Academic-UG Section
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105(444)/DTU/Acad-UG/2018-19/8410-17 Dated: 20/7/20

NOTIFICATION

Subject : Minor Amendments in syllabus of EC-201, EC-251/CEC-105 subjects of B.Tech (ECE).

The academic council in its 23rd meeting held on 15.05.2020 has approved the syllabus revision of EC-201, EC-251/CEC-105 as proposed by Department of Electronics & Communication Engineering. The revised syllabi for these subjects are given below and the same will be applicable from AY 20120-21:

EC-201Analog Electronics-I

S.No	Contents	Contact Hours
1.	Review of semiconductor physics, p-n Junction diode: Physical operation, I-V characteristic and diode equation, Large-signal model, Concept of load line, p-n junction capacitances (depletion and diffusion), small signal (low and high frequency) model, Breakdown in p-n diodes, Zener diode.	8
2.	Diode Applications: Rectifier circuits, Zener diode based voltage regulators, limiting and clamping circuits, voltage multipliers, switching behaviour of p-n diode, SPICE model of p-n diode, an example of p-n diode data sheet.	6
3.	Bipolar Junction Transistor(BJT): Physical structure and modes of operation, BJT current components, The Ebers-Moll model, BJT characteristics, and large-signal equivalent circuit, BJT Biasing for Discrete-Circuit Design, BJT small-signal equivalent, Basic single- stage BJT amplifier configurations, BJT as a switch, SPICE BJT model and simulation examples.	11
4.	Metal oxide semiconductor Field Effect Transistors MOSFET: Physical structure and V-I characteristics of Enhancement/Depletion- type MOSFETs (n/p-channel), Biasing in MOS amplifier circuits, Small signal equivalent circuit of MOSFET, Basic configurations of single-stage MOS amplifier circuits, MOSFET as an analog switch, SPICE MOSFET models and simulation examples. The Junction Field Effect Transistor (JFET): Physical structure, drain and transfer characteristics, SPICE JFET model and simulation examples.	12
5.	Multistage Amplifiers: Analysis of multistage amplifier using BJT and MOSFETs, Significance of coupling and bypass capacitor, types of coupling: DC, RC and Transformer. BJT and MOS based constant current sources.	5
	TOTAL	42

EC-251/CEC-105 Basic electronics and instrumentation

S. No.	Contents	Contact Hours
1	**Introduction to semiconductor physics:** Active and Passive devices Classification of materials (conductors, insulators and semiconductors) intrinsic and extrinsic semiconductor, drift and diffusion currents, **p-n junction diode:** physical operation, diode current equation and I-V characteristics and piecewise linear model, concept of load line, breakdown in p-n diode, Zener diode **Diode Applications:** Rectifier, Zener regulators,	8
2	**Bipolar Junction Transistor:** Physical structure and modes of operation. BJT current components, BJT characteristics, small signal equivalent ,basic single-stage BJT amplifiers (CE,CB,CC) and frequency response of an RC coupled amplifier. JFET	10
3	**Feedback:** Concept of negative feedback, merits and demerits of negative feedback, Concept of positive feedback and principle of oscillation. **Operational Amplifier and basic applications.** **Operation Amplifiers:** Ideal characteristics, **Basic applications**: Inverting and non-inverting amplifier, Integrator, Differentiator, Voltage follower, Summing and Difference Circuits.	7
4	**Introduction to Digital Circuits:** Boolean Algebra, Logical gates, minimization of switching function, Karnaugh map method, Binary adder, subtractor, multiplexer and decoder, Flip-flops, counters, Shift registers	10
5	**Electronic Instrumentation And Measurements:** Transducer, strain gauges, inductive & capacitive transducers, piezoelectric and Hall-effect transducers, thermistors, thermocouples, photo-diodes & photo-transistors, **Signal conditioning and telemetry** Electronic voltmeter, multimeter, time, frequency and phase angle measurement using CRO, Digital voltmeter, and storage oscilloscope.	7
	Total	42

(Prof. Madhusudan Singh)
Dean Academic (UG)

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(Prof. Rajeshwari Pandey)
Associate Dean Academic (UG)