RKUNIVERSITY

SYLLABUS

Course Title	**Electronic Devices and Circuits - II**
Course Code	**EC405**
Course Credit	Theory : 03
	Practical : 01
	Tutorial : 00
	Credits : 04

Course Learning Outcomes

After the completion of the course students will be able to

- **Understand** the basic of signal conversion process.
- **Compare** various logic circuits for IC development.
- **Implement** and **Perform** experimental analysis of various electronic circuits
- **Design** multistage amplifier circuit and **Analyze** frequency response of multistage amplifier.
- **Evaluate** behavior of transistor at high frequency.
- **Analyze** the stability behavior of various feedback amplifier circuits.
- **Test** mutivibrators and signal generator circuits.

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	Section – I	
1	**Multistage Amplifiers:** Classification of amplifiers, distortions in amplifiers, frequency response of an amplifier, cascade mechanism, overall gain of cascaded amplifiers, direct coupled, RC coupled and transformer coupled amplifiers and its frequency response.	**09**
2	**The Transistor at high Frequency:** The hybrid –pi (Π) common- emitter transistor model, Hybrid- Π conductance, Hybrid- Π capacitances, validity of hybrid Π model, the CE short circuit	**06**

	current gain, current gain with resistive load, the gain bandwidth product, Emitter Follower at high frequency	
3	**Overview of Logic Families:** Classification of IC based on circuit complexity and devices used, characteristics of digital IC, current sources and current sinking, Diode transistor logic (DTL), High threshold logic (HTL), Transistor Transistor logic (TTL), Resistor transistor logic (RTL), Direct coupled transistor logic, comparison of logic families.	**05**
	Section – II	
5	**Feedback Amplifiers:** Feedback concept, types of feedback, characteristics, input and output impedance of negative feedback amplifier, various analysis methods for feedback amplifier, Stability of feedback amplifiers, practical implementation.	**10**
6	**Waveform generators:** Need of waveform generators, concept of positive feedback and Barkhasuen criteria, waveform generators: Hartley, colpitts, wein bridge, RC phase shift, crystal, astable, monostable and bistable multivibrators, Schmitt trigger circuit	**06**
7	**Data Converters:** Introduction to data converters, classification of data converters, Digital to Analog conversion, Binary weighted resistor DAC, R- 2R ladder DAC comparison of various DAC, Analog to Digital Conversion, Flash type ADC, Sigma delta ADC,Successive Approximation ADC, comparison of various ADC	**05**

Instructional Method and Pedagogy:

- Lectures will be conducted with the aid of multi-media projector, blackboard, OHP etc. Assignments based on course contents will be given to the students at the end of each unit/topic and will be evaluated at regular interval
- Minimum ten experiments shall be there in the laboratory related to course contents

Reference Books:

1. Jacob Millman and Christos C. Halkias, “Integrated Electronics”, Tata McGraw Hill Publication, 2nd edition, ISBN-10: 0-07-015142-3
2. Robert L. Boylestad and Louis Nashelsky , "Electronic Devices and Circuit Theory" , 9th Edition - Pearson Education , International Edition, ISBN 978-81-317-2529-0.
3. Floyd ,” Electronics Devices ” Pearson Publication , 7TH edition, ISBN-20-978-81-778643-5.
4. Ben G. Streetman and Sanjay Kumar Banerjee. "Solid State Electronic Devices", 6th Edition, Pearson Education, ISBN-0133356035.
5. A.P. Malvino, “Electronics Principles”Tata McGraw Hill Publication, 6th edition, ISBN-0-07-463728-2.

Additional Resources

- http://www.nptel.ac.in/courses/Webcourse-contents/IIT-ROORKEE/BASIC-ELECTRONICS/home_page.htm
- http://nptel.ac.in/courses/117107094/21
- http://nptel.ac.in/courses/117103064/22
- http://www.allaboutcircuits.com/vol_6/chpt_5/13.html

LIST OF EXPERIMENT

Sr. No.	Name of experiment
1	To **design** and **perform** Single Stage CE Amplifier and analyze its Frequency Response
2	To **design** and **perform** two Stage R-C Coupled Amplifier and analyze its Frequency Response
3	To **perform** cascode operation using CE configuration.
4	To **perform** and **Measure** h-parameter of CE amplifier.
5	To **design** and **perform** Phase Shift Oscillator.
6	To **design** and **perform** Colpitts Oscillator.
7	To **design** and **perform** wein bridge Oscillator.
8	To **design** and **perform** Hartley Oscillator.
9	To **perform** VTC(voltage transfer characteristic)of TTL and CMOS digital Logic Family ICs.
10	To **perform** Astable multivibrator.
11	To **perform** Bistable multivibrators.
12	To **perform** Monostable mutivibrators.
13	To **perform** Schmitt trigger circuit.
14	To **identify** appropriate application and develop Project.