**COURSE FILE (2019-20 EVEN)**

**Course Title: Analog Circuits Semester: 4**

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**1. Course details**

**1.1 Primary information**

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| 1. | Course Code | 18EC42 |
| 2. | L-T-P | 3-2-0 |
| 3. | Marks (Min/Max)  VTU Exam  Internal Assessment | 40/100  21/60  16/40 |
| 4. | Prerequisite | Basic Electronics, Electronic Devices |
| 5. | Teaching Department | Electronics & Communication Engineering |
| 6. | Course Duration | 50 hours |
| 7. | Faculties Handling | Dr. Balachandra Achar |
| 8. | Course Coordinator | Dr. Balachandra Achar |

**1.2 Course Learning Objectives**

The course will enable the students to:

1. Understand the biasing of BJT and MOSFET amplifier circuits and analyze the amplifier using small-signal model.

2. Obtain the frequency response of amplifiers, and design oscillator circuits.

3. Appreciate the use of negative feedback in amplifiers.

4. Construct various circuits using op-amp and 555 timer ICs.

**1.3 Course Outcomes (COs)**

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

1. Design biasing circuits for BJT and MOSFET amplifiers, and analyze the amplifiers using small-signal model.

2. Analyze MOSFET amplifiers using high frequency model, and generate oscillations using different circuits.

3. Understand the different types of feedback amplifiers, and design power amplifiers.

4. Design Op-Amp circuits with and without negative feedback for general applications.

5. Design DAC, ADC, filters and multivibrators using Op-Amp and Timer ICs.

**1.4 Validation of Course Outcomes**

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| **Sl. No.** | **Course Outcomes** | **PO:Level** | **Cognitive Level** |
| CO1 | Design biasing circuits for BJT and MOSFET amplifiers, and analyze the amplifiers using small-signal model | PO1:3, PO2:2, PO5:1, PO12:3, PSO1:2 | L3 |
| CO2 | Analyze MOSFET amplifiers using high frequency model, and generate oscillations using different circuits | PO1:3, PO2:2, PO5:1, PO12:2, PSO1:2 | L3 |
| CO3 | Understand the different types of feedback amplifiers, and design power amplifiers | PO1:2, PO2:2, PO12:2, PSO1:2 | L3 |
| CO4 | Design Op-Amp circuits with and without negative feedback for general applications | PO1:3, PO2:2, PO3:2, PO5:2, PO12:3, PSO1:2, PSO2:3 | L3 |
| CO5 | Design DAC, ADC, filters and multivibrators using Op-Amp and Timer ICs | PO1:3, PO2:2, PO3:2, PO5:2, PO12:3, PSO1:2, PSO2:3 | L3 |

*POs Mapping Level: 1-Slightly ; 2-Moderately; 3-Highly*

**1.5 Mapping of COs with POs**

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|  | **PO-1** | **PO-2** | **PO-3** | **PO-4** | **PO-5** | **PO-6** | **PO-7** | **PO-8** | **PO-9** | **PO-10** | **PO-11** | **PO-12** | **PSO-1** | **PSO-2** |
| **CO1** | 3 | 2 |  |  | 1 |  |  |  |  |  |  | 3 | 2 |  |
| **CO2** | 3 | 2 |  |  | 1 |  |  |  |  |  |  | 2 | 2 |  |
| **CO3** | 2 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |
| **CO4** | 3 | 2 | 2 |  | 2 |  |  |  |  |  |  | 3 | 2 | 3 |
| **CO5** | 3 | 2 | 2 |  | 2 |  |  |  |  |  |  | 3 | 2 | 3 |

**2. Course Plan**

**2.1 Course Contents, Defining Topic Level Outcomes**

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| **Topic**  **Title** | **Description** | **Topic Level Outcomes (TLO)** | **Blooms Level**  **(L1–L6)** | **Dura**  **tion** |
| At the end of the topic, the students will be able to |
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**2.2 Text Books:**

**2.3 Reference Books:**

**2.4a Course Delivery Schedule:**

**Section-A**

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| **Lec.**  **Nos.** | **Topic to be covered** | **TLO** | **Mode of delivery** | **Date on which planned** | **Date on which covered** | **Faculty Sign** | **HOD Sign** |
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**2.4b Course Delivery Schedule:**

**Section-B**

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| **Lec.**  **Nos.** | **Topic to be covered** | **TLO** | **Mode of delivery** | **Date on which planned** | **Date on which covered** | **Faculty Sign** | **HOD Sign** |
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**Faculty-1 Faculty-2 HOD**

**3. Assessment of COs**

**3.1 Assessment Schedule:**

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| **Date** | **Assessment Tool used** | **TLOs Assessed** | **Average Cognitive Level** |
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**3.2 Measuring CO Attainment:**

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| **TLO** | **Attained Level of Bloom's Taxonomy** | **Assess-ment Tool Used** | **Weightage** | **Attainment Level** | **Contribution to CO Attainment** | | | | | **Attainment Goal** |
| **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
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| **Total Attainment of CO1** | | | | |  |  |  |  |  |  |
| **Total Attainment of CO2** | | | | |  |  |  |  |  |  |
| **Total Attainment of CO3** | | | | |  |  |  |  |  |  |
| **Total Attainment of CO4** | | | | |  |  |  |  |  |  |
| **Total Attainment of CO5** | | | | |  |  |  |  |  |  |

**3.3 Other Information:**

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|  | **Section - A** | **Section - B** |
| Total number of classes held |  |  |
| Number of tutorial classes held |  |  |
| Number of seminars held |  |  |
| Portion coverage |  |  |
| Students’ feedback |  |  |
| No. of students having attendance shortage |  |  |
| University result |  |  |
| Use of various teaching methods |  |  |

**3.4 Remarks:**

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| Faculty:  Signature |
| Course Coordinator:  Signature |
| Module Coordinator:  Signature |
| HOD:  Signature |