UNDERGRADUATE PROGRAM IN COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE AND ELECTRONICS
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS GADJAH MADA

Module name	**Parallel Systems and Programming**	
Module level	Undergraduate	
Code	MII - 4217	
Courses (if applicable)	Parallel Systems and Programming	
Semester	Spring (Genap)	
Contact person	Lukman Heryawan, ST,MT	
Lecturer	Lukman Heryawan, ST,MT	
Language	Bahasa Indonesia	
Relation to curriculum	1. Undergraduate degree program, elective, 4th or 6th semester. 2. International undergraduate program, elective, 4th or 6th semester.	
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 30 students.	
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Exercises and Assignments: 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 75% of the lectures to sit in the exams.	
Recommended prerequisites	Analysis of Algorithms and Complexity	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	LO1 Students are able to know and understand the concepts and terminology of parallel systems and applications in the real world.	**PLO3**
	LO2 Students are able to know and understand the terms of the parallel computing architecture of computers in general.	**PLO3**

	LO3 Students are able to know and understand the architecture of the parallel computer memory.	**PLO3**
	LO4 Students are able to know and understand the parallel programming model and implementation.	**PLO4**
	LO5 Students are able to know and understand the design of parallel programs that involve multiple distributed variables such as data dependencies, synchronization, load balancing, and granularity.	**PLO5**
	LO6 Students are able to independently for further study (self-development) and to think logically and analytically to solve problems encountered in a professional manner, especially in the area of parallel programming.	**PLO6**
	LO7 Become capable and competent to solve a problem with the parallel programming.	**PLO5**
Content	This lecture begins with a brief overview, including concepts and terminology associated with parallel computing systems. Topics of parallel memory architectures and parallel programming model was explored. This topic is followed by a discussion on a number of issues related to the design of parallel programs. The lecture concludes with some examples on how to parallelize simple sequential program.	
Study and examination requirements and forms of examination	1. Exercises. 2. Mid-term examination. 3. Final examination.	
Media employed	LCD, whiteboard, handouts, and websites.	
Assessments and Evaluation	**LO1**: Problem 1 in midterm (10%), and exercise 1 (5%). **LO2**: Problem 2 & 3 in midterm (10%), and exercise 2 (5%). **LO3**: Problem 4 in midterm (5%), and problem 1 in final exam (10%). **LO4**: Problem 2 in final exam (10%), and exercise 5 (5%). **LO5**: Problem 3 in final exam (7.5%), exercise 6 (2.5%), and exercise 7 (5%). **LO6**: Problem 4 in final exam (7.5%), and exercise 8 (2.5%). **LO7**: Problem 5 & 6 in final exam (10%), and exercise 9 (5%).	
Reading List	**W1**: Ivo Adan and Jacques Resing, Queueing Systems,	

	Eindhoven University of Technology, 2015. **W2**: Albrecth, M.C., and Az, P.E., Introduction to Discrete Event Simulation, 2010. **A1**: Law, A.M., and Kelton, W.D., Simulation Modeling and Analysis, 2nd Edition, McGraw-Hill, 1991.