MODULE HANDBOOK

Course:	**Controlling System**
Module Level:	Undergraduate
Code:	FIE308
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	6th / Third Year
Module Coordinator:	Dr. Riries Rulaningtyas, S.T, M.T.
Lecturer(s):	Dr. Riries Rulaningtyas, S.T, M.T. and Drs. Tri Anggono
Language:	Bahasa Indonesia
Classification within the Curriculum:	~~Compulsory Course~~ / Elective Course
Teaching format / class hours per week during semester:	2 hours of lectures (50 min / hour)
Workload:	2 hours of lectures, 2 hours of structural activities, 2 hours of individual study, 13 weeks per semester, and total of 78 hours per semester ~ 2.6 ECTS*
Credit Points:	2
Requirement(s):	(FIT 201) Mathematical Physics I and (FIT 202) Mathematical Physics II
Learning Goals/Competencies:	**General Competence (Knowledge):** Students able to understand the principles of controlling technique and it application. **Specific Competence:** 1. The ability to explain controlling system element 2. The ability to explain controlling system and its principles. 3. The ability to derivate mathematic model of physical system 4. The ability to clarify and also make block diagram system 5. The ability to explain controlling system basic and its application 6. The abbility to make transient response analysis of controlling system. 7. The ability to explain stability criteria. 8. The ability to explain error analysis. 9. The ability to explain root locus method. 10. The ability to set controlling system design.

Contents:	This course is consist of general controlling system topics including **Introduction:** controlling system basic philosophy and principles; **Mathematic model of physical system:** derivate transfer function of physical system, linearization non linear mathematic model; **Block diagram system :** Open and closed loop of control system block diagram, multivariable system, transfer matrix, and signal flow graph; **Controlling system basic:** Proportional controller, integral controller, differential controller, PID control, PID tuning, industrial automatic control, control system dynamics, complex control system; **Transient response analysis:** Impuls response function, first order system, second order system, high order system; **Error analysis:** Static and dynamic error, error criteria; **Root locus technique:** Root locus diagram, root locus sketch, control system analysis with root locus method, control system design with root locus technique; **Industrial control:** PLC, DCS, SCADA.
Soft Skill Attribute:	Effort and ethic
Study/Exam Achievements:	Student are considered competent and eligible to pass the course upon obtaining at least 40 of maximum score for the exams (midterm test and final exam) and structured activity. Final score is calculated as follow: ▪ 20% assignment : ▪ essay ▪ make papers ▪ 10% soft skill : ▪ from presentation : communication, leadership, team work ▪ discipline ▪ 35% midterm exam ▪ essay ▪ 35% final exam ▪ essay Final grade is defined as follow: A : 75 - 100 AB : 70 - 74.99 B : 65 - 69.99 BC : 60 - 64.99 C : 55 - 59.99 D : 40 - 54.99 E : 0 - 39.99
Forms of Media:	Powerpoint Slides, LCD projectors and whiteboards
Learning Methods:	Concept based learning with lecture , assessments , and group discussion

Literature(s):	1. Jacob, F. *Handbook Of Modern Sensors, Physics, Designs, And Aplications*, Advanced Monitors Coorporation, San Diego, California, 2003 2. Ogata, K. 1995, *Teknik Kontrol Automatik (Sistem Pengaturan)*, Penerbit Erlangga, Jakarta 3. Gunterus, F. 1994*Falsafah Dasar Sistem Pengendalian Proses*, PT Elex Media Komputindo, Jakarta. 4. Smith, C.A. *1985. Principles And Practice Of Automatic Procec Control*, John Wiley & Sons. 5. Doebelin, E.O., 1990. *Measurement Sytems Application and Design 4th ed*, McGraw – Hill Publishing Company, Singapore. 6. Nise, N. S. 1995, *Control Sistem Engineering 2nd ed*, Addison – Wesley Publishing Company, United State. 7. Schiff, Joel L., *The Laplace Transform, Theory And Aplications*, Springer-verlag, New York, 1999
Notes:	*Total ECTS = {(total hours workload × 50 min) / 25 hours Each ECTS is equals with 25 hours.