



DEPARTMENT OF INSTRUMENTATION AND CONTROL ENGINEERING

Course Code : IC1051
Course Title : ELECTRONICS AND INSTRUMENTATION
Year& Semester : II year, 3 semester
Course Duration : ODD Semester (Dec-May 2014)
Location : Tech Park

Faculty Details:

Name of the staff	Section	Office	Office Hours	Mail ID
Mr.Dominic Savio	Mech A&F	Tech Park	8:30-16:00	dominicsavio.a@ktr.srmuniv.ac.in
Mr.Senthil Murugan	Mech B	Tech Park	8:30-16:00	senthilmurugan.s@ktr.srmuniv.ac.in
Ms.S.Saranyaa	Mech C&D	Tech Park	8:30-16:00	Saranyaa.s@ktr.srmuniv.ac.in
Mr.Nurmesh Bhartiya	Mech E	Tech Park	8:30-16:00	nurmeshbhartiya.c@ktr.srmuniv.ac.in

Required Text Books:

- Sawhney, A. K., *A Course in Electrical and Electronic Measurement and Instrumentation*, Dhanpat Rai & Sons, New Delhi, 1999
- V.K, Mehta., and Rohit Metha, *Principles of Electronics*, S.chand & Company Ltd., First Edition, 1980
- Millman, and Halkias, *Electronic devices and Circuits*, Tata McGraw Hill International Edition, 1994
- Mithal, G. K., *Electronic Devices and Circuits*, Khanna Publishers, New Delhi, 1999

Required Reference Books:

- Stout .M. B., *Basic Electrical Measurements*, Prentice Hall of India, New Delhi, Salivahanan, S., Sureshkumar, N., and Vallavaraj, A., *Electronic Devices and Circuits*, Tata McGraw - Hill, New Delhi, 1998

- Sze, S. M., *Semiconductor Devices - Physics and Technology*, 2nd Edition, John Wiley & Sons, New York, 2002
- Ben G. Streetman and Sanjay Banerjee, *Solid State Electronic Devices*, Pearson Education, 2000
- Ernest O. Doebelin, *Measurement Systems - Application and Design*, Tata McGraw-Hill, New Delhi, 2004
- B.M. Oliver and J.M.Gage, *Electronic Measurements and Instrumentation*, McGraw Hill 1977.

Prerequisite: -

Objective:

1. To study the basics of Electronics
2. To study the Characteristics of Semiconductor action and Transistor
3. To study the application of Semiconductor Devices like UJT, MOSFET, SCR, UJT
4. To study the Basic of Measurement
5. To study the use of Primary sensing element and Signal Conditioning Unit

Tentative test details and portions:

Cycle Test - I: Unit I &II

Cycle Test –II: Unit III & IV

Model Exam: All five units

Assessment details

Cycle test-I	10
Cycle test –II	10
Model Examination	20
Surprise test	5
Attendance	5
Total	50

Outcomes

Students who have successfully completed this course

Course outcome	Program outcome
Familiarize the basics electronics instruments and interfacing devices	To understand basics electronics, instrumentation techniques, and working principles of different types of instruments
Discuss the different types of	

instrumentation process for different applications	To use Instruments for different applications
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Detailed Session Plan

Day	Name of the topics	Reference
DAY 1	UNIT1: Semiconductor diode	Millman, and Halkias
DAY 2	Crystal diode as a rectifier, Equivalent circuit of a Crystal Diode	Millman, and Halkias
DAY 3	Half Wave Rectifier - Efficiency of Half Wave Rectifier	Millman, and Halkias
DAY 4	Full wave Rectifier - Center tap Full Wave Rectifier	Millman, and Halkias
DAY 5	Full Wave Bridge Rectifier Efficiency of Full Wave Rectifier	Millman, and Halkias
DAY 6	Zener Diode - Equivalent Circuit of Zener Diode	Millman, and Halkias
DAY 7	Zener Diode as Voltage Stabilizer	Millman, and Halkias
DAY 8	Surprise I	Millman, and Halkias
DAY 9	Unit II: Transistor Symbols - Transistor as an Amplifier	Millman, and Halkias
DAY 10	CB, CE, &CC	Millman, and Halkias
DAY 11	Characteristics - Comparison of Transistor Connection	Millman, and Halkias
DAY 12	Transistor as an Amplifier in CE arrangement	Millman, and Halkias
DAY 13	Transistors Load Line analysis, Operating Point	Millman, and Halkias
DAY 14	CE Circuit - Performance of Transistor Amplifier	Millman, and Halkias
DAY 15	Cut Off and Saturation points	Millman, and Halkias
DAY 16	Transistor biasing: Methods of transistor Biasing	Millman, and Halkias
DAY 17	Base resistor method - Biasing with feedback resistor	Millman, and Halkias
DAY 18	Voltage divider bias method	Millman, and Halkias
DAY 19	Unit III: Types of Field Effect Transistor	Millman, and Halkias
DAY 20	JFET - Working Principles of JFET	Millman, and Halkias
DAY 21	JFET as an Amplifier and its Output Characteristics	Millman, and Halkias
DAY 22	JFET Applications - MOSFET Working Principles	Millman, and Halkias
DAY 23	SCR - Equivalent Circuit and V-I Characteristics.	Millman, and Halkias
DAY 24	SCR as a Half wave and full wave rectifier - Application of SCR	Millman, and Halkias
DAY 25	Triac and Diac characteristics and its applications	Millman, and Halkias
DAY 26	UJT - Equivalent Circuit of a UJT and its Characteristics.	Millman, and Halkias
DAY 27	Surprise Test II	Millman, and Halkias
DAY 28	Unit IV: Measurements and its Significance	V.K, Mehta., and Rohit Metha
DAY 29	Methods of Measurements, Classification of Instruments and application	V.K, Mehta., and Rohit Metha

DAY 30	Elements of a Generalized Measurement System	V.K, Mehta., and Rohit Metha
DAY 31	Static and Dynamic Characteristics of an Instruments	V.K, Mehta., and Rohit Metha
DAY 32	Errors in Measurement Systems	V.K, Mehta., and Rohit Metha
DAY 33	Units, System Dimension	V.K, Mehta., and Rohit Metha
DAY 34	Standards	V.K, Mehta., and Rohit Metha
DAY 35	Surprise Test III	V.K, Mehta., and Rohit Metha
DAY 36	Unit V: Introduction - Transducers - Advantage of Electric Transducers	V.K, Mehta., and Rohit Metha
DAY 37	Classification Based upon Principle of Transduction	V.K, Mehta., and Rohit Metha
DAY 38	, Primary and Secondary transducer	V.K, Mehta., and Rohit Metha
DAY 39	Passive and Active transducers, Analog and Digital transducers	V.K, Mehta., and Rohit Metha
DAY 40	Transducers and inverse transducers and examples for each.	V.K, Mehta., and Rohit Metha
DAY 41	Characteristics and Choice of transducers, Input, Transfer and output Characteristics and its application.	V.K, Mehta., and Rohit Metha
DAY 42	Operational Amplifier, Characteristics of Operational Amplifier	V.K, Mehta., and Rohit Metha
DAY 43	Attenuator, Amplitude Modulation and Demodulation	V.K, Mehta., and Rohit Metha
DAY 44	Basic Filters, Simple A/D Converters.	V.K, Mehta., and Rohit Metha
DAY 45	Revision	V.K, Mehta., and Rohit Metha