VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY
JNANASAGARA CAMPUS, BALLARI-583105

Department of Studies in

Electronics

III & IV Semester Syllabus

Bachelor of Science

With effect from 2021-22 Batch and onwards

Name of the Department: Electronics

Semester-III

DSC 3: Oscillations and OP-Amps

Course Title: Oscillations and OP-Amps	**Course code: :** 21BSC3C3ELL
Total Contact Hours: 55	**Course Credits: 04**
Internal Assessment Marks: 40 marks	**Duration of SEE: 03 hours**
Semester End Examination Marks: 60 marks	

Course Outcomes (CO's):

At the end of the course, students will be able to:

1. Advance Knowledge Of Wave Shaping Circuits.
2. Design different Types Of Oscillators.
3. Explain Basics Of Operational Amplifier.
4. Explain Operational amplifier applications and different Computation.

DSC 3: Oscillations and OP-Amps

Unit	Description	Hours
1	**Wave Shaping Circuits** : Introduction to linear and non linear wave shaping. RC & RL differentiating circuits- derivation , input and output wave forms. RC & RL integrating circuits- derivation , input and output wave forms. non - linear wave shaping- positive, negative clippers. biased - positive, negative clippers & combination clipper. Clamping circuits- positive and negative clampers.	11
2	**Sinusoidal Oscillators** : Classification of oscillators. Damped & un damped oscillator. The oscillatory circuit (tank circuit). essentials of transistor oscillator- barkhausen criterion. Transistor LC oscillator: Hartley oscillator and Colpitts oscillator limitations of LC & RC oscillators. Transistor crystal oscillator: working of quartz crystal, equivalent circuit of crystal frequency response of transistor crystal oscillator.	11
3	**Non sinusoidal oscillators :** Non sinusoidal wave forms, classification, Definitions of pulse parameters, time delay, rise time, turn on, turn off, storage time, fall time, pulse width and duty cycle. Multivibrators: types and uses, construction and working of Astable, Monostable and bistable multivibrators Schmitt trigger using transistors and 555 timer.	11
4	**Operational Amplifier** : introduction, advantages and disadvantages of IC technology, IC packages, scale of integration, IC terminology, Emitter coupled differential amplifier- differential and common mode operation, CMRR, block diagram of	11

	OPAMP. Characteristics of ideal OPAMP. Inverting and non inverting opamp expressions for closed loop voltage gain, op amp parameters- input bias current, input offset voltage, output offset voltage and input and output impedances, CMRR and slew rate, frequency compensation, null adjustment.	
5	**OPAMP Applications** & **Analog Computation**: OPAMP as an integrator , differentiator- circuit function and wave forms Active filters- OPAMP low pass, High pass, band pass and band reject filters- circuit construction, function and frequency response. OPAMP oscillators- comparator, Schmitt trigger phase shift oscillator, wein bridge oscillator, astable, bistable and monostable multivibrator- circuit and working. Introduction to Analog Computation, linear computing circuits and symbols using OPAMP- scale changer, adder, sub tractor, multiplication by a constant.	11

Reference Books:

1. Operatinal amplifiers &linear integrated circuits ;Ramakanth Gayakwad,
2. Electronics devices &circuit theory; Robert Boylestead & Louis Nashelsky
3. Operational amplifiers &linear integrated circuits by Robert F.Coughlin & Frederick F.Driscoll,
4. Electronic principles, AP Malvino,
5. Integrated circuits ,KR Botkar
6. Analog computation & simulation by V. Rajraman

Name of the Department: Electronics

Semester-III

DSC 3: Oscillations and OP-Amps Lab

Course Title: Oscillations and OP-Amps Lab	**Course code:** 21BSC3C3ELP
Total Contact Hours: 52	**Course Credits: 02**
Internal Assessment Marks: 25	**Duration of SEE: 03 hours**
Semester End Examination Marks: 25	

Course Outcomes (CO's):

At the end of the course, students will be able to:

1. Make connections using breadboard And IC's.
2. Design Different computations Using OP-AMP IC's.
3. Design Amplifier Circuits and analyze their Performance.
4. Analyze Performance Of Different Wave Shaping Circuits and Systems

DSC 3: Oscillations and OP-Amps Lab

List of Experiments

1. Colpitt's oscillator(using transistor)- determine the frequency of oscillation
2. Hartley oscillator(using transistor)- determine the frequency of oscillation
3. Phase shift oscillator(using transistor)- determine the frequency of oscillation
4. Wien bridge oscillator(using transistor)- determine the frequency of oscillation
5. Crystal oscillator(using transistor)- determine the frequency of oscillation
6. Inverting & non inverting op-Amp – determination of gain
7. Frequency response of inverting op-Amp
8. Frequency response of Non-inverting op-Amp
9. Phase shift oscillator(using op-Amp)- determine the frequency of oscillation
10. Wien bridge oscillator(using op-Amp)- determine the frequency of oscillation
11. Active low pass filter- Frequency response
12. Active high pass filter- Frequency response
13. Determination of op-Amp parameters
14. Op Amp as a differentiator & integrator

Note:

1. Minimum of EIGHT experiments must be carried out.
2. Experiments may be added as and when required with the approval of BoS.

Reference Books:

1. Operatinal amplifiers &linear integrated circuits ;Ramakanth Gayakwad,
2. Electronics devices &circuit theory; Robert Boylestead & Louis Nashelsky
3. Operational amplifiers &linear integrated circuits by Robert F.Coughlin & Frederick F.Driscoll,
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