



## DEPARTMENT OF ELECTRONICS &amp; COMMUNICATION ENGINEERING

ACADEMIC YEAR : 2023-2024

[illegible]

| MODULE 3: BASIC CONCEPTS OF NUMBER & FINITE FIELDS             |                                                             |         |         |   |    |                                                        |
|----------------------------------------------------------------|-------------------------------------------------------------|---------|---------|---|----|--------------------------------------------------------|
| 10                                                             | Groups, Rings and Fields, Finite fields of the form $GF(p)$ | L+D     | BB      | 1 | 25 | 10 <sup>th</sup> Oct2023                               |
| 11                                                             | Prime numbers                                               | L+D     | BB      | 2 | 27 | 10 <sup>th</sup> Oct2023 to 11 <sup>th</sup> Oct2023   |
| 12                                                             | Fermat's theorem,                                           | L+D     | BB      | 1 | 28 | 12 <sup>th</sup> Oct2023                               |
| 13                                                             | Euler's theorem,                                            | L+D     | BB      | 1 | 29 | 13 <sup>th</sup> Oct2023                               |
| 14                                                             | Discrete Logarithm                                          | L+D     | BB      | 1 | 30 | 19 <sup>th</sup> Oct2023                               |
| 15                                                             | Pedagogy activity                                           |         | LCD     | 1 | 31 | 20 <sup>th</sup> Oct 2023                              |
| MODULE 4: ASYMMETRIC CIPHER                                    |                                                             |         |         |   |    |                                                        |
| 16                                                             | Principle of public Key cryptosystem                        | L+D, PS | BB      | 2 | 33 | 25 <sup>th</sup> Oct 2023 to 26 <sup>th</sup> Oct2023  |
| 17                                                             | Principles of Public-Key Cryptosystems: The RSA algorithm   | L+D, PS | BB      | 4 | 37 | 27 <sup>th</sup> Oct 2023 to 30 <sup>th</sup> Oct 2023 |
| 18                                                             | Diffie - Hellman Key Exchange                               | L+D     | BB      | 4 | 41 | 31 <sup>th</sup> Oct2023 to 3 <sup>rd</sup> Nov 2023   |
| 19                                                             | Elliptic Curve Arithmetic,                                  | L+D     | BB      | 4 | 45 | 6 <sup>th</sup> Nov 2023 to 8 <sup>th</sup> Nov 2023   |
| 20                                                             | Elliptic Curve Cryptography                                 | L+D     | BB      | 4 | 49 | 9 <sup>th</sup> Nov 2023 to 13 <sup>th</sup> Nov 2023  |
| 21                                                             | Pedagogy activity                                           |         | LCD     | 1 | 50 | 15 <sup>th</sup> Nov 2023                              |
| MODULE 5: PSEUDO-RANDOM-SEQUENCE GENERATORS AND STREAM CIPHERS |                                                             |         |         |   |    |                                                        |
| 22                                                             | Linear Feedback Shift Registers                             | L+D, PS | BB      | 1 | 51 | 16 <sup>th</sup> Nov 2023                              |
| 23                                                             | Design and analysis of stream ciphers                       | L+D     | BB      | 2 | 53 | 17 <sup>th</sup> Nov 2023 to 20 <sup>th</sup> Nov 2023 |
| 24                                                             | Design & analysis of Stream ciphers using LFSRs             | L+D     | BB      | 2 | 55 | 21 <sup>st</sup> Nov 2023 to 22 <sup>nd</sup> Nov 2023 |
| 25                                                             | A5 algorithm                                                | L+D     | BB      | 2 | 57 | 27 <sup>th</sup> Nov 2023 to 28 <sup>th</sup> Nov 2023 |
| 26                                                             | Hughes XPD/KPD                                              | L+D     | BB      | 1 | 58 | 29 <sup>th</sup> Nov 2023 to 4 <sup>th</sup> Dec 2023  |
| 27                                                             | Nanotequ                                                    | L+D     | BB      | 1 | 59 | 5 <sup>th</sup> Dec 2023                               |
| 28                                                             | Additive generators                                         | L+D     | BB      | 1 | 60 | 6 <sup>th</sup> Dec 2023                               |
| 29                                                             | Gifford generator                                           | L+D     | BB      | 1 | 61 | 7 <sup>th</sup> Dec 2023                               |
| 30                                                             | PKZIP                                                       | L+D     | BB      | 1 | 62 | 8 <sup>th</sup> Dec 2023                               |
| 31                                                             | Pedagogy activity                                           | L+D     | LCD     | 1 | 63 | 9 <sup>th</sup> Dec 2023                               |
| 32                                                             | Revision                                                    | L+D     | BB, LCD | 1 | 64 | 11 <sup>th</sup> Dec 2023                              |
| 33                                                             | Revision                                                    | L+D     | BB, LCD | 2 | 65 | 12 <sup>th</sup> Dec 2023 to 13 <sup>th</sup> Dec 2023 |
| 34                                                             | Revision                                                    | L+D     | BB, LCD | 1 | 66 | 13 <sup>th</sup> Dec 2023                              |



### **Text Books:**

- William Stallings, "Cryptography and Network Security Principles and Practice", Pearson Education Inc., 6th Edition, 2014, ISBN: 978-93-325-1877-3
- Bruce Schneider, "Applied Cryptography Protocols, Algorithms, and Source code in C", Wiley Publications, 2nd Edition, ISBN: 9971-51-348-X

### **Reference Books:**

- Understanding Cryptography - A Textbook for Students and Practitioners, Paar, Christof, Pelzl, Jan, Springer (2010).
- Cryptography Engineering: Design Principles and Practical Applications, Niels Ferguson, Bruce Schneier, Tadayoshi Kohno, Wiley (2010).
- Cryptography: Theory and Practice, Third Edition, Douglas R. Stinson, CRC Press (2005).
- Cryptography: A Very Short Introduction, Fred C. Piper; Sean Murphy, Oxford University Press (2002)..

### **WEB MATERIALS:**

- <https://learncryptography.com/>
- [www.cryptolab.us/](http://www.cryptolab.us/)
- <https://cryptopals.com>

### **Details for the teaching Aids**

1. BB
2. LCD



**Signature of Course In charge**



**Signature of Module Coordinator**



**Signature of HOD**



# K.S. INSTITUTE OF TECHNOLOGY BANGALORE

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : Dr P N SUDHA

SUBJECT CODE/NAME : 18EC744/CRYPTOGRAPHY

SEMESTER/YEAR : VII/ IV/B

ACADEMIC YEAR : 2023-2024

| Sl. No.                                                                                                    | Topic to be covered                                   | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date                                          |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------|--------------|----------------|---------------------------|--------------------------------------------------------|
| <b>MODULE 1: CLASSICAL ENCRYPTION TECHNIQUES &amp; BASIC CONCEPTS OF NUMBER THEORY &amp; FINITE FIELDS</b> |                                                       |                  |              |                |                           |                                                        |
| 1                                                                                                          | Euclidean algorithm                                   | L+I              | LCD          | 4              | 4                         | 11 <sup>th</sup> Sep to 13 <sup>th</sup> Sep 2023      |
| 2                                                                                                          | Modular arithmetic                                    | L+D, PS          | BB           | 3              | 7                         | 14 <sup>th</sup> Sep to 19 <sup>th</sup> Sep 2023      |
| 3                                                                                                          | Symmetric cipher model, Substitution techniques       | L+ D, PS         | BB           | 6              | 13                        | 20 <sup>th</sup> Sep to 25 <sup>th</sup> Sep 2023      |
| 4                                                                                                          | Transposition techniques                              | L+D              | BB           | 2              | 15                        | 26 <sup>th</sup> Sep 2023 to 27 <sup>th</sup> Sep 2023 |
| 5                                                                                                          | Pedagogy                                              |                  | LCD          | 1              | 16                        | 27 <sup>th</sup> Sep 2023                              |
| <b>MODULE 2: SYMMETRICAL CIPHERS</b>                                                                       |                                                       |                  |              |                |                           |                                                        |
| 6                                                                                                          | SYMMETRIC CIPHERS: Traditional Block Cipher structure | L+D              | BB           | 2              | 18                        | 29 <sup>th</sup> Sep to 30 <sup>th</sup> Sep 2023      |
| 7                                                                                                          | Data Encryption Standard (DES)                        | L+D              | BB           | 3              | 21                        | 3 <sup>rd</sup> Oct 2023 to 4 <sup>th</sup> Oct 2023   |
| 8                                                                                                          | The AES Cipher                                        | L+D              | BB           | 2              | 23                        | 5 <sup>th</sup> Oct 2023 to 6 <sup>th</sup> Oct 2023   |
| 9                                                                                                          | Pedagogy                                              |                  | LCD          | 1              | 24                        | 9 <sup>th</sup> Oct 2023                               |



| MODULE 3: BASIC CONCEPTS OF NUMBER & FINITE FIELDS             |                                                             |         |         |   |    |                                                        |
|----------------------------------------------------------------|-------------------------------------------------------------|---------|---------|---|----|--------------------------------------------------------|
| 10                                                             | Groups, Rings and Fields, Finite fields of the form $GF(p)$ | L+D     | BB      | 1 | 25 | 10 <sup>th</sup> Oct2023                               |
| 11                                                             | Prime numbers                                               | L+D     | BB      | 2 | 27 | 11 <sup>th</sup> Oct2023                               |
| 12                                                             | Fermat's theorem,                                           | L+D     | BB      | 1 | 28 | 12 <sup>th</sup> Oct2023                               |
| 13                                                             | Euler's theorem,                                            | L+D     | BB      | 1 | 29 | 13 <sup>th</sup> Oct2023                               |
| 14                                                             | Discrete Logarithm                                          | L+D     | BB      | 1 | 30 | 19 <sup>th</sup> Oct2023                               |
| 15                                                             | Pedagogy activity                                           |         | LCD     | 1 | 31 | 20 <sup>th</sup> Oct 2023                              |
| MODULE 4: ASYMMETRIC CIPHER                                    |                                                             |         |         |   |    |                                                        |
| 16                                                             | Principle of public Key cryptosystem                        | L+D, PS | BB      | 2 | 33 | 25 <sup>th</sup> Oct 2023                              |
| 17                                                             | Principles of Public-Key Cryptosystems: The RSA algorithm   | L+D, PS | BB      | 4 | 37 | 26 <sup>th</sup> Oct 2023 to 30 <sup>th</sup> Oct 2023 |
| 18                                                             | Diffie - Hellman Key Exchange                               | L+D     | BB      | 4 | 41 | 31 <sup>th</sup> Oct2023 to 6 <sup>th</sup> Nov 2023   |
| 19                                                             | Elliptic Curve Arithmetic,                                  | L+D     | BB      | 4 | 45 | 7 <sup>th</sup> Nov 2023 to 9 <sup>th</sup> Nov 2023   |
| 20                                                             | Elliptic Curve Cryptography                                 | L+D     | BB      | 4 | 49 | 10 <sup>th</sup> Nov 2023 to 15 <sup>th</sup> Nov 2023 |
| 21                                                             | Pedagogy activity                                           |         | LCD     | 1 | 50 | 15 <sup>th</sup> Nov 2023                              |
| MODULE 5: PSEUDO-RANDOM-SEQUENCE GENERATORS AND STREAM CIPHERS |                                                             |         |         |   |    |                                                        |
| 22                                                             | Linear Feedback Shift Registers                             | L+D, PS | BB      | 1 | 51 | 16 <sup>th</sup> Nov 2023                              |
| 23                                                             | Design and analysis of stream ciphers                       | L+D     | BB      | 2 | 53 | 17 <sup>th</sup> Nov 2023 to 20 <sup>th</sup> Nov 2023 |
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| 25                                                             | A5 algorithm                                                | L+D     | BB      | 2 | 57 | 27 <sup>th</sup> Nov 2023 to 28 <sup>th</sup> Nov 2023 |
| 26                                                             | Hughes XPD/KPD                                              | L+D     | BB      | 1 | 58 | 29 <sup>th</sup> Nov 2023                              |
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| 28                                                             | Additive generators                                         | L+D     | BB      | 1 | 60 | 5 <sup>th</sup> Dec 2023                               |
| 29                                                             | Gifford generator                                           | L+D     | BB      | 1 | 61 | 6 <sup>th</sup> Dec 2023                               |
| 30                                                             | PKZIP                                                       | L+D     | BB      | 1 | 62 | 7 <sup>th</sup> Dec 2023                               |
| 31                                                             | Pedagogy activity                                           | L+D     | LCD     | 1 | 63 | 8 <sup>th</sup> Dec 2023                               |
| 32                                                             | Revision                                                    | L+D     | BB, LCD | 1 | 64 | 9 <sup>th</sup> Dec 2023                               |
| 33                                                             | Revision                                                    | L+D     | BB, LCD | 2 | 65 | 11 <sup>th</sup> Dec 2023 to 12 <sup>th</sup> Dec 2023 |
| 34                                                             | Revision                                                    | L+D     | BB, LCD | 1 | 66 | 13 <sup>th</sup> Dec 2023                              |

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1. BB
2. LCD



Signature of Course In charge



Signature of Module Coordinator



Signature of HOD





**K S INSTITUTE OF TECHNOLOGY BENGALURU**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**COURSE PLAN**

**NAME OF THE STAFF** : Dr. B Sudarshan

**COURSE CODE/NAME** : 21EC52/ Computer Organization  
& ARM Microcontrollers

**SEMESTER/YEAR** : V / III (A & B Sections)

**ACADEMIC YEAR** : 2023-2024

| Sl.No                                                                           | Topic to be covered                                       | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date<br>A Section | Proposed Date<br>B Section |
|---------------------------------------------------------------------------------|-----------------------------------------------------------|------------------|--------------|----------------|---------------------------|----------------------------|----------------------------|
| <b>MODULE 1- Basic Structure of Computers &amp; Input / Output Organization</b> |                                                           |                  |              |                |                           |                            |                            |
| 1                                                                               | Basic Operational Concepts, Bus Structures                | L+D              | LCD/BB       | 1              | 1                         | 4/12/23                    | 4/12/23                    |
| 2                                                                               | Performance - Processor Clock, Basic Performance Equation | L+D              | LCD/BB       | 1              | 2                         | 5/12/23                    | 5/12/23                    |
| 3                                                                               | Clock Rate, Performance Measurement                       | L+D              | LCD/BB       | 1              | 3                         | 7/12/23                    | 6/12/23                    |
| 4                                                                               | Accessing I/O Devices                                     | L+D              | LCD/BB       | 1              | 4                         | 8/12/23                    | 8/12/23                    |
| 5                                                                               | Interrupts Hardware                                       | L+D              | LCD/BB       | 1              | 5                         | 9/12/23                    | 9/12/23                    |

|                                                             |                                                                                       |     |          |   |    |          |          |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------|-----|----------|---|----|----------|----------|
| 6                                                           | Direct Memory Access                                                                  | L+D | LCD/BB   | 1 | 6  | 11/12/23 | 11/12/23 |
| 7                                                           | Buses, Interface Circuits, PCI Bus                                                    | L+D | LCD/BB   | 1 | 7  | 12/12/23 | 12/12/23 |
| 8                                                           | SCSI Bus                                                                              | L+D | LCD/BB Y | 1 | 8  | 14/12/23 | 13/12/23 |
| 9                                                           | USB                                                                                   | L+D | LCD/BB Y | 1 | 9  | 15/12/23 | 15/12/23 |
| 10                                                          | USB                                                                                   | L+D | LCD/BB Y | 1 | 10 | 18/12/23 | 18/12/23 |
| <b>MODULE 2 – Memory System &amp; Basic Processing Unit</b> |                                                                                       |     |          |   |    |          |          |
| 11                                                          | Basic Concepts                                                                        | L+D | LCD/BB   | 1 | 11 | 19/12/23 | 19/12/23 |
| 12                                                          | Semiconductor RAM Memories                                                            | L+D | LCD/BB   | 1 | 12 | 21/12/23 | 20/12/23 |
| 13                                                          | Read only Memories, Speed, Size and cost                                              | L+D | LCD/BB Y | 1 | 13 | 22/12/23 | 22/12/23 |
| 14                                                          | Cache Memory – Mapping Functions, Replacement Algorithms                              | L+D | LCD/BB   | 1 | 14 | 23/12/23 | 23/12/23 |
| 15                                                          | Performance Considerations                                                            | L+D | LCD/BB   | 1 | 15 | 26/12/23 | 26/12/23 |
| 16                                                          | Some Fundamental Concepts                                                             | L+D | LCD/BB   | 1 | 16 | 28/12/23 | 27/12/23 |
| 17                                                          | Execution of a Complete Instruction, Multiple Bus Organization                        | L+D | LCD/BB   | 1 | 17 | 29/12/23 | 29/12/23 |
| 18                                                          | Hard – wired control                                                                  | L+D | LCD/BB Y | 1 | 18 | 30/12/23 | 30/12/23 |
| 19                                                          | Micro Programmed Control                                                              | L+D | LCD/BB Y | 1 | 19 | 4/01/24  | 5/01/24  |
| 20                                                          | Basic Concepts of Pipelining                                                          | L+D | LCD/BB   | 1 | 20 | 5/01/24  | 8/01/24  |
| <b>MODULE 3 – ARM embedded Systems</b>                      |                                                                                       |     |          |   |    |          |          |
| 21                                                          | Introduction, RISC design Philosophy, ARM design Philosophy, Embedded system hardware | L+D | LCD/BB   | 1 | 21 | 8/01/24  | 9/01/24  |
| 22                                                          | AMBA bus protocol, ARM bus Technology, Memory, Peripherals                            | L+D | LCD/BB   | 1 | 22 | 9/01/24  | 10/01/24 |
| 23                                                          | Embedded system software, Initialization (BOOT) code                                  | L+D | LCD/BB   | 1 | 23 | 11/01/24 | 12/01/24 |



|                                                             |                                                                       |     |        |   |    |          |          |
|-------------------------------------------------------------|-----------------------------------------------------------------------|-----|--------|---|----|----------|----------|
| 24                                                          | Operating System, Applications                                        | L+D | LCD/BB | 1 | 24 | 12/01/24 | 13/01/24 |
| 25                                                          | ARM core dataflow model                                               | L+D | LCD/BB | 1 | 25 | 13/01/24 | 16/01/24 |
| 26                                                          | Registers,                                                            | L+D | LCD/BB | 1 | 26 | 16/01/24 | 17/01/24 |
| 27                                                          | Current Program Status register                                       | L+D | LCD/BB | 1 | 27 | 18/01/24 | 19/01/24 |
| 28                                                          | Pipeline, Exceptions                                                  | L+D | LCD/BB | 1 | 28 | 19/01/24 | 22/01/24 |
| 29                                                          | Interrupts and Vector Table                                           | L+D | LCD/BB | 1 | 29 | 22/01/24 | 23/01/24 |
| 30                                                          | Core extensions                                                       | L+D | LCD/BB | 1 | 30 | 23/01/24 | 24/01/24 |
| <b>MODULE 4 – Introduction to the ARM Instruction set</b>   |                                                                       |     |        |   |    |          |          |
| 31                                                          | Introduction                                                          | L+D | LCD/BB | 1 | 31 | 25/01/24 | 27/01/24 |
| 32                                                          | Data Processing instructions                                          | L+D | LCD/BB | 1 | 32 | 27/01/24 | 2/02/24  |
| 33                                                          | Data Processing instructions                                          | L+D | LCD/BB | 1 | 33 | 1/02/24  | 5/02/24  |
| 34                                                          | Data Processing instructions                                          | L+D | LCD/BB | 1 | 34 | 2/02/24  | 5/02/24  |
| 35                                                          | Load Store instruction                                                | L+D | LCD/BB | 1 | 35 | 5/02/24  | 6/02/24  |
| 36                                                          | Load Store instruction                                                | L+D | LCD/BB | 1 | 36 | 6/02/24  | 7/02/24  |
| 37                                                          | Load Store instruction                                                | L+D | LCD/BB | 1 | 37 | 8/02/24  | 9/02/24  |
| 38                                                          | Software interrupt instructions, Program status register instructions | L+D | LCD/BB | 1 | 38 | 9/02/24  | 10/02/24 |
| 39                                                          | Loading constants, ARMv5E extensions                                  | L+D | LCD/BB | 1 | 39 | 10/02/24 | 12/02/24 |
| 40                                                          | Conditional Execution                                                 | L+D | LCD/BB | 1 | 40 | 12/02/24 | 12/02/24 |
| <b>MODULE 5 – Introduction to the THUMB Instruction set</b> |                                                                       |     |        |   |    |          |          |
| 41                                                          | Introduction, THUMB register usage                                    | L+D | LCD/BB | 1 | 41 | 13/02/24 | 13/02/24 |
| 42                                                          | ARM – THUMB interworking, other branch instructions                   | L+D | LCD/BB | 1 | 42 | 15/02/24 | 14/02/24 |
| 43                                                          | Data Processing instructions                                          | L+D | LCD/BB | 1 | 43 | 16/02/24 | 16/02/24 |

|    |                                          |     |        |   |    |          |          |
|----|------------------------------------------|-----|--------|---|----|----------|----------|
| 44 | Stack instructions                       | L+D | LCD/BB | 1 | 44 | 19/02/24 | 19/02/24 |
| 45 | Software interrupt instructions          | L+D | LCD/BB | 1 | 45 | 20/02/24 | 19/02/24 |
| 46 | Overview of C Compilers and optimization | L+D | LCD/BB | 1 | 46 | 22/02/24 | 20/02/24 |
| 47 | Basic C Data types                       | L+D | LCD/BB | 1 | 47 | 23/02/24 | 21/02/24 |
| 48 | C looping structures                     | L+D | LCD/BB | 1 | 48 | 24/02/24 | 23/02/24 |
| 49 | C looping structures                     | L+D | LCD/BB | 1 | 49 | 29/02/24 | 6/03/24  |
| 50 | C looping structures                     | L+D | LCD/BB | 1 | 50 | 7/03/24  | 9/03/24  |



**Course Incharge**



**Module coordinator**



**HOD**





**KS INSTITUTE OF TECHNOLOGY, BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Dr. REKHA N  
SUBJECT CODE/NAME : 21EC51/DIGITAL COMMUNICATION  
SEMESTER/YEAR : V-A / III  
ACADEMIC YEAR : 2023-2024

| Sl. No.                                        | Topic to be covered                                                                                          | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Digital Modulation Techniques</b> |                                                                                                              |                  |              |                |                           |               |
| 1                                              | Digital Modulation Techniques: Phase shift Keying techniques using coherent detection:                       | L+D              | BB           | 1              | 1                         | 4/12/23       |
| 2                                              | generation, detection and error probabilities of BPSK                                                        | L+D+PS           | BB           | 1              | 2                         | 5/12/23       |
| 3                                              | generation, detection and error probabilities of QPSK                                                        | L+D              | BB           | 1              | 3                         | 6/12/23       |
| 4                                              | Numericals                                                                                                   | L+D              | BB           | 1              | 4                         | 8/12/23       |
| 5                                              | generation, detection and error probabilities of M-ary PSK                                                   | L+D              | BB           | 1              | 5                         | 9/12/23       |
| 6                                              | generation, detection and error probabilities of M-ary QAM                                                   | L+D              | BB           | 1              | 6                         | 11/12/23      |
| 7                                              | Frequency shift keying techniques using Coherent detection: BFSK generation, detection and error probability | L+D              | BB           | 1              | 7                         | 12/12/23      |
| 8                                              | M-ary PSK, M-ary QAM                                                                                         | L+D              | BB           | 1              | 8                         | 13/12/23      |
| 9                                              | Non coherent orthogonal modulation techniques: BFSK & probability of error,                                  | L+D+PS           | BB           | 1              | 10                        | 15/12/23      |

|                                                                             |                                                                                                                                                              |        |    |   |    |          |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|---|----|----------|
| 10                                                                          | DPSK Symbol representation, Block diagrams treatment of Transmitter and Receiver, Probability of error (without derivation of probability of error equation) | L+ D   | BB | 1 | 11 | 18/12/23 |
| <b>MODULE 2: Signaling Communication through Band Limited AWGN Channels</b> |                                                                                                                                                              |        |    |   |    |          |
| 11                                                                          | Signaling over AWGN Channels- Introduction                                                                                                                   | L+ D   | BB | 1 | 15 | 19/12/23 |
| 12                                                                          | Geometric representation of signals                                                                                                                          | L+D    | BB | 1 | 16 | 20/12/23 |
| 13                                                                          | Gram-Schmidt Orthogonalization procedure                                                                                                                     | L+D    | BB | 1 | 17 | 22/12/23 |
| 14                                                                          | Conversion of the continuous AWGN channel into a vector channel                                                                                              | L+D    | BB | 1 | 18 | 23/12/23 |
| 15                                                                          | Optimum receivers using coherent detection: ML Decoding                                                                                                      | L+D    | BB | 1 | 19 | 29/12/23 |
| 16                                                                          | Correlation receiver                                                                                                                                         | L+D    | BB | 1 | 20 | 30/12/23 |
| 17                                                                          | matched filter receiver                                                                                                                                      | L+D    | BB | 1 | 21 | 1/1/24   |
| 18                                                                          | Signal design for Band limited Channels: Design of band limited signals for zero ISI-The Nyquist Criterion (statement only)                                  | L+D+PS | BB | 1 | 22 | 2/1/24   |
| 19                                                                          | Design of band limited signals with controlled ISI- Partial Response signals                                                                                 | L+ D   | BB | 1 | 23 | 3/1/24   |
| 20                                                                          | Probability of error for detection of Digital PAM                                                                                                            | L+D    | BB | 1 | 24 | 5/1/24   |
| <b>MODULE 3: Principles of Spread Spectrum</b>                              |                                                                                                                                                              |        |    |   |    |          |
| 21                                                                          | Spread Spectrum Communication Systems                                                                                                                        | L+D    | BB | 1 | 26 | 8/1/24   |
| 22                                                                          | Model of a Spread Spectrum Digital Communication System                                                                                                      | L+D    | BB | 1 | 27 | 9/1/24   |
| 23                                                                          | Direct Sequence Spread Spectrum Systems                                                                                                                      | L+D    | BB | 1 | 28 | 10/1/24  |
| 24                                                                          | Effect of De-spreading on a narrowband Interference                                                                                                          | L+ D   | BB | 1 | 29 | 12/1/24  |
| 25                                                                          | Probability of error (statement only),                                                                                                                       | L+D    | BB | 1 | 30 | 13/1/24  |
| 26                                                                          | Some applications of DS Spread Spectrum Signals                                                                                                              | L+D    | BB | 1 | 31 | 16/1/24  |
| 27                                                                          | Generation of PN Sequences                                                                                                                                   | L+D    | BB | 1 | 32 | 17/1/24  |
| 28                                                                          | Frequency Hopped Spread Spectrum                                                                                                                             | L+D    | BB | 1 | 33 | 19/1/24  |
| 29                                                                          | CDMA based on IS-95                                                                                                                                          | L+D    | BB | 1 | 34 | 22/1/24  |



|                                                                                          |                                                                       |        |    |   |    |         |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------|----|---|----|---------|
| 30                                                                                       | Numerical Problems on PN sequence                                     | L+D    | BB | 1 | 35 | 23/1/24 |
| <b>MODULE 4: Introduction to Information Theory, Source Coding ,Error Control Coding</b> |                                                                       |        |    |   |    |         |
| 31                                                                                       | Introduction to Information Theory                                    | L+D    | BB | 1 | 36 | 24/1/24 |
| 32                                                                                       | Measure of information                                                | L+D    | BB | 1 | 37 | 27/1/24 |
| 33                                                                                       | Average information content of symbols in long independent sequences. | L+D    | BB | 1 | 38 | 1/2/24  |
| 34                                                                                       | Source Coding                                                         | L+D    | BB | 1 | 39 | 5/2/24  |
| 35                                                                                       | Shannon's Encoding Algorithm, Shannon-Fano Encoding Algorithm         | L+D    | BB | 1 | 40 | 6/2/24  |
| 36                                                                                       | Huffman coding.                                                       | L+D    | BB | 1 | 41 | 7/2/24  |
| 37                                                                                       | Error Control Coding                                                  | L+D    | BB | 1 | 42 | 9/2/24  |
| 38                                                                                       | Examples of Error control coding                                      | L+D    | BB | 1 | 43 | 10/2/24 |
| 39                                                                                       | methods of Controlling Errors                                         | L+D    | BB | 1 | 44 | 12/2/24 |
| 40                                                                                       | Types of Errors                                                       | L+D+PS | BB | 1 | 45 | 13/2/24 |
| <b>MODULE 5: Linear Block Codes ,Convolution Codes</b>                                   |                                                                       |        |    |   |    |         |
| 41                                                                                       | Matrix description of Linear Block Codes                              | L+D    | BB | 1 | 49 | 14/2/24 |
| 42                                                                                       | Error Detection & Correction capabilities of Linear Block Codes       | L+D    | BB | 1 | 50 | 16/2/24 |
| 43                                                                                       | Table lookup Decoding using Standard Array                            | L+D    | BB | 1 | 51 | 19/2/24 |
| 44                                                                                       | Convolution Encoder                                                   | L+D    | BB | 1 | 52 | 20/2/24 |
| 45                                                                                       | Time domain approach                                                  | L+D    | BB | 1 | 53 | 21/2/24 |
| 46                                                                                       | Transfer domain approach                                              | L+D    | BB | 1 | 54 | 23/2/24 |
| 47                                                                                       | Code Tree, Trellis & state Diagram                                    | L+D    | BB | 1 | 55 | 6/3/24  |

**Text Books: -**

1. Simon Haykin, "Digital Communication Systems", John Wiley & sons, First Edition, 2014, ISBN 978-0- 471-64735-5.
2. John G Proakis and Masoud Salehi, "Fundamentals of Communication Systems", 2014 Edition, Pearson Education, ISBN 978-8-131-70573-5.
3. K Sam Shanmugam, "Digital and analog communication systems", John Wiley India Pvt. Ltd, 1996.
4. Hari Bhat, Ganesh Rao, "Information Theory and Coding", Cengage, 2017.
5. Todd K Moon, "Error Correction Coding", Wiley Std. Edition, 2006.

**Reference Books:**

1. Bernard Sklar, "Digital Communications – Fundamentals and Applications", Second Edition, Pearson Education, 2016, ISBN: 9780134724058
2. K Sam Shanmugam, "Digital and analog communication systems", John Wiley India Pvt. Ltd, 1996.

**WEB Materials:**

- <https://nptel.ac.in/courses/108102096>
- <https://www.youtube.com/watch?v=f8RvFlr5wRk>

  
**Course In-charge**

  
**Module Coordinator**

  
**Signature of HOD-ECE**





**KS INSTITUTE OF TECHNOLOGY, BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Dr. REKHA N  
SUBJECT CODE/NAME : 21EC51/DIGITAL COMMUNICATION  
SEMESTER/YEAR : V-B / III  
ACADEMIC YEAR : 2023-2024

| Sl. No.                                        | Topic to be covered                                                                                          | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Digital Modulation Techniques</b> |                                                                                                              |                  |              |                |                           |               |
| 1                                              | Digital Modulation Techniques: Phase shift Keying techniques using coherent detection:                       | L+D              | BB           | 1              | 1                         | 5/12/23       |
| 2                                              | generation, detection and error probabilities of BPSK                                                        | L+D+PS           | BB           | 1              | 2                         | 6/12/23       |
| 3                                              | generation, detection and error probabilities of QPSK                                                        | L+D              | BB           | 1              | 3                         | 7/12/23       |
| 4                                              | Numericals                                                                                                   | L+D              | BB           | 1              | 4                         | 8/12/23       |
| 5                                              | generation, detection and error probabilities of M-ary PSK                                                   | L+D              | BB           | 1              | 5                         | 9/12/23       |
| 6                                              | generation, detection and error probabilities of M-ary QAM                                                   | L+D              | BB           | 1              | 6                         | 12/12/23      |
| 7                                              | Frequency shift keying techniques using Coherent detection: BFSK generation, detection and error probability | L+D              | BB           | 1              | 7                         | 13/12/23      |
| 8                                              | M-ary PSK, M-ary QAM                                                                                         | L+D              | BB           | 1              | 8                         | 14/12/23      |
| 9                                              | Non coherent orthogonal modulation techniques: BFSK & probability of error,                                  | L+D+PS           | BB           | 1              | 10                        | 15/12/23      |

|                                                                             |                                                                                                                                                              |        |    |   |    |          |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|---|----|----------|
| 10                                                                          | DPSK Symbol representation, Block diagrams treatment of Transmitter and Receiver, Probability of error (without derivation of probability of error equation) | L+ D   | BB | 1 | 11 | 19/12/23 |
| <b>MODULE 2: Signaling Communication through Band Limited AWGN Channels</b> |                                                                                                                                                              |        |    |   |    |          |
| 11                                                                          | Signaling over AWGN Channels- Introduction                                                                                                                   | L+ D   | BB | 1 | 15 | 20/11/23 |
| 12                                                                          | Geometric representation of signals                                                                                                                          | L+D    | BB | 1 | 16 | 21/12/23 |
| 13                                                                          | Gram-Schmidt Orthogonalization procedure                                                                                                                     | L+D    | BB | 1 | 17 | 22/12/23 |
| 14                                                                          | Conversion of the continuous AWGN channel into a vector channel                                                                                              | L+D    | BB | 1 | 18 | 29/12/23 |
| 15                                                                          | Optimum receivers using coherent detection: ML Decoding                                                                                                      | L+D    | BB | 1 | 19 | 2/1/24   |
| 16                                                                          | Correlation receiver                                                                                                                                         | L+D    | BB | 1 | 20 | 3/1/24   |
| 17                                                                          | matched filter receiver                                                                                                                                      | L+D    | BB | 1 | 21 | 4/1/24   |
| 18                                                                          | Signal design for Band limited Channels: Design of band limited signals for zero ISI-The Nyquist Criterion (statement only)                                  | L+D+PS | BB | 1 | 22 | 5/1/24   |
| 19                                                                          | Design of band limited signals with controlled ISI-Partial Response signals                                                                                  | L+ D   | BB | 1 | 23 | 9/1/24   |
| 20                                                                          | Probability of error for detection of Digital PAM                                                                                                            | L+D    | BB | 1 | 24 | 10/1/24  |
| <b>MODULE 3: Principles of Spread Spectrum</b>                              |                                                                                                                                                              |        |    |   |    |          |
| 21                                                                          | Spread Spectrum Communication Systems                                                                                                                        | L+D    | BB | 1 | 26 | 11/1/24  |
| 22                                                                          | Model of a Spread Spectrum Digital Communication System                                                                                                      | L+D    | BB | 1 | 27 | 12/1/24  |
| 23                                                                          | Direct Sequence Spread Spectrum Systems                                                                                                                      | L+D    | BB | 1 | 28 | 13/1/24  |
| 24                                                                          | Effect of De-spreading on a narrowband Interference                                                                                                          | L+ D   | BB | 1 | 29 | 16/1/24  |
| 25                                                                          | Probability of error (statement only),                                                                                                                       | L+D    | BB | 1 | 30 | 17/1/24  |
| 26                                                                          | Some applications of DS Spread Spectrum Signals                                                                                                              | L+D    | BB | 1 | 31 | 18/1/24  |
| 27                                                                          | Generation of PN Sequences                                                                                                                                   | L+D    | BB | 1 | 32 | 19/1/24  |
| 28                                                                          | Frequency Hopped Spread Spectrum                                                                                                                             | L+D    | BB | 1 | 33 | 23/1/24  |
| 29                                                                          | CDMA based on IS-95                                                                                                                                          | L+D    | BB | 1 | 34 | 24/1/24  |



|                                                                                          |                                                                       |        |    |   |    |         |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------|----|---|----|---------|
| 30                                                                                       | Numerical Problems on PN sequence                                     | L+D    | BB | 1 | 35 | 25/1/24 |
| <b>MODULE 4: Introduction to Information Theory, Source Coding ,Error Control Coding</b> |                                                                       |        |    |   |    |         |
| 31                                                                                       | Introduction to Information Theory                                    | L+D    | BB | 1 | 36 | 1/2/24  |
| 32                                                                                       | Measure of information                                                | L+D    | BB | 1 | 37 | 2/2/24  |
| 33                                                                                       | Average information content of symbols in long independent sequences. | L+D    | BB | 1 | 38 | 6/2/24  |
| 34                                                                                       | Source Coding                                                         | L+D    | BB | 1 | 39 | 7/2/24  |
| 35                                                                                       | Shannon's Encoding Algorithm, Shannon-Fano Encoding Algorithm         | L+D    | BB | 1 | 40 | 8/2/24  |
| 36                                                                                       | Huffman coding.                                                       | L+D    | BB | 1 | 41 | 9/2/24  |
| 37                                                                                       | Error Control Coding                                                  | L+D    | BB | 1 | 42 | 13/2/24 |
| 38                                                                                       | Examples of Error control coding                                      | L+D    | BB | 1 | 43 | 14/2/24 |
| 39                                                                                       | methods of Controlling Errors                                         | L+D    | BB | 1 | 44 | 15/2/24 |
| 40                                                                                       | Types of Errors                                                       | L+D+PS | BB | 1 | 45 | 16/2/24 |
| <b>MODULE 5: Linear Block Codes ,Convolution Codes</b>                                   |                                                                       |        |    |   |    |         |
| 41                                                                                       | Matrix description of Linear Block Codes                              | L+D    | BB | 1 | 49 | 20/2/24 |
| 42                                                                                       | Error Detection & Correction capabilities of Linear Block Codes       | L+D    | BB | 1 | 50 | 21/2/24 |
| 43                                                                                       | Table lookup Decoding using Standard Array                            | L+D    | BB | 1 | 51 | 22/2/24 |
| 44                                                                                       | Convolution Encoder                                                   | L+D    | BB | 1 | 52 | 23/2/24 |
| 45                                                                                       | Time domain approach                                                  | L+D    | BB | 1 | 53 | 24/2/24 |
| 46                                                                                       | Transfer domain approach                                              | L+D    | BB | 1 | 54 | 6/3/24  |
| 47                                                                                       | Code Tree, Trellis & state Diagram                                    | L+D    | BB | 1 | 55 | 7/3/24  |

**Text Books: -**

1. Simon Haykin, "Digital Communication Systems", John Wiley & sons, First Edition, 2014, ISBN 978-0- 471-64735-5.
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3. K Sam Shanmugam, "Digital and analog communication systems", John Wiley India Pvt. Ltd, 1996.
4. Hari Bhat, Ganesh Rao, "Information Theory and Coding", Cengage, 2017.
5. Todd K Moon, "Error Correction Coding", Wiley Std. Edition, 2006.



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2. K Sam Shanmugam, "Digital and analog communication systems", John Wiley India Pvt. Ltd, 1996.

**WEB Materials:**

- <https://nptel.ac.in/courses/108102096>
- <https://www.youtube.com/watch?v=f8RvFlr5wRk>

  
**Course In-charge**

  
**Module Coordinator**

  
**Signature of HOD-ECE**

**KSIT****K S INSTITUTE OF TECHNOLOGY BANGALORE-560109****DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Dr. DINESH KUMAR D S  
SUBJECT CODE/NAME : 18EC71/COMPUTER NETWORKS  
SEMESTER/YEAR/SEC : VII /A  
ACADEMIC YEAR : 2023-2024

| Sl. No.         | Topic to be covered                                                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------|-------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module 1</b> |                                                                                     |                  |              |                |                           |               |
| 1               | Introduction: Data Communications: Components, Representations,                     | L+D              | BB+PPT       | 1              | 1                         | 11/09/23      |
| 2               | Data Flow, Networks Physical Structures,                                            | L+D              | BB+PPT       | 1              | 2                         | 12/09/23      |
| 3               | Network Types: LAN, WAN,                                                            | L+ D             | BB+PPT       | 1              | 3                         | 14/09/23      |
| 4               | Switching, Internet                                                                 | L+ D             | BB+PPT       | 1              | 4                         | 15/09/23      |
| 5               | Protocol Layering: Scenarios, Principles, Logical Connections                       | L+ D             | BB+PPT       | 1              | 5                         | 19/09/23      |
| 6               | TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite.                | L+D              | BB+PPT       | 1              | 6                         | 21/09/23      |
| 7               | Description of layers                                                               | L+ D             | BB+PPT       | 1              | 7                         | 22/09/23      |
| 8               | Encapsulation and Decapsulation, Addressing                                         | L+AV             | BB+PPT       | 1              | 8                         | 23/09/23      |
| 9               | Multiplexing and Demultiplexing                                                     | L+D              | BB+PPT       | 1              | 9                         | 25/09/23      |
| 10              | The OSI Model: OSI Versus TCP/IP                                                    | L+D              | BB+PPT       | 1              | 10                        | 26/09/23      |
| <b>Module2</b>  |                                                                                     |                  |              |                |                           |               |
| 11              | <b>Data-Link Layer:</b> Introduction: Nodes and Links, Services, Categories of link | L+D              | BB+PPT       | 1              | 11                        | 29/10/23      |
| 12              | Sublayers, Link Layer addressing: Types of addresses                                | L+ D             | BB+PPT       | 1              | 12                        | 30/09/23      |
| 13              | ARP                                                                                 | L+D              | BB+PPT       | 1              | 13                        | 03/10/23      |
| 14              | <b>Data Link Control (DLC) services:</b> Framing, Flow and Error Control            | L+D              | BB+PPT       | 1              | 14                        | 05/10/23      |
| 15              | Data Link Layer Protocols: Simple Protocol                                          | L+D              | BB+PPT       | 1              | 15                        | 06/10/23      |
| 16              | Stop and Wait protocol, Piggybacking                                                | L+D              | BB+PPT       | 1              | 16                        | 09/10/23      |
| 17              | Media Access Control: Random Access: Pure ALOHA, slotted ALOHA                      | L+ D             | BB+PPT       | 1              | 17                        | 10/10/23      |

|                 |                                                                           |     |        |   |    |          |
|-----------------|---------------------------------------------------------------------------|-----|--------|---|----|----------|
| 18              | CSMA, CSMA/CD, CSMA/CA                                                    | L+D | BB+PPT | 1 | 18 | 12/10/23 |
| 19              | <b>Wired and Wireless LANs:</b> Ethernet Protocol,                        | L+D | BB+PPT | 1 | 19 | 13/10/23 |
| 20              | Standard Ethernet                                                         | L+D | BB+PPT | 1 | 20 | 19/10/23 |
| 21              | Introduction to wireless LAN: Architectural Comparison                    | L+D | BB+PPT | 1 | 21 | 20/10/23 |
| 22              | Characteristics, Access Control                                           | L+D | BB+PPT | 1 | 22 | 26/10/23 |
| <b>Module 3</b> |                                                                           |     |        |   |    |          |
| 23              | <b>Network Layer:</b> Introduction, Network Layer services: Packetizing.  | L+D | BB+PPT | 1 | 23 | 27/10/23 |
| 24              | Routing and Forwarding, Other services                                    | L+D | BB+PPT | 1 | 24 | 28/10/23 |
| 25              | Packet Switching: Datagram Approach, Virtual Circuit Approach             | L+D | BB+PPT | 1 | 25 | 30/10/23 |
| 26              | IPv4 Addresses: Address Space, Classful Addressing                        | L+D | BB+PPT | 1 | 26 | 31/10/23 |
| 27              | Classless Addressing                                                      | L+D | BB+PPT | 1 | 27 | 2/11/23  |
| 28              | DHCP, Network Address Resolution                                          |     | BB+PPT |   | 28 | 3/11/23  |
| 29              | Forwarding of IP Packets: Based on destination Address, Based and Label   | L+D | BB+PPT | 1 | 29 | 6/11/23  |
| 30              | Network Layer Protocols: Internet Protocol (IP): Datagram Format          | L+D | BB+PPT | 1 | 30 | 7/11/23  |
| 31              | Options, Security of IPv4 Datagrams                                       | L+D | BB+PPT | 1 | 31 | 9/11/23  |
| 32              | Unicast Routing: Introduction Routing Algorithms: Distance Vector Routing | L+D | BB+PPT | 1 | 32 | 10/11/23 |
| 33              | Link State Routing with example                                           | L+D | BB+PPT | 1 | 33 | 13/11/23 |
| 34              | Path vector routing with example                                          | L+D | BB+PPT | 1 | 34 | 16/11/23 |
| <b>Module 4</b> |                                                                           |     |        |   |    |          |
| 35              | <b>Transport Layer:</b> Introduction: Transport Layer Services,           | L+D | BB+PPT | 1 | 35 | 17/11/23 |
| 36              | Connectionless and Connection oriented Protocols, TCP Services, Features  | L+D | BB+PPT | 1 | 36 | 20/11/23 |
| 37              | Transport Layer Protocols: Simple protocol                                | L+D | BB+PPT | 1 | 37 | 21/11/23 |
| 38              | Stop and wait protocol, Go-Back-N Protocol                                | L+D | BB+PPT | 1 | 38 | 27/11/23 |
| 39              | Selective repeat protocol                                                 | L+D | BB+PPT | 1 | 39 | 28/11/23 |
| 40              | User Datagram Protocol: User Datagram UDP Services                        | L+D | BB+PPT | 1 | 40 | 1/12/23  |
| 41              | Transmission Control Protocol: Segments                                   | L+D | BB+PPT | 1 | 41 | 4/12/23  |
| 42              | TCP connection                                                            | L+D | BB+PPT | 1 | 42 | 5/12/23  |
| 43              | State Transition diagram, Flow control, Error control                     | L+D | BB+PPT | 1 | 43 | 7/12/23  |



|                 |                                                           |     |        |   |    |          |
|-----------------|-----------------------------------------------------------|-----|--------|---|----|----------|
| 44              | Windows in TCP, TCP congestion control                    | L+D | BB+PPT | 1 | 44 | 8/12/23  |
| <b>Module 5</b> |                                                           |     |        |   |    |          |
| 45              | Application Layer: Introduction: providing services       | L+D | BB+PPT | 1 | 45 | 9/12/23  |
| 46              | Application- layer paradigms                              | L+D | BB+PPT | 1 | 46 | 11/12/23 |
| 47              | Standard Client -Server Protocols: WWW                    | L+D | BB+PPT | 1 | 47 | 12/12/23 |
| 48              | Hyper Text Transfer Protocol,                             | L+D | BB+PPT | 1 | 48 | 14/12/23 |
| 49              | FTP: Two connections, Control Connection, Data Connection | L+D | BB+PPT | 1 | 49 | 15/12/23 |
| 50              | Electronic Mail: Architecture, Web Based Mail             | L+D | BB+PPT | 1 | 50 | 18/12/23 |
| 51              | Telnet: Local versus remote logging.                      | L+D | BB+PPT | 1 | 51 | 19/12/23 |
| 52              | Domain Name system: Name space, DNS in internet,          | L+D | BB+PPT | 1 | 52 | 21/12/23 |
| 53              | Resolution, DNS Messages, Security of DNS                 | L+D | BB+PPT | 1 | 53 | 22/12/23 |
| 54              | Revision of university question paper                     | L+D | BB+PPT | 1 | 54 | 23/12/23 |
| 55              | Revision of university question paper                     | L+D | BB+PPT | 1 | 55 | 4/01/24  |
| 56              | Revision of university question paper                     | L+D | BB+PPT | 1 | 56 | 5/01/24  |

**TEXTBOOK:**

T1: Data Communications and Networking, Forouzan, 5th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3.

**REFERENCES:**

R1: Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273-76896.

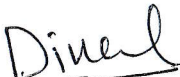
R2: Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN: 0130138282.

**WEB MATERIALS:**

W1: <https://nptel.ac.in/courses/106/105/106105183/>

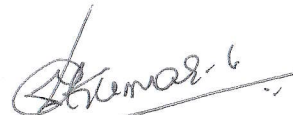
W2: <https://nptel.ac.in/courses/106/105/106105081/>

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>

  
Course Incharge

  
Module Coordinator

  
HOD

  
Principal  
PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109



## K S INSTITUTE OF TECHNOLOGY BANGALORE-560109

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : Dr. DINESH KUMAR D S  
SUBJECT CODE/NAME : 18EC71/COMPUTER NETWORKS  
SEMESTER/YEAR/SEC : VII /B  
ACADEMIC YEAR : 2023-2024

| Sl. No.         | Topic to be covered                                                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------|-------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module 1</b> |                                                                                     |                  |              |                |                           |               |
| 1               | Introduction: Data Communications: Components, Representations,                     | L+D              | BB+PPT       | 1              | 1                         | 12/09/23      |
| 2               | Data Flow, Networks Physical Structures,                                            | L+D              | BB+PPT       | 1              | 2                         | 13/09/23      |
| 3               | Network Types: LAN, WAN,                                                            | L+ D             | BB+PPT       | 1              | 3                         | 14/09/23      |
| 4               | Switching, Internet                                                                 | L+ D             | BB+PPT       | 1              | 4                         | 15/09/23      |
| 5               | Protocol Layering: Scenarios, Principles, Logical Connections                       | L+ D             | BB+PPT       | 1              | 5                         | 19/09/23      |
| 6               | TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite.                | L+D              | BB+PPT       | 1              | 6                         | 20/09/23      |
| 7               | Description of layers                                                               | L+ D             | BB+PPT       | 1              | 7                         | 21/09/23      |
| 8               | Encapsulation and Decapsulation, Addressing                                         | L+AV             | BB+PPT       | 1              | 8                         | 22/09/23      |
| 9               | Multiplexing and Demultiplexing                                                     | L+D              | BB+PPT       | 1              | 9                         | 26/09/23      |
| 10              | The OSI Model: OSI Versus TCP/IP                                                    | L+D              | BB+PPT       | 1              | 10                        | 27/09/23      |
| <b>Module2</b>  |                                                                                     |                  |              |                |                           |               |
| 11              | <b>Data-Link Layer:</b> Introduction: Nodes and Links, Services, Categories of link | L+D              | BB+PPT       | 1              | 11                        | 29/10/23      |
| 12              | Sublayers, Link Layer addressing: Types of addresses                                | L+ D             | BB+PPT       | 1              | 12                        | 30/09/23      |
| 13              | ARP                                                                                 | L+D              | BB+PPT       | 1              | 13                        | 03/10/23      |
| 14              | <b>Data Link Control (DLC) services:</b> Framing, Flow and Error Control            | L+D              | BB+PPT       | 1              | 14                        | 04/10/23      |
| 15              | Data Link Layer Protocols: Simple Protocol                                          | L+D              | BB+PPT       | 1              | 15                        | 05/10/23      |
| 16              | Stop and Wait protocol, Piggybacking                                                | L+D              | BB+PPT       | 1              | 16                        | 06/10/23      |
| 17              | Media Access Control: Random Access: Pure ALOHA, slotted ALOHA                      | L+ D             | BB+PPT       | 1              | 17                        | 10/10/23      |



|                 |                                                                           |     |        |   |    |          |
|-----------------|---------------------------------------------------------------------------|-----|--------|---|----|----------|
| 18              | CSMA, CSMA/CD, CSMA/CA                                                    | L+D | BB+PPT | 1 | 18 | 11/10/23 |
| 19              | <b>Wired and Wireless LANs: Ethernet Protocol,</b>                        | L+D | BB+PPT | 1 | 19 | 12/10/23 |
| 20              | Standard Ethernet                                                         | L+D | BB+PPT | 1 | 20 | 13/10/23 |
| 21              | Introduction to wireless LAN: Architectural Comparison                    | L+D | BB+PPT | 1 | 21 | 19/10/23 |
| 22              | Characteristics, Access Control                                           | L+D | BB+PPT | 1 | 22 | 20/10/23 |
| <b>Module 3</b> |                                                                           |     |        |   |    |          |
| 23              | <b>Network Layer: Introduction, Network Layer services: Packetizing.</b>  | L+D | BB+PPT | 1 | 23 | 25/10/23 |
| 24              | Routing and Forwarding, Other services                                    | L+D | BB+PPT | 1 | 24 | 26/10/23 |
| 25              | Packet Switching: Datagram Approach, Virtual Circuit Approach             | L+D | BB+PPT | 1 | 25 | 27/10/23 |
| 26              | IPv4 Addresses: Address Space, Classful Addressing                        | L+D | BB+PPT | 1 | 26 | 31/10/23 |
| 27              | Classless Addressing                                                      | L+D | BB+PPT | 1 | 27 | 2/11/23  |
| 28              | DHCP, Network Address Resolution                                          |     | BB+PPT |   | 28 | 3/11/23  |
| 29              | Forwarding of IP Packets: Based on destination Address, Based and Label   | L+D | BB+PPT | 1 | 29 | 7/11/23  |
| 30              | Network Layer Protocols: Internet Protocol (IP): Datagram Format          | L+D | BB+PPT | 1 | 30 | 8/11/23  |
| 31              | Options, Security of IPv4 Datagrams                                       | L+D | BB+PPT | 1 | 31 | 9/11/23  |
| 32              | Unicast Routing: Introduction Routing Algorithms: Distance Vector Routing | L+D | BB+PPT | 1 | 32 | 10/11/23 |
| 33              | Link State Routing with example                                           | L+D | BB+PPT | 1 | 33 | 11/11/23 |
| 34              | Path vector routing with example                                          | L+D | BB+PPT | 1 | 34 | 15/11/23 |
| <b>Module 4</b> |                                                                           |     |        |   |    |          |
| 35              | <b>Transport Layer: Introduction: Transport Layer Services,</b>           | L+D | BB+PPT | 1 | 35 | 16/11/23 |
| 36              | Connectionless and Connection oriented Protocols, TCP Services, Features  | L+D | BB+PPT | 1 | 36 | 17/11/23 |
| 37              | Transport Layer Protocols: Simple protocol                                | L+D | BB+PPT | 1 | 37 | 21/11/23 |
| 38              | Stop and wait protocol, Go-Back-N Protocol                                | L+D | BB+PPT | 1 | 38 | 22/11/23 |
| 39              | Selective repeat protocol                                                 | L+D | BB+PPT | 1 | 39 | 28/11/23 |
| 40              | User Datagram Protocol: User Datagram UDP Services                        | L+D | BB+PPT | 1 | 40 | 29/11/23 |
| 41              | Transmission Control Protocol: Segments                                   | L+D | BB+PPT | 1 | 41 | 1/12/23  |
| 42              | TCP connection                                                            | L+D | BB+PPT | 1 | 42 | 5/12/23  |
| 43              | State Transition diagram, Flow control, Error control                     | L+D | BB+PPT | 1 | 43 | 6/12/23  |



|                 |                                                           |     |        |   |    |          |
|-----------------|-----------------------------------------------------------|-----|--------|---|----|----------|
| 44              | Windows in TCP, TCP congestion control                    | L+D | BB+PPT | 1 | 44 | 7/12/23  |
| <b>Module 5</b> |                                                           |     |        |   |    |          |
| 45              | Application Layer: Introduction: providing services       | L+D | BB+PPT | 1 | 45 | 8/12/23  |
| 46              | Application- layer paradigms                              | L+D | BB+PPT | 1 | 46 | 9/12/23  |
| 47              | Standard Client -Server Protocols: WWW                    | L+D | BB+PPT | 1 | 47 | 12/12/23 |
| 48              | Hyper Text Transfer Protocol,                             | L+D | BB+PPT | 1 | 48 | 13/12/23 |
| 49              | FTP: Two connections, Control Connection, Data Connection | L+D | BB+PPT | 1 | 49 | 14/12/23 |
| 50              | Electronic Mail: Architecture, Wed Based Mail             | L+D | BB+PPT | 1 | 50 | 15/12/23 |
| 51              | Telnet: Local versus remote logging.                      | L+D | BB+PPT | 1 | 51 | 19/12/23 |
| 52              | Domain Name system: Name space, DNS in internet,          | L+D | BB+PPT | 1 | 52 | 20/12/23 |
| 53              | Resolution, DNS Messages, Security of DNS                 | L+D | BB+PPT | 1 | 53 | 21/12/23 |
| 54              | Revision of university question paper                     | L+D | BB+PPT | 1 | 54 | 22/12/23 |
| 55              | Revision of university question paper                     | L+D | BB+PPT | 1 | 55 | 4/01/24  |
| 56              | Revision of university question paper                     | L+D | BB+PPT | 1 | 56 | 5/01/24  |

**TEXTBOOK:**

T1: Data Communications and Networking, Forouzan, 5th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3.

**REFERENCES:**

R1: Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273-76896.

R2: Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN: 0130138282.

**WEB MATERIALS:**

W1: <https://nptel.ac.in/courses/106/105/106105183/>

W2: <https://nptel.ac.in/courses/106/105/106105081/>

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>

*Dineel*

Course Incharge

*Dineel*

Module Coordinator

*Pine*

HOD

*Shamesh*

Principal

K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109



6

**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2022-23 ODD SEMESTER**

**COURSE INCHARGE** : Santhosh Kumar B.R

**COURSE TYPE / CODE / TITLE** : Theory/ BESCK204C / Introduction to Electronics & Communication

**YEAR/ SEMESTER/SECTION** : 1<sup>st</sup> /Ist /D

**BRANCH** : Computer Science and Design

| Sl. No.                                        | Topic to be covered                                  | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date            |
|------------------------------------------------|------------------------------------------------------|------------------|--------------|----------------|---------------------------|--------------------------|
| <b>MODULE 1: Power Supplies and Amplifiers</b> |                                                      |                  |              |                |                           |                          |
| 1                                              | Introduction                                         | L+D              | BB           | 1              | 1                         | 15/09/2023               |
| 2                                              | Power Supplies: Block diagram                        | L+ D             | BB           | 1              | 2                         | 19/09/2023               |
| 3                                              | Half-wave rectifier and filters                      | L+ D             | BB           | 1              | 3                         | 21/09/2023               |
| 4                                              | Full-wave rectifiers with filters                    | L+ D             | BB           | 2              | 5                         | 21/09/2023<br>22/09/2023 |
| 5                                              | Voltage regulators                                   | L+D              | BB           | 1              | 6                         | 23/09/2023               |
| 6                                              | Output resistance and voltage regulation             | L+D              | BB           | 1              | 7                         | 25/09/2023               |
| 7                                              | Voltage multipliers                                  | L+D              | BB           | 1              | 8                         | 26/09/2023               |
| 8                                              | Amplifiers, types, gain, Input and output resistance | L+D              | BB           | 1              | 9                         | 29/09/2023               |
| 9                                              | Frequency Response, Negative feedback                | L+D              | BB           | 1              | 10                        | 30/09/2023               |



|                                                     |                                                                       |      |    |   |    |                          |
|-----------------------------------------------------|-----------------------------------------------------------------------|------|----|---|----|--------------------------|
| 10                                                  | Bandwidth and Phase Shift                                             | L+D  | BB | 1 | 11 | 30/09/2023               |
| 11                                                  | Negative Feedback and Multi stage Amplifiers                          | L+D  | BB | 1 | 12 | 03/10/2023               |
| <b>MODULE 2: Oscillators</b>                        |                                                                       |      |    |   |    |                          |
| 12                                                  | Barkhausen criterion                                                  | L+D  | BB | 1 | 13 | 05/10/2023               |
| 13                                                  | Sinusoidal and non-sinusoidal oscillators                             | L+D  | BB | 2 | 15 | 05/10/2023<br>06/10/2023 |
| 14                                                  | Ladder network oscillator                                             | L+ D | BB | 1 | 16 | 09/10/2023               |
| 15                                                  | Crystal Controlled Oscillator                                         | L+D  | BB | 1 | 17 | 10/10/2023               |
| 16                                                  | Operational Amplifiers: characteristics of ideal and practical op-amp | L+D  | BB | 2 | 19 | 12/10/2023<br>12/10/2023 |
| 17                                                  | Operational Amplifier Configurations                                  | L+D  | BB | 1 | 20 | 13/10/2023               |
| 18                                                  | Operational Amplifier Circuits: Voltage Follower, summer, subtractor  | L+D  | BB | 2 | 22 | 16/10/2023<br>17/10/2023 |
| 19                                                  | Integrator and Differentiator                                         | L+D  | BB | 1 | 23 | 19/10/2023               |
| <b>MODULE 3: Boolean Algebra and Logic Circuits</b> |                                                                       |      |    |   |    |                          |
| 20                                                  | Binary numbers, Number Base Conversion                                |      |    | 1 | 24 | 09/11/2023               |
| 21                                                  | Octal & Hexa Decimal Numbers,                                         | L+D  | BB | 1 | 25 | 10/11/2023               |
| 22                                                  | Complements                                                           |      |    | 2 | 27 | 13/11/2023<br>16/11/2023 |
| 23                                                  | Axiomatic Definition of Boolean Algebra                               | L+D  | BB | 1 | 28 | 16/11/2023               |
| 24                                                  | Basic Theorems and Properties of Boolean Algebra                      | L+D  | BB | 1 | 29 | 17/11/2023               |
| 25                                                  | Boolean Functions,                                                    |      |    | 2 | 31 | 20/11/2023<br>21/11/2023 |
| 26                                                  | Canonical and Standard Forms                                          | L+D  | BB | 1 | 32 | 23/11/2023               |
| 27                                                  | Other Logic Operations,                                               | L+D  | BB | 1 | 33 | 23/11/2023               |
| 28                                                  | Digital Logic Gates                                                   | L+D  | BB | 1 | 34 | 24/11/2023               |
| 29                                                  | Combinational Circuits: Introduction and Design procedure             | L+D  | BB | 1 | 35 | 27/11/2023               |
| 30                                                  | Adders' circuits: Half adders                                         | L+D  | BB | 1 | 36 | 28/11/2023               |

|                                                                              |                                                 |       |     |   |    |            |
|------------------------------------------------------------------------------|-------------------------------------------------|-------|-----|---|----|------------|
| 31                                                                           | Full adder                                      | L+D   | BB  | 1 | 37 | 01/12/2023 |
| <b>MODULE 4: Embedded Systems</b>                                            |                                                 |       |     |   |    |            |
| 32                                                                           | Embedded systems vs general computing systems   | L+D   | BB  | 1 | 38 | 20/10/2023 |
| 33                                                                           | Classification of Embedded Systems              | L+D   | BB  | 1 | 39 | 26/10/2023 |
| 34                                                                           | Major application areas of Embedded Systems     | L+PPT | PPT | 1 | 40 | 26/10/2023 |
| 35                                                                           | Elements of Embedded System                     | L+D   | BB  | 1 | 41 | 27/10/2023 |
| 36                                                                           | Core of the Embedded System                     | L+D   | BB  | 1 | 42 | 30/10/2023 |
| 37                                                                           | Microprocessor vs Microcontroller, RISC vs CISC | L+PPT | PPT | 1 | 43 | 31/10/2023 |
| 38                                                                           | Instrumentation and control system,             | L+D   | BB  | 1 | 44 | 02/11/2023 |
| 39                                                                           | Transducers, Sensors,                           | L+D   | BB  | 1 | 45 | 02/11/2023 |
| 40                                                                           | Actuators, LED                                  | L+D   | BB  | 1 | 46 | 03/11/2023 |
| <b>IA1-07/11/2023</b>                                                        |                                                 |       |     |   |    |            |
| 41                                                                           | 7-Segment LED Display                           | L+D   | BB  | 1 | 47 | 09/11/2023 |
| <b>MODULE 5: Analog Communication Scheme &amp; Digital Modulation Scheme</b> |                                                 |       |     |   |    |            |
| 42                                                                           | Modern communication system scheme              | L+D   | BB  | 1 | 48 | 04/12/2023 |
| 43                                                                           | Transmitter, Channel or Medium                  | L+D   | BB  | 1 | 49 | 05/12/2023 |
| 44                                                                           | Noise, Receiver, Multiplexing                   | L+D   | BB  | 1 | 50 | 07/12/2023 |
| 45                                                                           | Types of modulation – AM                        | L+D   | BB  | 1 | 51 | 07/12/2023 |
| 46                                                                           | FM Modulation                                   | L+D   | BB  | 1 | 52 | 08/12/2023 |
| 47                                                                           | Concept of Radio wave propagation               | L+D   | BB  | 1 | 53 | 08/12/2023 |
| 48                                                                           | Advantages of digital over analog communication | L+D   | BB  | 1 | 54 | 09/12/2023 |
| 49                                                                           | Radio signal transmission                       | L+D   | BB  |   | 55 | 11/12/2023 |
| 50                                                                           | ASK, FSK, PSK,                                  | L+D   | BB  | 1 | 56 | 12/12/2023 |
| 51                                                                           | Multiple access techniques                      | L+PPT | PPT | 1 | 57 | 14/12/2023 |
| 52                                                                           | Poster Presentation                             |       |     |   |    | 14/12/2023 |
| 53                                                                           | Poster Presentation                             |       |     |   |    | 15/12/2023 |
| 54                                                                           | Poster Presentation                             |       |     |   |    | 19/12/2023 |



|              |                     |  |  |  |  |            |
|--------------|---------------------|--|--|--|--|------------|
| 55           | Poster Presentation |  |  |  |  | 21/12/2023 |
| 56           | Revision            |  |  |  |  | 21/12/2023 |
| 57           | Revision            |  |  |  |  | 22/12/2023 |
|              |                     |  |  |  |  |            |
| IA2-02/09/23 |                     |  |  |  |  |            |

### Text Books:

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. eBook ISBN 9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-2030417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017

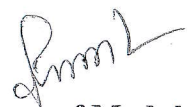
### Web Materials:

<https://www.youtube.com/watch?v=CWulQ1ZSE3c> -Basics of Magnet and motor  
<https://www.youtube.com/watch?v=mj2uoTztDI8>

Details of the teaching aids: 1. BB – Black Board

2. PPT Power Point Presentation

  
Signature of Course In-Charge

  
Signature of Module Coordinator

  
Signature of HOD

  
Signature of Principal



**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2022-23 ODD SEMESTER**

**COURSE INCHARGE** : Santhosh Kumar B.R

**COURSE TYPE / CODE / TITLE** : Theory/ BESCK204C / Introduction to Electronics & Communication

**YEAR/ SEMESTER/SECTION** : 1<sup>st</sup> /Ist /E

**BRANCH** : AI&ML

| Sl. No.                                        | Topic to be covered                      | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date            |
|------------------------------------------------|------------------------------------------|------------------|--------------|----------------|---------------------------|--------------------------|
| <b>MODULE 1: Power Supplies and Amplifiers</b> |                                          |                  |              |                |                           |                          |
| 1                                              | Introduction                             | L+D              | BB           | 1              | 1                         | 15/09/2023               |
| 2                                              | Power Supplies: Block diagram            | L+ D             | BB           | 1              | 2                         | 19/09/2023               |
| 3                                              | Half-wave rectifier and filters          | L+ D             | BB           | 1              | 3                         | 20/09/2023               |
| 4                                              | Full-wave rectifiers with filters        | L+ D             | BB           | 2              | 5                         | 21/09/2023<br>22/09/2023 |
| 5                                              | Voltage regulators                       | L+D              | BB           | 1              | 6                         | 23/09/2023               |
| 6                                              | Output resistance and voltage regulation | L+D              | BB           | 1              | 7                         | 25/09/2023               |



|                                                     |                                                                       |     |    |   |    |            |
|-----------------------------------------------------|-----------------------------------------------------------------------|-----|----|---|----|------------|
| 7                                                   | Voltage multipliers                                                   | L+D | BB | 1 | 8  | 26/09/2023 |
| 8                                                   | Amplifiers, types, gain, Input and output resistance                  | L+D | BB | 1 | 9  | 29/09/2023 |
| 9                                                   | Frequency Response, Negative feedback                                 | L+D | BB | 1 | 10 | 30/09/2023 |
| 10                                                  | Bandwidth and Phase Shift                                             | L+D | BB | 1 | 11 | 03/10/2023 |
| 11                                                  | Negative Feedback and Multi stage Amplifiers                          | L+D | BB | 1 | 12 | 05/10/2023 |
| <b>MODULE 2: Oscillators</b>                        |                                                                       |     |    |   |    |            |
| 12                                                  | Barkhausen criterion                                                  | L+D | BB | 1 | 13 | 06/10/2023 |
| 13                                                  | Sinusoidal and non-sinusoidal oscillators                             | L+D | BB | 2 | 15 | 09/10/2023 |
| 14                                                  | Ladder network oscillator                                             | L+D | BB | 1 | 16 | 10/10/2023 |
| 15                                                  | Crystal Controlled Oscillator                                         | L+D | BB | 1 | 17 | 12/10/2023 |
| 16                                                  | Operational Amplifiers: characteristics of ideal and practical op-amp | L+D | BB | 2 | 19 | 12/10/2023 |
| 17                                                  | Operational Amplifier Configurations                                  | L+D | BB | 1 | 20 | 13/10/2023 |
| 18                                                  | Operational Amplifier Circuits: Voltage Follower, summer, subtractor  | L+D | BB | 2 | 22 | 16/10/2023 |
| 19                                                  | Integrator and Differentiator                                         | L+D | BB | 1 | 23 | 17/10/2023 |
| <b>MODULE 3: Boolean Algebra and Logic Circuits</b> |                                                                       |     |    |   |    |            |
| 20                                                  | Binary numbers, Number Base Conversion                                |     |    | 1 | 24 | 20/10/2023 |
| 21                                                  | Octal & Hexa Decimal Numbers,                                         | L+D | BB | 1 | 25 | 11/11/2023 |
| 22                                                  | Complements                                                           |     |    | 2 | 27 | 13/11/2023 |
| 23                                                  | Axiomatic Definition of Boolean Algebra                               | L+D | BB | 1 | 28 | 16/11/2023 |
| 24                                                  | Basic Theorems and Properties of Boolean Algebra                      | L+D | BB | 1 | 29 | 16/11/2023 |
| 25                                                  | Boolean Functions,                                                    |     |    | 2 | 31 | 20/11/2023 |
| 26                                                  | Canonical and Standard Forms                                          | L+D | BB | 1 | 32 | 21/11/2023 |
| 27                                                  | Other Logic Operations,                                               | L+D | BB | 1 | 33 | 23/11/2023 |
|                                                     |                                                                       |     |    |   |    | 24/11/2023 |

|                                                                              |                                                           |       |     |   |    |            |
|------------------------------------------------------------------------------|-----------------------------------------------------------|-------|-----|---|----|------------|
| 28                                                                           | Digital Logic Gates                                       | L+D   | BB  | 1 | 34 | 25/11/2023 |
| 29                                                                           | Combinational Circuits: Introduction and Design procedure | L+D   | BB  | 1 | 35 | 27/11/2023 |
| 30                                                                           | Adders' circuits: Half adders                             | L+D   | BB  | 1 | 36 | 28/11/2023 |
| 31                                                                           | Full adder                                                | L+D   | BB  | 1 | 37 | 01/12/2023 |
| <b>MODULE 4: Embedded Systems</b>                                            |                                                           |       |     |   |    |            |
| 32                                                                           | Embedded systems vs general computing systems             | L+D   | BB  | 1 | 38 | 26/10/2023 |
| 33                                                                           | Classification of Embedded Systems                        | L+D   | BB  | 1 | 39 | 27/10/2023 |
| 34                                                                           | Major application areas of Embedded Systems               | L+PPT | PPT | 1 | 40 | 28/10/2023 |
| 35                                                                           | Elements of Embedded System                               | L+D   | BB  | 1 | 41 | 30/10/2023 |
| 36                                                                           | Core of the Embedded System                               | L+D   | BB  | 1 | 42 | 31/10/2023 |
| 37                                                                           | Microprocessor vs Microcontroller, RISC vs CISC           | L+PPT | PPT | 1 | 43 | 02/11/2023 |
| 38                                                                           | Instrumentation and control system,                       | L+D   | BB  | 1 | 44 | 02/11/2023 |
| <b>IA1-07/11/2023</b>                                                        |                                                           |       |     |   |    |            |
| 39                                                                           | Transducers, Sensors,                                     | L+D   | BB  | 1 | 45 | 09/11/2023 |
| 40                                                                           | Actuators, LED                                            | L+D   | BB  | 1 | 46 | 09/11/2023 |
| 41                                                                           | 7-Segment LED Display                                     | L+D   | BB  | 1 | 47 | 10/11/2023 |
| <b>MODULE 5: Analog Communication Scheme &amp; Digital Modulation Scheme</b> |                                                           |       |     |   |    |            |
| 42                                                                           | Modern communication system scheme                        | L+D   | BB  | 1 | 48 | 01/12/2023 |
| 43                                                                           | Transmitter, Channel or Medium                            | L+D   | BB  | 1 | 49 | 04/12/2023 |
| 44                                                                           | Noise, Receiver, Multiplexing                             | L+D   | BB  | 1 | 50 | 05/12/2023 |
| 45                                                                           | Types of modulation – AM                                  | L+D   | BB  | 1 | 51 | 07/12/2023 |
| 46                                                                           | FM Modulation                                             | L+D   | BB  | 1 | 52 | 07/12/2023 |
| 47                                                                           | Concept of Radio wave propagation                         | L+D   | BB  | 1 | 53 | 08/12/2023 |
| 48                                                                           | Advantages of digital over analog communication           | L+D   | BB  | 1 | 54 | 09/12/2023 |
| 49                                                                           | Radio signal transmission                                 | L+D   | BB  |   | 55 | 11/12/2023 |
| 50                                                                           | ASK, FSK, PSK,                                            | L+D   | BB  | 1 | 56 | 12/12/2023 |
| 51                                                                           | Multiple access techniques                                | L+PPT | PPT | 1 | 57 | 14/12/2023 |



|              |                     |  |  |  |  |            |
|--------------|---------------------|--|--|--|--|------------|
| 52           | Poster Presentation |  |  |  |  | 14/12/2023 |
| 53           | Poster Presentation |  |  |  |  | 18/12/2023 |
| 54           | Poster Presentation |  |  |  |  | 19/12/2023 |
| 55           | Poster Presentation |  |  |  |  | 21/12/2023 |
| 56           | Revision            |  |  |  |  | 21/12/2023 |
| 57           | Revision            |  |  |  |  | 22/12/2023 |
| IA2-26/12/23 |                     |  |  |  |  |            |

#### Text Books:

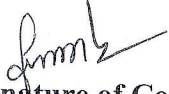
1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. eBook ISBN 9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-2030417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017

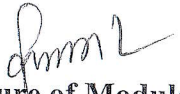
#### Web Materials:

<https://www.youtube.com/watch?v=CWulQ1ZSE3c> -Basics of Magnet and motor  
<https://www.youtube.com/watch?v=mj2uoTztDI8>

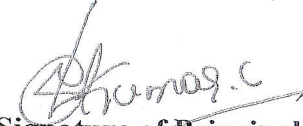
Details of the teaching aids: 1. BB – Black Board

2. PPT Power Point Presentation

  
Signature of Course In-Charge

  
Signature of Module Coordinator

  
Signature of HOD

  
Signature of Principal



# KS INSTITUTE OF TECHNOLOGY BANGALORE

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### LESSON PLAN 2023-2024 ODD Semester

COURSE INCHARGE : Dr. Devika B

COURSE CODE/NAME :BEC303/ELECTRONIC PRINCIPLES AND CIRCUITS

SEMESTER/YEAR/SEC :III/ II/A

ACADEMIC YEAR : 2023-24

| Sl. No.                                 | Topic to be covered                                               | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (A) |
|-----------------------------------------|-------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| <b>MODULE 3 : Linear Opamp Circuits</b> |                                                                   |                  |              |                |                           |                   |
| 1                                       | <b>Linear Opamp Circuits:</b> Summing Amplifier and D/A Converter | L                | BB+P         | 1              | 1                         | 23/11/23          |
| 2                                       | , Nonlinear Op-amp Circuits: Comparator with zero reference,      | L                | BB+P         | 1              | 2                         | 24/11/23          |
| 3                                       | Comparator with non-zero references.                              | L                | BB+P         | 1              | 3                         | 25/11/23          |
| 4                                       | Comparator with Hysteresis.                                       | L                | BB+P         | 1              | 4                         | 27/11/23          |
| 5                                       | <b>Oscillator:</b> Theory of Sinusoidal Oscillation               | L                | BB+P         | 1              | 5                         | 28/11/23          |
| 6                                       | The Wein-Bridge Oscillator, RC Phase Shift                        | L                | BB+P         | 1              | 6                         | 1/12/23           |



|                                     |                                                              |   |      |   |    |          |
|-------------------------------------|--------------------------------------------------------------|---|------|---|----|----------|
|                                     | Oscillator,                                                  |   |      |   |    |          |
| 7                                   | The Colpitts Oscillator                                      | L | BB+P | 1 | 7  | 4/12/23  |
| 8                                   | Hartley Oscillator, Crystal Oscillator.                      | L | BB+P | 1 | 8  | 5/12/23  |
| 9                                   | <b>The 555 timer:</b> Monostable Operation,                  | L | BB+P | 1 | 9  | 7/12/23  |
| 10                                  | Astable Operation                                            | L | BB+P | 1 | 10 | 8/12/23  |
| <b>MODULE 4: Negative Feedback:</b> |                                                              |   |      |   |    |          |
| 11                                  | <b>Negative Feedback:</b> Four Types of Negative Feedback,   | L | BB+P | 1 | 11 | 9/12/23  |
| 12                                  | VCVS Voltage gain                                            | L | BB+P | 1 | 12 | 11/12/23 |
| 13                                  | Other VCVS                                                   | L | BB+P | 1 | 13 | 12/12/23 |
| 14                                  | , Equations, ICVS Amplifier,                                 | L | BB+P | 1 | 14 | 14/12/23 |
| 15                                  | VCIS Amplifier, ICIS Amplifier (No Mathematical Derivation). | L | BB+P | 1 | 15 | 15/12/23 |
| 16                                  | <b>Active Filters:</b> Ideal Responses, First Order Stages,  | L | BB+P | 1 | 16 | 18/12/23 |
| 17                                  | VCVS Unity Gain Second Order Low pass Filters,               | L | BB+P | 1 | 17 | 19/12/23 |
| 18                                  | VCVS Equal Component Low Pass Filters,                       | L | BB+P | 1 | 18 | 21/12/23 |
| 19                                  | VCVS High Pass Filters,                                      | L | BB+P | 1 | 19 | 22/12/23 |
| 20                                  | MFB Bandpass Filters,                                        | L | BB+P | 1 | 20 | 23/12/23 |
| 21                                  | Bandstop Filters.                                            | L | BB+P | 1 | 21 | 26/12/23 |
| <b>MODULE 5: Power Amplifiers</b>   |                                                              |   |      |   |    |          |
| 22                                  | <b>Power Amplifiers:</b> Amplifier terms, Two load lines,    | L | BB+P | 1 | 22 | 28/12/23 |

|                                |                                                            |   |      |   |    |          |
|--------------------------------|------------------------------------------------------------|---|------|---|----|----------|
| 23                             | Class A Operation,                                         | L | BB+P | 1 | 23 | 29/12/23 |
| 24                             | Class B operation                                          | L | BB+P | 1 | 24 | 30/12/23 |
| IA-1                           |                                                            |   |      |   |    |          |
| 27                             | ,Class B push pull emitter follower,                       | L | BB+P | 1 | 27 | 4/1/24   |
| 28                             | Class C Operation                                          | L | BB+P | 1 | 28 | 5/1/24   |
| 29                             | <b>Thyristors:</b> The four layer Diode                    | L | BB+P | 1 | 29 | 8/1/24   |
| 30                             | , SCR,                                                     | L | BB+P | 1 | 30 | 9/1/24   |
| 31                             | SCR Phase control,                                         | L | BB+P | 1 | 31 | 11/1/24  |
| 32                             | Bidirectional Thyristors,                                  | L | BB+P | 1 | 32 | 12/1/24  |
| 33                             | IGBTs,                                                     | L | BB+P | 1 | 33 | 13/1/24  |
| 34                             | Other Thyristors.                                          | L | BB+P | 1 | 34 | 16/1/24  |
| <b>MODULE 1: BJT AC models</b> |                                                            |   |      |   |    |          |
| 35                             | <b>BJT AC models:</b> Base Biased Amplifier,               | L | BB+P | 1 | 35 | 18/1/24  |
| 36                             | Emitter Biased Amplifier, Small Signal Operation, AC Beta, | L | BB+P | 1 | 36 | 19/1/24  |
| 37                             | AC Resistance of the emitter diode, Two transistor models, | L | BB+P | 1 | 37 | 22/1/24  |
| 38                             | Analyzing an amplifier.                                    | L | BB+P | 1 | 38 | 23/1/24  |



|                         |                                                                                                                     |   |      |   |    |         |
|-------------------------|---------------------------------------------------------------------------------------------------------------------|---|------|---|----|---------|
|                         | <b>Voltage Amplifiers:</b> Voltage gain,                                                                            |   |      |   |    |         |
| 39                      | Multistage Amplifiers.<br><b>CC and CB Amplifiers:</b> CC Amplifier,                                                | L | BB+P | 1 | 39 | 25/1/24 |
| 40                      | Output Impedance, Cascading CE and CC,                                                                              | L | BB+P | 1 | 40 | 27/1/24 |
| 41                      | Darlington Connections,                                                                                             | L | BB+P | 1 | 41 | 29/1/24 |
| 42                      | Voltage regulation, The Common base Amplifier                                                                       | L | BB+P | 1 | 42 | 30/1/24 |
| <b>MODULE 2: MOSFET</b> |                                                                                                                     |   |      |   |    |         |
| 43                      | <b>MOSFET</b><br>Biasing in MOS amplifier circuits:                                                                 | L | BB+P | 1 | 43 | 1/2/24  |
| 44                      | Fixing VGS, Fixing VG, Drain to Gate feedback resistor.                                                             | L | BB+P | 1 | 44 | 2/2/24  |
| 45                      | Small signal operation and modelling: The DC bias point, signal current in drain, voltage gain,                     | L | BB+P | 1 | 45 | 5/2/24  |
| 46                      | small signal equivalent circuit models, transconductance,                                                           | L | BB+P | 1 | 46 | 6/2/24  |
|                         | IA-2                                                                                                                |   |      |   |    |         |
| 53                      | The T equivalent circuit model.<br>MOSFET Amplifier configuration: Basic configurations, characterizing amplifiers, | L | BB+P | 1 | 53 | 16/2/23 |
| 54                      | CS amplifier with and without source resistance, The                                                                | L | BB+P | 1 | 54 | 19/2/23 |

|    |                        |   |      |   |    |         |
|----|------------------------|---|------|---|----|---------|
|    | Common Gate Amplifier, |   |      |   |    |         |
| 55 | Source follower        | L | BB+P | 1 | 55 | 20/2/23 |

**TEXTBOOK:**

Albert Malvino, David J Bates, Electronic Principles, 7<sup>th</sup> Edition, Mc Graw Hill Education, 2017, ISBN:978-0-07-063424-4.

2. Microelectronic Circuits, Theory and Applications, Adel S Sedra, Kenneth C Smith, 6<sup>th</sup> Edition, Oxford, 2015. ISBN:978-0-19-808913-1

**REFERENCES:**

Integrated Electronics: Analog and Digital Circuits and Systems, Jacob Millman, Christos C. Halkias, McGraw-Hill, 2015.

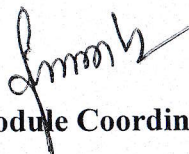
2. Electronic Devices and Circuit, Boylestad & Nashelsky, Eleventh Edition, Pearson, January 2015.

**WEB MATERIALS:**

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>



**Course Incharge**



**Module Coordinator**



**HOD**

**HEAD OF THE DEPARTMENT**  
 Dept. of Electronics & Communication Engg  
**K.S. Institute of Technology**  
 Bengaluru - 560 109





## KS INSTITUTE OF TECHNOLOGY BANGALORE

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

#### LESSON PLAN 2023-2024 ODD Semester

COURSE INCHARGE : Dr. Devika B

COURSE CODE/NAME :BEC303/ELECTRONIC PRINCIPLES AND CIRCUITS

SEMESTER/YEAR/SEC :III/ II/B

ACADEMIC YEAR : 2023-24

| Sl. No.                                 | Topic to be covered                                               | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (A) |
|-----------------------------------------|-------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| <b>MODULE 3 : Linear Opamp Circuits</b> |                                                                   |                  |              |                |                           |                   |
| 1                                       | <b>Linear Opamp Circuits:</b> Summing Amplifier and D/A Converter | L                | BB+P         | 1              | 1                         | 23/11/23          |
| 2                                       | , Nonlinear Op-amp Circuits: Comparator with zero reference,      | L                | BB+P         | 1              | 2                         | 24/11/23          |
| 3                                       | Comparator with non-zero references.                              | L                | BB+P         | 1              | 3                         | 25/11/23          |
| 4                                       | Comparator with Hysteresis.                                       | L                | BB+P         | 1              | 4                         | 27/11/23          |
| 5                                       | <b>Oscillator:</b> Theory of Sinusoidal Oscillation               | L                | BB+P         | 1              | 5                         | 28/11/23          |
| 6                                       | The Wein-Bridge Oscillator, RC Phase Shift                        | L                | BB+P         | 1              | 6                         | 1/12/23           |

|                                     |                                                              |   |      |   |    |          |
|-------------------------------------|--------------------------------------------------------------|---|------|---|----|----------|
|                                     | Oscillator,                                                  |   |      |   |    |          |
| 7                                   | The Colpitts Oscillator                                      | L | BB+P | 1 | 7  | 4/12/23  |
| 8                                   | Hartley Oscillator, Crystal Oscillator.                      | L | BB+P | 1 | 8  | 5/12/23  |
| 9                                   | <b>The 555 timer:</b> Monostable Operation,                  | L | BB+P | 1 | 9  | 7/12/23  |
| 10                                  | Astable Operation                                            | L | BB+P | 1 | 10 | 8/12/23  |
| <b>MODULE 4: Negative Feedback:</b> |                                                              |   |      |   |    |          |
| 11                                  | <b>Negative Feedback:</b> Four Types of Negative Feedback,   | L | BB+P | 1 | 11 | 9/12/23  |
| 12                                  | VCVS Voltage gain                                            | L | BB+P | 1 | 12 | 11/12/23 |
| 13                                  | Other VCVS                                                   | L | BB+P | 1 | 13 | 12/12/23 |
| 14                                  | , Equations, ICVS Amplifier,                                 | L | BB+P | 1 | 14 | 14/12/23 |
| 15                                  | VCIS Amplifier, ICIS Amplifier (No Mathematical Derivation). | L | BB+P | 1 | 15 | 15/12/23 |
| 16                                  | <b>Active Filters:</b> Ideal Responses, First Order Stages,  | L | BB+P | 1 | 16 | 18/12/23 |
| 17                                  | VCVS Unity Gain Second Order Low pass Filters,               | L | BB+P | 1 | 17 | 19/12/23 |
| 18                                  | VCVS Equal Component Low Pass Filters,                       | L | BB+P | 1 | 18 | 21/12/23 |
| 19                                  | VCVS High Pass Filters,                                      | L | BB+P | 1 | 19 | 22/12/23 |
| 20                                  | MFB Bandpass Filters,                                        | L | BB+P | 1 | 20 | 23/12/23 |
| 21                                  | Bandstop Filters.                                            | L | BB+P | 1 | 21 | 26/12/23 |
| <b>MODULE 5: Power Amplifiers</b>   |                                                              |   |      |   |    |          |
| 22                                  | <b>Power Amplifiers:</b> Amplifier terms, Two load lines,    | L | BB+P | 1 | 22 | 28/12/23 |



|                                |                                                                  |   |      |   |    |          |
|--------------------------------|------------------------------------------------------------------|---|------|---|----|----------|
| 23                             | Class A Operation,                                               | L | BB+P | 1 | 23 | 29/12/23 |
| 24                             | Class B operation                                                | L | BB+P | 1 | 24 | 30/12/23 |
| IA-1                           |                                                                  |   |      |   |    |          |
| 27                             | ,Class<br>B push pull emitter follower,                          | L | BB+P | 1 | 27 | 4/1/24   |
| 28                             | Class C Operation                                                | L | BB+P | 1 | 28 | 5/1/24   |
| 29                             | <b>Thyristors:</b> The four layer Diode                          | L | BB+P | 1 | 29 | 8/1/24   |
| 30                             | , SCR,                                                           | L | BB+P | 1 | 30 | 9/1/24   |
| 31                             | SCR Phase control,                                               | L | BB+P | 1 | 31 | 11/1/24  |
| 32                             | Bidirectional Thyristors,                                        | L | BB+P | 1 | 32 | 12/1/24  |
| 33                             | IGBTs,                                                           | L | BB+P | 1 | 33 | 13/1/24  |
| 34                             | Other Thyristors.                                                | L | BB+P | 1 | 34 | 16/1/24  |
| <b>MODULE 1: BJT AC models</b> |                                                                  |   |      |   |    |          |
| 35                             | <b>BJT AC models:</b> Base Biased Amplifier,                     | L | BB+P | 1 | 35 | 18/1/24  |
| 36                             | Emitter Biased Amplifier, Small Signal<br>Operation, AC<br>Beta, | L | BB+P | 1 | 36 | 19/1/24  |
| 37                             | AC Resistance of the emitter diode, Two<br>transistor models,    | L | BB+P | 1 | 37 | 22/1/24  |
| 38                             | Analyzing an amplifier.                                          | L | BB+P | 1 | 38 | 23/1/24  |





|    |                        |   |      |   |    |         |
|----|------------------------|---|------|---|----|---------|
|    | Common Gate Amplifier, |   |      |   |    |         |
| 55 | Source follower        | L | BB+P | 1 | 55 | 20/2/23 |

**TEXTBOOK:**

Albert Malvino, David J Bates, Electronic Principles, 7<sup>th</sup> Edition, Mc Graw Hill Education, 2017, ISBN:978-0-07-063424-4.

2. Microelectronic Circuits, Theory and Applications, Adel S Sedra, Kenneth C Smith, 6<sup>th</sup> Edition, Oxford, 2015. ISBN:978-0-19-808913-1

**REFERENCES:**

Integrated Electronics: Analog and Digital Circuits and Systems, Jacob Millman, Christos C. Halkias, McGraw-Hill, 2015.

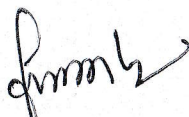
2. Electronic Devices and Circuit, Boylestad & Nashelsky, Eleventh Edition, Pearson, January 2015.

**WEB MATERIALS:**

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>



Course Incharge



Module Coordinator



**HOD**  
**HEAD OF THE DEPARTMENT**  
 Dept. of Electronics & Communication Engg  
 K.S. Institute of Technology  
 Bengaluru - 560 109



8

**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE : Ramya K R**

**COURSE TYPE / CODE/TITLE: Theory/BESCK104B /Introduction to Electrical Engineering**

**YEAR/ SEMESTER/SECTION : I / I / F**

**BRANCH : ELCECTRONICS AND COMMUNICATION ENGINEERING**

| Sl. No.                                                     | Topic to be covered                                                               | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module1: Introduction, Power Generation, DC Circuits</b> |                                                                                   |                  |              |                |                           |               |
| 1                                                           | Introduction: Conventional and non-conventional energy resources                  | L+D              | BB           | 1              | 1                         | 14/9/23       |
| 2                                                           | General structure of electrical power systems using single line diagram approach. | L+D              | BB           | 1              | 2                         | 15/9/23       |
| 3                                                           | Power Generation: Hydel, Nuclear                                                  | L+D              | LCD          | 1              | 3                         | 19/9/23       |
| 4                                                           | Power Generation: Solar, wind                                                     | L+D              | LCD          | 1              | 4                         | 21/9/23       |
| 5                                                           | DC Circuits: Ohm's Law and its limitations. KCL & KVL                             | L+PS             | BB           | 1              | 5                         | 22/9/23       |
| 6                                                           | Problems                                                                          | L+PS             | BB           | 1              | 6                         | 23/9/23       |
| 7                                                           | series, parallel circuits                                                         | L+D              | BB           | 1              | 7                         | 25/9/23       |
| 8                                                           | problems                                                                          | L+PS             | BB           | 1              | 8                         | 26/9/23       |
| 9                                                           | series-parallel circuits                                                          | L+D              | BB           | 1              | 9                         | 29/9/23       |
| 10                                                          | Problems                                                                          | L+PS             | BB           | 1              | 10                        | 30/9/23       |



| Module2: A.C. Fundamentals and Three phase Circuits    |                                                                                                                                         |        |     |   |    |                      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|-----|---|----|----------------------|
| 11                                                     | Equation of AC Voltage and current.                                                                                                     | L+D    | BB  | 1 | 11 | 31/10/23             |
| 12                                                     | Definition of waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor. | L+D    | BB  | 1 | 12 | 5/10/23              |
| 13                                                     | Voltage and current relationship with phasor diagrams in R, L, and C circuits.                                                          | L+D    | BB  | 1 | 13 | 6/10/23              |
| 14                                                     | Problems, Concept of Impedance.                                                                                                         | L+PS   | BB  | 1 | 14 | 9/10/23              |
| 15                                                     | Analysis of R-L, R-C Series circuits, concept of power factor                                                                           | L+D    | BB  | 1 | 15 | 10/10/23             |
| 16                                                     | problems                                                                                                                                | L+PS   | BB  | 1 | 16 | 12/10/23             |
| 17                                                     | Analysis of R-L-C Series circuits                                                                                                       | L+D    | BB  | 1 | 17 | 13/10/23             |
| 18                                                     | Problems                                                                                                                                | L+PS   | BB  | 1 | 18 | 16/10/23<br>17/10/23 |
| 19                                                     | Generation of Three phase AC quantity, advantages and limitations                                                                       | L+D    | LCD | 1 | 19 | 19/10/23             |
| 20                                                     | star and delta connection, relationship between line and phase quantities (excluding proof), Problems                                   | L+D+PS | BB  | 1 | 20 | 20/10/23             |
| Module 4-Transformers and Three-phase induction Motors |                                                                                                                                         |        |     |   |    |                      |
| 21                                                     | Transformers: Necessity of transformer, principle of operation                                                                          | L+D    | BB  | 1 | 21 | 26/10/23             |
| 22                                                     | Types and construction of single-phase transformers                                                                                     | L+D    | LCD | 1 | 22 | 27/10/23             |
| 23                                                     | EMF equation, losses                                                                                                                    | L+D    | BB  | 1 | 23 | 30/10/23             |
| 24                                                     | variation of losses with respect to load, Efficiency                                                                                    | L+D    | BB  | 1 | 24 | 31/10/23             |
| 25                                                     | Problems                                                                                                                                | L+PS   | BB  | 2 | 26 | 2/11/23<br>3/11/23   |
| FIRST IA TEST 8/11/2023                                |                                                                                                                                         |        |     |   |    |                      |
| 26                                                     | <b>Three-phase induction Motors:</b> Concept of rotating magnetic field                                                                 | L+D    | BB  | 1 | 27 | 9/11/23              |
| 27                                                     | Principle of operation, constructional features of motor types – squirrel cage and wound rotor                                          | L+D    | LCD | 1 | 28 | 10/11/23             |
| 28                                                     | Slip and its significance                                                                                                               | L+D    | BB  | 1 | 29 | 13/11/23             |

|                                                                                                            |                                                                                                                        |      |     |   |    |                      |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|-----|---|----|----------------------|
| 29                                                                                                         | Problems                                                                                                               | L+PS | BB  | 1 | 30 | 16/11/23             |
| <b>Module 5- Domestic Wiring, Electricity bill, Equipment Safety measures and Personal safety measures</b> |                                                                                                                        |      |     |   |    |                      |
| 30                                                                                                         | <b>Domestic Wiring:</b> Requirements, Types of wiring: casing, capping                                                 | L+D  | BB  | 1 | 31 | 17/11/23             |
| 31                                                                                                         | Two way and three-way control of load.                                                                                 | L+D  | LCD | 1 | 32 | 20/11/23             |
| 32                                                                                                         | <b>Electricity bill:</b> Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. | L+D  | BB  | 1 | 33 | 21/11/23             |
| 33                                                                                                         | Definition of "unit" used for consumption of electrical energy                                                         | L+D  | BB  | 1 | 34 | 23/11/23             |
| 34                                                                                                         | Two-part electricity tariff, calculation of electricity bill for domestic consumers                                    | L+D  | BB  | 1 | 35 | 24/11/23             |
| 35                                                                                                         | problems                                                                                                               | L+PS | BB  | 1 | 36 | 27/11/23             |
| 36                                                                                                         | Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.         | L+D  | BB  | 1 | 37 | 28/11/23             |
| 37                                                                                                         | Personal safety measures: Electric Shock, Safety Precautions to avoid shock                                            | L+D  | LCD | 1 | 38 | 1/12/23              |
| 38                                                                                                         | Earthing and its types,                                                                                                | L+D  | LCD | 1 | 39 | 4/12/23              |
| <b>Module 3- DC Machines</b>                                                                               |                                                                                                                        |      |     |   |    |                      |
| 39                                                                                                         | <b>DC Machines:</b> Generator- constructional details                                                                  | L+D  | LCD | 1 | 40 | 5/12/23              |
| 40                                                                                                         | Principle of operation, induced emf expression.                                                                        | L+D  | LCD | 1 | 41 | 4/12/23              |
| 41                                                                                                         | Types of generators, and the relation between induced emf and terminal voltage.                                        | L+D  | BB  | 1 | 42 | 7/12/23              |
| 42                                                                                                         | Problems.                                                                                                              | L+PS | BB  | 2 | 44 | 8/12/23<br>9/12/23   |
| 43                                                                                                         | Motor-Principle of operation, back emf and torque equations                                                            | L+D  | BB  | 1 | 45 | 11/12/23             |
| 44                                                                                                         | Types of motors                                                                                                        | L+D  | BB  | 1 | 46 | 12/12/23             |
| 45                                                                                                         | Problems.                                                                                                              | L+PS | BB  | 2 | 48 | 14/12/23<br>15/12/23 |
| 46                                                                                                         | Characteristics (shunt and series only), Problems.                                                                     | L+D  | BB  | 2 | 50 | 18/12/23<br>19/12/23 |



|                           |                                                                                                           |     |     |   |    |                      |
|---------------------------|-----------------------------------------------------------------------------------------------------------|-----|-----|---|----|----------------------|
| 47                        | speed control (armature & field) of DC motors (series & shunt only), Problems, Applications of DC motors. | L+D | BB  | 1 | 51 | 21/12/23             |
| 48                        | Presentation                                                                                              |     | LCD | 2 | 53 | 22/12/23<br>23/12/23 |
| SECOND IA TEST 28/12/2023 |                                                                                                           |     |     |   |    |                      |

### Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

  
Course Incharge

  
Module Coordinator

  
HOD  
HEAD OF THE DEPARTMENT  
Dept. of Electronics & Communication Engg  
K.S. Institute of Technology  
Bengaluru - 560 109

  
PRINCIPAL  
PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109.



**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE : Ramya K R**

**COURSE TYPE / CODE/TITLE: Theory/BESCK104B /Introduction to Electrical Engineering**

**YEAR/ SEMESTER/SECTION : I / I / G**

**BRANCH : ELCECTRONICS AND COMMUNICATION ENGINEERING**

| Sl. No.                                                     | Topic to be covered                                                               | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module1: Introduction, Power Generation, DC Circuits</b> |                                                                                   |                  |              |                |                           |               |
| 1                                                           | Introduction: Conventional and non-conventional energy resources                  | L+D              | BB           | 1              | 1                         | 14/9/23       |
| 2                                                           | General structure of electrical power systems using single line diagram approach. | L+D              | BB           | 1              | 2                         | 15/9/23       |
| 3                                                           | Power Generation: Hydel, Nuclear                                                  | L+D              | LCD          | 1              | 3                         | 19/9/23       |
| 4                                                           | Power Generation: Solar, wind                                                     | L+D              | LCD          | 1              | 4                         | 21/9/23       |
| 5                                                           | DC Circuits: Ohm's Law and its limitations. KCL & KVL                             | L+PS             | BB           | 1              | 5                         | 22/9/23       |
| 6                                                           | Problems                                                                          | L+PS             | BB           | 1              | 6                         | 23/9/23       |
| 7                                                           | series, parallel circuits                                                         | L+D              | BB           | 1              | 7                         | 25/9/23       |
| 8                                                           | problems                                                                          | L+PS             | BB           | 1              | 8                         | 26/9/23       |
| 9                                                           | series-parallel circuits                                                          | L+D              | BB           | 1              | 9                         | 29/9/23       |
| 10                                                          | Problems                                                                          | L+PS             | BB           | 1              | 10                        | 30/9/23       |



| Module 3 A.C. Fundamentals and Three phase Circuits    |                                                                                                                                         |        |     |   |    |                      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|-----|---|----|----------------------|
| 11                                                     | Equation of AC Voltage and current.                                                                                                     | L+D    | BB  | 1 | 11 | 31/10/23             |
| 12                                                     | Definition of waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor. | L+D    | BB  | 1 | 12 | 5/10/23              |
| 13                                                     | Voltage and current relationship with phasor diagrams in R, L, and C circuits.                                                          | L+D    | BB  | 1 | 13 | 6/10/23              |
| 14                                                     | Problems, Concept of Impedance.                                                                                                         | L+PS   | BB  | 1 | 14 | 9/10/23              |
| 15                                                     | Analysis of R-L, R-C Series circuits, concept of power factor                                                                           | L+D    | BB  | 1 | 15 | 10/10/23             |
| 16                                                     | problems                                                                                                                                | L+PS   | BB  | 1 | 16 | 12/10/23             |
| 17                                                     | Analysis of R-L-C Series circuits                                                                                                       | L+D    | BB  | 1 | 17 | 13/10/23             |
| 18                                                     | Problems                                                                                                                                | L+PS   | BB  | 1 | 18 | 16/10/23<br>17/10/23 |
| 19                                                     | Generation of Three phase AC quantity, advantages and limitations                                                                       | L+D    | LCD | 1 | 19 | 19/10/23             |
| 20                                                     | star and delta connection, relationship between line and phase quantities (excluding proof), Problems                                   | L+D+PS | BB  | 1 | 20 | 20/10/23             |
| Module 4-Transformers and Three-phase induction Motors |                                                                                                                                         |        |     |   |    |                      |
| 21                                                     | Transformers: Necessity of transformer, principle of operation                                                                          | L+D    | BB  | 1 | 21 | 26/10/23             |
| 22                                                     | Types and construction of single-phase transformers                                                                                     | L+D    | LCD | 1 | 22 | 27/10/23             |
| 23                                                     | EMF equation, losses                                                                                                                    | L+D    | BB  | 1 | 23 | 30/10/23             |
| 24                                                     | variation of losses with respect to load, Efficiency                                                                                    | L+D    | BB  | 1 | 24 | 31/10/23             |
| 25                                                     | Problems                                                                                                                                | L+PS   | BB  | 2 | 26 | 2/11/23<br>3/11/23   |
| FIRST IA TEST 8/11/2023                                |                                                                                                                                         |        |     |   |    |                      |
| 26                                                     | <b>Three-phase induction Motors:</b> Concept of rotating magnetic field                                                                 | L+D    | BB  | 1 | 27 | 9/11/23              |
| 27                                                     | Principle of operation, constructional features of motor types – squirrel cage and wound rotor                                          | L+D    | LCD | 1 | 28 | 10/11/23             |
| 28                                                     | Slip and its significance                                                                                                               | L+D    | BB  | 1 | 29 | 13/11/23             |

|                                                                                                            |                                                                                                                        |      |     |   |    |                      |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|-----|---|----|----------------------|
| 29                                                                                                         | Problems                                                                                                               | L+PS | BB  | 1 | 30 | 16/11/23             |
| <b>Module 5- Domestic Wiring, Electricity bill, Equipment Safety measures and Personal safety measures</b> |                                                                                                                        |      |     |   |    |                      |
| 30                                                                                                         | <b>Domestic Wiring:</b> Requirements, Types of wiring: casing, capping                                                 | L+D  | BB  | 1 | 31 | 17/11/23             |
| 31                                                                                                         | Two way and three-way control of load.                                                                                 | L+D  | LCD | 1 | 32 | 20/11/23             |
| 32                                                                                                         | <b>Electricity bill:</b> Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. | L+D  | BB  | 1 | 33 | 21/11/23             |
| 33                                                                                                         | Definition of “unit” used for consumption of electrical energy                                                         | L+D  | BB  | 1 | 34 | 23/11/23             |
| 34                                                                                                         | Two-part electricity tariff, calculation of electricity bill for domestic consumers                                    | L+D  | BB  | 1 | 35 | 24/11/23             |
| 35                                                                                                         | problems                                                                                                               | L+PS | BB  | 1 | 36 | 27/11/23             |
| 36                                                                                                         | Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.         | L+D  | BB  | 1 | 37 | 28/11/23             |
| 37                                                                                                         | Personal safety measures: Electric Shock, Safety Precautions to avoid shock                                            | L+D  | LCD | 1 | 38 | 1/12/23              |
| 38                                                                                                         | Earthing and its types,                                                                                                | L+D  | LCD | 1 | 39 | 4/12/23              |
| <b>Module 3- DC Machines</b>                                                                               |                                                                                                                        |      |     |   |    |                      |
| 39                                                                                                         | <b>DC Machines:</b> Generator- constructional details                                                                  | L+D  | LCD | 1 | 40 | 5/12/23              |
| 40                                                                                                         | Principle of operation, induced emf expression.                                                                        | L+D  | LCD | 1 | 41 | 4/12/23              |
| 41                                                                                                         | Types of generators, and the relation between induced emf and terminal voltage.                                        | L+D  | BB  | 1 | 42 | 7/12/23              |
| 42                                                                                                         | Problems.                                                                                                              | L+PS | BB  | 2 | 44 | 8/12/23<br>9/12/23   |
| 43                                                                                                         | Motor-Principle of operation, back emf and torque equations                                                            | L+D  | BB  | 1 | 45 | 11/12/23             |
| 44                                                                                                         | Types of motors                                                                                                        | L+D  | BB  | 1 | 46 | 12/12/23             |
| 45                                                                                                         | Problems.                                                                                                              | L+PS | BB  | 2 | 48 | 14/12/23<br>15/12/23 |
| 46                                                                                                         | Characteristics (shunt and series only), Problems.                                                                     | L+D  | BB  | 2 | 50 | 18/12/23<br>19/12/23 |



|                           |                                                                                                           |     |     |   |    |                      |
|---------------------------|-----------------------------------------------------------------------------------------------------------|-----|-----|---|----|----------------------|
| 47                        | speed control (armature & field) of DC motors (series & shunt only), Problems, Applications of DC motors. | L+D | BB  | 1 | 51 | 21/12/23             |
| 48                        | Presentation                                                                                              |     | LCD | 2 | 53 | 22/12/23<br>23/12/23 |
| SECOND IA TEST 28/12/2023 |                                                                                                           |     |     |   |    |                      |

### Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

  
Course Incharge

  
Module Coordinator

  
HOD  
HEAD OF THE DEPARTMENT  
Dept. of Electronics & Communication Engg  
K.S. Institute of Technology  
Bengaluru - 560 109

  
PRINCIPAL  
PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109.



**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**COURSE PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE:** Mrs. Vishalini Divakar

**COURSE CODE/TITLE:** Energy & Environment / 18ME751

**YEAR/ SEMESTER/SECTION :** IV/ VII/A

**BRANCH :** ECE

| Sl. No.                                       | Topic to be covered                                                     | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------|-------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module 1: Basic Introduction to Energy</b> |                                                                         |                  |              |                |                           |               |
| 1                                             | Energy and power, forms of energy, primary energy sources, energy flows | L+D              | BB+PPT       | 1              | 1                         | 11/9/23       |
| 2                                             | World energy production and consumption                                 | L+D              | BB+PPT       | 1              | 2                         | 12/9/23       |
| 3                                             | Key energy trends in India: Demand,                                     | L+ D             | BB+PPT       | 1              | 3                         | 13/9/23       |
| 4                                             | Electricity                                                             | L+D              | BB+PPT       | 1              | 4                         | 14/9/23       |
| 5                                             | Access to modern energy                                                 | L+D              | BB+PPT       | 1              | 5                         | 19/9/23       |
| 6                                             | Energy production and trade                                             | L+D              | BB+PPT       | 1              | 6                         | 20/9/23       |
| 7                                             | Factors affecting India's energy development                            | L+ D             | BB+PPT       | 1              | 7                         | 21/9/23       |
| 8                                             | Economy and demographics, Policy and institutional framework            | L+D              | BB+PPT       | 1              | 8                         | 23/9/23       |
| 9                                             | Energy prices and affordability                                         | L+D              | BB+PPT       | 1              | 9                         | 25/9/23       |
| 10                                            | Social and environmental aspects, Investment                            | L+D              | BB+PPT       | 1              | 10                        | 26/9/23       |
| <b>Module 2: Energy storage systems</b>       |                                                                         |                  |              |                |                           |               |
| 11                                            | Energy saving, Thermal energy storage systems                           | L+D              | BB+PPT       | 1              | 11                        | 27/9/23       |
| 12                                            | Energy saving, Thermal energy storage systems                           | L+D              | BB+PPT       | 1              | 12                        | 28/9/23       |
| 13                                            | Energy Management: Principles of Energy Management                      | L+ D             | BB+PPT       | 1              | 13                        | 30/9/23       |
| 14                                            | Energy demand estimation                                                | L+D              | BB+PPT       | 1              | 14                        | 3/10/23       |
| 15                                            | Energy pricing, Energy Audit: Purpose                                   | L+D              | BB+PPT       | 1              | 15                        | 4/10/23       |
| 16                                            | Methodology with respect to process Industries,                         | L+D              | BB+PPT       | 1              | 16                        | 5/10/23       |
| 17                                            | problems                                                                | L+D              | BB+PPT       | 1              | 17                        | 9/10/23       |
| 18                                            | problems                                                                | L+D              | BB+PPT       | 1              | 18                        | 10/10/23      |



| Module 3: Environment                   |                                                                               |      |        |   |    |          |
|-----------------------------------------|-------------------------------------------------------------------------------|------|--------|---|----|----------|
| 19                                      | Introduction, Multidisciplinary nature of environmental studies-              | L+D  | BB+PPT | 1 | 19 | 11/10/23 |
| 20                                      | Definition, scope and importance                                              | L+D  | BB+PPT | 1 | 20 | 12/10/23 |
| 21                                      | Need for public awareness, Water cycle, carbon cycle                          | L+D  | BB+PPT | 1 | 21 | 16/10/23 |
| 22                                      | Nitrogen cycle, Oxygen cycle                                                  | L+D  | BB+PPT | 1 | 22 | 17/10/23 |
| 23                                      | Energy cycle                                                                  | L+D  | BB+PPT | 1 | 23 | 18/10/23 |
| 24                                      | Ecosystem: Concept, Energy flow                                               | L+D  | BB+PPT | 1 | 24 | 19/10/23 |
| 25                                      | IA1                                                                           | L+D  | BB+PPT | 1 | 25 | 27/10/23 |
| 26                                      | Structure and function of an ecosystem                                        | L+D  | BB+PPT | 1 | 26 | 30/10/23 |
| 27                                      | Food webs and ecological pyramids                                             | L+D  | BB+PPT | 1 | 27 | 31/10/23 |
| 28                                      | Forest ecosystem                                                              | L+ D | BB+PPT | 1 | 28 | 2/11/23  |
| 29                                      | Grassland ecosystem                                                           | L+ D | BB+PPT | 1 | 29 | 6/11/23  |
| 30                                      | Desert ecosystem and Aquatic ecosystems                                       | L+ D | BB+PPT | 1 | 30 | 7/11/23  |
| 31                                      | Ecological succession                                                         | L+D  | BB+PPT | 1 | 31 | 8/11/23  |
| Module 4: Environmental Pollution       |                                                                               |      |        |   |    |          |
| 32                                      | Environmental Pollution, Definition, Cause, effects                           | L+D  | BB+PPT | 1 | 32 | 9/11/23  |
| 33                                      | Causes, effects and Control measures of - Air pollution                       | L+D  | BB+PPT | 1 | 33 | 11/11/23 |
| 34                                      | Causes, effects and Control measures of Water pollution                       | L+ D | BB+PPT | 1 | 34 | 13/11/23 |
| 35                                      | Causes, effects and Control measures of Soil pollution                        | L+ D | BB+PPT | 1 | 35 | 15/11/23 |
| 36                                      | Causes, effects and Control measures of Marine pollution                      | L+D  | BB+PPT | 1 | 36 | 16/11/23 |
| 37                                      | Causes, effects and Control measures of Noise pollution                       | L+D  | BB+PPT | 1 | 37 | 20/11/23 |
| 38                                      | Causes, effects and Control measures of Thermal pollution and nuclear hazards | L+D  | BB+PPT | 1 | 38 | 21/11/23 |
| 39                                      | Solid waste Management, Disaster management                                   | L+D  | BB+PPT | 1 | 39 | 22/11/23 |
| 40                                      | IA-2                                                                          |      |        |   | 40 | 25/11/23 |
| 41                                      | Role of an individual in prevention of pollution                              | L+D  | BB+PPT | 1 | 41 | 27/11/23 |
| 42                                      | Pollution case studies                                                        | L+ D | BB+PPT | 1 | 42 | 28/11/23 |
| 43                                      | Pollution case studies                                                        | L+ D | BB+PPT | 1 | 43 | 29/11/23 |
| Module 5: Social Issues and Environment |                                                                               |      |        |   |    |          |
| 44                                      | Social Issues and the Environment                                             | L+D  | BB+PPT | 1 | 44 | 4/12/23  |
| 45                                      | Climate change, global warming                                                | L+ D | BB+PPT | 1 | 45 | 5/12/23  |
| 46                                      | Acid rain, ozone layer depletion                                              | L+ D | BB+PPT | 1 | 46 | 7/12/23  |

|    |                                                                                          |      |        |   |    |          |
|----|------------------------------------------------------------------------------------------|------|--------|---|----|----------|
| 47 | Nuclear Accidents and holocaust. Case Studies                                            | L+D  | BB+PPT | 1 | 47 | 9/12/23  |
| 48 | Wasteland reclamation & Consumerism                                                      | L+ D | BB+PPT | 1 | 48 | 12/12/23 |
| 49 | Environment Protection Act, Water (Prevention and control of Pollution) Act              | L+D  | BB+PPT | 1 | 49 | 13/12/23 |
| 50 | Air (Prevention and Control of Pollution) Act                                            | L+D  | BB+PPT | 1 | 50 | 14/12/23 |
| 51 | Wildlife Protection Act, Forest Protection Act                                           | L+D  | BB+PPT | 1 | 51 | 18/12/23 |
| 52 | Group assignments: Assignments related to e-waste management                             | L+ D | BB+PPT | 1 | 52 | 19/12/23 |
| 53 | Municipal solid waste management; Air pollution control systems; Water treatment systems | L+D  | BB+PPT | 1 | 53 | 20/12/23 |
| 54 | Hydroelectric power plants; Biofuels                                                     | L+D  | BB+PPT | 1 | 54 | 21/12/23 |
| 55 | Wastewater treatment plants; Solar heating systems, power plants                         | L+D  | BB+PPT | 1 | 55 | 23/12/23 |
| 56 | IA3                                                                                      |      |        | 1 | 56 | 28/12/23 |
| 57 | Environmental status assessments; Energy status assessments etc                          | L+ D | BB+PPT | 1 | 57 | 4/1/24   |

**Textbooks:**

1. Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education by University grant commission and Bharathi Vidyapeeth Institute of environment education and Research, Pune
2. De, B. K., Energy Management audit & Conservation, 2nd Edition, Vrinda Publication, 2010.

**Reference Books:**

1. Energy Management Hand book, Turner, W. C., Doty, S. and Truner, W. C, Fairmont Press 7th Edition 2009
2. Energy Management Murphy, W. R Elsevier 2007
3. Energy Management Principles Smith, C. B Pergamum 2007
4. Environment pollution control Engineering, C S Rao New Age International reprint 2015, 2nd edition
5. Environmental studies, Benny Joseph Tata McGraw Hill, 2nd edition, 2008

**Details of the teaching aids:**

Black Board and Power Point Presentations



**Course Incharge**



**Module coordinator**



**HOD ECE**





**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**COURSE PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE:** Mrs. Vishalini Divakar

**COURSE CODE/TITLE:** Energy & Environment / 18ME751

**YEAR/ SEMESTER/SECTION :** IV/ VII/B

**BRANCH :** ECE

| Sl. No.                                       | Topic to be covered                                                     | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------|-------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module 1: Basic Introduction to Energy</b> |                                                                         |                  |              |                |                           |               |
| 1                                             | Energy and power, forms of energy, primary energy sources, energy flows | L+D              | BB+PPT       | 1              | 1                         | 11/9/23       |
| 2                                             | World energy production and consumption                                 | L+D              | BB+PPT       | 1              | 2                         | 13/9/23       |
| 3                                             | Key energy trends in India: Demand,                                     | L+D              | BB+PPT       | 1              | 3                         | 14/9/23       |
| 4                                             | Electricity                                                             | L+D              | BB+PPT       | 1              | 4                         | 15/9/23       |
| 5                                             | Access to modern energy                                                 | L+D              | BB+PPT       | 1              | 5                         | 20/9/23       |
| 6                                             | Energy production and trade                                             | L+D              | BB+PPT       | 1              | 6                         | 21/9/23       |
| 7                                             | Factors affecting India's energy development                            | L+D              | BB+PPT       | 1              | 7                         | 22/9/23       |
| 8                                             | Economy and demographics, Policy and institutional framework            | L+D              | BB+PPT       | 1              | 8                         | 23/9/23       |
| 9                                             | Energy prices and affordability                                         | L+D              | BB+PPT       | 1              | 9                         | 25/9/23       |
| 10                                            | Social and environmental aspects, Investment                            | L+D              | BB+PPT       | 1              | 10                        | 27/9/23       |
| <b>Module 2: Energy storage systems</b>       |                                                                         |                  |              |                |                           |               |
| 11                                            | Energy saving, Thermal energy storage systems                           | L+D              | BB+PPT       | 1              | 11                        | 29/9/23       |
| 12                                            | Energy saving, Thermal energy storage systems                           | L+D              | BB+PPT       | 1              | 12                        | 30/9/23       |
| 13                                            | Energy Management: Principles of Energy Management                      | L+D              | BB+PPT       | 1              | 13                        | 4/10/23       |
| 14                                            | Energy demand estimation                                                | L+D              | BB+PPT       | 1              | 14                        | 5/10/23       |
| 15                                            | Energy pricing, Energy Audit: Purpose                                   | L+D              | BB+PPT       | 1              | 15                        | 6/10/23       |
| 16                                            | Methodology with respect to process Industries,                         | L+D              | BB+PPT       | 1              | 16                        | 9/10/23       |
| 17                                            | problems                                                                | L+D              | BB+PPT       | 1              | 17                        | 11/10/23      |

|                                                |                                                                               |      |        |   |    |          |
|------------------------------------------------|-------------------------------------------------------------------------------|------|--------|---|----|----------|
| 18                                             | problems                                                                      | L+D  | BB+PPT | 1 | 18 | 12/10/23 |
| <b>Module 3: Environment</b>                   |                                                                               |      |        |   |    |          |
| 19                                             | Introduction, Multidisciplinary nature of environmental studies-              | L+D  | BB+PPT | 1 | 19 | 13/10/23 |
| 20                                             | Definition, scope and importance                                              | L+D  | BB+PPT | 1 | 20 | 16/10/23 |
| 21                                             | Need for public awareness, Water cycle, carbon cycle                          | L+D  | BB+PPT | 1 | 21 | 18/10/23 |
| 22                                             | Nitrogen cycle, Oxygen cycle                                                  | L+D  | BB+PPT | 1 | 22 | 19/10/23 |
| 23                                             | Energy cycle, Ecosystem: Concept, Energy flow                                 | L+D  | BB+PPT | 1 | 23 | 20/10/23 |
| 25                                             | IA1                                                                           | L+D  | BB+PPT | 1 | 25 | 27/10/23 |
| 26                                             | Structure and function of an ecosystem                                        | L+D  | BB+PPT | 1 | 26 | 30/10/23 |
| 27                                             | Food webs and ecological pyramids                                             | L+D  | BB+PPT | 1 | 27 | 31/10/23 |
| 28                                             | Forest ecosystem                                                              | L+ D | BB+PPT | 1 | 28 | 2/11/23  |
| 29                                             | Grassland ecosystem                                                           | L+ D | BB+PPT | 1 | 29 | 3/11/23  |
| 30                                             | Desert ecosystem and Aquatic ecosystems                                       | L+ D | BB+PPT | 1 | 30 | 6/11/23  |
| 31                                             | Ecological succession                                                         | L+D  | BB+PPT | 1 | 31 | 8/11/23  |
| <b>Module 4: Environmental Pollution</b>       |                                                                               |      |        |   |    |          |
| 32                                             | Environmental Pollution, Definition, Cause, effects                           | L+D  | BB+PPT | 1 | 32 | 9/11/23  |
| 33                                             | Causes, effects and Control measures of - Air pollution                       | L+D  | BB+PPT | 1 | 33 | 11/11/23 |
| 34                                             | Causes, effects and Control measures of Water pollution                       | L+ D | BB+PPT | 1 | 34 | 13/11/23 |
| 35                                             | Causes, effects and Control measures of Soil pollution                        | L+ D | BB+PPT | 1 | 35 | 15/11/23 |
| 36                                             | Causes, effects and Control measures of Marine pollution                      | L+D  | BB+PPT | 1 | 36 | 16/11/23 |
| 37                                             | Causes, effects and Control measures of Noise pollution                       | L+D  | BB+PPT | 1 | 37 | 17/11/23 |
| 38                                             | Causes, effects and Control measures of Thermal pollution and nuclear hazards | L+D  | BB+PPT | 1 | 38 | 20/11/23 |
| 39                                             | Solid waste Management, Disaster management                                   | L+D  | BB+PPT | 1 | 39 | 22/11/23 |
| 40                                             | IA-2                                                                          |      |        |   | 40 | 25/11/23 |
| 41                                             | Role of an individual in prevention of pollution                              | L+D  | BB+PPT | 1 | 41 | 27/11/23 |
| 42                                             | Pollution case studies                                                        | L+ D | BB+PPT | 1 | 42 | 29/11/23 |
| 43                                             | Pollution case studies                                                        | L+ D | BB+PPT | 1 | 43 | 1/12/23  |
| <b>Module 5: Social Issues and Environment</b> |                                                                               |      |        |   |    |          |
| 44                                             | Social Issues and the Environment                                             | L+D  | BB+PPT | 1 | 44 | 4/12/23  |
| 45                                             | Climate change, global warming                                                | L+ D | BB+PPT | 1 | 45 | 6/12/23  |
| 46                                             | Acid rain, ozone layer depletion                                              | L+ D | BB+PPT | 1 | 46 | 7/12/23  |



|    |                                                                             |      |        |   |    |          |
|----|-----------------------------------------------------------------------------|------|--------|---|----|----------|
| 47 | Nuclear Accidents and holocaust. Case Studies                               | L+D  | BB+PPT | 1 | 47 | 8/12/23  |
| 48 | Wasteland reclamation & Consumerism                                         | L+ D | BB+PPT | 1 | 48 | 9/12/23  |
| 49 | Environment Protection Act, Water (Prevention and control of Pollution) Act | L+D  | BB+PPT | 1 | 49 | 11/12/23 |
| 50 | Air (Prevention and Control of Pollution) Act                               | L+D  | BB+PPT | 1 | 50 | 13/12/23 |
| 51 | Wildlife Protection Act, Forest Protection Act                              | L+D  | BB+PPT | 1 | 51 | 14/12/23 |
| 52 | Group assignments: Assignments related to e-waste management                | L+ D | BB+PPT | 1 | 52 | 15/12/23 |
| 53 | Municipal solid waste management; Air pollution control systems             | L+D  | BB+PPT | 1 | 53 | 18/12/23 |
| 54 | Hydroelectric power plants; Biofuels                                        | L+D  | BB+PPT | 1 | 54 | 20/12/23 |
| 55 | Wastewater treatment plants                                                 | L+D  | BB+PPT | 1 | 55 | 21/12/23 |
| 56 | Solar heating systems                                                       | L+D  | BB+PPT | 1 | 56 | 22/12/23 |
| 57 | power plants                                                                | L+D  | BB+PPT | 1 | 57 | 23/12/23 |
| 58 | IA3                                                                         |      |        | 1 | 58 | 28/12/23 |
| 59 | Water treatment systems                                                     | L+ D | BB+PPT | 1 | 59 | 4/1/24   |
| 60 | Environmental status assessments; Energy status assessments etc             | L+D  | BB+PPT | 1 | 60 | 5/1/24   |

**Textbooks:**

1. Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education by University grant commission and Bharathi Vidyapeeth Institute of environment education and Research, Pune
2. De, B. K., Energy Management audit & Conservation, 2nd Edition, Vrinda Publication, 2010.

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2. Energy Management Murphy, W. R Elsevier 2007
3. Energy Management Principles Smith, C. B Pergamum 2007
4. Environment pollution control Engineering, C S Rao New Age International reprint 2015, 2nd edition
5. Environmental studies, Benny Joseph Tata McGraw Hill, 2nd edition, 2008

**Details of the teaching aids:**

Black Board and Power Point Presentations



Course Incharge



Module coordinator



HOD ECE



## K S INSTITUTE OF TECHNOLOGY BANGALORE-560109

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING COURSE PLAN 2023-2024 ODD SEMESTER

**COURSE IN-CHARGE** : V.SANGEETHA  
**COURSE CODE/NAME** : 21EC53/COMPUTER COMMUNICATION NETWORKS  
**SEMESTER/YEAR/SEC** : V -A  
**ACADEMIC YEAR** : 2023-2024

| Sl.No.          | Topic to be covered                                                                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative | Proposed Date |
|-----------------|-----------------------------------------------------------------------------------------------------|------------------|--------------|----------------|------------|---------------|
| <b>Module 1</b> |                                                                                                     |                  |              |                |            |               |
| 1               | Introduction: Data Communications: Components, Representations                                      | L+D              | BB+PPT       | 1              | 1          | 05.12.23      |
| 2               | Data Flow, Networks Physical Structures,                                                            | L+D              | BB+PPT       | 1              | 2          | 06.12.23      |
| 3               | Network Types: LAN, WAN, Switching, Internet                                                        | L+ D             | BB+PPT       | 1              | 3          | 07.12.23      |
| 4               | TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite.                                | L+ D             | BB+PPT       | 1              | 4          | 08.12.23      |
| 5               | Description of layers, Encapsulation and Decapsulation, Addressing, Multiplexing and Demultiplexing | L+ D             | BB+PPT       | 1              | 5          | 09.12.23      |
| 6               | The OSI Model: OSI Versus TCP/IP                                                                    | L+AV             | BB+PPT       | 1              | 6          | 12.12.23      |
| 7               | Data-Link Layer: Introduction: Nodes and Links, Services, Categories of link                        | L+ D             | BB+PPT       | 1              | 7          | 13.12.23      |
| 8               | Sublayers, Link Layer addressing: Types of addresses, ARP                                           | L+D              | BB+PPT       | 1              | 8          | 14.12.23      |
| <b>Module2</b>  |                                                                                                     |                  |              |                |            |               |
| 9               | Data Link Control (DLC) services: Framing, Flow and Error Control                                   | L+D              | BB+PPT       | 1              | 9          | 15.12.23      |
| 10              | Media Access Control: Random Access: Pure ALOHA,                                                    | L+ D             | BB+PPT       | 1              | 10         | 19.12.23      |



|                 |                                                                                                                |      |        |   |    |          |
|-----------------|----------------------------------------------------------------------------------------------------------------|------|--------|---|----|----------|
| 11              | slotted ALOHA,CSMA                                                                                             | L+D  | BB+PPT | 1 | 11 | 20.12.23 |
| 12              | CSMA/CD, CSMA/CA                                                                                               | L+D  | BB+PPT | 1 | 12 | 21.12.23 |
| 13              | Wired and Wireless LANs: Ethernet Protocol                                                                     | L+D  | BB+PPT | 1 | 13 | 22.12.23 |
| 14              | Standard Ethernet                                                                                              | L+D  | BB+PPT | 1 | 14 | 29.12.23 |
| 15              | Introduction to wireless LAN: Architectural Comparison                                                         | L+ D | BB+PPT | 1 | 15 | 02.01.24 |
| 16              | Characteristics, Access Control                                                                                | L+ D | BB+PPT | 1 | 16 | 03.01.24 |
| <b>Module 3</b> |                                                                                                                |      |        |   |    |          |
| 17              | <b>Network Layer:</b> Introduction, Network Layer services: Packetizing,Routing and Forwarding, Other services | L+D  | BB+PPT | 1 | 17 | 04.01.24 |
| 18              | Packet Switching: Datagram Approach, Virtual Circuit Approach                                                  | L+D  | BB+PPT | 1 | 18 | 05.01.24 |
| 19              | IPv4 Addresses: Address Space, Classful Addressing,Classless Addressing,DHCP, Network Address Resolution       | L+D  | BB+PPT | 1 | 19 | 09.01.24 |
| 20              | Forwarding of IP Packets: Based on destination Address, Based and Label                                        | L+D  | BB+PPT | 1 | 20 | 10.01.24 |
| 21              | Network Layer Protocols: Internet Protocol (IP): Datagram Format                                               | L+D  | BB+PPT | 1 | 21 | 11.01.24 |
| 22              | Options, Security of IPv4 Datagrams                                                                            | L+D  | BB+PPT | 1 | 22 | 12.01.24 |
| 23              | Unicast Routing: Introduction Routing Algorithms: Distance Vector Routing                                      | L+D  | BB+PPT | 1 | 23 | 13.01.24 |
| 24              | Link State Routing with example ,Path vector routing with example                                              | L+D  | BB+PPT | 1 | 24 | 16.01.24 |
| <b>Module 4</b> |                                                                                                                |      |        |   |    |          |
| 25              | Transport Layer: Introduction: Transport Layer Services,                                                       | L+D  | BB+PPT | 1 | 25 | 18.01.24 |
| 26              | Connectionless and Connection oriented Protocols                                                               | L+D  | BB+PPT | 1 | 26 | 19.01.24 |
| 27              | Transport Layer Protocols: Simple protocol,Stop and wait protocol                                              | L+D  | BB+PPT | 1 | 27 | 23.01.24 |
| 28              | Go-Back-N Protocol,Selective repeat protocol,Piggybacking                                                      | L+D  | BB+PPT | 1 | 28 | 24.01.24 |
| 29              | User Datagram Protocol: User DatagramUDP Services                                                              | L+D  | BB+PPT | 1 | 29 | 25.01.24 |
| 30              | Transmission Control Protocol: TCP services,TCP features,Segments,TCP connection                               | L+D  | BB+PPT | 1 | 30 | 01.02.24 |
| 31              | State Transition diagram, Error control                                                                        | L+D  | BB+PPT | 1 | 31 | 02.02.24 |
| 32              | Windows in TCP, TCP congestion control                                                                         | L+D  | BB+PPT | 1 | 32 | 06.02.24 |

| Module 5 |                                                           |     |        |   |    |          |
|----------|-----------------------------------------------------------|-----|--------|---|----|----------|
| 33       | Application Layer: Introduction: providing services       | L+D | BB+PPT | 1 | 33 | 08.02.24 |
| 34       | Application- layer paradigms                              | L+D | BB+PPT | 1 | 34 | 09.02.24 |
| 35       | Standard Client -Server Protocols: WWW                    | L+D | BB+PPT | 1 | 35 | 13.02.24 |
| 36       | Hyper Text Transfer Protocol,                             | L+D | BB+PPT | 1 | 36 | 14.02.24 |
| 37       | FTP: Two connections, Control Connection, Data Connection | L+D | BB+PPT | 1 | 37 | 15.02.24 |
| 38       | Electronic Mail: Architecture, Wed Based Mail             | L+D | BB+PPT | 1 | 38 | 16.01.24 |
| 39       | Telnet: Local versus remote logging.                      | L+D | BB+PPT | 1 | 39 | 20.01.24 |
| 40       | Domain Name system: Name space,DNS in internet,           | L+D | BB+PPT | 1 | 40 | 21.01.24 |
| 41       | Resolution, DNS Messages, Security of DNS                 | L+D | BB+PPT | 1 | 41 | 22.01.24 |
| 42       | Revision of university question paper                     | L+D | BB     | 1 | 42 | 23.01.24 |
| 43       | Revision of university question paper                     | L+D | BB     | 1 | 43 | 24.01.24 |
| 44       | Revision of university question paper                     | L+D | BB     | 1 | 44 | 06.03.24 |
| 45       | Revision of university question paper                     | L+D | BB     | 1 | 45 | 07.03.24 |
| 46       | Revision of university question paper                     | L+D | BB     | 1 | 46 | 09.03.24 |

**TEXTBOOK:**

T1: Data Communications and Networking, Forouzan, 5th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3.

**REFERENCES:**

R1: Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273-76896.

R2: Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN: 0130138282.

**WEB MATERIALS:**

W1: <https://nptel.ac.in/courses/106/105/106105183/>

W2: <https://nptel.ac.in/courses/106/105/106105081/>

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>

  
Course Incharge

  
Module Coordinator

  
HOD





## K S INSTITUTE OF TECHNOLOGY BANGALORE-560109

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING COURSE PLAN 2023-2024 ODD SEMESTER

**COURSE IN-CHARGE : V.SANGEETHA**  
**COURSE CODE/NAME : 21EC53/COMPUTER COMMUNICATION NETWORKS**  
**SEMESTER/YEAR/SEC : V -B**  
**ACADEMIC YEAR : 2023-2024**

| Sl.No.          | Topic to be covered                                                                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative | Proposed Date |
|-----------------|-----------------------------------------------------------------------------------------------------|------------------|--------------|----------------|------------|---------------|
| <b>Module 1</b> |                                                                                                     |                  |              |                |            |               |
| 1               | Introduction: Data Communications: Components, Representations                                      | L+D              | BB+PPT       | 1              | 1          | 04.12.23      |
| 2               | Data Flow, Networks Physical Structures,                                                            | L+D              | BB+PPT       | 1              | 2          | 06.12.23      |
| 3               | Network Types: LAN, WAN, Switching, Internet                                                        | L+ D             | BB+PPT       | 1              | 3          | 07.12.23      |
| 4               | TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite.                                | L+ D             | BB+PPT       | 1              | 4          | 08.12.23      |
| 5               | Description of layers, Encapsulation and Decapsulation, Addressing, Multiplexing and Demultiplexing | L+ D             | BB+PPT       | 1              | 5          | 11.12.23      |
| 6               | The OSI Model: OSI Versus TCP/IP                                                                    | L+AV             | BB+PPT       | 1              | 6          | 13.12.23      |
| 7               | Data-Link Layer: Introduction: Nodes and Links, Services, Categories of link                        | L+ D             | BB+PPT       | 1              | 7          | 14.12.23      |
| 8               | Sublayers, Link Layer addressing: Types of addresses, ARP                                           | L+D              | BB+PPT       | 1              | 8          | 15.12.23      |
| <b>Module2</b>  |                                                                                                     |                  |              |                |            |               |
| 9               | Data Link Control (DLC) services: Framing, Flow and Error Control                                   | L+D              | BB+PPT       | 1              | 9          | 18.12.23      |
| 10              | Media Access Control: Random Access: Pure ALOHA,                                                    | L+ D             | BB+PPT       | 1              | 10         | 20.12.23      |

|                 |                                                                                                                |      |        |   |    |          |
|-----------------|----------------------------------------------------------------------------------------------------------------|------|--------|---|----|----------|
| 11              | slotted ALOHA,CSMA                                                                                             | L+D  | BB+PPT | 1 | 11 | 21.12.23 |
| 12              | CSMA/CD, CSMA/CA                                                                                               | L+D  | BB+PPT | 1 | 12 | 22.12.23 |
| 13              | Wired and Wireless LANs: Ethernet Protocol                                                                     | L+D  | BB+PPT | 1 | 13 | 23.12.23 |
| 14              | Standard Ethernet                                                                                              | L+D  | BB+PPT | 1 | 14 | 29.12.23 |
| 15              | Introduction to wireless LAN: Architectural Comparison                                                         | L+ D | BB+PPT | 1 | 15 | 30.12.23 |
| 16              | Characteristics, Access Control                                                                                | L+ D | BB+PPT | 1 | 16 | 01.01.24 |
| <b>Module 3</b> |                                                                                                                |      |        |   |    |          |
| 17              | <b>Network Layer:</b> Introduction, Network Layer services: Packetizing,Routing and Forwarding, Other services | L+D  | BB+PPT | 1 | 17 | 03.01.24 |
| 18              | Packet Switching: Datagram Approach, Virtual Circuit Approach                                                  | L+D  | BB+PPT | 1 | 18 | 04.01.24 |
| 19              | IPv4 Addresses: Address Space, Classful Addressing, Classless Addressing, DHCP, Network Address Resolution     | L+D  | BB+PPT | 1 | 19 | 05.01.24 |
| 20              | Forwarding of IP Packets: Based on destination Address, Based and Label                                        | L+D  | BB+PPT | 1 | 20 | 08.01.24 |
| 21              | Network Layer Protocols: Internet Protocol (IP): Datagram Format                                               | L+D  | BB+PPT | 1 | 21 | 10.01.24 |
| 22              | Options, Security of IPv4 Datagrams                                                                            | L+D  | BB+PPT | 1 | 22 | 11.01.24 |
| 23              | Unicast Routing: Introduction Routing Algorithms: Distance Vector Routing                                      | L+D  | BB+PPT | 1 | 23 | 12.01.24 |
| 24              | Link State Routing with example ,Path vector routing with example                                              | L+D  | BB+PPT | 1 | 24 | 17.01.24 |
| <b>Module 4</b> |                                                                                                                |      |        |   |    |          |
| 25              | Transport Layer: Introduction: Transport Layer Services,                                                       | L+D  | BB+PPT | 1 | 25 | 18.01.24 |
| 26              | Connectionless and Connection oriented Protocols                                                               | L+D  | BB+PPT | 1 | 26 | 19.01.24 |
| 27              | Transport Layer Protocols: Simple protocol, Stop and wait protocol                                             | L+D  | BB+PPT | 1 | 27 | 22.01.24 |
| 28              | Go-Back-N Protocol, Selective repeat protocol, Piggybacking                                                    | L+D  | BB+PPT | 1 | 28 | 24.01.24 |
| 29              | User Datagram Protocol: User Datagram UDP Services                                                             | L+D  | BB+PPT | 1 | 29 | 25.01.24 |
| 30              | Transmission Control Protocol: TCP services, TCP features, Segments, TCP connection                            | L+D  | BB+PPT | 1 | 30 | 27.01.24 |
| 31              | State Transition diagram, Error control                                                                        | L+D  | BB+PPT | 1 | 31 | 01.02.24 |
| 32              | Windows in TCP, TCP congestion control                                                                         | L+D  | BB+PPT | 1 | 32 | 02.02.24 |



| Module 5 |                                                           |     |        |   |    |          |
|----------|-----------------------------------------------------------|-----|--------|---|----|----------|
| 33       | Application Layer: Introduction: providing services       | L+D | BB+PPT | 1 | 33 | 05.02.24 |
| 34       | Application- layer paradigms                              | L+D | BB+PPT | 1 | 34 | 07.02.24 |
| 35       | Standard Client -Server Protocols: WWW                    | L+D | BB+PPT | 1 | 35 | 08.02.24 |
| 36       | Hyper Text Transfer Protocol,                             | L+D | BB+PPT | 1 | 36 | 09.02.24 |
| 37       | FTP: Two connections, Control Connection, Data Connection | L+D | BB+PPT | 1 | 37 | 10.02.24 |
| 38       | Electronic Mail: Architecture, Web Based Mail             | L+D | BB+PPT | 1 | 38 | 12.02.24 |
| 39       | Telnet: Local versus remote logging.                      | L+D | BB+PPT | 1 | 39 | 14.02.24 |
| 40       | Domain Name system: Name space,DNS in internet,           | L+D | BB+PPT | 1 | 40 | 15.02.24 |
| 41       | Resolution, DNS Messages, Security of DNS                 | L+D | BB+PPT | 1 | 41 | 16.02.24 |
| 42       | Revision of university question paper                     | L+D | BB     | 1 | 42 | 19.02.24 |
| 43       | Revision of university question paper                     | L+D | BB     | 1 | 43 | 21.02.24 |
| 44       | Revision of university question paper                     | L+D | BB     | 1 | 44 | 22.02.24 |
| 45       | Revision of university question paper                     | L+D | BB     | 1 | 45 | 23.02.24 |
| 46       | Revision of university question paper                     | L+D | BB     | 1 | 46 | 24.02.24 |
| 47       | Revision of university question paper                     | L+D | BB     | 1 | 47 | 09.03.24 |

**TEXTBOOK:**

T1: Data Communications and Networking, Forouzan, 5th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3.

**REFERENCES:**

R1: Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273-76896.

R2: Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN: 0130138282.

**WEB MATERIALS:**

W1: <https://nptel.ac.in/courses/106/105/106105183/>

W2: <https://nptel.ac.in/courses/106/105/106105081/>

W3: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/>

  
Course Incharge

  
Module Coordinator

  
HOD



**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Praveen A  
SUBJECT CODE/NAME : 18EC72/VLSI Design  
SEMESTER/YEAR/SEC : VII /IV/A  
ACADEMIC YEAR : 2023-2024

| Sl. No.                                                   | Topic to be covered                   | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------------|---------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Introduction &amp; MOS Transistor Theory</b> |                                       |                  |              |                |                           |               |
| 1                                                         | A Brief History                       | L+I              | LCD          | 1              | 1                         | 12-09-23      |
| 2                                                         | MOS Transistors, CMOS Logic           | L+D              | BB           | 1              | 2                         | 13-09-23      |
| 3                                                         | CMOS Logic                            | L+D              | BB           | 1              | 3                         | 14-09-23      |
| 4                                                         | Introduction to MOS Transistor Theory | L+D              | BB           | 1              | 4                         | 15-09-23      |
| 5                                                         | Long channel I-V Characteristics      | L+ I             | BB, LCD      | 1              | 5                         | 19-09-23      |
| 6                                                         | Long channel I-V Characteristics      | L+I              | BB, LCD      | 1              | 6                         | 20-09-23      |
| 7                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 7                         | 21-09-23      |
| 8                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 8                         | 22-09-23      |
| 9                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 9                         | 25-09-23      |
| 10                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 10                        | 26-09-23      |
| 11                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 11                        | 27-09-23      |
| 12                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 12                        | 29-09-23      |



## MODULE 2: Fabrication and MOSFET Scaling

|                                                         |                                              |      |         |   |    |          |
|---------------------------------------------------------|----------------------------------------------|------|---------|---|----|----------|
| 13                                                      | CMOS Fabrication using N-well                | L+ I | BB+LCD  | 1 | 13 | 30-09-23 |
| 14                                                      | CMOS Fabrication using N-well                | L+I  | BB+LCD  | 1 | 14 | 03-10-23 |
| 15                                                      | Basic Layout concepts                        | L+ I | BB+LCD  | 1 | 15 | 04-10-23 |
| 16                                                      | Basic Layout concepts                        | L+ I | BB+LCD  | 1 | 16 | 05-10-23 |
| 17                                                      | VLSI Design Flow                             | L+D  | BB      | 1 | 17 | 06-10-23 |
| 18                                                      | Introduction to Fabrication Process          | L+I  | BB, LCD | 1 | 18 | 10-10-23 |
| 19                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 19 | 11-10-23 |
| 20                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 20 | 12-10-23 |
| 21                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 21 | 13-10-23 |
| 22                                                      | Layout Design Rules                          | L+ I | BB+LCD  | 1 | 22 | 19-10-23 |
| 23                                                      | Layout Design Rules                          | L+ I | BB+LCD  | 1 | 23 | 20-10-23 |
| 24                                                      | MOSFET Scaling and Small-Geometry Effects    | L+D  | BB      | 1 | 24 | 25-10-23 |
| 25                                                      | MOSFET Scaling and Small-Geometry Effects    | L+D  | BB      | 1 | 25 | 26-10-23 |
| 26                                                      | MOSFET Capacitances                          | L+D  | BB      | 1 | 26 | 27-10-23 |
| <b>MODULE 3: Delay and Combinational Circuit Design</b> |                                              |      |         |   |    |          |
| 27                                                      | Introduction to Delay concept                | L+D  | BB      | 1 | 27 | 31-10-23 |
| 28                                                      | Transient Response                           | L+D  | BB      | 1 | 28 | 02-11-23 |
| 29                                                      | RC Delay Model                               | L+D  | BB      | 1 | 29 | 03-11-23 |
| 30                                                      | Linear Delay Model                           | L+I  | BB      | 1 | 30 | 07-11-23 |
| 31                                                      | Logical Efforts of Paths                     | L+D  | BB      | 1 | 31 | 08-11-23 |
| 32                                                      | Introduction to combinational circuit design | L+D  | BB      | 1 | 32 | 09-11-23 |
| 33                                                      | Circuit families                             | L+D  | BB      | 1 | 33 | 10-11-23 |

| <b>MODULE 4: Sequential Circuit Design and Dynamic Logic Circuits</b>  |                                              |     |     |   |    |          |
|------------------------------------------------------------------------|----------------------------------------------|-----|-----|---|----|----------|
| 34                                                                     | Introduction to sequential circuit design    | L+D | BB  | 1 | 34 | 11-11-23 |
| 35                                                                     | Circuit Design for Latches                   | L+D | BB  | 1 | 35 | 15-11-23 |
| 36                                                                     | Circuit Design for Latches                   | L+D | BB  | 1 | 36 | 16-11-23 |
| 37                                                                     | Circuit Design for Flip-Flops                | L+D | BB  | 1 | 37 | 17-11-23 |
| 38                                                                     | Circuit Design for Flip-Flops                | L+D | BB  | 1 | 38 | 21-11-23 |
| 39                                                                     | Introduction Dynamic circuit design          | L+D | BB  | 1 | 39 | 22-11-23 |
| 40                                                                     | Basic Principles of Pass Transistor Circuits | L+D | BB  | 1 | 40 | 28-11-23 |
| 41                                                                     | Synchronous Dynamic Circuit Techniques       | L+D | BB  | 1 | 41 | 29-11-23 |
| 42                                                                     | Dynamic CMOS Circuit Techniques              | L+D | BB  | 1 | 42 | 01-12-23 |
| <b>MODULE 5: Semiconductor Memories &amp; Testing and Verification</b> |                                              |     |     |   |    |          |
| 43                                                                     | Introduction to Semiconductor Memories       | L+D | BB  | 1 | 43 | 05-12-23 |
| 44                                                                     | Dynamic Random-Access Memory                 | L+D | BB  | 1 | 44 | 06-12-23 |
| 45                                                                     | Static Random-Access Memory                  | L+D | BB  | 1 | 45 | 07-12-23 |
| 46                                                                     | Introduction Testing and Verification        | L+D | BB  | 1 | 46 | 08-12-23 |
| 47                                                                     | Logic Verification Principles                | L+D | BB  | 1 | 47 | 09-12-23 |
| 48                                                                     | Manufacturing Test Principles                | L+D | BB  | 1 | 48 | 12-12-23 |
| 49                                                                     | Manufacturing Test Principles                | L+D | BB  | 1 | 49 | 13-12-23 |
| 50                                                                     | Design for testability                       | L+D | BB  | 1 | 50 | 14-12-23 |
| 51                                                                     | Design for testability                       | L+D | BB  | 1 | 51 | 15-12-23 |
| 52                                                                     | Revision                                     | L+D | BB  | 1 | 52 | 19-12-23 |
| 53                                                                     | Revision                                     | L+D | BB  | 1 | 53 | 20-12-23 |
| 54                                                                     | Pedagogy Activity                            | L+I | LCD | 1 | 54 | 21-12-23 |
| 55                                                                     | VTU Question Paper Discussion                | L+D | BB  | 1 | 55 | 22-12-23 |
| 56                                                                     | VTU Question Paper Discussion                | L+D | BB  | 1 | 56 | 04-01-24 |

  
Signature of Course In charge

  
Signature of Module Coordinator

  
Signature of HOD ECE





**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Praveen A  
SUBJECT CODE/NAME : 18EC72/VLSI Design  
SEMESTER/YEAR/SEC : VII /IV/B  
ACADEMIC YEAR : 2023-2024

| Sl. No.                                                   | Topic to be covered                   | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------------|---------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Introduction &amp; MOS Transistor Theory</b> |                                       |                  |              |                |                           |               |
| 1                                                         | A Brief History                       | L+I              | LCD          | 1              | 1                         | 11-09-23      |
| 2                                                         | MOS Transistors, CMOS Logic           | L+D              | BB           | 1              | 2                         | 12-09-23      |
| 3                                                         | CMOS Logic                            | L+D              | BB           | 1              | 3                         | 13-09-23      |
| 4                                                         | Introduction to MOS Transistor Theory | L+D              | BB           | 1              | 4                         | 14-09-23      |
| 5                                                         | Long channel I-V Characteristics      | L+ I             | BB, LCD      | 1              | 5                         | 19-09-23      |
| 6                                                         | Long channel I-V Characteristics      | L+I              | BB, LCD      | 1              | 6                         | 20-09-23      |
| 7                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 7                         | 21-09-23      |
| 8                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 8                         | 23-09-23      |
| 9                                                         | Non-ideal I-V Effects                 | L+D              | BB           | 1              | 9                         | 25-09-23      |
| 10                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 10                        | 26-09-23      |
| 11                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 11                        | 27-09-23      |
| 12                                                        | DC Transfer Characteristics           | L+I              | BB, LCD      | 1              | 12                        | 30-09-23      |

## MODULE 2: Fabrication and MOSFET Scaling

|                                                         |                                              |      |         |   |    |          |
|---------------------------------------------------------|----------------------------------------------|------|---------|---|----|----------|
| 13                                                      | CMOS Fabrication using N-well                | L+ I | BB+LCD  | 1 | 13 | 03-10-23 |
| 14                                                      | CMOS Fabrication using N-well                | L+I  | BB+LCD  | 1 | 14 | 04-10-23 |
| 15                                                      | Basic Layout concepts                        | L+ I | BB+LCD  | 1 | 15 | 05-10-23 |
| 16                                                      | Basic Layout concepts                        | L+ I | BB+LCD  | 1 | 16 | 09-10-23 |
| 17                                                      | VLSI Design Flow                             | L+D  | BB      | 1 | 17 | 10-10-23 |
| 18                                                      | Introduction to Fabrication Process          | L+I  | BB, LCD | 1 | 18 | 11-10-23 |
| 19                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 19 | 12-10-23 |
| 20                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 20 | 19-10-23 |
| 21                                                      | CMOS Technologies                            | L+ I | BB+LCD  | 1 | 21 | 25-10-23 |
| 22                                                      | Layout Design Rules                          | L+ I | BB+LCD  | 1 | 22 | 26-10-23 |
| 23                                                      | Layout Design Rules                          | L+ I | BB+LCD  | 1 | 23 | 28-10-23 |
| 24                                                      | MOSFET Scaling and Small-Geometry Effects    | L+D  | BB      | 1 | 24 | 30-10-23 |
| 25                                                      | MOSFET Scaling and Small-Geometry Effects    | L+D  | BB      | 1 | 25 | 31-10-23 |
| 26                                                      | MOSFET Capacitances                          | L+D  | BB      | 1 | 26 | 02-11-23 |
| <b>MODULE 3: Delay and Combinational Circuit Design</b> |                                              |      |         |   |    |          |
| 27                                                      | Introduction to Delay concept                | L+D  | BB      | 1 | 27 | 06-11-23 |
| 28                                                      | Transient Response                           | L+D  | BB      | 1 | 28 | 07-11-23 |
| 29                                                      | RC Delay Model                               | L+D  | BB      | 1 | 29 | 08-11-23 |
| 30                                                      | Linear Delay Model                           | L+I  | BB      | 1 | 30 | 09-11-23 |
| 31                                                      | Logical Efforts of Paths                     | L+D  | BB      | 1 | 31 | 11-11-23 |
| 32                                                      | Introduction to combinational circuit design | L+D  | BB      | 1 | 32 | 13-11-23 |
| 33                                                      | Circuit families                             | L+D  | BB      | 1 | 33 | 15-11-23 |



| <b>MODULE 4: Sequential Circuit Design and Dynamic Logic Circuits</b>  |                                              |     |     |   |    |          |
|------------------------------------------------------------------------|----------------------------------------------|-----|-----|---|----|----------|
| 34                                                                     | Introduction to sequential circuit design    | L+D | BB  | 1 | 34 | 16-11-23 |
| 35                                                                     | Circuit Design for Latches                   | L+D | BB  | 1 | 35 | 20-11-23 |
| 36                                                                     | Circuit Design for Latches                   | L+D | BB  | 1 | 36 | 21-11-23 |
| 37                                                                     | Circuit Design for Flip-Flops                | L+D | BB  | 1 | 37 | 22-11-23 |
| 38                                                                     | Circuit Design for Flip-Flops                | L+D | BB  | 1 | 38 | 27-11-23 |
| 39                                                                     | Introduction Dynamic circuit design          | L+D | BB  | 1 | 39 | 28-11-23 |
| 40                                                                     | Basic Principles of Pass Transistor Circuits | L+D | BB  | 1 | 40 | 29-11-23 |
| 41                                                                     | Synchronous Dynamic Circuit Techniques       | L+D | BB  | 1 | 41 | 04-12-23 |
| 42                                                                     | Dynamic CMOS Circuit Techniques              | L+D | BB  | 1 | 42 | 05-12-23 |
| <b>MODULE 5: Semiconductor Memories &amp; Testing and Verification</b> |                                              |     |     |   |    |          |
| 43                                                                     | Introduction to Semiconductor Memories       | L+D | BB  | 1 | 43 | 06-12-23 |
| 44                                                                     | Dynamic Random-Access Memory                 | L+D | BB  | 1 | 44 | 07-12-23 |
| 45                                                                     | Static Random-Access Memory                  | L+D | BB  | 1 | 45 | 09-12-23 |
| 46                                                                     | Introduction Testing and Verification        | L+D | BB  | 1 | 46 | 11-12-23 |
| 47                                                                     | Logic Verification Principles                | L+D | BB  | 1 | 47 | 12-12-23 |
| 48                                                                     | Manufacturing Test Principles                | L+D | BB  | 1 | 48 | 13-12-23 |
| 49                                                                     | Design for testability                       | L+D | BB  | 1 | 49 | 14-12-23 |
| 50                                                                     | Revision                                     | L+D | BB  | 1 | 50 | 18-12-23 |
| 51                                                                     | Revision                                     | L+D | BB  | 1 | 51 | 19-12-23 |
| 52                                                                     | Pedagogy Activity                            | L+I | LCD | 1 | 52 | 20-12-23 |
| 53                                                                     | VTU Question Paper Discussion                | L+D | BB  | 1 | 53 | 21-12-23 |
| 54                                                                     | VTU Question Paper Discussion                | L+D | BB  | 1 | 54 | 04-01-24 |

  
Signature of Course In charge

  
Signature of Module Coordinator

  
Signature of HOD ECE



# KS INSTITUTE OF TECHNOLOGY BANGALORE

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : S CHRISTO JAIN

SUBJECT CODE/NAME : BEC304/ Network Analysis

SEMESTER/YEAR/SEC : III/ II/A

ACADEMIC YEAR : 2023-24

| SL No.                                              | Topic to be covered                                                                            | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module:1 Basic concepts and network theorems</b> |                                                                                                |                  |              |                |                           |               |
| 1                                                   | Practical sources                                                                              | L                | BB+P         | 1              | 1                         | 24/11/23      |
| 2                                                   | Source transformations                                                                         | L                | BB+P         | 1              | 2                         | 25/11/23      |
| 3                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 3                         | 27/11/23      |
| 4                                                   | Network reduction using Star - Delta transformation                                            | L                | BB+P         | 1              | 6                         | 28/11/23      |
| 5                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 8                         | 29/11/23      |
| 6                                                   | Loop analysis with linearly dependent independent sources for DC                               | L                | BB+P         | 1              | 9                         | 1/12/23       |
| 7                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 10                        | 4/12/23       |
| 8                                                   | Node analysis with linearly dependent sources for DC .                                         | L                | BB+P         | 1              | 12                        | 5/12/23       |
| 9                                                   | Loop and node analysis with linearly dependent and independent sources for DC and AC networks. | L                | BB+P         | 1              | 13                        | 6/12/23       |
| <b>MODULE 2: Network Theorems</b>                   |                                                                                                |                  |              |                |                           |               |
| 10                                                  | Superposition                                                                                  | L                | BB+P         | 1              | 16                        | 9/12/23       |
| 11                                                  | Numerical                                                                                      | L                | BB+P         | 1              | 17                        | 12/12/23      |
| 12                                                  | Numerical                                                                                      | L                | BB+P         | 1              | 18                        | 13/12/23      |
| 13                                                  | Millman's theorems                                                                             | L                | BB+P         | 1              | 19                        | 14/12/23      |



|                                                                      |                                                                       |   |      |   |    |          |
|----------------------------------------------------------------------|-----------------------------------------------------------------------|---|------|---|----|----------|
| 14                                                                   | Numerical                                                             |   |      |   |    |          |
| 15                                                                   | Thevenin's                                                            | L | BB+P | 1 | 20 | 15/12/23 |
| 16                                                                   | Numerical                                                             | L | BB+P | 1 | 21 | 19/12/23 |
| 17                                                                   | Norton's theorems                                                     | L | BB+P | 1 | 22 | 20/12/23 |
| 18                                                                   | Maximum Power transfer theorem                                        | L | BB+P | 1 | 23 | 21/12/23 |
| <b>MODULE 3: Transient behavior and initial conditions</b>           |                                                                       |   |      |   |    |          |
| 19                                                                   | Behavior of circuit elements under switching condition.               | L | BB+P | 1 | 26 | 23/12/23 |
| 20                                                                   | Numerical                                                             | L | BB+P | 1 | 27 | 26/12/23 |
| 21                                                                   | Numerical                                                             | L | BB+P | 1 | 28 | 27/12/23 |
| 22                                                                   | Evaluation of initial and final conditions in RL                      | L | BB+P | 1 | 29 | 28/12/23 |
| 23                                                                   | Numerical                                                             | L | BB+P | 1 | 30 | 29/12/24 |
| 24                                                                   | Numerical                                                             | L | BB+P | 1 | 31 | 2/1/24   |
| 25                                                                   | Evaluation of initial and final conditions in RC                      | L | BB+P | 1 | 32 | 3/1/24   |
| 26                                                                   | Evaluation of initial and final conditions in RLC DC & AC excitation. | L | BB+P | 1 | 35 | 4/1/24   |
| <b>MODULE 4: Laplace Transformation &amp; Applications</b>           |                                                                       |   |      |   |    |          |
| 27                                                                   | Laplace Transformation Solution of networks                           | L | BB+P | 1 | 41 | 5/1/24   |
| 28                                                                   | Numerical                                                             | L | BB+P | 1 | 42 | 9/1/24   |
| 29                                                                   | Solution of networks step Signal                                      | L | BB+P | 1 | 43 | 10/1/24  |
| 30                                                                   | Time response specifications of second order systems                  | L | BB+P | 1 | 44 | 11/1/24  |
| 31                                                                   | Numerical                                                             | L | BB+P | 1 | 45 | 12/1/24  |
| 32                                                                   | Solution of networks ramp Signal                                      | L | BB+P | 1 | 46 | 16/1/24  |
| 33                                                                   | Numerical                                                             | L | BB+P | 1 | 47 | 17/1/24  |
| 34                                                                   | Numerical                                                             | L | BB+P | 1 | 48 | 18/1/24  |
| 35                                                                   | Solution of networks impulse responses                                | L | BB+P | 1 | 49 | 19/1/24  |
| 36                                                                   | Waveform Synthesis.                                                   | L | BB+P | 1 | 51 | 20/1/24  |
| <b>Module 5: Two port network parameters &amp; Resonance Network</b> |                                                                       |   |      |   |    |          |
| 37                                                                   | Definition of Z, Y, h and Transmission parameters                     | L | BB+P | 1 | 54 | 23/1/24  |
| 38                                                                   | Modelling with these parameters                                       | L | BB+P | 1 | 55 | 24/1/24  |
| 39                                                                   | Numerical                                                             | L | BB+P | 1 | 56 | 25/1/24  |

|    |                                                                                                                     |   |      |   |    |         |
|----|---------------------------------------------------------------------------------------------------------------------|---|------|---|----|---------|
| 40 | Relationship between parameters sets                                                                                | L | BB+P | 1 | 57 | 26/1/24 |
| 41 | Resonance: Variation of Current and Voltage with Frequency, Selectivity and Bandwidth                               | L | BB+P | 1 | 58 | 30/1/24 |
| 42 | Q Factor, Circuit Magnification Factor, Selectivity with Variable Capacitance, Selectivity with Variable Inductance | L | BB+P | 1 | 59 | 31/1/24 |
| 43 | Numerical                                                                                                           | L | BB+P | 1 | 60 | 1/2/24  |
| 44 | Parallel Resonance: Selectivity and Bandwidth, Maximum Impedance Conditions with C, L and f Variable                | L | BB+P | 1 | 61 | 2/2/24  |
| 45 | Numerical                                                                                                           | L | BB+P | 1 | 62 | 3/2/24  |
| 46 | Current in Anti-Resonant Circuit, The General Case-Resistance Present in both Branches                              | L | BB+P | 1 | 63 | 6/2/24  |



Signature of Course Incharge



Signature of Module Coordinator



Signature of HOD/ECE





## KS INSTITUTE OF TECHNOLOGY BANGALORE

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : S CHRISTO JAIN

SUBJECT CODE/NAME : BEC304/ Network Analysis

SEMESTER/YEAR/SEC : III/ II/B

ACADEMIC YEAR : 2023-24

| SL No.                                              | Topic to be covered                                                                            | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module:1 Basic concepts and network theorems</b> |                                                                                                |                  |              |                |                           |               |
| 1                                                   | Practical sources                                                                              | L                | BB+P         | 1              | 1                         | 23/11/23      |
| 2                                                   | Source transformations                                                                         | L                | BB+P         | 1              | 2                         | 24/11/23      |
| 3                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 3                         | 25/11/23      |
| 4                                                   | Network reduction using Star - Delta transformation                                            | L                | BB+P         | 1              | 6                         | 29/11/23      |
| 5                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 8                         | 1/12/23       |
| 6                                                   | Loop analysis with linearly dependent independent sources for DC                               | L                | BB+P         | 1              | 9                         | 5/12/23       |
| 7                                                   | Numerical                                                                                      | L                | BB+P         | 1              | 10                        | 6/12/23       |
| 8                                                   | Node analysis with linearly dependent sources for DC .                                         | L                | BB+P         | 1              | 12                        | 7/12/23       |
| 9                                                   | Loop and node analysis with linearly dependent and independent sources for DC and AC networks. | L                | BB+P         | 1              | 13                        | 8/12/23       |
| <b>MODULE 2: Network Theorems</b>                   |                                                                                                |                  |              |                |                           |               |
| 10                                                  | Superposition                                                                                  | L                | BB+P         | 1              | 16                        | 9/12/23       |
| 11                                                  | Numerical                                                                                      | L                | BB+P         | 1              | 17                        | 12/12/23      |
| 12                                                  | Numerical                                                                                      | L                | BB+P         | 1              | 18                        | 13/12/23      |
| 13                                                  | Millman's theorems                                                                             | L                | BB+P         | 1              | 19                        | 14/12/23      |

|                                                                      |                                                                       |   |      |   |    |          |
|----------------------------------------------------------------------|-----------------------------------------------------------------------|---|------|---|----|----------|
| 14                                                                   | Numerical                                                             | L | BB+P | 1 | 20 | 15/12/23 |
| 15                                                                   | Thevenin's                                                            | L | BB+P | 1 | 21 | 19/12/23 |
| 16                                                                   | Numerical                                                             | L | BB+P | 1 | 22 | 20/12/23 |
| 17                                                                   | Norton's theorems                                                     | L | BB+P | 1 | 23 | 21/12/23 |
| 18                                                                   | Maximum Power transfer theorem                                        | L | BB+P | 1 | 24 | 22/12/23 |
| <b>MODULE 3: Transient behavior and initial conditions</b>           |                                                                       |   |      |   |    |          |
| 19                                                                   | Behavior of circuit elements under switching condition.               | L | BB+P | 1 | 26 | 23/12/23 |
| 20                                                                   | Numerical                                                             | L | BB+P | 1 | 27 | 26/12/23 |
| 21                                                                   | Numerical                                                             | L | BB+P | 1 | 28 | 27/12/23 |
| 22                                                                   | Evaluation of initial and final conditions in RL                      | L | BB+P | 1 | 29 | 28/12/23 |
| 23                                                                   | Numerical                                                             | L | BB+P | 1 | 30 | 29/12/24 |
| 24                                                                   | Numerical                                                             | L | BB+P | 1 | 31 | 2/1/24   |
| 25                                                                   | Evaluation of initial and final conditions in RC                      | L | BB+P | 1 | 32 | 3/1/24   |
| 26                                                                   | Evaluation of initial and final conditions in RLC DC & AC excitation. | L | BB+P | 1 | 35 | 4/1/24   |
| <b>MODULE 4: Laplace Transformation &amp; Applications</b>           |                                                                       |   |      |   |    |          |
| 27                                                                   | Laplace Transformation Solution of networks                           | L | BB+P | 1 | 41 | 5/1/24   |
| 28                                                                   | Numerical                                                             | L | BB+P | 1 | 42 | 9/1/24   |
| 29                                                                   | Solution of networks step Signal                                      | L | BB+P | 1 | 43 | 10/1/24  |
| 30                                                                   | Time response specifications of second order systems                  | L | BB+P | 1 | 44 | 11/1/24  |
| 31                                                                   | Numerical                                                             | L | BB+P | 1 | 45 | 12/1/24  |
| 32                                                                   | Solution of networks ramp Signal                                      | L | BB+P | 1 | 46 | 16/1/24  |
| 33                                                                   | Numerical                                                             | L | BB+P | 1 | 47 | 17/1/24  |
| 34                                                                   | Numerical                                                             | L | BB+P | 1 | 48 | 18/1/24  |
| 35                                                                   | Solution of networks impulse responses                                | L | BB+P | 1 | 49 | 19/1/24  |
| 36                                                                   | Waveform Synthesis.                                                   | L | BB+P | 1 | 51 | 20/1/24  |
| <b>Module 5: Two port network parameters &amp; Resonance Network</b> |                                                                       |   |      |   |    |          |
| 37                                                                   | Definition of Z, Y, h and Transmission parameters                     | L | BB+P | 1 | 54 | 23/1/24  |
| 38                                                                   | Modelling with these parameters                                       | L | BB+P | 1 | 55 | 24/1/24  |
| 39                                                                   | Numerical                                                             | L | BB+P | 1 | 56 | 25/1/24  |



|    |                                                                                                                     |   |      |   |    |         |
|----|---------------------------------------------------------------------------------------------------------------------|---|------|---|----|---------|
| 40 | Relationship between parameters sets                                                                                | L | BB+P | 1 | 57 | 26/1/24 |
| 41 | Resonance: Variation of Current and Voltage with Frequency, Selectivity and Bandwidth                               | L | BB+P | 1 | 58 | 30/1/24 |
| 42 | Q Factor, Circuit Magnification Factor, Selectivity with Variable Capacitance, Selectivity with Variable Inductance | L | BB+P | 1 | 59 | 31/1/24 |
| 43 | Numerical                                                                                                           | L | BB+P | 1 | 60 | 1/2/24  |
| 44 | Parallel Resonance: Selectivity and Bandwidth, Maximum Impedance Conditions with C, L and f Variable                | L | BB+P | 1 | 61 | 2/2/24  |
| 45 | Numerical                                                                                                           | L | BB+P | 1 | 62 | 3/2/24  |
| 46 | Current in Anti-Resonant Circuit, The General Case-Resistance Present in both Branches                              | L | BB+P | 1 | 63 | 6/2/24  |

  
Signature of Course Incharge

  
Signature of Module Coordinator

  
Signature of HOD/ECE



(13)

**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**COURSE PLAN ODD SEM-2023-24**

**NAME OF THE STAFF** : Mr. Saleem S Tevaramani  
**SUBJECT CODE/NAME** : 18EC732/ SATELLITE COMMUNICATION  
**SEMESTER/SEC** : VII SEM / A  
**ACADEMIC YEAR** : 2023-2024

| Sl. No.                                                   | Topic to be covered                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------------|-----------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE -1: SATELLITE ORBITS &amp; TRAJECTORIES</b>     |                                                     |                  |              |                |                           |               |
| 1                                                         | Satellite Orbits and Trajectories: Definition       | L+AV             | BB           | 1              | 1                         | 12/9/2023     |
| 2                                                         | Basic Principles                                    | L+ D             | LCD +BB      | 1              | 2                         | 13/9/2023     |
| 3                                                         | Orbital Parameters                                  | L+ D             | LCD +BB      | 1              | 3                         | 14/9/2023     |
| 4                                                         | Injection Velocity and satellite Trajectory         | L+D              | LCD +BB      | 1              | 4                         | 15/9/2023     |
| 5                                                         | Types of satellite orbits                           | L+D              | LCD +BB      | 1              | 5                         | 19/9/2023     |
| 6                                                         | Orbital perturbations                               | L+D              | LCD +BB      | 1              | 6                         | 20/9/2023     |
| 7                                                         | Satellite stabilization                             | L+D              | LCD +BB      | 1              | 7                         | 21/9/2023     |
| 8                                                         | Orbital effects on satellite's performance          | L+D              | LCD +BB      | 1              | 8                         | 22/9/2023     |
| 9                                                         | Eclipses, Look angles: Azimuth and Elevation angles | L+D              | LCD +BB      | 1              | 9                         | 27/9/2023     |
| <b>MODULE -2: SATELLITE SUBSYSTEM &amp; EARTH STATION</b> |                                                     |                  |              |                |                           |               |
| 10                                                        | Satellite Power supply subsystem                    | L+ D             | BB           | 1              | 10                        | 29/9/2023     |
| 11                                                        | Attitude and Orbit control                          | L+D              | LCD +BB      | 1              | 11                        | 30/9/2023     |
| 12                                                        | Tracking, Telemetry and command subsystem           | L+D, PS          | LCD +BB      | 1              | 12                        | 3/10/2023     |



|    |                                |         |         |   |    |            |
|----|--------------------------------|---------|---------|---|----|------------|
| 13 | Types of earth station         | L+D, PS | LCD +BB | 1 | 13 | 4/10/2023  |
| 14 | Architecture                   | L+D, PS | LCD +BB | 1 | 14 | 5/10/2023  |
| 15 | Design considerations, Testing | L+D, PS | LCD +BB | 1 | 15 | 6/10/2023  |
| 16 | Earth Station Hardware         | L+D, PS | LCD +BB | 1 | 16 | 10/10/2023 |
| 17 | Satellite tracking             | L+D     | LCD +BB | 1 | 17 | 11/10/2023 |

### MODULE -3: MULTIPLE ACCESS TECHNIQUES & SATELLITE LINK DESIGN

|    |                                            |     |         |   |    |            |
|----|--------------------------------------------|-----|---------|---|----|------------|
| 18 | Introduction to Multiple Access Techniques | L+D | BB      | 1 | 18 | 12/10/2023 |
| 19 | FDMA (No Derivation)                       | L+D | LCD +BB | 1 | 19 | 13/10/2023 |
| 20 | SCPC Systems                               | L+D | LCD +BB | 1 | 20 | 19/10/2023 |
| 21 | TDMA, CDMA, SDMA                           | L+D | LCD +BB | 1 | 21 | 20/10/2023 |
| 22 | Satellite link design fundamentals         | L+D | LCD +BB | 1 | 22 | 25/10/2023 |
| 23 | Transmission Equation                      | L+D | LCD +BB | 1 | 23 | 26/10/2023 |
| 24 | Satellite Link Parameters                  | L+D | LCD +BB | 1 | 24 | 27/10/2023 |
| 25 | Propagation considerations                 | L+D | LCD +BB | 1 | 25 | 31/10/2023 |

### MODULE -4: COMMUNICATION SATELLITES

|    |                                          |      |         |   |    |            |
|----|------------------------------------------|------|---------|---|----|------------|
| 26 | Introduction to Communication Satellites | L+AV | BB      | 1 | 26 | 2/11/2023  |
| 27 | Related Applications                     | L+D  | LCD +BB | 1 | 27 | 3/11/2023  |
| 28 | Frequency Bands, Payloads                | L+D  | LCD +BB | 1 | 28 | 7/11/2023  |
| 29 | Satellite vs Terrestrial networks        | L+D  | LCD +BB | 1 | 29 | 8/11/2023  |
| 30 | Satellite Telephony                      | L+D  | LCD +BB | 1 | 30 | 9/11/2023  |
| 31 | Satellite Television                     | L+D  | LCD +BB | 1 | 31 | 11/11/2023 |
| 32 | Satellite Radio                          | L+D  | LCD +BB | 1 | 32 | 15/11/2023 |
| 33 | Regional Satellite Systems               | L+D  | LCD +BB | 1 | 33 | 16/11/2023 |
| 34 | National Satellite Systems               | L+D  | BB      | 1 | 34 | 17/11/2023 |

### MODULE -5: REMOTE SENSING, WEATHER FORECASTING & NAVIGATION SATELLITES

|    |                                          |      |         |   |    |            |
|----|------------------------------------------|------|---------|---|----|------------|
| 35 | Classification of Remote Sensing Systems | L+AV | BB      | 1 | 35 | 21/11/2023 |
| 36 | Orbits, Payloads                         | L+D  | LCD +BB | 1 | 36 | 22/11/2023 |
| 37 | Types of images: Image classification    | L+D  | LCD +BB | 1 | 37 | 28/11/2023 |

|    |                                                |     |         |   |    |            |
|----|------------------------------------------------|-----|---------|---|----|------------|
| 38 | Interpretation, Applications                   | L+D | LCD +BB | 1 | 38 | 29/11/2023 |
| 39 | Fundamentals of weather forecasting satellites | L+D | LCD +BB | 1 | 39 | 1/12/2023  |
| 40 | Images, Orbits, Payloads, Applications         | L+D | LCD +BB | 1 | 40 | 5/12/2023  |
| 41 | Development of Satellite Navigation Systems    | L+D | LCD +BB | 1 | 41 | 6/12/2023  |
| 42 | GPS system, Applications                       | L+D | LCD +BB | 1 | 42 | 7/12/2023  |
| 43 | VTU QP Revision                                | L+D | BB      | 1 | 43 | 9/12/2023  |
| 44 | VTU QP Revision                                | L+D | BB      | 1 | 44 | 12/12/2023 |
| 45 | VTU QP Revision                                | L+D | BB      | 1 | 45 | 13/12/2023 |

**Text Books: -**

1. Anil K. Maini, Varsha Agrawal, Satellite Communications, Wiley India Pvt. Ltd., 2015, ISBN: 978-81-265-2071-8.

**Reference Books:**

1. Dennis Roddy, Satellite Communications, 4th Edition, McGraw- Hill International edition, 2006
2. Timothy Pratt, Charles Bostian, Jeremy Allnutt, Satellite Communications, 2nd Edition, Wiley India Pvt. Ltd, 2017, ISBN: 978-81-265-0833-4.

**WEB Materials:**

W1: <https://nptel.ac.in/courses/106105082/33>

W2: [https://www.tutorialspoint.com/principles\\_of\\_communication/principles\\_of\\_satellite\\_communications.htm](https://www.tutorialspoint.com/principles_of_communication/principles_of_satellite_communications.htm)

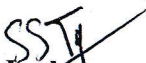
W3: <https://www.intelsatgeneral.com/satellite-basics/>

W4: [https://www.youtube.com/watch?v=LC9\\_GCnON8](https://www.youtube.com/watch?v=LC9_GCnON8)

W5: <https://www.youtube.com/watch?v=Au4Ab7PBRVA>

**Details for the Teaching Aids:**

1. Black Board
2. LCD for PPT
3. AV for Audio Video

  
Course In charge

  
Module Coordinator

  
HOD/ECE





**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**COURSE PLAN ODD SEM-2023-24**

**NAME OF THE STAFF** : Mr. Saleem S Tevaramani  
**SUBJECT CODE/NAME** : 18EC732/ SATELLITE COMMUNICATION  
**SEMESTER/SEC** : VII SEM / B  
**ACADEMIC YEAR** : 2023-2024

| Sl. No.                                                   | Topic to be covered                                 | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------------------------------------------------|-----------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE -1: SATELLITE ORBITS &amp; TRAJECTORIES</b>     |                                                     |                  |              |                |                           |               |
| 1                                                         | Satellite Orbits and Trajectories: Definition       | L+AV             | BB           | 1              | 1                         | 11/9/2023     |
| 2                                                         | Basic Principles                                    | L+ D             | LCD +BB      | 1              | 2                         | 12/9/2023     |
| 3                                                         | Orbital Parameters                                  | L+ D             | LCD +BB      | 1              | 3                         | 13/9/2023     |
| 4                                                         | Injection Velocity and satellite Trajectory         | L+D              | LCD +BB      | 1              | 4                         | 15/9/2023     |
| 5                                                         | Types of satellite orbits                           | L+D              | LCD +BB      | 1              | 5                         | 19/9/2023     |
| 6                                                         | Orbital perturbations                               | L+D              | LCD +BB      | 1              | 6                         | 20/9/2023     |
| 7                                                         | Satellite stabilization                             | L+D              | LCD +BB      | 1              | 7                         | 22/9/2023     |
| 8                                                         | Orbital effects on satellite's performance          | L+D              | LCD +BB      | 1              | 8                         | 23/9/2023     |
| 9                                                         | Eclipses, Look angles: Azimuth and Elevation angles | L+D              | LCD +BB      | 1              | 9                         | 25/9/2023     |
| <b>MODULE -2: SATELLITE SUBSYSTEM &amp; EARTH STATION</b> |                                                     |                  |              |                |                           |               |
| 10                                                        | Satellite Power supply subsystem                    | L+ D             | BB           | 1              | 10                        | 27/9/2023     |
| 11                                                        | Attitude and Orbit control                          | L+D              | LCD +BB      | 1              | 11                        | 30/9/2023     |
| 12                                                        | Tracking, Telemetry and command subsystem           | L+D, PS          | LCD +BB      | 1              | 12                        | 3/10/2023     |

|    |                                |         |         |   |    |            |
|----|--------------------------------|---------|---------|---|----|------------|
| 13 | Types of earth station         | L+D, PS | LCD +BB | 1 | 13 | 4/10/2023  |
| 14 | Architecture                   | L+D, PS | LCD +BB | 1 | 14 | 6/10/2023  |
| 15 | Design considerations, Testing | L+D, PS | LCD +BB | 1 | 15 | 9/10/2023  |
| 16 | Earth Station Hardware         | L+D, PS | LCD +BB | 1 | 16 | 10/10/2023 |
| 17 | Satellite tracking             | L+D     | LCD +BB | 1 | 17 | 11/10/2023 |

### MODULE -3: MULTIPLE ACCESS TECHNIQUES & SATELLITE LINK DESIGN

|    |                                            |     |         |   |    |            |
|----|--------------------------------------------|-----|---------|---|----|------------|
| 18 | Introduction to Multiple Access Techniques | L+D | BB      | 1 | 18 | 13/10/2023 |
| 19 | FDMA (No Derivation)                       | L+D | LCD +BB | 1 | 19 | 20/10/2023 |
| 20 | SCPC Systems                               | L+D | LCD +BB | 1 | 20 | 21/10/2023 |
| 21 | TDMA, CDMA, SDMA                           | L+D | LCD +BB | 1 | 21 | 25/10/2023 |
| 22 | Satellite link design fundamentals         | L+D | LCD +BB | 1 | 22 | 27/10/2023 |
| 23 | Transmission Equation                      | L+D | LCD +BB | 1 | 23 | 28/10/2023 |
| 24 | Satellite Link Parameters                  | L+D | LCD +BB | 1 | 24 | 6/11/2023  |
| 25 | Propagation considerations                 | L+D | LCD +BB | 1 | 25 | 7/11/2023  |

### MODULE -4: COMMUNICATION SATELLITES

|    |                                          |      |         |   |    |            |
|----|------------------------------------------|------|---------|---|----|------------|
| 26 | Introduction to Communication Satellites | L+AV | BB      | 1 | 26 | 8/11/2023  |
| 27 | Related Applications                     | L+D  | LCD +BB | 1 | 27 | 10/11/2023 |
| 28 | Frequency Bands, Payloads                | L+D  | LCD +BB | 1 | 28 | 11/11/2023 |
| 29 | Satellite vs Terrestrial networks        | L+D  | LCD +BB | 1 | 29 | 13/11/2023 |
| 30 | Satellite Telephony                      | L+D  | LCD +BB | 1 | 30 | 15/11/2023 |
| 31 | Satellite Television                     | L+D  | LCD +BB | 1 | 31 | 17/11/2023 |
| 32 | Satellite Radio                          | L+D  | LCD +BB | 1 | 32 | 20/11/2023 |
| 33 | Regional Satellite Systems               | L+D  | LCD +BB | 1 | 33 | 21/11/2023 |
| 34 | National Satellite Systems               | L+D  | BB      | 1 | 34 | 22/11/2023 |

### MODULE -5: REMOTE SENSING, WEATHER FORECASTING & NAVIGATION SATELLITES

|    |                                          |      |         |   |    |            |
|----|------------------------------------------|------|---------|---|----|------------|
| 35 | Classification of Remote Sensing Systems | L+AV | BB      | 1 | 35 | 27/11/2023 |
| 36 | Orbits, Payloads                         | L+D  | LCD +BB | 1 | 36 | 28/11/2023 |
| 37 | Types of images: Image classification    | L+D  | LCD +BB | 1 | 37 | 29/11/2023 |



|    |                                                |     |         |   |    |            |
|----|------------------------------------------------|-----|---------|---|----|------------|
| 38 | Interpretation, Applications                   | L+D | LCD +BB | 1 | 38 | 1/12/2023  |
| 39 | Fundamentals of weather forecasting satellites | L+D | LCD +BB | 1 | 39 | 4/12/2023  |
| 40 | Images, Orbits, Payloads, Applications         | L+D | LCD +BB | 1 | 40 | 5/12/2023  |
| 41 | Development of Satellite Navigation Systems    | L+D | LCD +BB | 1 | 41 | 6/12/2023  |
| 42 | GPS system, Applications                       | L+D | LCD +BB | 1 | 42 | 8/12/2023  |
| 43 | VTU QP Revision                                | L+D | BB      | 1 | 43 | 9/12/2023  |
| 44 | VTU QP Revision                                | L+D | BB      | 1 | 44 | 11/12/2023 |
| 45 | VTU QP Revision                                | L+D | BB      | 1 | 45 | 12/12/2023 |

**Text Books: -**

1. Anil K. Maini, Varsha Agrawal, Satellite Communications, Wiley India Pvt. Ltd., 2015, ISBN: 978-81-265-2071-8.

**Reference Books:**

1. Dennis Roddy, Satellite Communications, 4th Edition, McGraw- Hill International edition, 2006
2. Timothy Pratt, Charles Bostian, Jeremy Allnutt, Satellite Communications, 2nd Edition, Wiley India Pvt. Ltd , 2017, ISBN: 978-81-265-0833-4.

**WEB Materials:**

W1: <https://nptel.ac.in/courses/106105082/33>

W2: [https://www.tutorialspoint.com/principles\\_of\\_communication/principles\\_of\\_satellite\\_communications.htm](https://www.tutorialspoint.com/principles_of_communication/principles_of_satellite_communications.htm)

W3: <https://www.intelsatgeneral.com/satellite-basics/>

W4: [https://www.youtube.com/watch?v=LC9\\_GCrNoN8](https://www.youtube.com/watch?v=LC9_GCrNoN8)

W5: <https://www.youtube.com/watch?v=Au4Ab7PBRVA>

**Details for the Teaching Aids:**

1. Black Board
2. LCD for PPT
3. AV for Audio Video

  
Course In charge

  
Module Coordinator

  
HOD/ECE



(14)

**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE** : Satish Kumar B

**COURSE TYPE / CODE / TITLE** : Theory/ BESCK104C / Introduction to Electronics & Communication

**YEAR/ SEMESTER/SECTION** : 1<sup>st</sup> /I<sup>st</sup> /A

**BRANCH** : Computer Science and Engineering

| Sl. No.                                        | Topic to be covered                                  | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------------------|------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Power Supplies and Amplifiers</b> |                                                      |                  |              |                |                           |               |
| 1                                              | Introduction                                         | L+D              | BB           | 1              | 1                         | 14/09/2023    |
| 2                                              | Power Supplies: Block diagram                        | L+ D             | BB           | 1              | 2                         | 15/09/2023    |
| 3                                              | Half-wave rectifier and filters                      | L+ D             | BB           | 1              | 3                         | 19/09/2023    |
| 4                                              | Full-wave rectifiers with filters                    | L+ D             | BB           | 1              | 4                         | 20/09/2023    |
| 5                                              | Voltage regulators                                   | L+D              | BB           | 1              | 5                         | 21/09/2023    |
| 6                                              | Output resistance and voltage regulation             | L+D              | BB           | 1              | 6                         | 22/09/2023    |
| 7                                              | Voltage multipliers                                  | L+D              | BB           | 1              | 7                         | 23/09/2023    |
| 8                                              | Amplifiers, types, gain, Input and output resistance | L+D              | BB           | 1              | 8                         | 25/09/2023    |
| 9                                              | Frequency Response                                   | L+D              | BB           | 1              | 9                         | 26/09/2023    |
| 10                                             | Negative feedback                                    | L+D              | BB           | 1              | 10                        | 27/09/2023    |



|                                   |                                                                       |       |     |   |    |            |
|-----------------------------------|-----------------------------------------------------------------------|-------|-----|---|----|------------|
| 11                                | Bandwidth and Phase Shift                                             |       |     |   |    |            |
| 12                                | Negative Feedback                                                     | L+D   | BB  | 1 | 11 | 29/09/2023 |
| 13                                | Multi stage Amplifiers                                                | L+D   | BB  | 1 | 12 | 30/11/2023 |
|                                   |                                                                       | L+D   | BB  | 1 | 13 | 03/10/2023 |
| <b>MODULE 2: Oscillators</b>      |                                                                       |       |     |   |    |            |
| 14                                | Barkhausen criterion                                                  |       |     |   |    |            |
| 15                                | Sinusoidal and non-sinusoidal oscillators                             | L+D   | BB  | 1 | 14 | 04/10/2023 |
| 16                                | Ladder network oscillator                                             | L+D   | BB  | 1 | 15 | 05/10/2023 |
| 17                                | Crystal Controlled Oscillator                                         | L+D   | BB  | 1 | 16 | 06/10/2023 |
| 18                                | Operational Amplifiers: characteristics of ideal and practical op-amp | L+D   | BB  | 1 | 17 | 09/10/2023 |
|                                   |                                                                       | L+D   | BB  | 1 | 18 | 10/10/2023 |
| <b>IA 1-8/11/2023</b>             |                                                                       |       |     |   |    |            |
| 19                                | Operational Amplifier Configurations                                  |       |     |   |    |            |
| 20                                | Non inverting Configuration                                           | L+D   | BB  | 1 | 19 | 11/10/2023 |
| 21                                | Voltage Follower                                                      | L+D   | BB  | 1 | 20 | 12/10/2023 |
| 22                                | Summer, subtractor                                                    | L+D   | BB  | 1 | 21 | 13/10/2023 |
| 23                                | Integrator and Differentiator                                         | L+D   | BB  | 1 | 22 | 16/10/2023 |
|                                   |                                                                       | L+D   | BB  | 1 | 23 | 17/10/2023 |
| <b>MODULE 4: Embedded Systems</b> |                                                                       |       |     |   |    |            |
| 24                                | Embedded systems vs general computing systems                         | L+D   | BB  | 1 | 24 | 18/10/2023 |
| 25                                | Classification of Embedded Systems                                    | L+D   | BB  | 1 | 25 | 19/10/2023 |
| 26                                | Major application areas of Embedded Systems                           | L+D   | BB  | 1 | 26 | 20/11/2023 |
| 27                                | Elements of Embedded System                                           | L+D   | BB  | 1 | 27 | 25/10/2023 |
| 28                                | Core of the Embedded System                                           | L+D   | BB  | 1 | 28 | 26/10/2023 |
| 29                                | Microprocessor vs Microcontroller, ,                                  | L+D   | BB  | 1 | 29 | 27/10/2023 |
| 30                                | RISC vs CISC                                                          | L+D   | BB  | 1 | 30 | 30/10/2023 |
| 31                                | Instrumentation and control system,                                   | L+D   | BB  | 1 | 31 | 31/10/2023 |
| 32                                | Transducers                                                           | L+D   | BB  | 1 | 32 | 02/11/2023 |
| 33                                | Sensors                                                               | L+D   | BB  | 1 | 33 | 03/11/2023 |
| 34                                | Actuators, LED                                                        | L+PPT | PPT | 1 | 34 | 09/11/2023 |
| 35                                | 7-Segment LED                                                         | L+PPT | PPT | 1 | 35 | 10/11/2023 |



| MODULE 3: Boolean Algebra and Logic Circuits                      |                                                           |       |     |   |    |            |
|-------------------------------------------------------------------|-----------------------------------------------------------|-------|-----|---|----|------------|
| 36                                                                | Binary numbers, Number Base Conversion                    | L+D   | BB  | 1 | 36 | 13/11/2023 |
| 37                                                                | Octal & Hexa Decimal Numbers,                             | L+D   | BB  | 1 | 37 | 15/11/2023 |
| 38                                                                | Complements                                               | L+D   | BB  | 1 | 38 | 16/11/2023 |
| 39                                                                | Axiomatic Definition of Boolean                           | L+D   | BB  | 1 | 39 | 17/11/2023 |
| 40                                                                | Basic Theorems and Properties of Boolean Algebra          | L+D   | BB  | 1 | 40 | 20/11/2023 |
| 41                                                                | Boolean Functions                                         | L+PPT | PPT | 1 | 41 | 21/11/2023 |
| 42                                                                | Canonical and Standard Forms                              | L+D   | BB  | 1 | 42 | 22/11/2023 |
| 43                                                                | Other Logic Operations                                    | L+D   | BB  | 1 | 43 | 23/11/2023 |
| 44                                                                | Digital Logic Gates                                       | L+D   | BB  | 1 | 44 | 24/11/2023 |
| 45                                                                | Combinational Circuits: Introduction and Design procedure | L+D   | BB  | 1 | 45 | 25/11/2023 |
| 46                                                                | Adders' circuits: Half adders                             | L+D   | BB  | 1 | 46 | 27/11/2023 |
| 47                                                                | Full adder                                                | L+D   | BB  | 1 | 47 | 28/11/2023 |
| MODULE 5: Analog Communication Scheme & Digital Modulation Scheme |                                                           |       |     |   |    |            |
| 48                                                                | Modern communication system scheme                        | L+D   | BB  | 1 | 48 | 29/11/2023 |
| 49                                                                | Transmitter, Channel                                      | L+D   | BB  | 1 | 49 | 04/12/2023 |
| 50                                                                | Medium,                                                   | L+D   | BB  | 1 | 50 | 05/12/2023 |
| 51                                                                | Noise, Receiver, Multiplexing                             | L+D   | BB  | 1 | 51 | 06/12/2023 |
| 52                                                                | Multiplexing                                              | L+D   | BB  | 1 | 52 | 07/12/2023 |
| 53                                                                | Types of modulation – AM                                  | L+D   | BB  | 1 | 53 | 08/12/2023 |
| 54                                                                | FM Modulation                                             | L+D   | BB  | 1 | 54 | 09/12/2023 |
| 55                                                                | Concept of Radio wave propagation                         | L+D   | BB  | 1 | 55 | 11/12/2023 |
| 56                                                                | Advantages of digital over analog communication           | L+D   | BB  | 1 | 56 | 12/12/2023 |
| 57                                                                | Radio signal transmission                                 | L+D   | BB  | 1 | 57 | 13/12/2023 |
| 58                                                                | Problems                                                  | L+D   | BB  | 1 | 58 | 14/12/2023 |
| 59                                                                | ASK                                                       | L+D   | BB  | 1 | 59 | 15/12/2023 |
| 60                                                                | FSK                                                       | PPT   | PPT | 1 | 60 | 18/12/2023 |
| 61                                                                | PSK                                                       | PPT   | PPT | 1 | 61 | 19/12/2023 |



|                     |                            |     |     |   |    |            |
|---------------------|----------------------------|-----|-----|---|----|------------|
| 62                  | Multiple Access Techniques | PPT | PPT | 1 | 62 | 20/12/2023 |
| 63                  | Revision                   | L+D | BB  | 1 | 63 | 21/12/2023 |
| 64                  | Revision                   | L+D | BB  | 1 | 64 | 22/12/2023 |
| 65                  | Revision                   | L+D | BB  | 1 | 65 | 23/12/2023 |
| <b>IA2-28/12/23</b> |                            |     |     |   |    |            |
| 66                  | Solving Previous Year QPS  | L+D | BB  | 1 | 66 | 04/01/2024 |
| 67                  | Solving Previous Year QPS  | L+D | BB  | 1 | 67 | 05/01/2024 |

#### Text Books:

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. EBook ISBN9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-2030417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017

#### Web Materials:

- <https://www.youtube.com/watch?v=C8eebS5MhuU>
- <https://www.youtube.com/watch?v=00ZbuhPruJw>

Details of the teaching aids: 1. BB – Black Board

2. PPT Power Point Presentation

Signature of Course In-Charge

Signature of Module Coordinator

Signature of HOD

Signature of Principal

HEAD OF THE DEPARTMENT  
Dept. of Electronics & Communication Engg.  
K.S. Institute of Technology  
Bengaluru - 560 109

PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109.



**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE**

**: Satish Kumar B**

**COURSE TYPE / CODE / TITLE**

**: Theory/ BESCK104C / Introduction to Electronics &  
Communication**

**YEAR/ SEMESTER/SECTION**

**: 1<sup>st</sup> /I<sup>st</sup> /B**

**BRANCH**

**: Computer Science and Engineering**

| Sl. No.                                        | Topic to be covered                                  | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------------------|------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Power Supplies and Amplifiers</b> |                                                      |                  |              |                |                           |               |
| 1                                              | Introduction                                         | L+D              | BB           | 1              | 1                         | 14/09/2023    |
| 2                                              | Power Supplies: Block diagram                        | L+ D             | BB           | 1              | 2                         | 15/09/2023    |
| 3                                              | Half-wave rectifier and filters                      | L+ D             | BB           | 1              | 3                         | 19/09/2023    |
| 4                                              | Full-wave rectifiers with filters                    | L+ D             | BB           | 1              | 4                         | 20/09/2023    |
| 5                                              | Voltage regulators                                   | L+D              | BB           | 1              | 5                         | 21/09/2023    |
| 6                                              | Output resistance and voltage regulation             | L+D              | BB           | 1              | 6                         | 22/09/2023    |
| 7                                              | Voltage multipliers                                  | L+D              | BB           | 1              | 7                         | 23/09/2023    |
| 8                                              | Amplifiers, types, gain, Input and output resistance | L+D              | BB           | 1              | 8                         | 25/09/2023    |
| 9                                              | Frequency Response                                   | L+D              | BB           | 1              | 9                         | 26/09/2023    |
| 10                                             | Negative feedback                                    | L+D              | BB           | 1              | 10                        | 27/09/2023    |



|                                   |                                                                       |       |     |   |    |            |
|-----------------------------------|-----------------------------------------------------------------------|-------|-----|---|----|------------|
| 11                                | Bandwidth and Phase Shift                                             | L+D   | BB  | 1 | 11 | 29/09/2023 |
| 12                                | Negative Feedback                                                     | L+D   | BB  | 1 | 12 | 30/11/2023 |
| 13                                | Multi stage Amplifiers                                                | L+D   | BB  | 1 | 13 | 03/10/2023 |
| <b>MODULE 2: Oscillators</b>      |                                                                       |       |     |   |    |            |
| 14                                | Barkhausen criterion                                                  | L+D   | BB  | 1 | 14 | 04/10/2023 |
| 15                                | Sinusoidal and non-sinusoidal oscillators                             | L+D   | BB  | 1 | 15 | 05/10/2023 |
| 16                                | Ladder network oscillator                                             | L+D   | BB  | 1 | 16 | 06/10/2023 |
| 17                                | Crystal Controlled Oscillator                                         | L+D   | BB  | 1 | 17 | 09/10/2023 |
| 18                                | Operational Amplifiers: characteristics of ideal and practical op-amp | L+D   | BB  | 1 | 18 | 10/10/2023 |
| <b>IA 1-8/11/2023</b>             |                                                                       |       |     |   |    |            |
| 19                                | Operational Amplifier Configurations                                  | L+D   | BB  | 1 | 19 | 11/10/2023 |
| 20                                | Non inverting Configuration                                           | L+D   | BB  | 1 | 20 | 12/10/2023 |
| 21                                | Voltage Follower                                                      | L+D   | BB  | 1 | 21 | 13/10/2023 |
| 22                                | Summer, subtractor                                                    | L+D   | BB  | 1 | 22 | 16/10/2023 |
| 23                                | Integrator and Differentiator                                         | L+D   | BB  | 1 | 23 | 17/10/2023 |
| <b>MODULE 4: Embedded Systems</b> |                                                                       |       |     |   |    |            |
| 24                                | Embedded systems vs general computing systems                         | L+D   | BB  | 1 | 24 | 18/10/2023 |
| 25                                | Classification of Embedded Systems                                    | L+D   | BB  | 1 | 25 | 19/10/2023 |
| 26                                | Major application areas of Embedded Systems                           | L+D   | BB  | 1 | 26 | 20/11/2023 |
| 27                                | Elements of Embedded System                                           | L+D   | BB  | 1 | 27 | 25/10/2023 |
| 28                                | Core of the Embedded System                                           | L+D   | BB  | 1 | 28 | 26/10/2023 |
| 29                                | Microprocessor vs Microcontroller, ,                                  | L+D   | BB  | 1 | 29 | 27/10/2023 |
| 30                                | RISC vs CISC                                                          | L+D   | BB  | 1 | 30 | 30/10/2023 |
| 31                                | Instrumentation and control system,                                   | L+D   | BB  | 1 | 31 | 31/10/2023 |
| 32                                | Transducers                                                           | L+D   | BB  | 1 | 32 | 02/11/2023 |
| 33                                | Sensors                                                               | L+D   | BB  | 1 | 33 | 03/11/2023 |
| 34                                | Actuators, LED                                                        | L+PPT | PPT | 1 | 34 | 09/11/2023 |
| 35                                | 7-Segment LED                                                         | L+PPT | PPT | 1 | 35 | 10/11/2023 |



| MODULE 3: Boolean Algebra and Logic Circuits                      |                                                           |       |     |   |    |            |
|-------------------------------------------------------------------|-----------------------------------------------------------|-------|-----|---|----|------------|
| 36                                                                | Binary numbers, Number Base Conversion                    | L+D   | BB  | 1 | 36 | 13/11/2023 |
| 37                                                                | Octal & Hexa Decimal Numbers,                             | L+D   | BB  | 1 | 37 | 15/11/2023 |
| 38                                                                | Complements                                               | L+D   | BB  | 1 | 38 | 16/11/2023 |
| 39                                                                | Axiomatic Definition of Boolean                           | L+D   | BB  | 1 | 39 | 17/11/2023 |
| 40                                                                | Basic Theorems and Properties of Boolean Algebra          | L+D   | BB  | 1 | 40 | 20/11/2023 |
| 41                                                                | Boolean Functions                                         | L+PPT | PPT | 1 | 41 | 21/11/2023 |
| 42                                                                | Canonical and Standard Forms                              | L+D   | BB  | 1 | 42 | 22/11/2023 |
| 43                                                                | Other Logic Operations                                    | L+D   | BB  | 1 | 43 | 23/11/2023 |
| 44                                                                | Digital Logic Gates                                       | L+D   | BB  | 1 | 44 | 24/11/2023 |
| 45                                                                | Combinational Circuits: Introduction and Design procedure | L+D   | BB  | 1 | 45 | 25/11/2023 |
| 46                                                                | Adders' circuits: Half adders                             | L+D   | BB  | 1 | 46 | 27/11/2023 |
| 47                                                                | Full adder                                                | L+D   | BB  | 1 | 47 | 28/11/2023 |
| MODULE 5: Analog Communication Scheme & Digital Modulation Scheme |                                                           |       |     |   |    |            |
| 48                                                                | Modern communication system scheme                        | L+D   | BB  | 1 | 48 | 29/11/2023 |
| 49                                                                | Transmitter, Channel                                      | L+D   | BB  | 1 | 49 | 04/12/2023 |
| 50                                                                | Medium,                                                   | L+D   | BB  | 1 | 50 | 05/12/2023 |
| 51                                                                | Noise, Receiver, Multiplexing                             | L+D   | BB  | 1 | 51 | 06/12/2023 |
| 52                                                                | Multiplexing                                              | L+D   | BB  | 1 | 52 | 07/12/2023 |
| 53                                                                | Types of modulation – AM                                  | L+D   | BB  | 1 | 53 | 08/12/2023 |
| 54                                                                | FM Modulation                                             | L+D   | BB  | 1 | 54 | 09/12/2023 |
| 55                                                                | Concept of Radio wave propagation                         | L+D   | BB  | 1 | 55 | 11/12/2023 |
| 56                                                                | Advantages of digital over analog communication           | L+D   | BB  | 1 | 56 | 12/12/2023 |
| 57                                                                | Radio signal transmission                                 | L+D   | BB  | 1 | 57 | 13/12/2023 |
| 58                                                                | Problems                                                  | L+D   | BB  | 1 | 58 | 14/12/2023 |
| 59                                                                | ASK                                                       | L+D   | BB  | 1 | 59 | 15/12/2023 |
| 60                                                                | FSK                                                       | PPT   | PPT | 1 | 60 | 18/12/2023 |
| 61                                                                | PSK                                                       | PPT   | PPT | 1 | 61 | 19/12/2023 |



|              |                            |     |     |   |    |            |
|--------------|----------------------------|-----|-----|---|----|------------|
| 62           | Multiple Access Techniques | PPT | PPT | 1 | 62 | 20/12/2023 |
| 63           | Revision                   | L+D | BB  | 1 | 63 | 21/12/2023 |
| 64           | Revision                   | L+D | BB  | 1 | 64 | 22/12/2023 |
| 65           | Revision                   | L+D | BB  | 1 | 65 | 23/12/2023 |
| IA2-28/12/23 |                            |     |     |   |    |            |
| 66           | Solving Previous Year QPS  | L+D | BB  | 1 | 66 | 04/01/2024 |
| 67           | Solving Previous Year QPS  | L+D | BB  | 1 | 67 | 05/01/2024 |

#### Text Books:

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. EBook ISBN9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-2030417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017

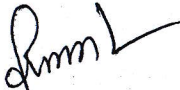
#### Web Materials:

- <https://www.youtube.com/watch?v=C8eebS5MhuU>
- <https://www.youtube.com/watch?v=00ZbuhPruJw>

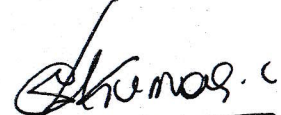
Details of the teaching aids: 1. BB – Black Board

2. PPT Power Point Presentation

  
Signature of Course In-Charge

  
Signature of Module Coordinator

  
Signature of HOD  
HEAD OF THE DEPARTMENT  
Dept. of Electronics & Communication Engg  
K.S. Institute of Technology  
Bengaluru - 560 109

  
Signature of Principal  
PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109.



KS INSTITUTE OF TECHNOLOGY BANGALORE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE COURSE INCHARGE : Bhargavi Ananth

COURSE CODE/NAME :BEC302/DIGITAL SYSTEM DESIGN USING VERILOG

SEMESTER/YEAR/SEC :III/ II/B

ACADEMIC YEAR :2023-24

| Sl. No.                                  | Topic to be covered                                                       | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (B) |
|------------------------------------------|---------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| 1                                        | Introduction to combinational logic.<br>Definition of combinational logic | L                | BB           | 1              | 1                         | 22/11/23          |
| 2                                        | Introduction to combinational logic.<br>Definition of combinational logic | L                | BB           | 1              | 2                         | 22/11/23          |
| 3                                        | Canonical forms                                                           | L                | BB           | 1              | 3                         | 25/11/23          |
| 4                                        | Canonical forms                                                           | L                | BB           | 1              | 4                         | 27/11/23          |
| 5                                        | Generation of switching equations from truth tables                       | L                | BB           | 1              | 5                         | 28/11/23          |
| 6                                        | Generation of switching equations from truth tables                       | L                | BB           | 1              | 6                         | 29/11/23          |
| 7                                        | Karnaugh maps- up to 4 variables                                          | L                | BB           | 1              | 7                         | 4/12/23           |
| 8                                        | Quine-McCluskey Minimization Technique                                    | L                | BB           | 1              | 8                         | 5/12/23           |
| 9                                        | Quine-McCluskey using Don't Care Terms                                    | L                | BB           | 1              | 9                         | 6/12/23           |
| <b>MODULE 4: Introduction to Verilog</b> |                                                                           |                  |              |                |                           |                   |
| 10                                       | Structure of Verilog module                                               | L                | BB           | 1              | 10                        | 7/12/23           |

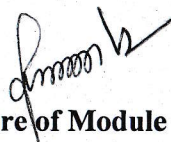


|                                                                                  |                                                                               |   |    |   |    |          |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---|----|---|----|----------|
| 11                                                                               | Operators, Data Types                                                         | L | BB | 1 | 11 | 9/12/23  |
| 12                                                                               | Styles of Description                                                         | L | BB | 1 | 12 | 11/12/23 |
| 13                                                                               | Verilog Data flow description                                                 | L | BB | 1 | 13 | 12/12/23 |
| 14                                                                               | Highlights of Data flow description                                           | L | BB | 1 | 14 | 13/12/23 |
| 15                                                                               | Highlights of Data flow description                                           | L | BB | 1 | 15 | 14/12/23 |
| 16                                                                               | Highlights of Data flow description                                           | L | BB | 1 | 16 | 18/12/23 |
| 17                                                                               | Structure of Data flow description                                            | L | BB | 1 | 17 | 19/12/23 |
| 18                                                                               | Structure of Data flow description                                            | L | BB | 1 | 18 | 20/12/23 |
| <b>MODULE 2: Logic Design with MSI Components and Programmable Logic Devices</b> |                                                                               |   |    |   |    |          |
| 19                                                                               | Binary Adders and Subtractors                                                 | L | BB | 1 | 19 | 21/12/23 |
| 20                                                                               | Comparators                                                                   | L | BB | 1 | 20 | 23/12/23 |
| 21                                                                               | Decoders                                                                      | L | BB | 1 | 21 | 26/12/23 |
| 22                                                                               | Decoders                                                                      | L | BB | 1 | 22 | 27/12/23 |
| 23                                                                               | Encoders, Multiplexers,                                                       | L | BB | 1 | 23 | 28/12/23 |
| 24                                                                               | Encoders, Multiplexers,                                                       | L | BB | 1 | 24 | 30/12/23 |
| 25                                                                               | Programmable Logic Devices (PLDs)                                             | L | BB | 1 | 25 | 4/1/24   |
| 26                                                                               | Programmable Logic Devices (PLDs)                                             | L | BB | 1 | 26 | 8/1/24   |
| 27                                                                               | Revision                                                                      | L | BB | 1 | 27 | 9/1/24   |
| <b>MODULE 3: Flip-Flops and its Applications</b>                                 |                                                                               |   |    |   |    |          |
| 28                                                                               | The Master-Slave Flip-flops (Pulse-Triggered flip-flops): SR flip-flops,      | L | BB | 1 | 28 | 10/1/24  |
| 29                                                                               | Characteristic equations                                                      | L | BB | 1 | 29 | 11/1/24  |
| 30                                                                               | Registers                                                                     | L | BB | 1 | 30 | 13/1/24  |
| 31                                                                               | Binary Ripple Counters                                                        | L | BB | 1 | 31 | 16/1/24  |
| 32                                                                               | Synchronous Binary Counters                                                   | L | BB | 1 | 32 | 17/1/24  |
| 33                                                                               | Synchronous Binary Counters                                                   | L | BB | 1 | 33 | 18/1/24  |
| 34                                                                               | Counters based on Shift Registers                                             | L | BB | 1 | 34 | 22/1/24  |
| 35                                                                               | Design of Synchronous mod-n Counter using clocked T, JK, D and SR flip-flops. | L | BB | 1 | 35 | 23/1/24  |
| 36                                                                               | Design of Synchronous mod-n Counter                                           | L | BB | 1 | 36 | 24/1/24  |

|                                                 |                                                |   |    |   |    |         |
|-------------------------------------------------|------------------------------------------------|---|----|---|----|---------|
|                                                 | using clocked T, JK, D and SR flip-flops.      |   |    |   |    |         |
| <b>MODULE 5: Verilog Behavioral description</b> |                                                |   |    |   |    |         |
| 37                                              | Structure                                      | L | BB | 1 | 37 | 25/1/24 |
| 38                                              | Variable Assignment Statement                  | L | BB | 1 | 38 | 27/1/24 |
| 39                                              | Sequential Statements, Loop Statements         | L | BB | 1 | 39 | 29/1/24 |
| 40                                              | Verilog Behavioral Description of Multiplexers | L | BB | 1 | 40 | 30/1/24 |
| 41                                              | Verilog Structural description                 | L | BB | 1 | 41 | 31/1/24 |
| 42                                              | Highlights of Structural description           | L | BB | 1 | 42 | 1/2/24  |
| 43                                              | Organization of structural description         | L | BB | 1 | 43 | 5/2/24  |
| 44                                              | Structural description of ripple carry adder   | L | BB | 1 | 44 | 6/2/24  |
| 45                                              | Revision                                       | L | BB | 1 | 45 | 7/2/24  |



Signature of Course Incharge



Signature of Module Coordinator



Signature of HOD





**KS INSTITUTE OF TECHNOLOGY, BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Bhanumathi A  
 SUBJECT CODE/NAME : 21EC54/Electromagnetic waves  
 SEMESTER/YEAR : V 'A' / III  
 ACADEMIC YEAR : 2023-2024

| Sl. No.         | Topic to be covered                                                           | Offline Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------|-------------------------------------------------------------------------------|--------------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1</b> |                                                                               |                          |              |                |                           |               |
| 1.              | Revision of Vector Calculus                                                   | L+D                      | BB           | 1              | 1                         | 04.12.2023    |
| 2.              | <b>Coulomb's Law, Electric Field Intensity and Flux density: Introduction</b> | L+D                      | BB           | 1              | 2                         | 05.12.2023    |
| 3.              | Experimental law of Coulomb                                                   | L+D                      | BB           | 1              | 3                         | 06.12.2023    |
| 4.              | Electric Field intensity                                                      | L+D                      | BB           | 1              | 4                         | 07.12.2023    |
| 5.              | Field due to continuous volume charge distribution                            | L+D                      | BB           | 1              | 5                         | 09.12.2023    |
| 6.              | Field of a line charge                                                        | L+D                      | BB           | 1              | 6                         | 11.12.2023    |
| 7.              | Field due to infinite sheet of charge                                         | L+D                      | BB           | 1              | 7                         | 12.12.2023    |
| 8.              | Electric flux density                                                         | L+D                      | BB           | 1              | 8                         | 13.12.2023    |
| 9.              | Problems on Electric field intensity                                          | L+PS                     | BB           | 1              | 9                         | 14.12.2023    |
| 10.             | Problems on distribution of charges                                           | L+PS                     | BB           | 1              | 10                        | 18.12.2023    |
| 11.             | Problems on Electric Flux density                                             | L+PS                     | BB           | 1              | 11                        | 19.12.2023    |
| <b>MODULE 2</b> |                                                                               |                          |              |                |                           |               |
| 12.             | <b>Gauss's law and Divergence: Gauss Law</b>                                  | L+D                      | BB           | 1              | 12                        | 20.12.2023    |
| 13.             | Application of Gauss Law to a point charge and line charge.                   | L+D                      | BB           | 1              | 13                        | 21.12.2023    |





|                 |                                                                                                                        |      |    |   |    |            |
|-----------------|------------------------------------------------------------------------------------------------------------------------|------|----|---|----|------------|
| 35.             | <b>Magnetic Forces</b><br>Force on a moving charge, differential current elements                                      | L+D  | BB | 1 | 35 | 06.02.2024 |
| 36.             | Force between differential current elements.                                                                           | L+D  | BB | 1 | 36 | 07.02.2024 |
| 37.             | Numerical Problems on force on a moving charge, force between differential current elements.                           | L+PS | BB | 1 | 37 | 08.02.2024 |
| 38.             | <b>Magnetic Materials</b><br>Magnetization and permeability,                                                           | L+D  | BB | 1 | 38 | 10.02.2024 |
| 39.             | Magnetic boundary conditions, Magnetic circuit.                                                                        | L+D  | BB | 1 | 39 | 12.02.2024 |
| 40.             | Potential Energy and forces on magnetic materials.                                                                     | L+D  | BB | 1 | 40 | 13.02.2024 |
| 41.             | Inductance and mutual reactance.                                                                                       | L+D  | BB | 1 | 41 | 14.02.2024 |
| 42.             | Numerical Problems on magnetization and permeability                                                                   | L+PS | BB | 1 | 42 | 15.02.2024 |
| 43.             | Faraday's law of electromagnetic induction – integral and point form                                                   | L+D  | BB | 1 | 43 | 19.02.2024 |
| 44.             | Numerical Problems on faraday's law                                                                                    | L+PS | BB | 1 | 44 | 20.02.2024 |
| <b>MODULE 5</b> |                                                                                                                        |      |    |   |    |            |
| 45.             | <b>Maxwell's equations</b> : Continuity equation                                                                       | L+D  | BB | 1 | 45 | 21.02.2024 |
| 46.             | Inconsistency of Ampere's law with continuity equation, displacement current, conduction current                       | L+D  | BB | 1 | 46 | 22.02.2024 |
| 47.             | Derivation of Maxwell's equations in point form and integral form.                                                     | L+D  | BB | 1 | 47 | 24.02.2024 |
| 48.             | Maxwell's equations for different media                                                                                | L+D  | BB | 1 | 48 | 29.02.2024 |
| 49.             | <b>Uniform Plane Wave:</b> Plane wave, Uniform plane wave, Derivation of plane wave equations from Maxwell's equations | L+D  | BB | 1 | 49 | 01.03.2024 |
| 50.             | Solution of wave equation for perfect dielectric, Relation between E and H                                             | L+D  | BB | 1 | 50 | 04.03.2024 |
| 51.             | Wave propagation in free space, solution of wave equation for sinusoidal excitation                                    | L+D  | BB | 1 | 51 | 05.03.2024 |

|     |                                                                                                   |      |    |   |    |            |
|-----|---------------------------------------------------------------------------------------------------|------|----|---|----|------------|
| 52. | Wave propagation in any conducting media and good conductors, Skin effect or depth of penetration | L+D  | BB | 1 | 52 | 06.03.2024 |
| 53. | Poynting's theorem and Wave power                                                                 | L+D  | BB | 1 | 53 | 07.03.2024 |
| 54. | Numerical Problems                                                                                | L+PS | BB | 1 | 54 | 09.03.2024 |

### **TEXT BOOK:**

1. W.H. Hayt and J.A. Buck, "Engineering Electromagnetics", 8th Edition, Tata McGraw-Hill, 2014, ISBN-978-93-392-0327-6.

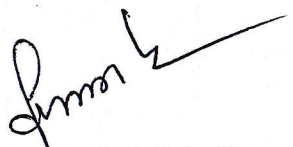
### **REFERENCES:**

1. Elements of Electromagnetics- Matthew N.O., Sadiku, Oxford university press, 4<sup>th</sup> Edn.
2. Electromagnetic Waves and Radiating systems- E.C Jordan and K.G. Balmain, PHI, 2<sup>nd</sup> Edn.
3. Electromagnetics-Joseph Edminister, Schaum Outline Series, McGraw Hill.
4. N. Narayana Rao, -Fundamentals of Electromagnetics for Engineering ,Pearson.

### **WEB MATERIALS:**

- 1 <https://nptel.ac.in/courses/108106073/>
2. <https://freevideolectures.com/course/2340/electromagnetic-fields>
3. <https://www.khanacademy.org/science/physics/.../v/discovery-of-electromagnetism>

  
Signature of Course In-charge

  
Signature of Module Coordinator

  
Signature of HOD-ECE





**KS INSTITUTE OF TECHNOLOGY, BANGALORE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

NAME OF THE STAFF : Kavya B M  
 SUBJECT CODE/NAME : 21EC54/Electromagnetic waves  
 SEMESTER/YEAR : V/ III /B sec  
 ACADEMIC YEAR : 2023-2024

| Sl. No.         | Topic to be covered                                                                                        | Offline Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|-----------------|------------------------------------------------------------------------------------------------------------|--------------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1</b> |                                                                                                            |                          |              |                |                           |               |
| 1               | <b>Coulomb's Law, Electric Field Intensity and Flux density:</b> Revision of Vector Calculus, Introduction | L+D                      | BB           | 1              | 1                         | 04.12.2023    |
| 2               | Experimental law of Coulomb                                                                                | L+D                      | BB           | 1              | 2                         | 05.12.2023    |
| 3               | Electric Field intensity                                                                                   | L+D                      | BB           | 1              | 3                         | 06.12.2023    |
| 4               | Field due to continuous volume charge distribution                                                         | L+D                      | BB           | 1              | 4                         | 07.12.2023    |
| 5               | Field of a line charge                                                                                     | L+D                      | BB           | 1              | 5                         | 09.12.2023    |
| 6               | Field due to infinite sheet of charge                                                                      | L+D                      | BB           | 1              | 6                         | 11.12.2023    |
| 7               | Electric flux density                                                                                      | L+D                      | BB           | 1              | 7                         | 12.12.2023    |
| 8               | Problems on Electric field intensity                                                                       | L+D                      | BB           | 1              | 8                         | 13.12.2023    |
| 9               | Problems on volume integral                                                                                | L+D                      | BB           | 1              | 9                         | 14.12.2023    |
| 10              | Electric Flux density                                                                                      | L+D                      | BB           | 1              | 10                        | 18.12.2023    |
| <b>MODULE 2</b> |                                                                                                            |                          |              |                |                           |               |
| 11              | <b>Gauss's law and Divergence:</b> Gauss Law                                                               | L+ D                     | BB           | 1              | 11                        | 19.12.2023    |





|                 |                                                                                                                        |      |    |   |    |            |
|-----------------|------------------------------------------------------------------------------------------------------------------------|------|----|---|----|------------|
| 32              | <b>Magnetic Forces</b><br>Force on a moving charge, differential current elements                                      | L+D  | BB | 1 | 32 | 27.01.2024 |
| 33              | Force between differential current elements.                                                                           | L+D  | BB | 1 | 33 | 01.02.2024 |
| 34              | Numerical Problems                                                                                                     | L+PS | BB | 1 | 34 | 05.02.2024 |
| 35              | <b>Magnetic Materials</b><br>Magnetization and permeability,                                                           | L+D  | BB | 1 | 35 | 06.02.2024 |
| 36              | Magnetic boundary conditions, Magnetic circuit, Potential Energy and forces on magnetic materials                      | L+D  | BB | 1 | 36 | 07.02.2024 |
| 37              | Magnetic boundary conditions, Magnetic circuit, Potential Energy and forces on magnetic materials                      | L+D  | BB | 1 | 37 | 08.02.2024 |
| 38              | Inductance and mutual reactance                                                                                        | L+D  | BB | 1 | 38 | 10.02.2024 |
| 39              | Faraday law of electromagnetic induction – integral and point form                                                     | L+D  | BB | 1 | 39 | 12.02.2024 |
| 40              | Numerical Problems                                                                                                     | L+D  | BB | 1 | 40 | 13.02.2024 |
| <b>MODULE 5</b> |                                                                                                                        |      |    |   |    |            |
| 41              | <b>Maxwell's equations :</b> Continuity equation                                                                       | L+D  | BB | 1 | 41 | 14.02.2024 |
| 42              | Inconsistency of Ampere's law with continuity equation, displacement current, conduction current                       | L+D  | BB | 1 | 42 | 15.02.2024 |
| 43              | Maxwell's equations in point form and Maxwell's equations in integral form.                                            | L+D  | BB | 1 | 43 | 19.02.2024 |
| 44              | Maxwell's equations for different media                                                                                | L+D  | BB | 1 | 44 | 20.02.2024 |
| 45              | <b>Uniform Plane Wave:</b> Plane wave, Uniform plane wave, Derivation of plane wave equations from Maxwell's equations | L+D  | BB | 1 | 45 | 21.02.2024 |
| 46              | Solution of wave equation for perfect dielectric, Relation between E and H                                             | L+D  | BB | 1 | 46 | 22.02.2024 |
| 47              | Wave propagation in free space, solution of wave equation of wave equation for sinusoidal excitation                   | L+D  | BB | 1 | 47 | 24.02.2024 |
| 48              | Wave propagation in any conducting media and good conductors, Skin effect or depth of penetration                      | L+D  | BB | 1 | 48 | 29.02.2024 |
| 49              | Poynting theorem and Wave power                                                                                        | L+D  | BB | 1 | 49 | 06.03.2024 |

|    |                    |     |    |   |    |            |
|----|--------------------|-----|----|---|----|------------|
| 50 | Numerical Problems | L+D | BB | 1 | 50 | 07.03.2024 |
| 51 | Numerical Problems | L+D | BB | 1 | 51 | 09.03.2024 |

### **TEXT BOOK:**

W.H. Hayt and J.A. Buck, "Engineering Electromagnetics", 8th Edition, Tata McGraw-Hill, 2014, ISBN-978-93-392-0327-6.

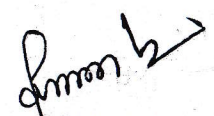
### **REFERENCES:**

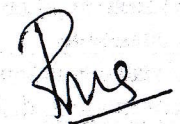
1. Elements of Electromagnetics- Matthew N.O., Sadiku, Oxford university press, 4<sup>th</sup> Edn.
2. Electromagnetic Waves and Radiating systems- E.C Jordan and K.G. Balmain, PHI, 2<sup>nd</sup> Edn.
3. Electromagnetics-Joseph Edminister, Schaum Outline Series, McGraw Hill.
4. N. Narayana Rao, -Fundamentals of Electromagnetics for Engineering –Pearson.

### **WEB MATERIALS:**

1. <https://nptel.ac.in/courses/108106073/>
2. <https://freevideolectures.com/course/2340/electromagnetic-fields>
3. <https://www.khanacademy.org/science/physics/.../v/discovery-of-electromagnetism>

  
Signature of Course In-charge

  
Signature of Module Coordinator

  
Signature of HOD-ECE





(18)

**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

NAME OF THE STAFF : ANITA P  
SUBJECT CODE/NAME : BEC306C /COMPUTER ORGANIZATION AND ARCHITECTURE  
SEMESTER/YEAR/SEC : III / II/ A  
ACADEMIC YEAR : 2023-2024

| Sl. No.                                                                          | Topic to be covered                                                                        | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date(A) |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|------------------|
| <b>MODULE 1: Basic Structure of Computers, Machine Instructions and Programs</b> |                                                                                            |                  |              |                |                           |                  |
| 1                                                                                | <b>Basic Structure of Computers:</b><br>Computer Types, Functional Units, Booting process  | L                | BB+P         | 1              | 1                         | 23/11/23         |
| 2                                                                                | Basic Operational Concepts, Bus Structures                                                 | L                | BB+P         | 1              | 2                         | 25/11/23         |
| 3                                                                                | Software, Performance – Processor Clock                                                    | L                | BB+P         | 1              | 3                         | 27/11/23         |
| 4                                                                                | Basic Performance Equation                                                                 | L                | BB+P         | 1              | 4                         | 28/11/23         |
| 5                                                                                | <b>Machine Instructions and Programs:</b><br>Numbers, Arithmetic Operations and Characters | L                | BB+P         | 1              | 5                         | 29/11/23         |
| 6                                                                                | Memory Location and Addresses, Memory Operations                                           | L                | BB+P         | 1              | 6                         | 4/12/23          |
| 7                                                                                | Instructions and Instruction Sequencing                                                    | L                | BB+P         | 1              | 7                         | 5/12/23          |
| 8                                                                                | IEEE standard for Floating point Numbers                                                   | L                | BB+P         | 1              | 8                         | 6/12/23          |
| 9                                                                                | Writing simple machine instruction                                                         | L                | BB+P         | 1              | 9                         | 7/12/23          |

## MODULE 2: Addressing Modes

|    |                                                                          |   |      |   |    |          |
|----|--------------------------------------------------------------------------|---|------|---|----|----------|
| 10 | Addressing Modes                                                         | L | BB+P | 1 | 10 | 9/12/23  |
| 11 | Addressing Modes                                                         | L | BB+P | 1 | 11 | 11/12/23 |
| 12 | Assembly Language                                                        | L | BB+P | 1 | 12 | 12/12/23 |
| 13 | Basic Input and Output Operations                                        | L | BB+P | 1 | 13 | 13/12/23 |
| 14 | Basic Input and Output Operations                                        | L | BB+P | 1 | 14 | 14/12/23 |
| 15 | Stacks and Queues                                                        | L | BB+P | 1 | 15 | 18/12/23 |
| 16 | Subroutines                                                              | L | BB+P | 1 | 16 | 19/12/23 |
| 17 | Additional Instructions                                                  | L | BB+P | 1 | 17 | 20/12/23 |
| 18 | Solving problems on machine instructions with different addressing modes | L | BB+P | 1 | 18 | 21/12/23 |

## Module 3: Input/output Organization

|    |                                                         |   |      |   |    |          |
|----|---------------------------------------------------------|---|------|---|----|----------|
| 19 | <b>Input/output Organization: Accessing I/O Devices</b> | L | BB+P | 1 | 19 | 23/12/23 |
| 20 | Interrupts – Interrupt Hardware                         | L | BB+P | 1 | 20 | 26/12/23 |
| 21 | Interrupts – Interrupt Hardware                         | L | BB+P | 1 | 21 | 27/12/23 |
| 22 | Enabling and Disabling Interrupts                       | L | BB+P | 1 | 22 | 28/12/23 |
| 23 | Handling Multiple Devices                               | L | BB+P | 1 | 23 | 4/1/24   |
| 24 | Controlling Device Requests                             | L | BB+P | 1 | 24 | 8/1/24   |
| 25 | Direct Memory Access                                    | L | BB+P | 1 | 25 | 9/1/24   |
| 26 | Direct Memory Access                                    | L | BB+P | 1 | 26 | 10/1/24  |

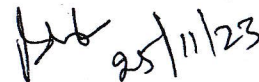
## Module 4: Memory System

|    |                                                                  |   |      |   |    |         |
|----|------------------------------------------------------------------|---|------|---|----|---------|
| 27 | Basic Concepts                                                   | L | BB+P | 1 | 27 | 11/1/24 |
| 28 | Semiconductor RAM memories-Internal organization of memory chips | L | BB+P | 1 | 28 | 13/1/24 |
| 29 | Static memories                                                  | L | BB+P | 1 | 29 | 16/1/24 |
| 30 | Asynchronous DRAMs                                               | L | BB+P | 1 | 30 | 17/1/24 |



|                                        |                                                  |   |      |   |    |         |
|----------------------------------------|--------------------------------------------------|---|------|---|----|---------|
| 31                                     | Read Only Memories                               | L | BB+P | 1 | 31 | 18/1/24 |
| 32                                     | Cache Memories                                   | L | BB+P | 1 | 32 | 22/1/24 |
| 33                                     | Virtual Memories                                 | L | BB+P | 1 | 33 | 23/1/24 |
| 34                                     | Secondary storage magnetic hard disks            | L | BB+P | 1 | 34 | 24/1/24 |
| 35                                     | Videos on hard disks and its parts               | L | LCD  | 1 | 35 | 25/1/24 |
| 36                                     | Revision                                         | L | BB+P | 1 | 36 |         |
| <b>MODULE 5: Basic Processing Unit</b> |                                                  |   |      |   |    |         |
| 37                                     | Basic Processing Unit: Some fundamental concepts | L | BB+P | 1 | 37 | 27/1/24 |
| 38                                     | Execution of complete instruction                | L | BB+P | 1 | 38 | 29/1/24 |
| 39                                     | Multiple bus organization                        | L | BB+P | 1 | 39 | 30/1/24 |
| 40                                     | Multiple bus organization                        | L | BB+P | 1 | 40 | 31/1/24 |
| 41                                     | Hardwired control                                | L | BB+P | 1 | 41 | 1/2/24  |
| 42                                     | Micro programmed control                         | L | BB+P | 1 | 42 | 5/1/24  |
| 43                                     | Timing analysis of some simple programs          | L | BB+P | 1 | 43 | 6/1/24  |
| 44                                     | Revision                                         | L | BB+P | 1 | 44 | 7/1/24  |
| 45                                     | Revision                                         | L | BB+P | 1 | 45 | 19/1/24 |
| 46                                     | Revision                                         | L | BB+P | 1 | 46 | 20/1/24 |

  
Signature of Course Incharge

 25/11/23  
Signature of Module Coordinator

  
Signature of HOD/ECE



19

**K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109**  
**DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES**  
**LESSON PLAN 2023-24 ODD SEMESTER**

**COURSE INCHARGE** : Suma Santosh

**COURSE TYPE / CODE / TITLE** : Theory/ BESCK104C / Introduction to Electronics & Communication

**YEAR/ SEMESTER/SECTION** : 1<sup>st</sup> /I<sup>st</sup> /C

**BRANCH** : Computer Science and Engineering

| Sl. No.                                 | Topic to be covered                      | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date            |
|-----------------------------------------|------------------------------------------|------------------|--------------|----------------|---------------------------|--------------------------|
| MODULE 1: Power Supplies and Amplifiers |                                          |                  |              |                |                           |                          |
| 1                                       | Introduction                             | L+D              | BB           | 1              | 1                         | 14/09/2023               |
| 2                                       | Power Supplies: Block diagram            | L+ D             | BB           | 1              | 2                         | 15/09/2023<br>15/09/2023 |
| 3                                       | Half-wave rectifier and filters          | L+ D             | BB           | 1              | 3                         | 20/09/2023               |
| 4                                       | Full-wave rectifiers with filters        | L+ D             | BB           | 2              | 5                         | 21/09/2023               |
| 5                                       | Voltage regulators                       | L+D              | BB           | 1              | 6                         | 22/09/2023               |
| 6                                       | Output resistance and voltage regulation | L+D              | BB           | 1              | 7                         | 22/09/2023               |
| 7                                       | Voltage multipliers                      | L+D              | BB           | 1              | 8                         | 23/09/2023               |



|                                   |                                                                       |      |    |   |    |            |
|-----------------------------------|-----------------------------------------------------------------------|------|----|---|----|------------|
| 8                                 | Amplifiers, types, gain, Input and output resistance                  | L+D  | BB | 1 | 9  | 25/09/2023 |
| 9                                 | Frequency Response, Negative feedback                                 | L+D  | BB | 2 | 11 | 27/09/2023 |
| 10                                | Bandwidth and Phase Shift                                             | L+D  | BB | 1 | 12 | 29/09/2023 |
| 11                                | Negative Feedback and Multi stage Amplifiers                          | L+D  | BB | 1 | 13 | 30/09/2023 |
| <b>MODULE 2: Oscillators</b>      |                                                                       |      |    |   |    |            |
| 12                                | Barkhausen criterion                                                  | L+D  | BB | 1 | 14 | 4/10/2023  |
| 13                                | Sinusoidal and non-sinusoidal oscillators                             | L+D  | BB | 2 | 16 | 5/10/2023  |
| 14                                | Ladder network oscillator                                             | L+ D | BB | 1 | 17 | 6/10/2023  |
| 15                                | Crystal Controlled Oscillator                                         | L+D  | BB | 1 | 18 | 9/10/2023  |
| 16                                | Operational Amplifiers: characteristics of ideal and practical op-amp | L+D  | BB | 2 | 20 | 11/10/2023 |
| 17                                | Operational Amplifier Configurations                                  | L+D  | BB | 2 | 22 | 12/10/2023 |
| 18                                | Operational Amplifier Circuits: Voltage Follower, summer, subtractor  | L+D  | BB | 2 | 24 | 13/10/2023 |
| 19                                | Integrator and Differentiator                                         | L+D  | BB | 1 | 25 | 16/10/2023 |
| <b>MODULE 4: Embedded Systems</b> |                                                                       |      |    |   |    |            |
| 20                                | Embedded systems vs general computing systems                         | L+D  | BB | 1 | 26 | 18/10/2023 |
| 21                                | Classification of Embedded Systems                                    | L+D  | BB | 1 | 27 | 19/10/2023 |
| 22                                | Major application areas of Embedded Systems                           | L+D  | BB | 2 | 29 | 20/10/2023 |
| 23                                | Elements of Embedded System                                           | L+D  | BB | 1 | 30 | 25/10/2023 |
| 24                                | Core of the Embedded System                                           | L+D  | BB | 1 | 31 | 26/10/2023 |
| 25                                | Microprocessor vs Microcontroller; RISC vs CISC,                      | L+D  | BB | 2 | 33 | 27/10/2023 |
| 26                                | Instrumentation and control system,                                   | L+D  | BB | 1 | 34 | 30/10/2023 |
|                                   |                                                                       |      |    |   |    | 02/11/2023 |

|                                                                   |                                                           |       |     |   |    |                          |
|-------------------------------------------------------------------|-----------------------------------------------------------|-------|-----|---|----|--------------------------|
| 27                                                                | Transducers, Sensors, ,                                   | L+D   | BB  | 1 | 35 | 3/11/2023                |
| 28                                                                | Actuators, LED                                            | L+D   | BB  | 1 | 36 | 3/11/2023                |
| IA 1-8/11/2023                                                    |                                                           |       |     |   |    |                          |
| 29                                                                | 7-Segment LED                                             | L+D   | BB  | 1 | 37 | 9/11/2023                |
| MODULE 3: Boolean Algebra and Logic Circuits                      |                                                           |       |     |   |    |                          |
| 30                                                                | Binary numbers, Number Base Conversion                    | L+D   | BB  | 1 | 38 | 10/11/2023               |
| 31                                                                | Octal & Hexa Decimal Numbers,                             | L+D   | BB  | 1 | 39 | 10/11/2023               |
| 32                                                                | Complements                                               | L+PPT | PPT | 1 | 40 | 11/11/2023               |
| 33                                                                | Axiomatic Definition of Boolean                           | L+D   | BB  | 1 | 41 | 13/11/2023               |
| 34                                                                | Basic Theorems and Properties of Boolean Algebra          | L+D   | BB  | 1 | 42 | 15/11/2023               |
| 35                                                                | Boolean Functions                                         | L+PPT | PPT | 1 | 43 | 16/11/2023               |
| 36                                                                | Canonical and Standard Forms                              | L+D   | BB  | 2 | 45 | 17/11/2023               |
| 37                                                                | Other Logic Operations                                    | L+D   | BB  | 1 | 46 | 20/11/2023               |
| 38                                                                | Digital Logic Gates                                       | L+D   | BB  | 2 | 48 | 22/11/2023<br>23/11/2023 |
| 39                                                                | Combinational Circuits: Introduction and Design procedure | L+D   | BB  | 1 | 49 | 24/11/2023               |
| 40                                                                | Adders' circuits: Half adders                             | L+D   | BB  | 1 | 50 | 24/11/2023               |
| 41                                                                | Full adder                                                | L+D   | BB  | 2 | 52 | 25/11/2023<br>27/11/2023 |
| MODULE 5: Analog Communication Scheme & Digital Modulation Scheme |                                                           |       |     |   |    |                          |
| 42                                                                | Modern communication system scheme                        | L+D   | BB  | 1 | 53 | 29/11/2023               |
| 43                                                                | Transmitter, Channel                                      | L+D   | BB  | 1 | 54 | 1/12/2023                |
| 44                                                                | Medium,                                                   | L+D   | BB  | 1 | 55 | 1/12/2023                |
| 45                                                                | Noise, Receiver, Multiplexing                             | L+D   | BB  | 1 | 56 | 4/12/2023                |
| 46                                                                | Multiplexing                                              | L+D   | BB  | 1 | 57 | 6/12/2023                |



|                     |                                                 |     |     |   |    |            |
|---------------------|-------------------------------------------------|-----|-----|---|----|------------|
| 47                  | Types of modulation – AM                        | L+D | BB  | 1 | 58 | 7/12/2023  |
| 48                  | FM Modulation                                   | L+D | BB  | 1 | 59 | 8/12/2023  |
| 49                  | Concept of Radio wave propagation               | L+D | BB  | 1 | 60 | 8/12/2023  |
| 50                  | Advantages of digital over analog communication | L+D | BB  | 1 | 61 | 11/12/2023 |
| 51                  | Radio signal transmission                       | L+D | BB  | 1 | 62 | 13/12/2023 |
| 52                  | ASK, FSK, PSK, Multiple Access Techniques       | L+D | BB  | 1 | 63 | 14/12/2023 |
| 53                  | Multiple Access Techniques                      | L+D | BB  | 1 | 64 | 15/12/2023 |
| 54                  | Activity                                        | PPT | PPT | 1 | 65 | 18/12/2023 |
| 55                  | Activity                                        | PPT | PPT | 1 | 66 | 20/12/2023 |
| 56                  | Activity                                        | PPT | PPT | 1 | 67 | 21/12/2023 |
| <b>IA2-28/12/23</b> |                                                 |     |     |   |    |            |
| 57                  | Revision, Solving Previous Year QPS             | L+D | BB  | 1 | 68 | 4/1/2024   |
| 58                  | Revision, Solving Previous Year QPS             | L+D | BB  | 1 | 69 | 5/1/2024   |

#### Text Books:

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. EBook ISBN9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-2030417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017

**Web Materials:**

- <https://www.youtube.com/watch?v=C8eebS5MhuU>
- <https://www.youtube.com/watch?v=00ZbuhPruJw>

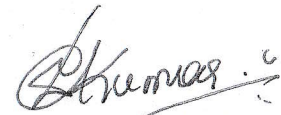
**Details of the teaching aids: 1. BB – Black Board**

**2. PPT Power Point Presentation**

  
**Signature of Course In-Charge**

  
**Signature of Module Coordinator**

  
**Signature of HOD**

  
**Signature of Principal**





|                                   |                                                                      |
|-----------------------------------|----------------------------------------------------------------------|
| <b>COURSE INCHARGE</b>            | <b>: AMRUTHA R</b>                                                   |
| <b>COURSE TYPE / CODE / TITLE</b> | <b>: Theory / BESCK104B / Introduction to Electrical Engineering</b> |
| <b>YEAR/ SEMESTER/SECTION</b>     | <b>: I / I / H</b>                                                   |
| <b>BRANCH</b>                     | <b>: IoT and Cybersecurity including Blockchain</b>                  |

| Sl. No.                            | Topic to be covered                                                                                                                     | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>Module 1: Introduction</b>      |                                                                                                                                         |                  |              |                |                           |               |
| 1                                  | Introduction to Electrical Engineering                                                                                                  | L+D              | BB           | 1              | 1                         | 15/09/2023    |
| 2                                  | Conventional and , non-conventional energy resources; General structure of electrical power systems using single line diagram approach. | L+D              | BB           | 1              | 2                         | 19/09/2023    |
| 3                                  | Power Generation: Hydel, Nuclear, Solar & wind power generation (Block Diagram approach).                                               | L+D              | BB           | 1              | 3                         | 21/09/2023    |
| 4                                  | DC Circuits: Ohm's Law and its limitations                                                                                              | L+D              | BB           | 1              | 4                         | 22/09/2023    |
| 5                                  | Series, parallel, series-parallel circuits.                                                                                             | L+D              | BB           | 1              | 5                         | 23/09/2023    |
| 6                                  | Numerical on series, parallel circuits                                                                                                  | L+D              | BB           | 1              | 6                         | 25/09/2023    |
| 7                                  | KCL & KVL                                                                                                                               | L+D              | BB           | 1              | 7                         | 26/09/2023    |
| 8                                  | Numerical on KVL and KCL                                                                                                                | L+D              | BB           | 1              | 8                         | 29/09/2023    |
| <b>Module 2: A.C. Fundamentals</b> |                                                                                                                                         |                  |              |                |                           |               |

|                              |                                                                                                                                                               |     |    |   |    |            |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|----|------------|
| 9                            | Equation of AC Voltage and current, Waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor. | L+D | BB | 1 | 9  | 30/09/2023 |
| 10                           | Voltage and current relationship with phasor diagrams in R, L, and C circuits. Concept of Impedance.                                                          | L+D | BB | 1 | 10 | 3/10/2023  |
| 11                           | Analysis of R-L, R-C, R-L-C Series circuits. Active power, reactive power and apparent power. Concept of power factor.                                        | L+D | BB | 1 | 11 | 5/10/2023  |
| 12                           | Analysis of R-L, R-C, R-L-C Series circuits. Active power, reactive power and apparent power. Concept of power factor.                                        | L+D | BB | 1 | 12 | 6/10/2023  |
| 13                           | Numericals on AC Fundamentals                                                                                                                                 | L+D | BB | 1 | 13 | 9/10/2023  |
| 14                           | <b>Three Phase Circuits:</b> Generation of Three phase AC quantity, advantages and limitations;                                                               | L+D | BB | 1 | 14 | 10/10/2023 |
| 15                           | Star and delta connection, relationship between line and phase quantities                                                                                     | L+D | BB | 1 | 15 | 12/10/2023 |
| 16                           | Numerical on Three phase circuits                                                                                                                             | L+D | BB | 1 | 16 | 13/10/2023 |
| <b>Module 3: DC Machines</b> |                                                                                                                                                               |     |    |   |    |            |
| 17                           | DC Generator: Principle of operation, constructional details,                                                                                                 | L+D | BB | 1 | 17 | 16/10/2023 |
| 18                           | Induced emf expression, types of generators.                                                                                                                  | L+D | BB | 1 | 18 | 17/10/2023 |
| 19                           | Relation between induced emf and terminal voltage.                                                                                                            | L+D | BB | 1 | 19 | 19/10/2023 |
| 20                           | Numerical on DC generator                                                                                                                                     | L+D | BB | 1 | 20 | 20/10/2023 |
| 21                           | <b>DC Motor:</b> Principle of operation, back emf and                                                                                                         | L+D | BB | 1 | 21 | 26/10/2023 |



|                                  |                                                                                                                                   |     |    |   |    |            |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----|----|---|----|------------|
|                                  | its significance.                                                                                                                 |     |    |   |    |            |
| 22                               | Torque equation, types of motors,                                                                                                 | L+D | BB | 1 | 22 | 27/10/2023 |
| 23                               | Characteristics and speed control (armature & field) of DC motors (series & shunt only). Applications of DC motors.               | L+D | BB | 1 | 23 | 30/10/2023 |
| 24                               | Numerical on DC motor                                                                                                             | L+D | BB | 1 | 24 | 31/10/2023 |
| <b>Module 4: Transformers</b>    |                                                                                                                                   |     |    |   |    |            |
| 25                               | Necessity of transformer, principle of operation                                                                                  | L+D | BB | 1 | 25 | 2/11/2023  |
| 26                               | Types and construction of single-phase transformers                                                                               | L+D | BB | 1 | 26 | 3/11/2023  |
| 27                               | EMF equation, losses, variation of losses with respect to load.                                                                   | L+D | BB | 1 | 27 | 6/11/2023  |
| 28                               | Efficiency and Numerical                                                                                                          | L+D | BB | 1 | 28 | 7/11/2023  |
| 29                               | <b>Three-phase induction Motors:</b> Concept of rotating magnetic field, Principle of operation, constructional features of motor | L+D | BB | 1 | 29 | 13/11/2023 |
| 30                               | Types – squirrel cage and wound rotor.                                                                                            | L+D | BB | 1 | 30 | 16/11/2023 |
| 31                               | Slip and its significance                                                                                                         | L+D | BB | 1 | 31 | 17/11/2023 |
| 32                               | Numerical                                                                                                                         | L+D | BB | 1 | 32 | 20/11/2023 |
| <b>MODULE 5: Domestic Wiring</b> |                                                                                                                                   |     |    |   |    |            |
| 33                               | Requirements, Types of wiring: casing, capping.                                                                                   | L+D | BB | 1 | 33 | 21/11/2023 |
| 34                               | Two way and three way control of load..                                                                                           | L+D | BB | 1 | 34 | 23/11/2023 |
| 35                               | Electricity Bill: Power rating of household appliances including air conditioners, PCs, laptops, printers, etc.                   | L+D | BB | 1 | 35 | 24/11/2023 |
| 36                               | Definition of “unit” used for consumption of electrical energy, two-part electricity tariff,                                      | L+D | BB | 1 | 36 | 27/11/2023 |
| 37                               | Calculation of electricity bill for domestic consumers.                                                                           | L+D | BB | 1 | 37 | 28/11/2023 |
| 38                               | Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.                    | L+D | BB | 1 | 38 | 1/12/2023  |

|    |                                                            |     |    |   |    |           |
|----|------------------------------------------------------------|-----|----|---|----|-----------|
| 39 | Personal safety measures: Electric Shock                   | L+D | BB | 1 | 39 | 4/12/2023 |
| 40 | Earthing and its types, Safety Precautions to avoid shock. | L+D | BB | 1 | 40 | 5/12/2023 |

### Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

### Useful websites:

- <http://elearning.vtu.ac.in/econtent/BS.php>

<http://nptel.ac.in/courses/108108076/>

### Useful Journals:

- Electrical Engineering
- IEEE Transactions on Power Apparatus and Systems
- Journal of the Institution of Electrical Engineers

### Details for the teaching Aids

Lecture class, Black Board, Discussions



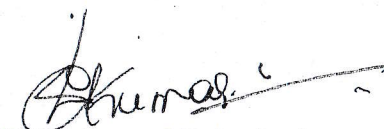
Signature of Course In-Charge



Signature of Module Coordinator



Signature of HOD



Signature of Principal

HEAD OF THE DEPARTMENT  
Dept. of Electronics & Communication Engg.  
K.S. Institute of Technology  
Bengaluru - 560 109

PRINCIPAL  
K.S. INSTITUTE OF TECHNOLOGY  
BENGALURU - 560 109.





|                                   |                                                                      |
|-----------------------------------|----------------------------------------------------------------------|
| <b>COURSE INCHARGE</b>            | <b>: AMRUTHA R</b>                                                   |
| <b>COURSE TYPE / CODE / TITLE</b> | <b>: Theory / BESCK104B / Introduction to Electrical Engineering</b> |
| <b>YEAR/ SEMESTER/SECTION</b>     | <b>: I / I / I</b>                                                   |
| <b>BRANCH</b>                     | <b>: Computers and Communication Engineering</b>                     |

| Sl. No.                            | Topic to be covered                                                                                                                   | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|---------------|
| <b>MODULE 1: Introduction</b>      |                                                                                                                                       |                  |              |                |                           |               |
| 1                                  | Introduction to Electrical Engineering                                                                                                | L+D              | BB           | 1              | 1                         | 19/09/2023    |
| 2                                  | Conventional and non-conventional energy resources; General structure of electrical power systems using single line diagram approach. | L+D              | BB           | 1              | 2                         | 20/09/2023    |
| 3                                  | Power Generation: Hydel, Nuclear, Solar & wind power generation (Block Diagram approach).                                             | L+D              | BB           | 1              | 3                         | 22/09/2023    |
| 4                                  | DC Circuits: Ohm's Law and its limitations                                                                                            | L+D              | BB           | 1              | 4                         | 23/09/2023    |
| 5                                  | Series, parallel, series-parallel circuits.                                                                                           | L+D              | BB           | 1              | 5                         | 25/09/2023    |
| 6                                  | Numerical on series, parallel circuits                                                                                                | L+D              | BB           | 1              | 6                         | 26/09/2023    |
| 7                                  | KCL & KVL                                                                                                                             | L+D              | BB           | 1              | 7                         | 29/09/2023    |
| 8                                  | Numerical on KVL and KCL                                                                                                              | L+D              | BB           | 1              | 8                         | 3/10/2023     |
| <b>MODULE 2: A.C. Fundamentals</b> |                                                                                                                                       |                  |              |                |                           |               |

|                              |                                                                                                                                                               |     |    |   |    |            |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|----|------------|
| 9                            | Equation of AC Voltage and current, Waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor. | L+D | BB | 1 | 9  | 4/10/2023  |
| 10                           | Voltage and current relationship with phasor diagrams in R, L, and C circuits. Concept of Impedance.                                                          | L+D | BB | 1 | 10 | 6/10/2023  |
| 11                           | Analysis of R-L, R-C, R-L-C Series circuits. Active power, reactive power and apparent power. Concept of power factor.                                        | L+D | BB | 1 | 11 | 9/10/2023  |
| 12                           | Analysis of R-L, R-C, R-L-C Series circuits. Active power, reactive power and apparent power. Concept of power factor.                                        | L+D | BB | 1 | 12 | 10/10/2023 |
| 13                           | Numericals on AC Fundamentals                                                                                                                                 | L+D | BB | 1 | 13 | 11/10/2023 |
| 14                           | <b>Three Phase Circuits:</b> Generation of Three phase AC quantity, advantages and limitations;                                                               | L+D | BB | 1 | 14 | 13/10/2023 |
| 15                           | Star and delta connection, relationship between line and phase quantities                                                                                     | L+D | BB | 1 | 15 | 16/10/2023 |
| 16                           | Numerical on Three phase circuits                                                                                                                             | L+D | BB | 1 | 16 | 17/10/2023 |
| <b>MODULE 3: DC Machines</b> |                                                                                                                                                               |     |    |   |    |            |
| 17                           | DC Generator: Principle of operation, constructional details,                                                                                                 | L+D | BB | 1 | 17 | 18/10/2023 |
| 18                           | Induced emf expression, types of generators.                                                                                                                  | L+D | BB | 1 | 18 | 20/10/2023 |
| 19                           | Relation between induced emf and terminal voltage.                                                                                                            | L+D | BB | 1 | 19 | 25/10/2023 |
| 20                           | Numerical on DC generator                                                                                                                                     | L+D | BB | 1 | 20 | 27/10/2023 |
| 21                           | <b>DC Motor:</b> Principle of operation, back emf and                                                                                                         | L+D | BB | 1 | 21 | 30/10/2023 |



|                                  |                                                                                                                                   |     |    |   |    |            |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----|----|---|----|------------|
|                                  | its significance.                                                                                                                 |     |    |   |    |            |
| 22                               | Torque equation, types of motors,                                                                                                 | L+D | BB | 1 | 22 | 31/10/2023 |
| 23                               | Characteristics and speed control (armature & field) of DC motors (series & shunt only). Applications of DC motors.               | L+D | BB | 1 | 23 | 3/11/2023  |
| 24                               | Numerical on DC motor                                                                                                             | L+D | BB | 1 | 24 | 6/11/2023  |
| <b>MODULE 4: Transformers</b>    |                                                                                                                                   |     |    |   |    |            |
| 25                               | Necessity of transformer, principle of operation                                                                                  | L+D | BB | 1 | 25 | 7/11/2023  |
| 26                               | Types and construction of single-phase transformers                                                                               | L+D | BB | 1 | 26 | 13/11/2023 |
| 27                               | EMF equation, losses, variation of losses with respect to load.                                                                   | L+D | BB | 1 | 27 | 15/11/2023 |
| 28                               | Efficiency and Numerical                                                                                                          | L+D | BB | 1 | 28 | 17/11/2023 |
| 29                               | <b>Three-phase induction Motors:</b> Concept of rotating magnetic field, Principle of operation, constructional features of motor | L+D | BB | 1 | 29 | 20/11/2023 |
| 30                               | Types – squirrel cage and wound rotor.                                                                                            | L+D | BB | 1 | 30 | 21/11/2023 |
| 31                               | Slip and its significance                                                                                                         | L+D | BB | 1 | 31 | 22/11/2023 |
| 32                               | Numerical                                                                                                                         | L+D | BB | 1 | 32 | 24/11/2023 |
| <b>MODULE 5: Domestic Wiring</b> |                                                                                                                                   |     |    |   |    |            |
| 33                               | Requirements, Types of wiring: casing, capping.                                                                                   | L+D | BB | 1 | 33 | 25/11/2023 |
| 34                               | Two way and three way control of load.                                                                                            | L+D | BB | 1 | 34 | 27/11/2023 |
| 35                               | Electricity Bill: Power rating of household appliances including air conditioners, PCs, laptops, printers, etc.                   | L+D | BB | 1 | 35 | 28/11/2023 |
| 36                               | Definition of “unit” used for consumption of electrical energy, two-part electricity tariff,                                      | L+D | BB | 1 | 36 | 29/11/2023 |
| 37                               | Calculation of electricity bill for domestic consumers.                                                                           | L+D | BB | 1 | 37 | 1/12/2023  |
| 38                               | Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits                                  | L+D | BB | 1 | 38 | 4/12/2023  |

|    |                                                            |     |    |   |    |           |
|----|------------------------------------------------------------|-----|----|---|----|-----------|
|    | and demerits.                                              |     |    |   |    |           |
| 39 | Personal safety measures: Electric Shock                   | L+D | BB | 1 | 39 | 5/12/2023 |
| 40 | Earthing and its types, Safety Precautions to avoid shock. | L+D | BB | 1 | 40 | 6/12/2023 |

### Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

### Useful websites:

- <http://elearning.vtu.ac.in/econtent/BS.php>
- <http://nptel.ac.in/courses/108108076/>

### Useful Journals:

- Electrical Engineering
- IEEE Transactions on Power Apparatus and Systems
- Journal of the Institution of Electrical Engineers

### Details for the teaching Aids

Lecture class, Black Board, Discussions



Signature of Course In-Charge



Signature of Module Coordinator



Signature of HOD



Signature of Principal

HEAD OF THE DEPARTMENT  
 Dept. of Electronics & Communication Engineering  
 K.S. Institute of Technology  
 Bengaluru - 560 109

PRINCIPAL  
 INSTITUTE OF TECHNOLOGY  
 BENGALURU - 560 109





# KS INSTITUTE OF TECHNOLOGY BANGALORE

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : Naveen Kumar S

SUBJECT CODE/NAME : BEC302/DIGITAL SYSTEM DESIGN USING VERILOG

SEMESTER/YEAR/SEC : III/ II/A

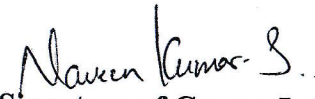
ACADEMIC YEAR : 2023-24

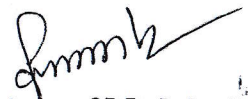
| Sl. No.                                  | Topic to be covered                                                    | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (B) |
|------------------------------------------|------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| 1                                        | Introduction to combinational logic. Definition of combinational logic | L                | BB+P         | 1              | 1                         | 22/11/23          |
| 2                                        | Introduction to combinational logic. Definition of combinational logic | L                | BB+P         | 1              | 2                         | 23/11/23          |
| 3                                        | Canonical forms                                                        | L                | BB+P         | 1              | 3                         | 24/11/23          |
| 4                                        | Canonical forms                                                        | L                | BB+P         | 1              | 4                         | 25/11/23          |
| 5                                        | Generation of switching equations from truth tables                    | L                | BB+P         | 1              | 5                         | 27/11/23          |
| 6                                        | Generation of switching equations from truth tables                    | L                | BB+P         | 1              | 6                         | 29/11/23          |
| 7                                        | Karnaugh maps- up to 4 variables                                       | L                | BB+P         | 1              | 7                         | 1/12/23           |
| 8                                        | Quine-McCluskey Minimization Technique                                 | L                | BB+P         | 1              | 8                         | 4/12/23           |
| 9                                        | Quine-McCluskey using Don't Care Terms                                 | L                | BB+P         | 1              | 9                         | 6/12/23           |
| <b>MODULE 4: Introduction to Verilog</b> |                                                                        |                  |              |                |                           |                   |
| 10                                       | Structure of Verilog module                                            | L                | BB+P         | 1              | 10                        | 7/12/23           |
| 11                                       | Operators, Data Types                                                  | L                | BB+P         | 1              | 11                        | 8/12/23           |
| 12                                       | Styles of Description                                                  | L                | BB+P         | 1              | 12                        | 11/12/23          |
| 13                                       | Verilog Data flow description                                          | L                | BB+P         | 1              | 13                        | 13/12/23          |

|                                                                                  |                                                                               |   |      |   |    |          |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---|------|---|----|----------|
| 14                                                                               | Highlights of Data flow description                                           | L | BB+P | 1 | 14 | 14/12/23 |
| 15                                                                               | Highlights of Data flow description                                           | L | BB+P | 1 | 15 | 15/12/23 |
| 16                                                                               | Highlights of Data flow description                                           | L | BB+P | 1 | 16 | 18/12/23 |
| 17                                                                               | Structure of Data flow description                                            | L | BB+P | 1 | 17 | 20/12/23 |
| 18                                                                               | Structure of Data flow description                                            | L | BB+P | 1 | 18 | 21/12/23 |
| <b>MODULE 2: Logic Design with MSI Components and Programmable Logic Devices</b> |                                                                               |   |      |   |    |          |
| 19                                                                               | Binary Adders and Subtractors                                                 | L | BB+P | 1 | 19 | 22/12/23 |
| 20                                                                               | Comparators                                                                   | L | BB+P | 1 | 20 | 23/12/23 |
| 21                                                                               | Decoders                                                                      | L | BB+P | 1 | 21 | 27/12/23 |
| 22                                                                               | Decoders                                                                      | L | BB+P | 1 | 22 | 28/12/23 |
| 23                                                                               | Encoders, Multiplexers,                                                       | L | BB+P | 1 | 23 | 29/12/23 |
| 24                                                                               | Encoders, Multiplexers,                                                       | L | BB+P | 1 | 24 | 30/12/23 |
| 25                                                                               | Programmable Logic Devices (PLDs)                                             | L | BB+P | 1 | 25 | 4/1/24   |
| 26                                                                               | Programmable Logic Devices (PLDs)                                             | L | BB+P | 1 | 26 | 5/1/24   |
| 27                                                                               | Revision                                                                      | L | BB+P | 1 | 27 | 8/1/24   |
| <b>MODULE 3: Flip-Flops and its Applications</b>                                 |                                                                               |   |      |   |    |          |
| 28                                                                               | The Master-Slave Flip-flops (Pulse-Triggered flip-flops): SR flip-flops,      | L | BB+P | 1 | 28 | 11/1/24  |
| 29                                                                               | Characteristic equations                                                      | L | BB+P | 1 | 29 | 12/1/24  |
| 30                                                                               | Registers                                                                     | L | BB+P | 1 | 30 | 17/1/24  |
| 31                                                                               | Binary Ripple Counters                                                        | L | BB+P | 1 | 31 | 18/1/24  |
| 32                                                                               | Synchronous Binary Counters                                                   | L | BB+P | 1 | 32 | 19/1/24  |
| 33                                                                               | Synchronous Binary Counters                                                   | L | BB+P | 1 | 33 | 22/1/24  |
| 34                                                                               | Counters based on Shift Registers                                             | L | BB+P | 1 | 34 | 24/1/24  |
| 35                                                                               | Design of Synchronous mod-n Counter using clocked T, JK, D and SR flip-flops. | L | BB+P | 1 | 35 | 25/1/24  |
| 36                                                                               | Design of Synchronous mod-n Counter using clocked-T, JK, D and SR flip-flops. | L | BB+P | 1 | 36 | 27/1/24  |
| <b>MODULE 5: Verilog Behavioral description</b>                                  |                                                                               |   |      |   |    |          |
| 37                                                                               | Structure                                                                     | L | BB+P | 1 | 37 | 29/1/24  |



|    |                                                |   |      |   |    |         |
|----|------------------------------------------------|---|------|---|----|---------|
| 38 | Variable Assignment Statement                  | L | BB+P | 1 | 38 | 31/1/24 |
| 39 | Sequential Statements, Loop Statements         | L | BB+P | 1 | 39 | 29/1/24 |
| 40 | Verilog Behavioral Description of Multiplexers | L | BB+P | 1 | 40 | 31/1/24 |
| 41 | Verilog Structural description                 | L | BB+P | 1 | 41 | 1/2/24  |
| 42 | Highlights of Structural description           | L | BB+P | 1 | 42 | 2/2/24  |
| 43 | Organization of structural description         | L | BB+P | 1 | 43 | 5/2/24  |
| 44 | Structural description of ripple carry adder   | L | BB+P | 1 | 44 | 7/2/24  |
| 45 | Revision                                       | L | BB+P | 1 | 45 | 16/2/24 |

  
Signature of Course Incharge

  
Signature of Module Coordinator

  
Signature of HOD



**K S INSTITUTE OF TECHNOLOGY BANGALORE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

NAME OF THE STAFF : PRIYADHARSHINI V  
 SUBJECT CODE/NAME : BEC306C /COMPUTER ORGANIZATION AND ARCHITECTURE  
 SEMESTER/YEAR/SEC : III / II/ B  
 ACADEMIC YEAR : 2023-2024

| Sl. No.                                                                          | Topic to be covered                                                                        | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date(A) |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|------------------|
| <b>MODULE 1: Basic Structure of Computers, Machine Instructions and Programs</b> |                                                                                            |                  |              |                |                           |                  |
| 1                                                                                | <b>Basic Structure of Computers:</b><br>Computer Types, Functional Units, Booting process  | L                | BB+P         | 1              | 1                         | 23/11/23         |
| 2                                                                                | Basic Operational Concepts, Bus Structures                                                 | L                | BB+P         | 1              | 2                         | 24/11/23         |
| 3                                                                                | Software, Performance – Processor Clock                                                    | L                | BB+P         | 1              | 3                         | 25/11/23         |
| 4                                                                                | Basic Performance Equation                                                                 | L                | BB+P         | 1              | 4                         | 29/11/23         |
| 5                                                                                | <b>Machine Instructions and Programs:</b><br>Numbers, Arithmetic Operations and Characters | L                | BB+P         | 1              | 5                         | 1/12/23          |
| 6                                                                                | Memory Location and Addresses, Memory Operations                                           | L                | BB+P         | 1              | 6                         | 5/12/23          |
| 7                                                                                | Instructions and Instruction Sequencing                                                    | L                | BB+P         | 1              | 7                         | 6/12/23          |
| 8                                                                                | IEEE standard for Floating point Numbers                                                   | L                | BB+P         | 1              | 8                         | 7/12/23          |
| 9                                                                                | Writing simple machine instruction                                                         | L                | BB+P         | 1              | 9                         | 8/12/23          |



### MODULE 2: Addressing Modes

|    |                                                                          |   |      |   |    |          |
|----|--------------------------------------------------------------------------|---|------|---|----|----------|
| 10 | Addressing Modes                                                         | L | BB+P | 1 | 10 | 9/12/23  |
| 11 | Addressing Modes                                                         | L | BB+P | 1 | 11 | 12/12/23 |
| 12 | Assembly Language                                                        | L | BB+P | 1 | 12 | 13/12/23 |
| 13 | Basic Input and Output Operations                                        | L | BB+P | 1 | 13 | 14/12/23 |
| 14 | Basic Input and Output Operations                                        | L | BB+P | 1 | 14 | 15/12/23 |
| 15 | Stacks and Queues                                                        | L | BB+P | 1 | 15 | 19/12/23 |
| 16 | Subroutines                                                              | L | BB+P | 1 | 16 | 20/12/23 |
| 17 | Additional Instructions                                                  | L | BB+P | 1 | 17 | 21/12/23 |
| 18 | Solving problems on machine instructions with different addressing modes | L | BB+P | 1 | 18 | 22/12/23 |

### Module 3: Input/output Organization

|    |                                                         |   |      |   |    |          |
|----|---------------------------------------------------------|---|------|---|----|----------|
| 19 | <b>Input/output Organization:</b> Accessing I/O Devices | L | BB+P | 1 | 19 | 23/12/23 |
| 20 | Interrupts – Interrupt Hardware                         | L | BB+P | 1 | 20 | 26/12/23 |
| 21 | Interrupts – Interrupt Hardware                         | L | BB+P | 1 | 21 | 27/12/23 |
| 22 | Enabling and Disabling Interrupts                       | L | BB+P | 1 | 22 | 28/12/23 |
| 23 | Handling Multiple Devices                               | L | BB+P | 1 | 23 | 29/12/23 |
| 24 | Controlling Device Requests                             | L | BB+P | 1 | 24 | 2/1/24   |
| 25 | Direct Memory Access                                    | L | BB+P | 1 | 25 | 3/1/24   |
| 26 | Direct Memory Access                                    | L | BB+P | 1 | 26 | 4/1/24   |

### Module 4: Memory System

|    |                                                                  |   |      |   |    |         |
|----|------------------------------------------------------------------|---|------|---|----|---------|
| 27 | Basic Concepts                                                   | L | BB+P | 1 | 27 | 5/1/24  |
| 28 | Semiconductor RAM memories-Internal organization of memory chips | L | BB+P | 1 | 28 | 9/1/24  |
| 29 | Static memories                                                  | L | BB+P | 1 | 29 | 10/1/24 |
| 30 | Asynchronous DRAMs                                               | L | BB+P | 1 | 30 | 11/1/24 |

|                                        |                                                  |   |      |   |    |         |
|----------------------------------------|--------------------------------------------------|---|------|---|----|---------|
| 31                                     | Read Only Memories                               | L | BB+P | 1 | 31 | 12/1/24 |
| 32                                     | Cache Memories                                   | L | BB+P | 1 | 32 | 16/1/24 |
| 33                                     | Virtual Memories                                 | L | BB+P | 1 | 33 | 17/1/24 |
| 34                                     | Secondary storage magnetic hard disks            | L | BB+P | 1 | 34 | 18/1/24 |
| 35                                     | Videos on hard disks and its parts               | L | LCD  | 1 | 35 | 19/1/24 |
| 36                                     | Revision                                         | L | BB+P | 1 | 36 | 20/1/24 |
| <b>MODULE 5: Basic Processing Unit</b> |                                                  |   |      |   |    |         |
| 37                                     | Basic Processing Unit: Some fundamental concepts | L | BB+P | 1 | 37 | 23/1/24 |
| 38                                     | Execution of complete instruction                | L | BB+P | 1 | 38 | 24/1/24 |
| 39                                     | Multiple bus organization                        | L | BB+P | 1 | 39 | 25/1/24 |
| 40                                     | Multiple bus organization                        | L | BB+P | 1 | 40 | 26/1/24 |
| 41                                     | Hardwired control                                | L | BB+P | 1 | 41 | 30/1/24 |
| 42                                     | Micro programmed control                         | L | BB+P | 1 | 42 | 31/1/24 |
| 43                                     | Timing analysis of some simple programs          | L | BB+P | 1 | 43 | 1/2/24  |
| 44                                     | Revision                                         | L | BB+P | 1 | 44 | 2/2/24  |
| 45                                     | Revision                                         | L | BB+P | 1 | 45 | 3/2/24  |
| 46                                     | Revision                                         | L | BB+P | 1 | 46 | 6/2/24  |

*V. Prayadhasini*  
Signature of Course Incharge

*23/1/23*  
Signature of Module Coordinator

*[Signature]*  
Signature of HOD/ECE





## KS INSTITUTE OF TECHNOLOGY BANGALORE

### DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : Dr. Electa Alice Jayarani A

SUBJECT CODE/NAME :21RMI56 – Research Methodology & Intellectual Property Right

SEMESTER/YEAR/SEC :V/ III/A

ACADEMIC YEAR : 2023-24

| Sl. No.         | Topic to be covered                                                                                      | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (B) |
|-----------------|----------------------------------------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| <b>MODULE 1</b> |                                                                                                          |                  |              |                |                           |                   |
| 1               | Introduction: Meaning of Research                                                                        | L                | BB+P         | 1              | 1                         | 4/12/2023         |
| 2               | Objectives of Engineering Research,                                                                      | L                | BB+P         | 1              | 2                         | 5/12/2023         |
| 3               | Motivation in Engineering Research                                                                       | L                | BB+P         | 1              | 3                         | 6/12/2023         |
| 4               | Types of Engineering Research,                                                                           | L                | BB+P         | 1              | 4                         | 8/12/2023         |
| 5               | Finding and Solving a Worthwhile Problem.                                                                | L                | BB+P         | 1              | 5                         | 9/12/2023         |
| 6               | Ethics in Engineering Research                                                                           | L                | BB+P         | 1              | 6                         | 11/12/2023        |
| 7               | Ethics in Engineering Research Practice                                                                  | L                | BB+P         | 1              | 7                         | 12/12/2023        |
| 8               | Types of Research Misconduct                                                                             | L                | BB+P         | 1              | 8                         | 13/12/2023        |
| 9               | Ethical Issues Related to Authorship                                                                     | L                | BB+P         | 1              | 9                         | 15/12/2023        |
| <b>MODULE 2</b> |                                                                                                          |                  |              |                |                           |                   |
| 10              | Literature Review and Technical Reading, New and Existing Knowledge, Analysis and Synthesis of Prior Art | L                | BB+P         | 1              | 10                        | 18/12/2023        |
| 11              | Bibliographic Databases, Web of Science, Google and Google Scholar                                       | L                | BB+P         | 1              | 11                        | 19/12/2023        |
| 12              | Effective Search: The Way Forward<br>Introduction to Technical Reading,                                  | L                | BB+P         | 1              | 12                        | 20/12/2023        |

|                   |                                                                                                                                                                                                                                                       |   |      |   |    |            |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|---|----|------------|
| 13                | Conceptualizing Research, Critical and Creative Reading,                                                                                                                                                                                              | L | BB+P | 1 | 13 | 22/12/2023 |
| 14                | Taking Notes While Reading, Reading Mathematics and Algorithms,                                                                                                                                                                                       | L | BB+P | 1 | 14 | 23/12/2023 |
| 15                | Reading a Datasheet.                                                                                                                                                                                                                                  | L | BB+P | 1 | 15 | 29/12/2023 |
| 16                | Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes, Impact of Title and Keywords on Citations                                                                                                                | L | BB+P | 1 | 16 | 30/12/2023 |
| 17                | Knowledge Flow through Citation, Citing Datasets, Styles for Citations,                                                                                                                                                                               | L | BB+P | 1 | 17 | 1/1/2024   |
| 18                | Acknowledgments and Attributions, What Should Be Acknowledged, Acknowledgments in, Books Dissertations, Dedication or Acknowledgments.                                                                                                                | L | BB+P | 1 | 18 | 2/1/2024   |
| <b>MODULE – 3</b> |                                                                                                                                                                                                                                                       |   |      |   |    |            |
| 19                | Introduction To Intellectual Property: Role of IP in the Economic and Cultural Development of the Society, IP Governance, IP as a Global Indicator of Innovation, Origin of IP History of IP in India. Major Amendments in IP Laws and Acts in India. | L | BB+P | 1 | 19 | 3/1/2024   |
| 20                | Patents: Conditions for Obtaining a Patent Protection, To Patent or Not to Patent an Invention. Rights Associated with Patents.                                                                                                                       | L | BB+P | 1 | 20 | 5/1/2024   |
| 21                | Enforcement of Patent Rights. Inventions Eligible for Patenting. Non-Patentable Matters.                                                                                                                                                              | L | BB+P | 1 | 21 | 8/1/2024   |
| 22                | Patent Infringements. Avoid Public Disclosure of an Invention before Patenting.,                                                                                                                                                                      | L | BB+P | 1 | 22 | 9/1/2024   |
| 23                | Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent                                                                                                                                                                     | L | BB+P | 1 | 23 | 10/1/2024  |



|                 |                                                                                                                                                                                        |   |      |   |    |           |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|---|----|-----------|
|                 | Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent. Validity of Patent Protection. Post-grant Opposition. |   |      |   |    |           |
| 24              | Commercialization of a Patent, Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained.                                                                                   | L | BB+P | 1 | 24 | 12/1/2024 |
| 25              | Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure.                                                                                                        | L | BB+P | 1 | 25 | 13/1/2024 |
| 26              | Types of Patent Applications. Commonly Used Terms in Patenting.                                                                                                                        | L | BB+P | 1 | 26 | 16/1/2024 |
| 27              | National Bodies Dealing with Patent Affairs. Utility Models.                                                                                                                           | L | BB+P | 1 | 27 | 17/1/2024 |
| <b>MODULE 4</b> |                                                                                                                                                                                        |   |      |   |    |           |
| 28              | Copyrights and Related Rights: Classes of Copyrights. Criteria for Copyright. Ownership of Copyright. Copyrights of the Author. Copyright Infringements.                               | L | BB+P | 1 | 28 | 19/1/2024 |
| 29              | Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence. Fair Use Doctrine., Copyrights and Internet. Non-Copyright Work.                         | L | BB+P | 1 | 29 | 22/1/2024 |
| 30              | Copyright Registration. Judicial Powers of the Registrar of Copyrights. Fee Structure. Copyright Symbol. Validity of Copyright. Copyright Profile of India.                            | L | BB+P | 1 | 30 | 23/1/2024 |
| 31              | Copyright and the word 'Publish', Transfer of Copyrights to a Publisher. Copyrights and the Word 'Adaptation'. Copyrights and the Word 'Indian Work'.                                  | L | BB+P | 1 | 31 | 24/1/2024 |
| 32              | Joint Authorship. Copyright Society.                                                                                                                                                   | L | BB+P | 1 | 32 | 27/1/2024 |

|                 |                                                                                                                                                                                                         |   |      |   |    |           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|---|----|-----------|
|                 | Copyright Board. Copyright Enforcement Advisory Council (CEAC). International Copyright Agreements, Conventions and Treaties. Interesting Copyrights Cases.                                             |   |      |   |    |           |
| 33              | Trademarks: Eligibility Criteria. Who Can Apply for a Trademark. Acts and Laws. Designation of Trademark Symbols.                                                                                       | L | BB+P | 1 | 33 | 1/2/2024  |
| 34              | Classification of Trademarks. Registration of a Trademark is Not Compulsory. Validity of Trademark.                                                                                                     | L | BB+P | 1 | 34 | 2/2/2024  |
| 35              | Types of Trademarks Registered in India. Trademark Registry.                                                                                                                                            | L | BB+P | 1 | 35 | 5/2/1014  |
| 36              | Process for Trademarks Registration. Prior Art Search. Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.                                                                           | L | BB+P | 1 | 36 | 6/2/2024  |
| <b>MODULE 5</b> |                                                                                                                                                                                                         |   |      |   |    |           |
| 37              | Industrial Designs: Eligibility Criteria. Acts and Laws to Govern Industrial Designs. Design Rights. Enforcement of Design Rights.                                                                      | L | BB+P | 1 | 37 | 7/2/2024  |
| 38              | Non-Protectable Industrial Designs India. Protection Term. Procedure for Registration of Industrial Designs. Prior Art Search. Application for Registration., Duration of the Registration of a Design. | L | BB+P | 1 | 38 | 9/2/2024  |
| 39              | Importance of Design Registration. Cancellation of the Registered Design. Application Forms. Classification of Industrial Designs.                                                                      | L | BB+P | 1 | 39 | 10/2/2024 |
| 40              | Designs Registration Trend in India. International Treaties. Famous Case Law: Apple Inc. vs. Samsung Electronics Co.,                                                                                   | L | BB+P | 1 | 40 | 12/2/2024 |
| 41              | Geographical Indications: Acts, Laws and Rules Pertaining to GI. Ownership of GI.                                                                                                                       | L | BB+P | 1 | 41 | 13/2/2024 |



|    |                                                                                                                          |   |      |   |    |           |
|----|--------------------------------------------------------------------------------------------------------------------------|---|------|---|----|-----------|
|    | Rights Granted to the Holders. Registered GI in India.                                                                   |   |      |   |    |           |
| 42 | Identification of Registered GI. Classes of GI. Non-Registerable GI Protection of GI. Collective or Certification Marks. | L | BB+P | 1 | 42 | 14/2/2024 |
| 43 | Enforcement of GI Rights. Procedure for GI Registration Documents Required for GI Registration.                          | L | BB+P | 1 | 43 | 16/2/2024 |
| 44 | GI Ecosystem in India                                                                                                    | L | BB+P | 1 | 44 | 19/2/2024 |
| 45 | IP Organizations in India. Schemes and Programmes                                                                        | L | BB+P | 1 | 45 | 20/2/2024 |
| 46 | Case Studies on Patents. Case study of Curcuma (Turmeric) Patent,                                                        | L | BB+P | 1 | 46 | 21/2/2024 |
| 47 | Case study of Neem Patent, Case study of Basmati patent.                                                                 | L | BB+P | 1 | 47 | 23/2/2024 |
| 48 | Revision                                                                                                                 | L | BB+P | 1 | 48 | 6/3/2024  |
| 49 | Revision                                                                                                                 | L | BB+P | 1 | 49 | 9/3/2024  |

  
Signature of Course In charge

  
Signature of Module Coordinator

  
Signature of HOD



# KS INSTITUTE OF TECHNOLOGY BANGALORE

24

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : Radhika T S

SUBJECT CODE/NAME :21RM156/Research methodology & Intellectual property rights

SEMESTER/YEAR/SEC :V/B

ACADEMIC YEAR : 2023-24

### MODULE 1: Introduction to Research Methodology

| Sl. No.                                                  | Topic to be covered                                                       | Mode of Delivery | Teaching Aid | No. of Periods | Cumulative No. of Periods | Proposed Date (B) |
|----------------------------------------------------------|---------------------------------------------------------------------------|------------------|--------------|----------------|---------------------------|-------------------|
| 1                                                        | Introduction of Research, Meaning of research                             | L                | BB+P         | 1              | 1                         | 04/12/23          |
| 2                                                        | Objectives of engineering research                                        | L                | BB+P         | 1              | 2                         | 06/12/23          |
| 3                                                        | Motivation in engineering research                                        | L                | BB+P         | 1              | 3                         | 07/12/23          |
| 4                                                        | Types of engineering research                                             | L                | BB+P         | 1              | 4                         | 08/12/23          |
| 5                                                        | Finding and solving a worthwhile problem                                  | L                | BB+P         | 1              | 5                         | 11/12/23          |
| 6                                                        | Ethics in engineering research                                            | L                | BB+P         | 1              | 6                         | 13/12/23          |
| 7                                                        | Ethics in engineering research practice                                   | L                | BB+P         | 1              | 7                         | 14/12/23          |
| 8                                                        | Types of research misconduct                                              | L                | BB+P         | 1              | 8                         | 15/12/23          |
| 9                                                        | Ethical issues related to authorship                                      | L                | BB+P         | 1              | 9                         | 18/12/23          |
| <b>MODULE 2: Literature Review and Technical Reading</b> |                                                                           |                  |              |                |                           |                   |
| 10                                                       | Introduction of Literature Review New and Technical reading               | L                | BB+P         | 1              | 10                        | 20/12/23          |
| 11                                                       | New & Existing Knowledge, Analysis & synthesis of prior art bibliographic | L                | BB+P         | 1              | 11                        | 21/12/23          |



|    |                                                                                                    |   |      |   |    |            |
|----|----------------------------------------------------------------------------------------------------|---|------|---|----|------------|
|    | Databases                                                                                          |   |      |   |    |            |
| 12 | Web of science, google & google scholar                                                            | L | BB+P | 1 | 12 | 22/12/23   |
| 13 | Effective search: The way forward<br>introduction to technical reading<br>conceptualizing research | L | BB+P | 1 | 13 | 12/12/23   |
| 14 | Critical & creative reading                                                                        | L | BB+P | 1 | 14 | 13/12/23   |
| 15 | Taking notes while reading, reading<br>mathematics & Algorithms, Reading a<br>datasheet            | L | BB+P | 1 | 15 | 14/12/23   |
| 16 | Attributions & citations, giving credit<br>wherever due                                            | L | BB+P | 1 | 16 | 18/12/23   |
| 17 | Citations: Functions & attributes, Impact of<br>Title & keywords on citations                      | L | BB+P | 1 | 17 | 20/12/23   |
| 18 | Knowledge flow through citation, citing<br>datasets, Styles of citations                           | L | BB+P | 1 | 18 | 21/12/23   |
| 19 | Acknowledgements & Attributions, what<br>should be Acknowledged, Ack in                            | L | BB+P | 1 | 19 | 22/12/2023 |
| 20 | Books Dissertations, dedication or<br>Acknowledgement                                              | L | BB+P | 1 | 20 | 29/12/2023 |

### MODULE 3: Introduction to Intellectual property

|    |                                                                                    |   |      |   |    |          |
|----|------------------------------------------------------------------------------------|---|------|---|----|----------|
| 19 | Role of IP in the Economic & cultural<br>development of the society, IP Governance | L | BB+P | 1 | 19 | 21/12/23 |
| 20 | IP as a Global indicator of innovation,<br>origin of IP History of IP in India     | L | BB+P | 1 | 20 | 23/12/23 |
| 21 | Major Amendments in IP laws & Acts in<br>India                                     | L | BB+P | 1 | 21 | 26/12/23 |
| 22 | Patents: Conditions for obtaining a patent<br>protection                           | L | BB+P | 1 | 22 | 27/12/23 |
| 23 | To patent or not to patent an<br>invention, Rights Associated with patents         | L | BB+P | 1 | 23 | 28/12/23 |
| 24 | Enforcement of patent rights, Inventions<br>Eligible for patenting                 | L | BB+P | 1 | 24 | 30/12/23 |
| 25 | Non-patentable matters, patent                                                     | L | BB+P | 1 | 25 | 4/1/24   |

|                                                |                                                                                                                       |   |      |   |    |         |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---|------|---|----|---------|
|                                                | Infringements, Avoid public disclosure of an invention before patenting, Process of patenting                         |   |      |   |    |         |
| 26                                             | Prior art search, choice of application to be filed, patent application forms                                         | L | BB+P | 1 | 26 | 8/1/24  |
| 27                                             | Jurisdiction of filing patent application, publication                                                                | L | BB+P | 1 | 27 | 9/1/24  |
| 28                                             | Pre-grant opposition, commercialization of a patent, Need for a patent attorney/agent                                 | L | BB+P | 1 | 28 | 10/1/24 |
| 29                                             | Can a worldwide patent be obtained; Do I need first to file a patent in India                                         | L | BB+P | 1 | 29 | 11/1/24 |
| 30                                             | Patent related forms, fee structures, types of patent applications                                                    | L | BB+P | 1 | 30 | 13/1/24 |
| 31                                             | Commonly used terms in patenting, National bodies dealing with patent affairs, utility models                         | L | BB+P | 1 | 31 | 16/1/24 |
| <b>MODULE 4: Copyrights and related rights</b> |                                                                                                                       |   |      |   |    |         |
| 32                                             | Classes of copyrights, criteria for copyright                                                                         | L | BB+P | 1 | 32 | 17/1/24 |
| 33                                             | Ownership of copyright, copyrights of the author                                                                      | L | BB+P | 1 | 33 | 18/1/24 |
| 34                                             | Copyright infringements, copyright infringement is a criminal offence, copyright infringement is a cognizable offence | L | BB+P | 1 | 34 | 22/1/24 |
| 35                                             | Fair use doctrine, copyrights and internet, non-copyright work, Copyright registration                                | L | BB+P | 1 | 35 | 23/1/24 |
| 36                                             | Judicial powers of the registrar of copyrights, Fee structure                                                         | L | BB+P | 1 | 36 | 24/1/24 |
| 37                                             | Copyright symbol, validity of copyright, copyright profile of India                                                   | L | BB+P | 1 | 37 | 25/1/24 |
| 38                                             | Copyright and word publish, Transfer of copyrights to a publisher, copyrights and the word 'Adaption'                 | L | BB+P | 1 | 38 | 1/2/24  |



|                                     |                                                                                                               |   |      |   |    |         |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------|---|------|---|----|---------|
| 39                                  | Copyrights and the word 'Indian work', Joint Authorship, copyright society                                    | L | BB+P | 1 | 39 | 2/2/24  |
| 40                                  | Copyright board, Copyright Enforcement Advisory Council, International copyright agreements                   | L | BB+P | 1 | 40 | 7/2/24  |
| 41                                  | Conventions and Treaties, Interesting copyright cases                                                         | L | BB+P | 1 | 41 | 8/2/24  |
| 42                                  | Introduction of Trademarks, Eligibility criteria, who can apply for a Trademark, Acts and laws                | L | BB+P | 1 | 42 | 9/2/24  |
| 43                                  | Designation of Trademark symbols, Classification of Trademarks, Registration of a Trademark is not compulsory | L | BB+P | 1 | 43 | 10/2/24 |
| 44                                  | Validity of Trademark, Types of Trademarks Registered in India, Trademark Registry                            | L | BB+P | 1 | 44 | 12/2/24 |
| 45                                  | Process for Trademarks Registration, Prior Art search, Famous case law                                        | L | BB+P | 1 | 45 | 14/2/24 |
| <b>MODULE 5: Industrial Designs</b> |                                                                                                               |   |      |   |    |         |
| 46                                  | Eligibility criteria, Acts & Laws to govern industrial Designs                                                | L | BB+P | 1 | 46 | 15/2/24 |
| 47                                  | Design Rights, Enforcement of Design Rights, Non-Protectable Industrial Designs India                         | L | BB+P | 1 | 47 | 16/2/24 |
| 48                                  | Protection Term, Procedure for Registration of Industrial Designs, Prior Art Search                           | L | BB+P | 1 | 48 | 19/2/24 |
| 49                                  | Application for Registration, Duration of the Registration of a Design, Importance of Design Registration     | L | BB+P | 1 | 49 | 21/2/24 |
| 50                                  | Cancellation of the Registered Design, Application Forms, Classification of Industrial Designs                | L | BB+P | 1 | 50 | 22/2/24 |
| 51                                  | Designs Registration Trend in India, International Treaties, Introduction of                                  | L | BB+P | 1 | 51 | 23/2/24 |

|    |                                                                                                                                                |   |      |   |    |        |
|----|------------------------------------------------------------------------------------------------------------------------------------------------|---|------|---|----|--------|
|    | Geographical Indications, Acts, Laws and Rules pertaining to GI                                                                                |   |      |   |    |        |
| 52 | Ownership of GI, Rights granted to the Holders, Registered GI in India, Identification of Registered GI                                        | L | BB+P | 1 | 52 | 6/3/24 |
| 53 | Classes of GI, Non-Registerable GI, Protection of GI, Collective or Certification Marks.                                                       | L | BB+P | 1 | 53 | 7/3/24 |
| 54 | Enforcement of GI Rights, Procedure for GI Registration Documents Required for GI Registration, GI Ecosystem in India, Case studies on planets | L | BB+P | 1 | 54 | 9/3/24 |

  
Signature of Course Incharge

  
Signature of Module Coordinator

  
Signature of HOD