



TEACHING PLAN

| Course Code | Course Title | Semester | Branch | Contact Period /Week | Academic Year | Semester commencement date |
|-------------|--|----------|--------|----------------------|---------------|----------------------------|
| 20EC5T01 | Linear & Digital IC Applications (R20) | V | ECE | 5 | 2024-25 | 03-06-2024 |

COURSE OUTCOMES

After completion of the course student are able to

| | |
|---|--|
| 1 | Demonstrate the performance parameters and characteristics of operational amplifiers. (K3) |
| 2 | Estimate the function of Op amp based active filters, timers and converters. (K4) |
| 3 | Construct and implement the Combinational circuits using digital ICs.(K3) |
| 4 | Develop and implement the Sequential circuits using digital ICs. (K3) |

| Unit No | OutCome/ Bloom's Level | Topics/Activity | Reference Text book | Contact Periods | Delivery Method | |
|---------|---|-------------------------------|--|-----------------|---|---|
| 1. | CO1: Demonstrate the performance parameters and characteristics of operational amplifiers. (K3) | 1. INTEGRATED CIRCUITS | | | Chalk & Talk, PPT, Active Learning & Tutorial | |
| | | 1.1 | Introduction | T1 | | 1 |
| | | 1.2 | Types, Classification | T1 | | 1 |
| | | 1.3 | Package Types and temperature ranges. | T1 | | 1 |
| | | 1.4 | Differential Amplifier- Types | T1 | | 1 |
| | | 1.5 | Dual input balanced output Configuration - DC analysis | T1 | | 1 |
| | | 1.6 | Dual input balanced output Configuration - AC analysis | T1 | | 1 |
| | | 1.7 | Dual input unbalanced output Configuration - DC analysis | T1 | | 1 |
| | | 1.8 | Dual input unbalanced output Configuration - AC analysis | T1 | | 1 |
| | | 1.9 | Cascade Differential Amplifier Stages, | T1 | | 1 |
| | | 1.10 | Level translator | T1 | | 1 |
| | | 1.11 | Characteristics of OP-Amp and Op-Amp Block Diagram | T1 | | 1 |
| | | 1.12 | Op-Amp -Ideal and practical specifications , Parameters | T1 | | 1 |
| | | 1.13 | DC & AC characteristics | T1 | | 1 |
| | | 1.14 | 741 op-amp & its features | T1 | | 1 |
| | | 1.15 | Slew Rate, CMRR,PSRR | T1 | | 1 |
| | | 1.16 | Problems | T1 | | 1 |



| | | | | | | | |
|----|--|---|--|--------------|-----------|---|-----------|
| | | 1.17 | Class Test 1 | | 1 | | |
| | | TOTAL | | | 17 | | |
| 2. | CO1: Demonstrate the performance parameters and characteristics of operational amplifiers. (K3) | 2. LINEAR and NON-LINEAR APPLICATIONS OF OP-AMPS | | | | | |
| | | 2.1 | Linear Applications of Op-Amps: Inverting amplifier | T1 | 1 | Chalk & Talk, PPT, Active Learning & Tutorial | |
| | | 2.2 | Linear Applications of Op-Amps: Non-inverting amplifier | T1 | 1 | | |
| | | 2.3 | Integrator and differentiator | T1 | 1 | | |
| | | 2.4 | Summing and Difference amplifier | T1 | 1 | | |
| | | 2.5 | Non-Linear Applications of Op-Amps: Comparators | T1 | 1 | | |
| | | 2.6 | Triangular and Square wave generators | T1 | 1 | | |
| | | 2.7 | Sine wave generation: principle, Wein-bridge | T1 | 1 | | |
| | | 2.8 | Phase-shift oscillators. | T1 | 1 | | |
| | | 2.9 | Problems | T1 | 1 | | |
| | | 2.10 | Class Test 2 | | 1 | | |
| | | | | TOTAL | | | 10 |
| 3. | CO2: Summarize the function of Opamp based active filters, timers and converters. (K4) | 3. ACTIVE FILTERS ,TIMERS and CONVERTERS | | | | | |
| | | 3.1 | Introduction, classification, Butter worth filters – 1st order LPF | T1 | 1 | Chalk & Talk, PPT, Active Learning & Case study | |
| | | 3.2 | Butter worth filters – 1st order HPF | T1 | 1 | | |
| | | 3.3 | Band pass, Band reject, | T1 | 1 | | |
| | | 3.4 | All pass filters | T1 | 1 | | |
| | | 3.5 | Timers: Introduction to 555 timer, Functional diagram of 555 timer | T1 | 1 | | |
| | | 3.6 | Monostable operations and applications | T1 | 1 | | |
| | | 3.7 | Astable operations and applications | T1 | 1 | | |
| | | 3.8 | Schmitt Trigger | T1 | 1 | | |
| | | 3.9 | DAC and ADC Converters: Introduction, Types | T1 | 1 | | |
| | | 3.10 | Weighetd resistor DAC | T1 | 1 | | |
| | | 3.11 | R-2R ladder DAC | T1 | 1 | | |
| | | 3.12 | Types of ADC- Parallel Comparator Type ADC | T1 | 1 | | |
| | | 3.13 | Successive approximation ADC | T1 | 1 | | |
| | | 3.14 | Class Test 3 | | 1 | | |
| | | TOTAL | | | 14 | | |



| | | | | | | |
|---|--|--------------------------------------|---|-----------|---|--|
| 4. | CO3: Construct and implement the Combinational circuits using digital ICs. (K3) | 4. COMBINATIONAL LOGIC DESIGN | | | | Chalk &Talk,PPT, Active Learning & Project based learning |
| | | 4.1 | Introduction, Design and Analysis procedures. | T2 | 1 | |
| | | 4.2 | Decoders with Digital IC _s | T2 | 1 | |
| | | 4.3 | Encoders with Digital IC _s | T2 | 1 | |
| | | 4.4 | Multiplexers with Digital IC _s | T2 | 1 | |
| | | 4.5 | De-multiplexers with Digital IC _s | T2 | | |
| | | 4.6 | Comparators-1bit & 2- bit with Digital IC _s | T2 | 1 | |
| | | 4.7 | Comparators- 4-bit with Digital IC _s | T2 | 1 | |
| | | 4.8 | Ripple Adder with Digital IC _s | T2 | 1 | |
| | | 4.9 | Binary Parallel Adder with Digital IC _s | T2 | 1 | |
| | | 4.10 | Look ahead carry generator with Digital IC _s | T2 | 1 | |
| | | 4.11 | Combinational multipliers with Digital IC _s | T2 | 1 | |
| | | 4.12 | Class Test 4 | | 1 | |
| | | TOTAL | | | | |
| 5. | CO4: Develop and implement the Sequential circuits using digital ICs. (K3) | 5. SEQUENTIAL LOGIC DESIGN | | | | Chalk &Talk,PPT, Active Learning Simulations Exercises Chalk &Talk,PPT, Active Learning & Project based learning |
| | | 5.1 | Introduction to SSI latches | T2 | 1 | |
| | | 5.2 | Flip-Flops: SR, D | T2 | 1 | |
| | | 5.3 | JK flip-flop, T Flip-flop | T2 | 1 | |
| | | 5.4 | Design of Asynchronous Counters using Digital ICs | T2 | 1 | |
| | | 5.5 | Synchronous design methodology | T2 | 1 | |
| | | 5.6 | Design of Synchronous Counters using Digital ICs | T2 | 1 | |
| | | 5.7 | Shift Registers - Types | T2 | 1 | |
| | | 5.8 | Universal Shift Register using Digital ICs | T2 | 1 | |
| | | 5.9 | Ring Counter and Johnson Counter using Digital ICs | T2 | 1 | |
| | | 5.10 | Counter applications | T2 | | |
| | | 5.11 | Class Test 5 | | 1 | |
| | Content Beyond Syllabus | 5.12 | Log and Antilog amplifiers, Instrumentation amplifier | T1 | 1 | |
| TOTAL | | | | 12 | | |
| TOTAL NO. OF CLASSES PROPOSED PER PERIOD'S | | | | 65 | | |



SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

Narsapur, West Godavari District, A.P. 534280

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Text Books:

| S.No. | AUTHORS/BOOK TITLE/EDITION(latest)/PUBLISHER/YEAR OF PUBLICATION |
|-------|--|
| 1 | D. Roy Chowdary, "Linear Integrated Circuits", 3 rd Edition, New Age International (p) Ltd,2016. Unit-I, II, III. |
| 2 | F. Wakerly, "Digital Design Principles & Practices", 4 th Edition, PHI/ Pearson Education Asia, 2012. Unit-IV, V |

Reference Books:

| S.No. | AUTHORS/BOOK TITLE/EDITION(latest)/PUBLISHER/YEAR OF PUBLICATION |
|-------|--|
| 1 | M. Morris Mano, "Digital Logic and Computer Design", 4 th Edition Pearson Education, 2016, Unit-IV, V |
| 2 | Sergio Franco, "Design with Operational Amplifiers & Analog Integrated Circuits", 5 th Edition, McGraw Hill, 2000. Unit-I, II, III. |

Web Details:

| | |
|---|---|
| 1 | www.nptel.ac.in |
| 2 | www.slideshare.net |
| 3 | https://youtu.be/Z-Hw3CpPVj0 |

| | Name | Signature with Date |
|------|--|---------------------|
| i. | Faculty i Dr. B. Ramana Kumar | |
| ii. | Faculty ii(for common Course) Mrs E. Suma | |
| iii. | Course Coordinator Dr. B. Ramana Kumar | |
| iv. | Module Coordinator Dr. D. Nataraj | |
| v. | Programme Coordinator Dr.B.Subrahmanyeswara Rao | |

Principal