reinforcement learning. (-th). In International Conference on Machine Learning (pp. 6131-6141). PMLR.. ISBN: - Mitchell, Tom M.. (1997). Machine learning. (-th). McGraw Hill. ISBN: - Mohanty, S.N., et al. (2020). Recommender system with machine learning and artificial intelligence: Practical tools and applications in medical, agricultural, and other industries. (-th). John Wiley & Sons. ISBN: - Murphy, K. P. (2022). Probabilistic machine learning: an introduction. (-th). MIT press. ISBN:

	<ul style="list-style-type: none">- Raschka, S., & Mirjalili, V. (2019). Python machine learning: Machine learning and deep learning with Python, scikit-learn, and TensorFlow 2. (-th). Packt Publishing Ltd. ISBN:- Van der Laak, J., Litjens, G., & Ciompi, F.. (2021). Deep learning in histopathology: the path to the clinic. (-th). Nature medicine, 27(5), 775-784. ISBN:
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Deep Learning and Its Applications

Module name	Deep Learning and Its Applications		
Module level	Master		
Code	COMP8044041		
Courses (if applicable)	Deep Learning and Its Applications		
Semester	2		
Contact person	I Gede Putra Kusuma Negara, B.Eng., PhD		
Lecturer	I Gede Putra Kusuma Negara, Lili Ayu Wulandhari, Derwin Suhartono.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation , Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Identify various building blocks of deep learning	-
	CLO-2	Comprehend the importance of deep learning in solving real life problems.	-
	CLO-3	Apply appropriate deep learning architectures for various applications.	-
	CLO-4	Analyze the architectures and performances of deep learning models.	-
	CLO-5	Evaluate the advancements and challenges in deep learning research.	LObj 5.3
	CLO-6	Design new approaches that can improve the deep learning performances.	LObj 5.3

Content	<p>This course introduces the building blocks of deep learning and provides an overview of various deep learning architectures. It also demonstrates how to solve real-world problems using a practical approach. Deep learning has been shown to outperform other machine learning models in a variety of research fields and applications. This course begins with introducing the concept of deep learning and its building blocks. It then addresses some deep learning models and its applications, such as deep learning for computer vision, deep learning with sequential data, generative networks, and modern network architectures in computer vision and text analysis. Through this course, students will explore the application of the deep learning model in solving real-world engineering problems such as computer vision, text analysis, dan audio processing. The students will also be introduced to the latest advancements and research challenges of deep learning. To equip the students with practical experiences, this course is also enriched by hands-on implementations of deep learning models using PyTorch and Jupyter Notebook.</p>
Study and examination requirements and forms of examination	<p>The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass</p>
Media employed	<p>LCD, LED Projector, PTZ Camera, whiteboards, and websites.</p>
Assessments and Evaluation	<p>One final exam (100 minutes), short computer-based quizzes, take-home written assignments</p>
Reading List	<ul style="list-style-type: none"> - Subramanian, V. (2018). Deep Learning with PyTorch. (Firstth). Packt Publishing. ISBN: ISBN 978-1-78862-433. - Pointer, I. (2019). Programming PyTorch for Deep Learning. (1st). O'Reilly Media. ISBN: 978-1-492-04535. - Rao, D., McMahan, B.. (2019). Natural Language Processing with PyTorch. (1st). O'Reilly Media. ISBN: 978-1-491-97823.

Optimization and Computational Intelligence

Module name	Optimization and Computational Intelligence		
Module level	Master		
Code	COMP8045041		
Courses (if applicable)	Optimization and Computational Intelligence		
Semester	2		
Contact person	Dr. Eng. Antoni Wibowo, S.Si., M.Kom., M.Eng		
Lecturer	Derwin Suhartono, Amalia Zahra, Antoni Wibowo, Diaz D. Santika.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: $4 \times 60 = 240$ minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: $4 \times 90 = 360$ minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Modelling of the Optimization Problem.	-
	CLO-2	Apply the tools and techniques of optimization problem and Computational Intelligence	-
	CLO-3	Appraise the Computational intelligence techniques	LObj 5.2
	CLO-4	Analyse and differentiate the Computational Intelligence domain.	-
	CLO-5	Propose Fuzzy Logic model and its implementation	-

Content	This course has two importance parts namely optimization and computation intelligence. The part of optimization introduces the tools and techniques in computer sciences and engineering optimization. The subject introduces the linear programming, simplex methods, duality theory, integer programming, nonlinear programming, and decision analysis. The part of computation intelligence presents an introduction to some of these technological paradigms, under the umbrella of computational intelligence (CI) and extended into some state of the art topics in computational Intelligence. In this context, the course includes artificial neural networks, evolutionary computation, swarm intelligence, artificial immune systems, and fuzzy systems, which are respectively models of the following natural systems: biological neural networks, evolution, swarm behaviour of social organisms, natural immune systems, and human thinking processes.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Andries P. Engelbrecht. (2007). Computational Intelligence An Introduction. (th). John Wiley & Sons. USA. ISBN: 978-0-470-03561-0. - James M. Keller, Derong Liu, David B. Fogel. (2016). Fundamentals of Computational Intelligence. Neural Networks, Fuzzy Systems and Evolutionary Computation. (th). Wiley. ISBN: 978-1-110-21434. - Bansal, Jagdish Chand, Pramod Kumar Singh, and Nikhil R. Pal. (2017). "Evolutionary and Swarm Intelligence Algorithms". (th). Springer. ISBN: 978-3-319-9. - Bernhard, Korte, and J. Vygen. (2008). "Combinatorial optimization: Theory and algorithms.". (3th). Springer. ISBN:. - Frederick S. Hillier and Gerald J. Lieberman. (2010). Introduction to Operations Research. (9th). Mc Graw Hill.. New York. ISBN: 978-0-07-337629. - James D. McCafrey. (2014). Neural Network using c# Succinctly. (th). Syncfusion Publisher. ISBN:. - Roger Jang. (1997). Fuzzy and Soft Computing: A Computational Approach to Learning and Machine Intelligence. (1thth). Prentice Hall Publisher. ISBN: 978-0132610667.

Fundamental of Cyber Security

Module name	Fundamental of Cyber Security		
Module level	Master		
Code	COMP8046041		
Courses (if applicable)	Fundamental of Cyber Security		
Semester	2		
Contact person	Dr.rer.nat. Ditdit Nugeraha Utama, S.Kom, MMSI		
Lecturer	Benfano Soewito, Aditya Kurniawan, Ditdit Nugeraha Utama.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation , Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activites, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Classify web application vulnerabilities	LObj 6.1
	CLO-2	Employ key networking concepts, principles, design issues and techniques at all protocol layers.	LObj 6.1
	CLO-3	Analyze several techniques for facing given vulnerability.	LObj 6.3
	CLO-4	Analyze the Internet architecture, relevant features of TCP/IP protocols, and unique characteristics of Ethernet and Wireless LANs.	LObj 6.3
	CLO-5	Evaluate layered communication architectures (OSI and TCP/IP).	LObj 6.3

	CLO-6	Evaluate defense methods to web systems using the knowledge of cryptography and network security.	-
Content	<p>This course is for IT managers, Network practitioners professional. The course is divided into two parts. In the first part, the course introduces the concept of data communication network such as architecture, structure, functions, components, and models of the Internet and other computer networks. It explains the OSI layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. For a network to function effectively, sound planning, design and management are required. In this course, students will examine the design considerations and management aspects of a data network. The second part of this course is designed to understand computer security through experiment. It shows the educational benefit from computer break-ins through capturing ever-changing penetration line of attack such as botnets, worms, and malware. Students will install a computer system on a network and observe what happens to it, learn which vulnerabilities adversaries are using. The observed methods of operations by these intruders might even be some of which we are unaware. If the system serves no other purpose, then every attempt to contact it seems suspect. If the system is attacked, the students will learn methods of identifying the actors and evaluate their actions that can be of novel techniques. These are further analyzed to exhibit the impact of the incident on the victim organization.</p>		
Study and examination requirements and forms of examination	<p>The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass</p>		
Media employed	<p>LCD, LED Projector, PTZ Camera, whiteboards, and websites.</p>		
Assessments and Evaluation	<p>One final exam (100 minutes), short computer-based quizzes, take-home written assignments</p>		
Reading List	<ul style="list-style-type: none"> - Kurose, J. and Ross, K., (2017). Computer networking: A Top-Down approach. (7th). Pearson. ISBN: 978-0133594140. - Jones, Keith J. Bejtlich, Richard. Rose, Curtis W.. (2006). Real Digital Forensic: Computer Security and Incident Response. (th). Addison Wesley. ISBN:. - Mark Ciampa.. (2013). Security Awareness: Applying Practical Security in Your World. (th). Cengage Learning. ISBN: 13: 978-1111644. - Peter Kim.. (2014). The Hacker Playbook: Practical Guide To Penetration Testing. (th). CreateSpace Independent Publishing Platform. ISBN: 13: 978-1494932. - (0). CCNA Exploration 4.0 Network Fundamentals. (th).. ISBN:. - Atul Kahate. (2013). Cryptography and Network Security. (th). McGraw Hill Education. (India). ISBN:. - Jordan, Ernie & Luke Silcock.. (2005). Beating IT Risks. (th). PA Consulting Group. John Wiley & Sons, Ltd. ISBN:. - Mandia, Kevin. Prosis, Chris. Pepe, Matt.. (2003). Incident Response & Computer Forensics. (th). Mc.Graw-Hill/Osborne. ISBN:. - Oppenheimer, P.. (2011). Top-Down Network Design. (th). Cisco Press. ISBN:. - Peterson, L. and Davie B.,. (2011). Computer networks: A systems approach. (th). Morgan Kaufmann. ISBN: 978-9380501932. 		

	<ul style="list-style-type: none">- Scambray, Joel; Liu, Vincent; Sima, Caleb.. (2011). Hacking Exposed Web Applications: Web Application Security Secrets and Solutions. (th). McGraw-Hill. ISBN: 9780071740647.- Simpson, Michael, Backman, Kent, and Cortey, James. (2013). Hands-on Ethical Hacking and Network Defense. (th). Cengage Learning. ISBN: 13: 978-1133935.- Slay, Jill and Andy Koronios. (2006). Security and Risk Management. (th). John Wiley & Sons, Inc. ISBN:.- Stallings, William. (2006). Cryptography and Network Security. (th). Pearson Education. ISBN:.- Stallings, William.. (2014). Computer Security: Principles and Practice. (3th). Prentice Hall. ISBN:.- Stuttard, D. & Pinto, M. (2011). The Web Application Hacker's Handbook,. (th). IN:Wiley Publishing, Inc. ISBN:.
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Business Intelligence and Analytics

Module name	Business Intelligence and Analytics		
Module level	Master		
Code	COMP8047041		
Courses (if applicable)	Business Intelligence and Analytics		
Semester	2		
Contact person	Dr. Sani Muhamad Isa, S.Si., M.Kom.		
Lecturer	Amalia Zahra, Arief Ramadhan, Sani Muhamad Isa.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Brainstroming, Case Study, Class discussion, Demonstration, Laboratory Experiments , Lecture, Observation , Project Work), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activites, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Explain basic concepts of Data Warehouse, Data Warehouse development, architecture, and business intelligence applications.	LObj 5.1
	CLO-2	Design a dimensional and physical model for data warehouse.	LObj 5.1
	CLO-3	Comprehend ETL strategies	LObj 5.2
	CLO-4	Develop business intelligence applications.	LObj 5.2

Content	The primary focus of this course is on Data Warehousing and its applications to business intelligence. The course will concentrate on topics like: requirements gathering for data warehousing, data warehouse architecture, dimensional model design for data warehousing, physical database design for data warehousing, extracting, transforming, and loading strategies, introduction to business intelligence, design and development of business intelligence applications, expansion and support of a data warehouse.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Kimball, R. (2008). The data warehouse lifecycle toolkit. (th). John Wiley & Sons. ISBN: 978-0470149775. - Eckerson, W. W.. (2010). Performance Dashboards: Measuring, Monitoring, and Managing Your Business. (th). John Wiley & Sons. ISBN:. - Kimball, R., & Ross, M. (2011). The data warehouse toolkit: the complete guide to dimensional modeling. (th). John Wiley & Sons. ISBN: 978-1118082140. - Ramesh. Delen Sharda (Dursun. Turban, Efraim). (2016). Business Intelligence and Analytics: Systems For Decision Support. (th). Prentice Hall. ISBN: 978-0133401936. - Vaisman, A., & Zimányi, E.. (2014). Data Warehouse Systems: Design and Implementation. (th). Springer. ISBN: 978-3-642-54654. - Wilke, C. O.. (2019). Fundamentals of data visualization: a primer on making informative and compelling figures. (th). O'Reilly Media. ISBN: 9781492031086.

Network and Cyber Security

Module name	Network and Cyber Security		
Module level	Master		
Code	CPEN8005041		
Courses (if applicable)	Network and Cyber Security		
Semester	1		
Contact person	Benfano Soewito, M.Sc., Ph.D		
Lecturer	Benfano Soewito, Aditya Kurniawan.		
Language	Bahasa		
Relation to curriculum	compulsory, 1st semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation , Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Apply layered communication architectures (OSI and TCP/IP).	-
	CLO-2	Explain key networking concepts, principles, design issues and techniques at all protocol layers.	-
	CLO-3	Describe the Internet architecture, relevant features of TCP/IP protocols, and unique characteristics of Ethernet and Wireless LANs.	-
	CLO-4	Define exploit techniques out of a given vulnerability.	-
	CLO-5	Identify web application vulnerabilities.	-
	CLO-6	Apply defense methods to web systems using the knowledge of cryptography and network security.	LObj 6.1

Content	<p>This course is for IT managers, Network practitioners professional. The course is divided into two parts. In the first part, the course introduces the concept of data communication network such as architecture, structure, functions, components, and models of the Internet and other computer networks. It explain the OSI layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. For a network to function effectively, sound planning, design and management are required. In this course, students will examine the design considerations and management aspects of a data network. The second part of this course is designed to understand computer security through experiment. It shows the educational benefit from computer break-ins through capturing ever-changing penetration line of attack such as botnets, worms, and malware. Students install a computer system on a network and observe what happens to it, learn which vulnerabilities adversaries are using. The observed methods of operations by these intruders might even be some of which we are unaware. If the system serves no other purpose, then every attempt to contact it seems suspect. If the system is attacked, the students learned methods of identifying the actors and evaluate their actions that can be of novel techniques. These are further analyzed to exhibit the impact of the incident on the victim organization.</p>
Study and examination requirements and forms of examination	<p>The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass</p>
Media employed	<p>LCD, LED Projector, PTZ Camera, whiteboards, and websites.</p>
Assessments and Evaluation	<p>One final exam (100 minutes), short computer-based quizzes, take-home written assignments</p>
Reading List	<ul style="list-style-type: none"> - Kurose, J. and Ross, K., (2017). Computer networking: A Top-Down approach. (7thth). Pearson. ISBN: 978-0133594140. - (0). CCNA Exploration 4.0 Network Fundamentals. (th).. ISBN:. - Barry L. Williams. (2013). Information Security Policy Development for Compliance: ISO/IEC 27001, NIST SP 800-53, HIPAA Standard, PCI DSS V2.0, and AUP V5.0. (th). Taylor and Francis Group. ISBN: 978-1-4665-8058. - Mark Ciampa. (2017). MindTap for Security Awareness: Applying Practical Security in Your World. (th). Cengage Learning. ISBN: 9781305946682. - Peter Kim.. (2014). The Hacker Playbook: Practical Guide To Penetration Testing. (th). CreateSpace Independent Publishing Platform. ISBN: 13: 978-1494932. - Peterson, L. and Davie B.,. (2020). Computer networks: A systems approach. (th). Morgan Kaufmann. Paperback. ISBN: 9780128182000. - Russ White and Denise Donohue. (2014). The Art of Network Architecture. (th). CISCO Pres. ISBN: 10: 1-58714-375. - Simpson, Michael T., and Antill, Nicholas. (2017). Hands-on Ethical Hacking and Network Defense. (th). Cengage Learning. ISBN: 9781285454672. - Stallings, William. (2016). Cryptography and Network Security: Principles and Practice. (th). Pearson Education.. ISBN: 13: 97801344446. - Stallings, William.. (2014). Computer Security: Principles and Practice. (th). Prentice Hall. ISBN: 13: 978-0133773.

	<p>- White, Curt M. (2016). Data Communications and Computer Network: A Business User's Approach.. (7thth). Course Technology.. Boston, Massachusetts. ISBN: 9781305116634.</p>
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Enterprise Network

Module name	Enterprise Network		
Module level	Master		
Code	CPEN8006041		
Courses (if applicable)	Enterprise Network		
Semester	2		
Contact person	Benfano Soewito, M.Sc., Ph.D		
Lecturer	Benfano Soewito, Nico Surantha.		
Language	Bahasa		
Relation to curriculum	compulsory, 2nd semester.		
Type of teaching, contact hours	Graduate programs, TLS (lecturing, role play, demonstration, case study, presentation, observation), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Analyze review of current technical and research literature on a range of networking topics.	-
	CLO-2	Establish an organization's networking needs.	-
	CLO-3	Elaborate a detailed knowledge of emerging network technologies.	-
	CLO-4	Combine detailed skills and knowledge of network design, security and management.	LObj 6.3
	CLO-5	Adapt as a professional practitioner and a creative thinker who is able to contribute to the enterprise organization's networking requirements.	-

Content	For a network to function effectively, sound planning, design and management are required. In this course, students will examine the design considerations and management aspects of a data network. This course is for IT managers, Network practitioners or other professionals, who would like to have a deeper understanding of network design, management, and the associated technologies. Specifically, it is intended for individuals who are preparing for careers in the data network management field, but who do not have prior academic backgrounds in telecommunication studies or technical work experience in the telecommunications field but have some basic knowledge on telecommunications. The basic information presented in this course will enable those individuals to pursue further specialized training in specific technology areas with the eventual goal of qualifying for work as a network management professional.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Oppenheimer, Priscilla. (2013). Top-Down Network Design. 3rd Edition. Cisco Press. Indianapolis. ISBN: 978-1-58705-152-4. - Bongsik Shin (2021). A Practical Introduction to Enterprise Network and Security Management. Auerbach Publications. ISBN 9781032048024. - Nitesh Garg and Atul Sharma. (2021). Enterprise Solution Architecture - Strategy Guide. BPB Publications. ISBN: 9390684579. - Svyatoslav Kotusev. (2018). The Practice of Enterprise Architecture: A Modern Approach to Business and IT Alignment. SK Publishing. ISBN: 978-0648309826. - Russ White and Denise Donohue. (2014). Art of Network Architecture, The: Business-Driven Design (Networking Technology). Cisco Press. Indianapolis. ISBN: 978-1-587143755. - Hummel, S. L. (2015). Cisco Design Fundamentals: Multilayered Network Architecture and Design for Network Engineers. - Bruno, A., & Jordan, S. (2016). CCDA 200-310 Official Cert Guide. Cisco Press. - Bongsik Shin. (2017). A Practical Introduction to Enterprise Network and Security Management. Auerbach Publications. ISBN-10: 1498787975.

IT Research Methodology

Module name	IT Research Methodology		
Module level	Master		
Code	RSCH8079041		
Courses (if applicable)	IT Research Methodology		
Semester	1		
Contact person	Abba Suganda Girsang, ST, MCs, PhD		
Lecturer	Abba Suganda Girsang, I Gede Putra Kusuma Negara, Ditdit Nugeraha Utama, Benfano Soewito, Derwin Suhartono, Antoni Wibowo, Suharjito, Bens Pardamean.		
Language	Bahasa		
Relation to curriculum	compulsory, 1st semester.		
Type of teaching, contact hours	Graduate programs, TLS (Case Study, Demonstration, Lecture, Observation , Presentation, Role Play), 200 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 4 x 60 = 240 minutes (4 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included 3. Private study: 4 x 90 = 360 minutes (6 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	4 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Understand various aspects of research activities	-
	CLO-2	Comprehend the importance of research to solve real life problems	-
	CLO-3	Apply appropriate research methodology to achieve research goals	-
	CLO-4	Analyze the current advancements in the selected research field	-
	CLO-5	Evaluate the merit of the available solutions and discover their research problems	-
	CLO-6	Design new approaches that can solve the research problems	LObj 2.2, LObj 3.2

Content	This course introduces the fundamental concept of how to conduct research. The emphasis is on quantitative research. It begins with getting and developing research idea and writing research proposal, which consist of defining research background, statement of problem, objective of the research, and research scope, conducting literature review, and developing research methodology. This course then covers methods of evaluating research results using statistical tools for data analysis, reporting research results through publication and technical presentation, and familiarizing students with plagiarism and fraud in scientific publications. At the end of this course, the student is expected to be able to propose, plan, and manage all research activities including the formulation of research objectives/hypotheses, research questions, literature review, data collection, data analysis, and research report in general.
Study and examination requirements and forms of examination	The final grade in the module is composed of 0% performance on midterm exams, 40% final exam, 60% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass
Media employed	LCD, LED Projector, PTZ Camera, whiteboards, and websites.
Assessments and Evaluation	One final exam (100 minutes), short computer-based quizzes, take-home written assignments
Reading List	<ul style="list-style-type: none"> - Bordens, K. S., Abbott, B. B. (2013). Research Design and Methods: A Process Approach. (9th). McGraw-Hill Education.. ISBN: 978-007-803545-6. - BINUS Graduate Program. (2017). Pedoman Penulisan Tesis Program Studi Magister Teknik Informatika. (th). Bina Nusantara University.. ISBN:. - Kothari, C.R., Garg, G. (2013). Research Methodology: Methods and Techniques. (3th). New Age.. ISBN: 978-812-243623

Writing Paper & Colloquium Thesis

Module name	Writing Paper & Colloquium Thesis		
Module level	Master		
Code	RSCH8081041		
Courses (if applicable)	Writing Paper & Colloquium Thesis		
Semester	3		
Contact person	Dr. Eng. Antoni Wibowo, S.Si., M.Kom., M.Eng		
Lecturer	Antoni Wibowo, Derwin Suhartono, I Gede Putra Kusuma Negara, Andry Chowanda, Ditdit Nugeraha Utama, Abba Suganda Girsang.		
Language	Bahasa		
Relation to curriculum	compulsory, 3rd semester.		
Type of teaching, contact hours	Graduate programs, TLS (Group Discussion , Lecture, Paper Writing , Presentation), 100 minutes		
Workload	<ol style="list-style-type: none"> 1. Class Hour: 2 x 60 = 120 minutes (2 hours) per week. 2. Structured Activities, e.g. exercises and Assignments: average 90 minutes per week as class exercise or homework, included. 3. Private study: 2 x 90 = 180 minutes (3 hours) per week. 4. GSLC (Forum Discussion through LMS Binusmaya) : 3 time/ semester 		
Credit points	2 credit points		
Requirements according to the examination regulations	A student must have registered for the course.		
Recommended prerequisites	-		
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) = LO	Description	Supported Learning Objective (LObj)
	CLO-1	Applying how to write a general academic paper and publication	LObj 1.2
	CLO-2	Applying concept of scientific research	-
	CLO-3	Capable to writing a good scientific article	-
	CLO-4	Capable how to present the results	-
	CLO-5	Evaluate a general scientific research and publication	LObj 1.2

Content	<p>This course will provide a comprehensive suite of knowledge of writing a scientific article. The main purpose of this course is to help students, scientists, and researcher of the sciences in all disciplines to prepare manuscripts that will have a high probability of being accepted for publication and of being completely understood when they are published. The goal of scientific research is publication and the other hand, the requirements of journals vary widely from discipline to other discipline, therefore, in this course present certain basic principles that are accepted in most disciplines. Data communications and computer networks are becoming increasingly more important and, today's business world could not function without either. Business managers, computer programmers, system designers, and home computer users alike need a thorough understanding of the basic features, operations, and limitations of different types of computer networks. Course in Network Technology introduces concepts that help the student achieve an in-depth understanding of the often complex topic of data communications and computer networks by balancing the more technical aspects and the everyday practical aspects. Some of these topics include: Latest wireless technologies, Switching in LANs, Advanced encryption standards and digital signatures, Compression techniques, Next generation internet (IPv6), Wi-Max wireless Internet service. Some issues relating to Network security, Network Design and Network management is also discussed in this course. It is also important to remember the many older technologies still prevalent use today. Discussions of these older technologies can be provided in this course when appropriate. Some of these topics include: introduction to write and publish paper including how to write title, abstract and keywords, how to write introduction related works, how to prepare research framework, theory background, methods proposed method, how to prepare good results discussion and how to make good conclusion future works, acknowledgement, references citation and supplementary material. In addition, this course also covers how to select and publish to Journal.</p>
Study and examination requirements and forms of examination	<p>The final grade in the module is composed of 0% performance on midterm exams, 0% final exam, 100% take-home assignments, 10% in-class participation. Students must have a final grade of B to pass</p>
Media employed	<p>LCD, LED Projector, PTZ Camera, whiteboards, and websites.</p>
Assessments and Evaluation	<p>One final exam (100 minutes), short computer-based quizzes, take-home written assignments</p>
Reading List	<ul style="list-style-type: none"> - Day A, Robert and Gastel, Barbara.. (2011). How to write and publish a scientific paper. (th). Greenwood. ISBN: 13: 978-0313391972. - Belcher, Laura Wendy.. (2009). Writing your journal article in twelve weeks: A guide to academic publishing success. (th).. ISBN: 13: 978-1412957. - Feibelman J., Peter.. (2011). A PhD is not enough!: A Guide to survival in science. (th).. ISBN: 13: 978-0465022. - Gustavii, B.. (2008). How to write and illustrate a scientific paper.. (th).. ISBN: 9780521703932. - Kate L. Turabian, Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams.. (2013). A manual for writers of research papers, theses, and dissertations. (th).. ISBN: 13: 978-0226823. - Modern Language Association. (2009). MLA Handbook for writers of research papers. (th).. ISBN: 13: 860-1200663.

	<ul style="list-style-type: none">- Schimel, Joshua.. (2011). Writing science: How to write papers that get cited and proposals that get funded. (th). Oxford University Press. ISBN: 13: 978-0199760.- Silvia, Paul. (2014). Write it up: Practical strategies for writing and publishing journal articles (APA Lifetools: Books for the general public).. (th).. ISBN: 13: 978-1433818.
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