YOGYAKARTA STATE UNIVERSITY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES

SYLLABI

FRM/FMIPA/063-00
1 April 2010

Faculty : Mathematics and Natural Sciences
Study Program : Physics and Physics Education
Course / Code : Analog Electronics/FIS 313
Credit : Theory: 3 SKS Practice: 1 sks
Semester : 3th (physics & physics education study program)
Prerequisite/Code : Electricity Circuit Analysis/FIS 211
Lecturer : Pujianto, M.Pd.

I. Course Description
This course studies concept and the principle of analog electrostatics such as direct current circuit, alternating current circuit, semiconductor, semiconductor diode, rectifying circuit, concept of amplification, bipolar transistor amplifiers, field effect amplifiers and their application in daily life.

II. Standard of Competence
After conducting this course, the students can understand analog electronics concepts and has ability to aply in the daily life.

III. Activity

Mee-ting#	Basic Competence	Essentials Concept	Learning Strategy	Learning Materials/ Referrences	Character
1st	Introduction	• Sillaby • Course Contract	Discussion and information	Sillaby	responsible
2nd	To understand the principle of analog electronics	• Semiconductor • Diodes • Junction Diodes	Discussion and information	A1, A2	Confident complying, appreciating
3th	To understand the characteristics of semiconductor	• Intrinsic Semiconductor • Extrinsic Semiconductor • N-type Semiconductor • P-type Semiconductor	Discussion and information	A1, A2, B2	Responsible, thinking logically, creatively, inovatively,
4th, 5th,6th	Junction Diodes	• N-type material • P-type material • PN Junction	Discussion and information	A1, A2,B3	Responsible, thinking logically,

		• Forwarded-Biased Junction • Reverse-Biased Junction			creatively, inovatively,
7 th,8 th	Rectifying Circuits and DC Power Supplies (1st)	• Load Line Analysis of Diode Circuit • The Half-wave Rectifier • Voltage Regulation • Ripple Factor • Ratio of Rectifications • TUF	Discussion and information	A1, A2	Responsible, thinking logically, creatively, inovatively
9th	Mid Term				
10 th	Rectifying Circuits and DC Power Supplies (2nd)	• The Full-wave Rectifier • The Bridge Rectifier • Comparison of Rectifier Circuits	Discussion and information	A1, A2,B2	Responsible, thinking logically, creatively, inovatively appreciating
11 th	Zener Diodes	• Zener Diode Specifications • The Voltage Regulator Circuit • Design of Voltage Regulator Circuit • Effect of Supply Voltage Variations • Zener Diode Breakdown Mechanism • Reference Zener Diode	Discussion and information	A1,A2, B1, B3	Responsible, thinking logically, creatively, inovatively appreciating
12th	General Amplifier Characteristics	• Concept of Amplification • Amplifier Notation • Current Gain, A_i • Voltage Gain, A_v • Power Gain, A_p	Discussion and information	A1, A2, B3	Responsible, thinking logically, creatively, inovatively, dicipline,

		• Amplifier Input Resistance, R_i • Amplifier Output Resistance, R_o			curious
13th, 14th	Bipolar Transistor Amplifier	• Basic characteristics of the Transistor • Basic Transistor Amplifier • Transistor Input Characteristics • Transistor Collector Characteristics, CE • Collector Cutoff Current, I_{CEO} • Forward Current Tranfer Ratio, CE	Discussion and information	A, B1, B2	Responsible, thinking logically, creatively, inovatively, dicipline, curious
15th	The Common-Base Amplifier and The Common-Emitter Amplifier	• The Basic Common-Base Amplifier • Forward Current Tranfer Ratio, CB • Relation Between α and β • Analysis of the Common-Base Amplifier • Power Relationships • Efficiency • Graphical Analysis of a Common-Emmiter Class A Amplifier • Input and Output Resistance • Effect of Adding an AC Load • Phase Relationships in a CE Amplifier	Discussion and information	A1, A2,B3	Responsible, thinking logically, creatively, inovatively, dicipline, curious
16th	Field Effect Transistors	• Advantages and Disadvantages of the FET		A1, A2	

		• Basic Construction of the JFET • Characteristic Curves of the JFET • Principle of Operation of the JFET • Frequency Response of the FET Amplifier			

IV. Referrences

A, Compulsory:

1. Mottershead, A., 1981. Electronic Device and Circuits, An Introduction. New Delhi : Prenice Hall of India.
2. Sutrisno, 1986. *Elektronika Teori dan Penerapannya 1*. Bandung : Penerbit ITB.

B. Additional:

1. Milman, J. & Halkias, C.C., (1971), *IntegratedElectronics*, New York : McGraw Hill Inc.

2. Mehta, V.K., (1997), *Principles of Electronics*, New Delhi : S. Chand & Company LTD.

3. Brophy, J.J., (1983), *Basic Electronics for Scientists*, New York : McGraw Hill Book Company.

V. Evaluation

No	Componen	Worth
1	Participation	10 %
2	Assignment	30 %
3	Midterm Exam	30%
4	Final Exam	30%
		100%

Yogyakarta, August 16th , 2010

Pujianto, M.Pd.