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Description generated with very high confidence

**Course Plan**

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| **Department :** | Electronics and Communication Engineering |
| **Course Name & code :** | Basic Electronics , ECE 1071 |
| **Semester & branch :** | II, ECE |
| **Name of the faculty :** | 1. Dr. Ananthakrishna T 2. Dr. Aparna U 3. Dr. Yashwanth N |
| **No of contact hours/week:** | |  |  |  |  | | --- | --- | --- | --- | | **L** | **T** | **P** | **C** | | 3 | 0 | 0 | 3 | |

**Course Outcomes (COs)**

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|  | ***At the end of this course, the student should be able to:*** | **No. of Contact Hours** | **Marks** |
| CO1: | Describe the characteristics of various electronic devices and analyze simple circuit applications using them | 6 | 17 |
| CO2: | Analyze rectifier circuits, voltage regulator and Amplifier | 7 | 20 |
| CO3: | Discuss Op-Amp and its basic applications using suitable circuits | 5 | 14 |
| CO4: | Simplify Boolean expressions and implement simple digital circuits using logic gates. | 12 | 33 |
| CO5: | Describe the principles of analog and digital communication. | 6 | 16 |
|  | **Total** | 36 | 100 |

**Assessment Plan**

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| **Components** | **Continuous Assessment** | **In-Semester**  **Examination 1 & 2** | **End-Semester**  **Examination** |
| **Duration** | 1 week per assignment | 60 minutes | 180 minutes |
| **Weightage** | 20% (20 marks) | 30% (15 marks each) | 50% (50 marks) |
| **Typology of Questions** | Knowledge/ Recall; Understanding/ Comprehension; Application;  Analysis | Understanding/ Comprehension; Application;  Analysis | Understanding/ Comprehension; Application; Analysis |
| **Pattern** | Answer all questions uploaded to the LMS platform | MCQs for 5 marks and 2/3 marks question for a total of 10 marks | Answer all 5 full questions of 10 marks each. |
| **Schedule** | A1:29-10-22; A2:12-11-22  A3: 19-11-22; A4: 10-12-22  Questions will be uploaded on the dates mentioned above. A total of 4 online submissions with 5 marks each. Submission will be one week from the date of uploading the questions. (5-11-22; 19-11-22;  26-11-22; 17-12-22) | 6th and 12th week of the academic calendar | Starting from  2 Jan 2023 |
| **Topics Covered** | L 1 onwards  **(CO1-5)** | Comprehensive examination covering  In-sem exam 1: L 1-8  In-sem exam 2: L 9-21  Students are expected to answer all questions  **(CO1-4)** | Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-5)** |

**Lecture Plan**

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| **L. No./ T. No.** | **Topics** | **Course Outcome Addressed** |
| **L0** | Introduction to Basic Electronics | - |
| **L1** | Discussion of Junction Diode and V-I characteristics. | 1 |
| **L2** | Equivalent circuit of Junction Diode. Breakdown phenomenon in diodes, Zener diode. | 1 |
| **L3** | Rectifiers: Discussion of half wave rectifiers. | 2 |
| **L4** | Discussion of center tapped full wave rectifiers. | 2 |
| **L5** | Discussion of bridge rectifier, Capacitor filters | 2 |
| **L6** | Zener regulator and regulated power supplies | 2 |
| **L7** | Special diodes - LEDs, Photo diodes and their applications. | 1,2 |
| **L8** | Block diagram and characteristics of op-amp. | 3 |
| **L9** | Op-amp Inverting amplifier, non- inverting amplifier. | 3 |
| **L10** | Op-amp adder, subtractor. | 3 |
| **L11** | Op-amp integrator and differentiator. | 3 |
| **L12** | Op-amp based Comparator and square wave generator. | 3 |
| **L13** | Discussion of Number systems: Decimal, binary, octal and Hexadecimal number systems. | 4 |
| **L14** | One’s and two’s complements, subtraction using complements | 4 |
| **L15** | Weighted and non-weighted codes, Self-complimenting codes, error detecting and correcting codes. | 4 |
| **L16** | Boolean algebraic theorems and simplification of Boolean expressions. | 4 |
| **L17** | Logic gates: OR, NOT, AND, NOR, NAND , XOR and XNOR. Concept of Universal Logic. | 4 |
| **L18** | Implementation of Boolean expressions using logic gates, | 4 |
| **L19** | Standard forms of Boolean expressions- POS and SOP. | 4 |
| **L20** | Simplification of Boolean expressions using K-map. | 4 |
| **L21** | Multiplexers and Demultiplexers | 4 |
| **L22** | Sequential circuits- Discussion of SR flip flop, JK flip flop. | 4 |
| **L23** | D-flip flop and T flip flop. | 4 |
| **L24** | Applications of flip flops- Simple binary counters and shift registers. | 4 |
| **L25** | Introduction to communication, Need for modulation. | 5 |
| **L26** | Amplitude and Frequency modulation concepts, Principle and block diagram | 5 |
| **L27** | Comparison of AM and FM. | 5 |
| **L28** | Basic principle of Sampling and digitization. Block schematic of general digital communication system. | 5 |
| **L29** | Qualitative discussion of pulse modulation schemes - PAM, PPM and PWM and digital modulation schemes – ASK,PSK, FSK. | 5 |
| **L30** | Principle of Cellular mobile communication and architecture of GSM. | 5 |
| **L31** | Structure and operation of NMOS, V-I Characterestics, Regions of operation. | 1 |
| **L32** | Channel length modulation, Small-Signal Model | 1 |
| **L33** | Structure and Operation of PMOS | 1 |
| **L34** | Amplifier Biasing Techniques | 1 |
| **L35** | Amplifier Configurations, | 2 |
| **L36** | CS Amplifier working principle and frequency response | 2 |

**References:**

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| 1. | Robert L. Boylestad, Louis Nashelsky- Electronic Devices & Circuit Theory, 11th Edition, PHI, 2012 |
| 2. | Behzad Razavi, “Fundamental of Microelectronics”, Wiley, 2013. |
| 3. | Morris Mano- Digital design, Prentice Hall of India, Third Edition, 2013. |
| 4. | George Kennedy, Bernad Davis- Electronic Communication Systems, Fourth edition, TMH, 2004. |
| 5. | Raj Pandya, “Mobile and Personal Communication Services and Systems”, Wiley-IEEE Press, 1999 |

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| **Submitted by:** | Dr. Ananthakrishna T, Dr. Aparna U & Dr. Yashwanth N |

**(Signature of the faculty)**

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| **Date:** | 14-02-2023 |

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| **Approved by:** | Dr. Kumara Shama |

**(Signature of HOD)**

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| **Date:** | 14-02-2023 |

**Faculty members teaching the course:**

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| **fACULTY nAME** | **Section** |
| Dr. Anitha H | A |
| Jagadeesh Chandra R.B | b |
| Dr.Aparna U | C |
| Shashi Kumar G S | D |
| Dr. R Vinoth | E |
| Navya K T | F |
| Shreeharsha K G | G |
| Divya B | H |
| Suhas K | I |
| Akshatha K R | j |
| Soumya S | k |
| Dr. Yashwanth N | L |