



MODULE HANDBOOK DESCRIPTION

Module designation	Control System	
Code	FBS3139	
Semester(s) in which the module is taught	5 / third year	
Person responsible for the module	Dr. Ir. I Ketut Wiryajati,ST.,MT.,IPU.,ASEAN.Eng.	
Language	Indonesian	
Relation to curriculum	Compulsory	
Teaching methods	Lecture, small group discussion, case base method.	
Workload (incl. contact hours, self-study hours)	<p>Contact minutes every week, each week of the 16 weeks/semester :</p> <ul style="list-style-type: none"> • Lectures: 3 x 50 minutes • Exercises and Assignments: 3 x 60 minutes • Self-study: 3 x 60 minutes. <p>Total study hours = 8 hours 30 minutes/week</p>	
Credit points	3 (~ 4,8 ECTS)	
Required and recommended prerequisites for joining the module	- Signal and System (FBS2229)	
Module objectives/intended learning outcomes	1. Students are able to design mathematical model of various system	PLO2
	2. Students are able to develop block diagram	
	3. Students are able to analyse transient responses 4. Students are able to analyse system stability 5. Students are able to design control systems with root locus 6. Students are able to use Bode plots to determine stability 7. Students are able to get stability and gain and phase margins using Nyquist diagrams	PLO2 and PLO3
	8. Students are able to apply PID control	PLO4
Content	System modelling, transient response analysis, root locus control system design, bode plot to determine stability, frequency response analysis (Nyquist diagram) and PID control application.	

Examination forms	<ul style="list-style-type: none"> - Homework, - Written case study, - Midterm and final test.
Study and examination requirements	<p>The final grade in the module is composed of:</p> <ul style="list-style-type: none"> a. Exercise Report/ Homework/Portofolio: 15% b. Case I assessment: 20% c. Case II assessment: 15% d. Case III assessment: 20% e. Midterm assessment: 15% f. Final assessment: 15% <p>Students must have a final grade of 65% or higher to pass</p>
Reading list	<ol style="list-style-type: none"> 1. Ogata, K., 2010, Modern Control Engineering (Fifth Edition), Prentice Hall, USA. 2. Hussein, A. M., 2019, "Lecturer note: Block Diagram; Signal Flow Graph; State Variables; Modelling physical systems; Transient Response; Steady State Error; Stability Analysis; Root Locus; Design by Root Locus; Bode Plots; Nyquist Analysis", Benha University, Faculty of Engineering at Shubra, available on: https://bu.edu.eg/staff/ahmedhussein3-courses/15061/files. 3. Articles from the last 5 years journal on system modeling and control.