



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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## Doctoral Programme of Computer Science

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Module name : **ADVANCE NETWORK SECURITY**

Module level, if applicable : **DOCTORAL**

Code, if applicable : MII7635

Semester(s) in which the module is taught : 1 (Odd)

Person responsible for the module : Anny Kartika Sari, S.Si., M.Sc., Ph.D.

Lecturer(s) : Anny Kartika Sari, S.Si., M.Sc., Ph.D., Dr.techn. Ahmad Ashari, M.Kom., Dr.-Ing. Reza Pulungan, M.Sc.

Language : Indonesia

Relation to curriculum : Doctorate, Elective course

Credit points : 3 credits

Type of teaching, contact hours : Doctorate: lectures for < 5 students. Contact hours are lecture hours.

Workload : (1) Lectures and discussion: 3 x 50 = 150 minutes (2.5 hours) per week. (2) Assignments: 5 x 60 = 300 minutes (5 hours) per week. (3) Independent study: 6 x 60 = 360 minutes (6 hours) per week.

Requirements according to the examination regulations : A student must have attended at least 75% of the lectures to sit in the exams.

Recommended prerequisite : -

Module objectives/ intended learning outcomes : After completing this course, students are expected to be able to:

CO1: Analyse the research development of a specific field of interest in network security, including cryptographic protocol, attack and penetration on computer network and wireless network, cybersecurity, digital forensic.

CO2: Write a short review paper related to network security with an emphasis on a specific field of interest.

CO3: Create a new research plan in the field of network security with an adequate novelty.

Content	: Cryptographic protocol, attack and penetration on computer network, security on wireless network, cybersecurity, digital forensic, research trend on network security.
Study and examination requirements and forms of examination	: Evaluation is done in 2 forms, namely: 1. A short review paper on the state-of-the-art of network security. 2. A new research plan in the field of network security.
Media employed	: LCD, books, websites.
Reading List	1. William Stallings, <i>Network Security Essentials: Applications and Standards</i> (6 <sup>th</sup> Ed.), Prentice Hall, 2016. 2. Charles P. Pflieger and Shari Lawrence Pflieger, <i>Security in Computing</i> (5 <sup>th</sup> Ed.), Prentice Hall, 2018. 3. William Stallings, <i>Cryptography and Network Security</i> , 7 <sup>th</sup> Ed., Prentice Hall, 2017.

#### The Mapping of COs to PLOs

COs	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1								
CO2								
CO3								

#### The PLO of DP-CS

PLO	Knowledge Area	PLO Description
<b>PLO1</b>	[Values and principles]	A graduate should be devoted to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working around expertise independently.
<b>Managerial Capability</b>		
<b>PLO2</b>	[Professional attitudes]	A graduate should have good interpersonal skills; able to work together within the organization, both as a leader and a member; able to be the initiator; able to manage and delegate tasks; and have a sense of responsibility for their own work as well as take responsibility for the achievement of the organization's work.
<b>PLO3</b>	[Communication skills]	A graduate should be able to communicate effectively and efficiently with stakeholders from various backgrounds; use English well; and able to write and present scientific papers correctly and well.
<b>PLO4</b>	[Life-long learning]	A graduate should be up to date with the state-of-the-art especially in computer science field, able to take parts in the development of computer science field that is engaged in and relate it to other fields throughout life.

<b>Working Capability</b>		
<b>PLO5</b>	[Problem-solving and Scientific skills]	A graduate should be able to analyse science and technology problems in the computer science field, develop alternative solutions through intra disciplinary, interdisciplinary, and trans disciplinary approaches to produce innovative, original, and tested works.
<b>PLO6</b>	[Ability to formulate and do research]	A graduate should be able to formulate research problems through critical, exploratory, and innovative studies both independently and in groups of computer science field that is engaged in and present research results in a scientific paper at regional or international level.
<b>Mastering Knowledge</b>		
<b>PLO7</b>	[Fundamental knowledge]	A graduate should be able to develop knowledge in the field of computer science that is engaged, which includes abstraction, complexity, evolution and philosophy of changes or developments in the field of science.
<b>PLO8</b>	[Applied knowledge]	A graduate should be able to develop theoretical, philosophical, and applied concepts in the field of computer science that is engaged in, and to represent them in a structured and systematic manner.