
# Department of Electronics and Communication Engg.

## LESSON PLAN

## Session: April –July, 2023

## Semester: 4th

**Name:_____**

**University Roll Number: _____**

**BUDDHA INSTITUTE OF TECHNOLOGY**

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CL-1 Sector - 7, GIDA, Gorakhpur - 273209 (U.P)

Phones : (0551) 2580413-415

# Index



**TIME TABLE**

| Day / Time | 9:05-10:00 AM | 10:00-10:55 AM | BREAK | 11:10-12:05 PM | 12:05-01:00 PM | 01:00-1:55 PM | LUNCH BREAK | 2:40-3:35 PM | 3:35-4:30 PM |
|---|---|---|---|---|---|---|---|---|---|
| Monday | | | | | | | | | |
| Tuesday | | | | | | | | | |
| Wednesday | | | | | | | | | |
| Thursday | | | | | | | | | |
| Friday | | | | | | | | | |
| Saturday | | | | | | | | | |

**EVALUATION SCHEME**

| Subject Code | Subject | Sessional Marks | Exam Marks | Total Marks |
|---|---|---|---|---|
| **THEORY SUBJECTS** | | | | |
| KAS 402 | Mathematics-IV | 50 | 100 | 150 |
| KEC401 | Communication Engineering | 50 | 100 | 150 |
| KEC402 | Analog Circuits | 50 | 100 | 150 |
| KEC-403 | Signal System | 50 | 100 | 150 |
| KAS401 | Technical Communication | 50 | 100 | 150 |
| KNC 402 | Python Programming | 50 | -- | -- |
| **PRACTICAL/DESIGN/DRAWING** | | | | |
| KEC 451 | Communication Engineering Lab | 25 | 25 | 50 |
| KEC 452 | Analog Circuits Lab | 25 | 25 | 50 |
| KEC 453 | Signal SystemLab | 25 | 25 | 50 |

# Buddha Institute of Technology

Gorakhpur

Department of Electronics and Communication Engineering

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session: April 2023 – July 2023

| | |
|---|---|
| Name of the Staff | Dr. Arun Kumar Pandey |
| Area of Specialization | Mathematical Modeling |
| Subject Allotted | Mathematics-IV |

| Sl. # | Course Code | Course Title | Semester | Theory |
|---|---|---|---|---|
| 1. | KAS402 | Mathematics IV | IV Semester | Theory |

**HOD**

# Course Outcome and Programme Outcome

| | |
|---|---|
| Program | **: B. Tech.** |
| Branch | **: ECE** |
| Semester | **: IV** |
| Session | **: 2022-23** |
| Name of the Course | **: MATHEMATICS-IV** |
| Code | **: KAS402** |
| Name of the Course Instructor | **: Dr. Arun Kumar Pandey** |
| Designation | **: Associate Professor** |
| Department | **: Applied Science and Humanities** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| KAS402.1 | Apply the basic concept of partial differential equation to solve mathematical problems. |
| KAS402.2 | Use the concept of partial differential equations to solve engineering problems. |
| KAS402.3 | Apply the basic concept of statistical techniques to solve statistical problems. |
| KAS402.4 | Use the concept of probability and probability distributions functions to solve engineering problems. |
| KAS402.5 | Apply the basic concept of hypothesis testing and statistical quality control technique for statistical problems. |

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|---|---|---|---|---|
| Buddha Institute of Technology, Gorakhpur | | | | |
| Department: Electronics and Communication Engineering | | | | |
| Academic Semester: April 2023- July 2023 | | | | |
| Semester: IV | Section: 3A & 3B | Course Code: KAS402 | Course: Mathematics IV | |
| Course Instructor: Dr. Arun Kumar Pandey | | Contact Hours /week: 05+01 | # of credits: 03 | |
| CIE Marks: 50 | | SEE Marks: 100 | Exam Hours: 03 | |

| |
|---|
| Prerequisites if any: Knowledge of Mathematics I and II of B. Tech or equivalent |

| | |
|---|---|
| Content delivery: | Chalk & Board, Online Video Lectures |

| **COURSE SYLLABUS:** | | | |
|---|---|---|---|
| **Module No** | **Contents of Module** | **Hrs** | **COs** |
| 1 | **Partial Differential Equations** : Origin of Partial Differential Equations, Linear and Non Linear Partial Equations of first order, Lagrange's Equations, Charpit's method, Cauchy's method of Characteristics, Solution of Linear Partial Differential Equation of Higher order with constant coefficients, Equations reducible to linear partial differential equations with constant coefficients. | **15** | **CO1** |
| 2 | **Applications of Partial Differential Equations**: Classification of linear partial differential equation of second order, Method of separation of variables, Solution of wave and heat conduction equation up to two dimension, Laplace equation in two dimensions, Equations of Transmission lines. | **15** | **CO2** |
| 3 | **Statistical Techniques I:** Introduction: Measures of central tendency, Moments, Moment generating function (MGF) , Skewness, Kurtosis, Curve Fitting , Method of least squares, Fitting of straight lines, Fitting of second degree parabola, Exponential curves ,Correlation and Rank correlation, Regression Analysis: Regression lines of y on x and x on y, regression coefficients, properties of regressions coefficients and non linear regression. | **15** | **CO3** |
| 4 | **Statistical Techniques II:** Probability and Distribution: Introduction, Addition and multiplication law of probability, Conditional probability, Baye's theorem, Random variables (Discrete and Continuous Random variable) Probability mass function and Probability density function, Expectation and variance, Discrete and Continuous Probability distribution: Binomial, Poission and Normal distributions. | **17** | **CO4** |
| 5 | **Statistical Techniques III**: Sampling, Testing of Hypothesis and Statistical Quality Control: Introduction , Sampling Theory (Small and Large) , Hypothesis, Null hypothesis, Alternative hypothesis, Testing a Hypothesis, Level of significance, Confidence limits, Test of significance of difference of means, T-test, F-test and Chi-square test, One way Analysis of Variance (ANOVA).Statistical Quality Control (SQC) , Control Charts , Control Charts for variables ( X and R Charts), Control Charts for Variables ( p, np and C charts). | **13** | **CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| KAS402.1 | Apply the basic concept of partial differential equation to solve mathematical problems. |
| KAS402.2 | Use the concept of partial differential equations to solve engineering problems. |
| KAS402.3 | Apply the basic concept of statistical techniques to solve statistical problems. |
| KAS402.4 | Use the concept of probability and probability distributions functions to solve engineering problems. |
| KAS402.5 | Apply the basic concept of hypothesis testing and statistical quality control technique for statistical problems. |

**Mapping of CO v/s PO**:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KAS402.1 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| KAS402.2 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| KAS402.3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| KAS402.4 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| KAS402.5 | 2 | 2 | - | - | - | - | - | - | - | - | - | - |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

**Mapping of CO v/s PSO**:

| | PSO1 | PSO2 |
|---|---|---|
| KAS402.1 | 1 | 1 |
| KAS402.2 | 1 | 1 |
| KAS402.3 | 1 | 1 |
| KAS402.4 | 1 | 1 |
| KAS402.5 | 1 | 1 |

| | |
|---|---|
| **Gap in the syllabus** | NOT APPLICABLE |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | NOT APPLICABLE |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |
| 6 | Employers feedback | Indirect |

# LESSON PLAN

| Lecture # | Module# | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Origin of PDE | L3 | CO1 | | | | |
| 2 | | Problems | | | | | | |
| 3 | | Linear PDE of first order | | | | | | |
| 4 | | Problems | | | | | | |
| 5 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 6 | | Non-linear PDE of First order | | | | | | |
| 7 | | Lagrange's equations | | | | | | |
| 8 | | Charpit's method | | | | | | |
| 9 | | Cauchy's method of characteristics | | | | | | |
| 10 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 11 | | Solution of Linear Partial Differential equation of Higher order with constant coefficients | | | | | | |
| 12 | | Problems | | | | | | |
| 13 | | Equations reducible to linear partial differential equations with constant coefficients | | | | | | |
| 14 | | Problems | | | | | | |
| 15 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 16 | 2 | Classification of linear PDE of Second order | L3 | CO2 | | | | |
| 17 | | Problems | | | | | | |
| 18 | | Method of separation of variables | | | | | | |
| 19 | | Problems | | | | | | |
| 20 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 21 | | Solution of Wave equation up to two dimension | | | | | | |
| 22 | | Problems | | | | | | |
| 23 | | Solution of heat conduction equation up to two dimension | | | | | | |
| 24 | | Problems | | | | | | |
| 25 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26 | | Laplace equation in two dimensions | | | | | | |
| 27 | | Problems | | | | | | |
| 28 | | Equations of Transmission lines | | | | | | |
| 29 | | Problems | | | | | | |
| 30 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 31 | | Introduction, Measures of central tendency | | | | | | |
| 32 | | Moments | | | | | | |
| 33 | | Moment generating function | | | | | | |
| 34 | | Problems | | | | | | |
| 35 | | Skewness, Kurtosis | | | | | | |
| | | **Tutorial** | | | | | | |
| 36 | | Curve Fitting, Method of least squares | | | | | | |
| 37 | | Problems | | | | | | |
| 38 | | Fitting of straight lines, parabola and exponential curves | | | | | | |
| 39 | **3** | Problems | **L3** | **CO3** | | | | |
| 40 | | Correlation and Rank correlation, Regression Analysis | | | | | | |
| | | **Tutorial** | | | | | | |
| 41 | | Problems | | | | | | |
| 42 | | Regression coefficient and Problems | | | | | | |
| 43 | | Properties of regression coefficients | | | | | | |
| 44 | | Non-linear regression | | | | | | |
| 45 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 46 | | Introduction, Addition and multiplication law of probability | | | | | | |
| 47 | | Conditional probability, Baye's theorem, | | | | | | |
| 48 | | Problems | | | | | | |
| 49 | | Random variables (Discrete and continuous Random variable) | | | | | | |
| 50 | **4** | Problems | **L3** | **CO4** | | | | |
| | | **Tutorial** | | | | | | |
| 51 | | Probability mass function | | | | | | |
| 52 | | Probability density function | | | | | | |
| 53 | | Problems | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 54 | | Expectation and variance | | | | | | |
| 55 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 56 | | Discrete and continuous Probability distribution | | | | | | |
| 57 | | Binomial distributions | | | | | | |
| 58 | | Problems | | | | | | |
| 59 | | Poisson distributions | | | | | | |
| 60 | | Problems | | | | | | |
| | | **Tutorial** | | | | | | |
| 61 | | Normal distributions | | | | | | |
| 62 | | Problems | | | | | | |
| 63 | | Introduction, Sampling theory (Small and large) | | | | | | |
| 64 | | Hypothesis (Null & Alternate) | | | | | | |
| 65 | | T-test | | | | | | |
| | | **Tutorial** | | | | | | |
| 66 | | Problems | | | | | | |
| 67 | | F-Test | | | | | | |
| 68 | | Problems | | | | | | |
| 69 | | Chi-square test & Problems | | | | | | |
| 70 | | Problems | | | | | | |
| | **5** | **Tutorial** | **L3** | **CO5** | | | | |
| 71 | | ANOVA | | | | | | |
| 72 | | Problems | | | | | | |
| 73 | | Statistical Quality Control, Control Charts, Control Charts for Variables (X and R charts) | | | | | | |
| 74 | | Problems | | | | | | |
| 75 | | Control Charts for Variables (p, np and C charts) | | | | | | |
| | | **Tutorial** | | | | | | |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

**Literature:**

**Text Books**


1. **E. Kreyszig:** Advanced Engineering Mathematics; John Wiley & Sons.
2. **R.K. Jain & S.R.K. Iyenger:** Adnanced Engineering Mathematics, Narosa Publishing House.
3. **C.L.Liu:** Elements of Discrete Mathematics; Tata McGraw- Hill Publishing Company Limited, New Delhi.
4. **S. Lipschutz, M.L. Lipson and Varsha H. Patil:** Discrete Mathematics; Tata McGraw- Hill Publishing Company Limited, New Delhi
5. **B. Kolman , Robert C. Busby & S. C. Ross:** Discrete Mathematical Structures' 5th Edition, Perason Education ( Singapore), Delhi, India.


**Reference Books**


1. **B.S. Grewal:** Higher Engineering Mathematics; Khanna Publishers, New Delhi.
2. **B.V. Ramana:** Higher Engineering Mathematics; Tata McGraw- Hill Publishing Company Limited, New Delhi.
3. **Peter V.O' Neil:** Advanced Engineering Mathematics, Thomas (Cengage) Learning.
4. **Kenneth H. Rosem:** Discrete Mathematics its Application, with Combinatorics and Graph Theory; Tata McGraw- Hill Publishing Company Limited, New Delhi.


Assessment rubrics that is going to be adopted for direct attainment is depicted in below table

| Level of Achievement | Elaboration on Course Grading Description | Bench Mark Set (Out of 100) |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | 60 to 100 |
| **Good (B)** | The student's performance is good in most of the intended course learning outcomes. | 45 to 59 |
| **Marginal (C)** | The student's performance is barely satisfactory. It marginally meets the intended course learning outcomes | 30 to 44 |
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | Less than 30 |

# Buddha Institute of Technology

Gorakhpur

Department of Electronics & Communication Engineering

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session April - July 2023

| | |
|---|---|
| Name of the Staff | ANIL KUMAR CHAUDHARY |
| Area of Specialization | Principles of Communication, Optical Communication, Data Communication, Electronic Devices , Communication Engineering |
| Subject Allotted | COMMUNICATION ENGINEERING |

| Sl. # | Course Code | Course Title | Semester | Theory |
|---|---|---|---|---|
| 1 | KEC401 | Communication Engineering | IV-A | Theory |
| 2 | KEC401 | Communication Engineering | IV-B | Theory |
| 3 | KEC 451 | Communication Engineering Lab | IV-A | Lab |
| 4 | KEC 451 | Communication Engineering Lab | IV-B | Lab |

**HOD**

# Course Outcome and Programme Outcome

| | |
|---|---|
| Program | **: B. Tech.** |
| Branch | **: EC** |
| Semester | **: IV** |
| Session | **: 2022-23** |
| Name of the Course | **: Communication Engineering** |
| Code | **: KEC-401** |
| Name of the Course Instructor | **: Mr. Anil Kumar Chaudhary** |
| Designation | **: Assistant Professor** |
| Department | **: Electronics & Communication Engineering** |

**Description of the Course Outcome:**

| CO | After completion of the course students will be able to: |
|---|---|
| KEC-401.1 | Understand the concepts of amplitude modulation in communication engineering. |
| KEC-401.2 | Utilize the concept of angle modulation to find the parameters like modulation index, bandwidth and frequency components. |
| KEC-401.3 | Apply the concept of probability and random process to find the noise in communication systems. |
| KEC-401.4 | Illustrate the sampling process and various pulse modulation techniques like PCM, PWM, PPM. |
| KEC-401.5 | Explain the concept of digital modulation signals and techniques like ASK, PSK and FSK. |

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|---|---|---|---|---|
| Buddha Institute of Technology, Gorakhpur | | | | |
| Department: Electronics & Communication Engg. | | | | |
| Academic Semester: April - July 2023 | | | | |
| Semester: IV | Section: A+B | Course Code: KEC-401 | Course: COMMUNICATION ENGINEERING | |
| Course Instructor: MR. ANIL KUMAR CHAUDHARY | | Contact Hours /week: 5+1 | # of credits: 3 | |
| CIE Marks: 50 | | SEE Marks: 100 | Exam Hours: 3 | |

| Prerequisites if any: | | | |
|---|---|---|---|
| Code No | Course Name | Description | Semester |
| NA | NA | NA | NA |

| | |
|---|---|
| Content delivery: | Chalk & Board |

**COURSE SYLLABUS:**

| ModuleNo | Contents of Module | Hrs | COs |
|---|---|---|---|
| 1 | Review of signals and systems, Overview of analog communication system Principles of modulation systems and need of modulation, Principles of amplitude modulation systems Frequency domain representation of signals, AM Receiver, TRF Receiver, Superhetrodyne receiver, AM transmitter, DSB modulations balance mode, DSB modulations ring modulation ,SSB modulations, VSB modulations | **8** | **CO1** |
| 2 | Angle modulation, Tone modulated FM signal, Tone modulated PM signal, Representation of FM and PM signals, FM Modulators, Indirect FM Modulators, Spectral characteristics of angle modulated signals, FM Demodulators, Balance Slope Detector, Foster-Seeley Discriminator, PLL FM demodulator, Stereo FM transmitter & Receiver | **8** | **CO2** |
| 3 | Review of probability and random process, Gaussian and white noise characteristics, noise in amplitude modulation systems, noise in frequency modulation systems, pre-emphasis and de-emphasis, threshold effect in angle modulation. | **8** | **CO3** |
| 4 | Sampling process, Pulse modulation, Pulse amplitude modulation, Pulse position modulation, Pulse width modulation, Pulse width demodulation, Pulse amplitude and pulse code modulation (PCM), Differential pulse code modulation, Delta modulation, Adaptive delta modulation, Noise considerations in PCM, Digital multiplexers, | **8** | **CO4** |
| 5 | Digital modulation schemes- phase shift keying, frequency shift keying, quadrature amplitude modulation, continuous phase modulation and minimum shift keying. | **8** | **CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| **CO1** | Understand the concepts of amplitude modulation in communication engineering. |
| **CO2** | Utilize the concept of angle modulation to find the parameters like modulation index, bandwidth and frequency components. |
| **CO3** | Apply the concept of probability and random process to find the noise in communication systems. |
| **CO4** | Illustrate the sampling process and various pulse modulation techniques like PCM, PWM, PPM. |
| **CO5** | Explain the concept of digital modulation signals and techniques like ASK, PSK and FSK. |

**Mapping of CO v/s PO v/s PSO**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KEC-401.1 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| KEC-401.2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| KEC-401.3 | 2 | 2 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 |
| KEC-401.4 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 1 |
| KEC-401.5 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| **Average** | ***1.6*** | ***1.2*** | ***1.4*** | ***1.0*** | ***1.4*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***1.0*** | ***1.8*** | ***1.4*** | **1.0** |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

| | |
|---|---|
| **Gap in the syllabus** | NA |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | NA |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |
| 6 | Employers feedback | Indirect |

# LESSON PLAN

| Lecture # | Module# | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | References | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Review of signals and systems | L1 | CO1 | 10/04/23 | | T1 | | |
| 2 | | Overview of analog communication system | | | 11/04/23 | | T1 | | |
| 3 | | Overview of digital communication system | | | 12/04/23 | | T1 | | |
| 4 | | Principles of modulation systems and need of modulation | | | 13/04/23 | | T1 | | |
| 5 | | Principles of amplitude modulation systems | | | 15/04/23 | | T1 | | |
| 6 | | Frequency domain representation of signals | | | 17/04/23 | | | | |
| 7 | | AM Receiver, TRF Receiver | | | 18/04/23 | | T1 | | |
| 8 | | Superhetrodyne receiver | | | 19/04/23 | | T1 | | |
| 9 | | **Tutorial 1** | | | 20/04/23 | | | | |
| 10 | | AM transmitter | | | 24/04/23 | | T1 | | |
| 11 | | DSB modulations balance mode | | | 25/04/23 | | T1 | | |
| 12 | | DSB modulations ring modulation | | | 26/04/23 | | T1 | | |
| 13 | | SSB modulations | | | 27/04/23 | | T1 | | |
| 14 | | VSB modulations | | | 29/04/23 | | T1 | | |
| 15 | | Revision | | | 30/04/23 | | T1 | | |
| 16 | | **Tutorial 2** | | | 01/05/23 | | | | |
| 17 | 2 | Angle modulation | L1 | CO2 | 02/05/23 | | T1 | | |
| 18 | | Tone modulated FM signal | | | 03/05/23 | | T1 | | |
| 19 | | Representation of FM and PM signals | | | 04/05/23 | | T1 | | |
| 20 | | FM Modulators | | | 06/05/23 | | T1 | | |
| 21 | | Indirect FM Modulators | | | 08/05/23 | | T1 | | |
| 22 | | Spectral characteristics of angle modulated signals | | | 09/05/23 | | T1 | | |
| 23 | | **Tutorial 3** | | | 10/05/23 | | | | |
| 24 | | FM Demodulators | | | 11/05/23 | | T1 | | |
| 25 | | Balance Slope Detector | | | 13/05/23 | | T1 | | |
| 26 | | Foster-Seeley Discriminator | | | 18/05/23 | | T1 | | |
| 27 | | PLL FM demodulator | | | 20/05/23 | | T1 | | |
| 28 | | Stereo FM transmitter & Receiver | | | 22/05/23 | | T1 | | |
| 29 | | Revision | | | 23/05/23 | | T1 | | |
| 30 | | **Tutorial 4** | | | 24/05/23 | | | | |
| 31 | 4 | Sampling process | L1 | CO4 | 25/05/23 | | T1 | | |
| 32 | | Pulse amplitude modulation | | | 27/05/23 | | T1 | | |
| 33 | | Pulse position modulation | | | 29/05/23 | | T1 | | |
| 34 | | Pulse width modulation | | | 30/05/23 | | T1 | | |
| 35 | | Pulse width demodulation | | | 31/05/23 | | T1 | | |
| 36 | | Pulse code modulation (PCM) | | | 01/06/23 | | T1 | | |
| 37 | | **Tutorial 5** | | | 03/06/23 | | | | |
| 38 | | Differential pulse code modulation | | | 05/06/23 | | T1 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **39** | | Delta modulation | | | 06/06/23 | | T1 | | |
| **40** | | Adaptive delta modulation | | | 07/06/23 | | T1 | | |
| **41** | | Noise considerations in PCM | | | 08/06/23 | | T1 | | |
| **42** | | **Tutorial 6** | | | 10/06/23 | | | | |
| **43** | | Digital multiplexers | | | 12/06/23 | | T1 | | |
| **44** | | Time division multiplexing | | | 13/06/23 | | T1 | | |
| **45** | | Digital modulation schemes | | | 14/06/23 | | T1 | | |
| **46** | | Phase shift keying | | | 15/06/23 | | T1 | | |
| **47** | | Frequency shift keying | | | 17/06/23 | | T1 | | |
| **48** | | **Tutorial 7** | | | 22/06/23 | | | | |
| **49** | | Frequency shift keying | | | 24/06/23 | | T1 | | |
| **50** | **5** | Quadrature amplitude modulation | **L1** | **CO5** | 26/06/23 | | T1 | | |
| **51** | | Continuous phase modulation and minimum shift keying | | | 27/06/23 | | T1 | | |
| **52** | | **Tutorial 8** | | | 28/06/23 | | | | |
| **53** | | Review of probability and random process | **L3** | **CO3** | 01/07/23 | | T1 | | |
| **54** | | Gaussian and white noise characteristics | | | 03/07/23 | | T1 | | |
| **55** | | Noise in amplitude modulation systems | | | 04/07/23 | | T1 | | |
| **56** | | Noise in DSB modulation systems | | | 05/07/23 | | T1 | | |
| **57** | | Noise in SSB modulation systems | | | 06/07/23 | | T1 | | |
| **58** | | **Tutorial 9** | | | 08/07/23 | | | | |
| **59** | **3** | Noise in frequency modulation systems | | | 10/07/23 | | T1 | | |
| **60** | | Pre-emphasis and de-emphasis | | | 11/07/23 | | T1 | | |
| **61** | | **Tutorial 10** | | | 12/07/23 | | | | |
| **62** | | Revision &Test | | | 12/07/23 | | | | |
| **63** | | Revision &Test | | | 12/07/23 | | | | |
| **64** | | Revision &Test | | | 13/07/23 | | | | |
| **65** | | Revision &Test | | | 15/07/23 | | | | |
| **66** | | Revision &Test | | | 17/07/23 | | | | |
| **67** | | Revision &Test | | | 18/07/23 | | | | |
| **68** | | Revision &Test | | | 19/07/23 | | | | |
| **69** | | Revision &Test | | | 20/07/23 | | | | |
| **70** | | Revision &Test | | | 21/07/23 | | | | |

**Syllabus for Sessionals:**

| Sessional | Syllabus |
|---|---|
| CT1 | Class 1- Class 16 |
| CT2 | Class 17- Class 34 |
| Pre - AKTU | Full Syllabus |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

**Literature:**

**Text Books:**

1. RP SINGH "Communication System- Modern Digital and Analog' 3rd edition TMH India, 2006

**Reference Books:**

1. Taub H. and Schilling D.L., "Principles of Communication Systems, " RP SINGH Tata McGraw Hill,2001.
2. Haykin S., "Communications Systems," John Wiley and Sons, 2001

Sample Questions:

| Question No. | Questions |
|---|---|
| 1 | Draw the Basic Block Diagram of Communication System |
| 2 | Explain why modulation is required? |
| 3 | Draw the amplitude modulated wave equation and explains each term with the help of frequency spectrum |
| 4 | Draw the block diagram high level AM transmitter and explain the function of each block. |
| 5 | With the help of block diagram explain the operation of a low level AM transmitter |
| 6 | What is angle modulation? |
| 7 | Define phase modulation? |
| 8 | Illustrate the relation between frequency modulation and phase modulation? |
| 9 | How the angle modulated wave forms are classified defends upon modulation index value? |
| 10 | Draw the block diagram of wideband FM transmitter based on Armstrong method of FM generation. Explain its operation. |
| 11 | State sampling theorem? |
| 12 | What is aliasing? |
| 13 | What is PAM? |
| 14 | Define adaptive delta modulation? |
| 15 | Explain adaptive delta modulation. |
| 16 | Explain in detail the Nyquist criterion for distortion less transmission of base band PAM signal |
| 17 | Explain the working of DPCM (Differential Pulse Code Modulation ). |
| 18 | What do you understand by PCM (Pulse Code Modulation). Explain the working of PCM (Pulse Code Modulation). |
| 19 | What is Phase shift keying. |
| 20 | What is Frequency shift keying |
| 21 | Calculate the figure of merit in DSB-SC signal |

| | |
|---|---|
| 22 | Calculate the signal to noise ratio of frequency modulation . Also calculate noise figure |
| 23 | Write the short note on Pre-emphasis and De-emphasis |
| 24 | Explain the Digital modulation schemes |
| 25 | Explain the Noise in communication. |

**Assessment rubrics that is going to be adopted for direct attainment is depicted in below table**

| Level of Achievement | Elaboration on Course Grading Description | Bench Mark Set (Out of 100) |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | 86 to 100 |
| **Very Good (B)** | The student's performance is very good in most of the intended course learning outcomes. | 76 to 85 |
| **Good (C)** | The student's performance is good in most of the intended course learning outcomes. | 61 to 75 |
| **Fair (D)** | The student's performance is barely satisfactory. | 46 to 60 |
| **Marginal(E)** | The student's performance is marginally meets the intended course learning outcomes | 30 to 45 |
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | Less than 30 |

**NOTE:** Have different Assessment pattern for tests, assignments, quizzes etc.

**Staff In-charge** **HOD**

**Buddha Institute of Technology**

Gorakhpur

Department of Electronics and Communication Engineering

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session: April - July 2023

| | |
|---|---|
| Name of the Staff | Arun Kumar Mishra |
| Area of Specialization | Digital Communication & Networking |
| Subject Allotted | Analog Circuits , Analog Circuits Lab |

| Sl. # | Course Code | Course Title | Semester | Theory/Lab |
|---|---|---|---|---|
| 1 | KEC402 | Analog Circuits | IV-A | Theory |
| 2 | KEC402 | Analog Circuits | IV-B | Theory |
| 3 | KEC452 | Analog Circuits Lab | IV-A | Lab |
| 4 | KEC452 | Analog Circuits Lab | IV-B | Lab |

**HOD**

**Course Outcome and Programme Outcome**

| | |
|---|---|
| Program | : B. Tech. |
| Branch | : EC |
| Semester | : IV |
| Session | : 2022-23 |
| Name of the Course | : Analog Circuits |
| Code | : KEC 402 |
| Name of the Course Instructor | : Mr. Arun Kumar Mishra |
| Designation | : Assistant Professor |
| Department | : Electronic and Communication Engineering. |

**Description of the Course Outcome:**

| CO | After completion of the course students will be able to: |
|---|---|
| KEC 402.1 | Use diodes and transistors in various electronic circuits. |
| KEC 402.2 | Apply different feedback topologies. |
| KEC 402.3 | Explain sinusoidal and non-sinusoidal oscillators. |
| KEC 402.4 | Explain OP-AMP based electronic circuits |
| KEC 402.5 | Design active Low- pass, High-pass, Band-pass and Band-reject filters. |

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| | | | | |
|---|---|---|---|---|
| Buddha Institute of Technology, Gorakhpur | | | | |
| Department: Electronics & Communication Engg. | | | | |
| Academic Semester: April - July 2023 | | | | |
| Semester: IV | Section: A+B | Course Code: KEC402 | Course: Analog Circuits | |
| Course Instructor: Mr. Arun Kumar Mishra | | Contact Hours /week: 4+1 | # of credits: 4 | |
| CIE Marks: 50 | | SEE Marks: 100 | Exam Hours: 3 | |

| Prerequisites if any: | | | |
|---|---|---|---|
| Code No | Course Name | Description | Semester |
| KEC301 | Electronic Devices | Basic Knowledge of semiconductor diode, BJT, MOSFET, etc | 3 |

| | |
|---|---|
| Content delivery: | Chalk & Board, PPT, Video Lectures |

**COURSE SYLLABUS:**

| Module No | Contents of Module | Hrs | COs |
|---|---|---|---|
| 1 | Diode circuits, amplifier models: Voltage amplifier, current amplifier, trans-conductance amplifier and trans-resistance amplifier. biasing schemes for BJT and FET amplifiers, bias stability, various configurations (such as CE/CS, CB/CG, CC/CD) and their features, small signal analysis, low frequency transistor models, estimation of voltage gain, input resistance, output resistance etc., design procedure for particular specifications, low frequency analysis of multistage amplifiers. | **8** | **CO1** |
| 2 | High frequency transistor models, frequency response of single stage and multistage amplifiers, cascade amplifier, various classes of operation (Class A, B, AB, C etc.), their power efficiency and linearity issues, feedback topologies: Voltage series, current series, voltage shunt, current shunt, effect of feedback on gain, bandwidth etc., calculation with practical circuits, concept of stability, gain margin and phase margin. | **8** | **CO1 & CO2** |
| 3 | Oscillators: Review of the basic concept, Barkhausen criterion, RC oscillators (phase shift, Wien bridge etc.), LC oscillators (Hartley, Colpitt, Clapp etc.), non-sinusoidal oscillators. | **8** | **CO3** |
| 4 | Current mirror: Basic topology and its variants, V-I characteristics, output resistance and minimum sustainable voltage (VON), maximum usable load, differential amplifier: Basic structure and principle of operation, calculation of differential gain, common mode gain, CMRR and ICMR, Op-Amp design: Design of differential amplifier for a given specification, design of gain stages and output stages, compensation | **8** | **CO4** |
| 5 | Op-Amp applications: Review of inverting and non-inverting amplifiers, integrator and differentiator, summing amplifier, precision rectifier, Schmitt trigger and its applications, active filters: Low pass, high pass, band pass and band stop, design guidelines. | **8** | **CO4 & CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| KEC 402.1 | Use diodes and transistors in various electronic circuits. |
| KEC 402.2 | Apply different feedback topologies. |
| KEC 402.3 | Explain sinusoidal and non-sinusoidal oscillators. |
| KEC 402.4 | Explain OP-AMP based electronic circuits |
| KEC 402.5 | Design active Low- pass, High-pass, Band-pass and Band-reject filters. |

**Mapping of CO v/s PO**:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KEC 402.1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 |
| KEC 402.2 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | - | 2 |
| KEC 402.3 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| KEC 402.4 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - |
| KEC 402.5 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

**Mapping of CO v/s PSO**:

| CO | PSO1 | PSO2 | PSO-3 |
|---|---|---|---|
| KEC 402.1 | 2 | 2 | - |
| KEC 402.2 | 2 | 2 | - |
| KEC 402.3 | - | - | - |
| KEC 402.4 | 1 | - | - |
| KEC 402.5 | 2 | 1 | - |

| | |
|---|---|
| **Gap in the syllabus** | NA |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | NA |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |

| | | |
|---|---|---|
| 6 | Employers feedback | Indirect |

**LESSON PLAN (Section- IVA)**

| Lecture # | Module# | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Diode circuits | L3 | CO1 & CO2 | | | | |
| 2 | | Amplifier models: Voltage amplifier, current amplifier | | | | | | |
| 3 | | Trans-conductance amplifier and trans-resistance amplifier | | | | | | |
| 4 | | Biasing schemes for BJT amplifiers | | | | | | |
| 5 | | Tutorial | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 6 | | Biasing schemes for FET amplifiers, bias stability | | | | | | |
| 7 | | CE, CB & CC configurations | | | | | | |
| 8 | | CS, CD & CG, configuration | | | | | | |
| 9 | | Small signal analysis, low frequency transistor models | | | | | | |
| 10 | | Tutorial | | | | | | |
| | | Weak Students (Remedial Class | | | | | | |
| 11 | | Estimation of voltage gain, input resistance, output resistance | | | | | | |
| 12 | | Design procedure for particular specifications, | | | | | | |
| 13 | | Low frequency analysis of multistage amplifiers | | | | | | |
| 14 | | Problems | | | | | | |
| 15 | | Tutorial | | | | | | |
| | 2 | Weak Students (Remedial Class) | L3 | CO2 | | | | |
| 16 | | High frequency transistor Model | | | | | | |
| 17 | | Frequency response of single stage and multistage amplifiers | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 18 | | Cascade amplifier | | | | | | |
| 19 | | Class A , Class B power Amplifier | | | | | | |
| | | Weak Students (Remedial Class | | | | | | |
| 20 | | Tutorial | | | | | | |
| 21 | | Class AB , Class C power Amplifier | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 22 | | Feedback topologies: Voltage series, current series ,Voltage shunt, current shunt | | | | | | |
| 23 | | Effect of feedback on gain, bandwidth etc | | | | | | |
| 24 | | Calculation with practical circuits, | | | | | | |
| 25 | | Tutorial | | | | | | |
| 26 | | concept of stability , Gain margin and phase margin | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 27 | | Oscillators: Review of the basic concept, Barkhausen criterion | | | | | | |
| 28 | | Effects of positive feedback on gain, bandwidth, stability | | | | | | |
| 29 | | RC oscillators, phase shift oscillator | | | | | | |
| 30 | | Tutorial | | | | | | |
| 31 | | Wien bridge oscillator | | | | | | |
| | 3 | Weak Students (Remedial Class) | L3 | CO3 | | | | |
| 32 | | LC oscillators: Hartley oscillator, Colpitt oscillator | | | | | | |
| 33 | | Clapp oscillators | | | | | | |
| 34 | | Non-sinusoidal oscillators | | | | | | |
| 35 | | Tutorial | | | | | | |
| 36 | | Problems | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 37 | | Integrator and differentiator | | | | | | |
| 38 | 5 | Summing amplifier | L3 | CO4 | | | | |
| 39 | | Precision rectifier | | | | | | |
| 40 | | Tutorial | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 41 | | Schmitt trigger and its applications | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 42 | | Active filters: Low pass, High pass Op-Amp design: Design of differential amplifier for a given specification | | | | | | |
| 43 | | Band pass filter Design of gain stages and output stages | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 44 | | Band Reject Filteer | | | | | | |
| 45 | | Tutorial | | | | | | |
| 46 | | Problems | | | | | | |
| 47 | 4 | Current mirror: Basic topology and its variants | L3 | CO4 & CO5 | | | | |
| 48 | | V-I characteristics, output resistance and minimum sustainable voltage (VON), | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 49 | | Differential amplifier: Basic structure and principle of operation | | | | | | |
| 50 | | Tutorial | | | | | | |
| 51 | | Calculation of differential gain, common mode gain, CMRR and ICMR | | | | | | |
| 52 | | Op-Amp design: Design of differential amplifier for a given specification | | | | | | |
| 53 | | Design of gain stages and output stages, Compensation | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |
| 54 | | Compensation | | | | | | |
| 55 | | Tutorial | | | | | | |
| 56 | | Revision | | | | | | |
| 57 | | Revision | | | | | | |
| 58 | | Revision | | | | | | |
| | | Weak Students (Remedial Class) | | | | | | |

| Test | No of Lectures |
|---|---|
| CT-1 | |
| CT-2 | |
| PAKTU | |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

**Literature:**

**Text Books**

1. A.S. Sedra and K.C. Smith, “Microelectronic Circuits,” Saunder's College11, Publishing, 4th edition
2. Ramakant A. Gayakwad, “Op-Amps and Linear Integrated Circuits”, PEARSON Education, 4th Edition.

**Reference Book**

P. Raja, “Electronic Circuits” Umesh Publication

**Sample Questions:**

| Question No. | Questions |
|---|---|
| 1 | What is emitter stabilization in self-bias circuit of an npn transistor in CE amplifier ? Explain high frequency response of common emitter amplifier |
| 2 | Sketch a family of CB output characteristics for a transistor. Indicate the active , cutoff, and saturation regions. |
| 3 | Name the different biasing methods of MOSFET. Describe in detail the biasing using a constant current source. Implement this biasing for the application of current mirror. |
| 4 | Draw the circuit diagram of CE amplifier. Replacing the transistor with hybrid π model deduce the expression for its voltage gain |
| 5 | What is bias stabilization? Explain the basic current mirror with suitable diagram |
| 6 | Draw the circuit of Phase-Shift oscillator and explain its working. State the advantages and disadvantages of this oscillator |
| 7 | Draw the circuit of Wien- bridge oscillator and find the expression for its frequency of oscillation. Will oscillation take place if bridge is balanced. Explain |
| 8 | Draw the circuit of a Clapp oscillator and derive the expression for frequency of oscillation |
| 9 | Draw the circuit of colpitts oscillator using Transistor device and find the expression for frequency of oscillation |
| 10 | Explain the properties of negative feedback |
| 11 | Design a series-series feedback amplifier and calculate expressions for $A_f$, $R_{of}$ and $R_{if.}$ |
| 12 | Explain how negative feedback affects gain, bandwidth and noise |
| 13 | Draw the circuit of difference amplifier using OP-AMP and apply superposition theorem to determine the common mode gain expression. |
| 14 | Draw the circuit diagram of inverting weighted summer and calculate the output voltage for the same. |
| 15 | Derive the expression for closed loop gain of non-inverting configuration of OP-AMP. What are its characteristics? Discuss the effect of finite open loop gain |

Assessment rubrics that is going to be adopted for direct attainment is depicted in below table

| Level of Achievement | Elaboration on Course Grading Description | Bench Mark Set (Out of 100) |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | 80 to 100 |
| **Very Good (B)** | The student's performance is very good in most of the intended course learning outcomes. | 65 to 79 |
| **Good (C)** | The student's performance is good in most of the intended course learning outcomes. | 50 to 64 |
| **Satisfactory (D)** | The student's performance is barely satisfactory. | 40 to 49 |
| **Marginal(E)** | The student's performance is marginally meets the intended course learning outcomes | 30 to 39 |
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | Less than 30 |

**NOTE:** Have different Assessment pattern for tests, assignments, quizzes etc.

**Staff In-charge** **HOD**

# Buddha Institute of Technology

Gorakhpur

Department of Electronics & Communication Engineering

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session - April - July 2023

| | |
|---|---|
| Name of the Staff | Prabha Kant Dwivedi |
| Area of Specialization | Signals and systems, Principles of Communication, Digital electronics, Electronic Devices |
| Subject Allotted | Signals and Systems |

| Sl. # | Course Code | Course Title | Semester | Theory |
|---|---|---|---|---|
| 1 | KEC-403 | Signal System | IV-A | Theory |
| 2 | KEC-403 | Signal System | IV-B | Theory |
| 3 | KEC -453 | Signal SystemLab | IV-A | Lab |
| 4 | KEC -453 | Signal SystemLab | IV-B | Lab |

**HOD**

# Course Outcome and Programme Outcome

| | |
|---|---|
| Program | **: B. Tech.** |
| Branch | **: EC** |
| Semester | **: IV** |
| Session | **: 2022-23** |
| Name of the Course | **: Signal System** |
| Code | **: KEC-403** |
| Name of the Course Instructor | **: Mr. Prabha Kant Dwivedi** |
| Designation | **: Assistant Professor** |
| Department | **: Electronics & Communication Engineering** |

**Description of the Course Outcome:**

| CO | After completion of the course students will be able to: |
|---|---|
| KEC-403.1 | Explain different types of signals and system properties. |
| KEC-403.2 | Apply the concept of convolution to find the response of LSI system for differentinput signals. |
| KEC-403.3 | Explain the idea of Eigen functions, Fourier series representation and different frequency transformation techniques like FT, DTFT, DFT, Z- transform and Laplace transform. |
| KEC-403.4 | Analyze the behavior of discrete and continuous time LSI Systems by using respective frequency transformation techniques and convolution. |
| KEC-403.5 | Explainthe process and techniques of sampling and reconstruction, effect of under sampling and relation between continuous and discrete time systems. |

| | | | | |
|---|---|---|---|---|
| Buddha Institute of Technology, Gorakhpur | | | | |
| Department: Electronics & Communication Engg. | | | | |
| Academic Semester: April - July 2023 | | | | |
| Semester: IV | Section: A+B | Course Code: KEC-403 | Course: Signal System | |
| Course Instructor: Mr. Prabha Kant Dwivedi | | Contact Hours /week: 5+1 | # of credits: 4 | |
| CIE Marks: 50 | | SEE Marks: 100 | Exam Hours: 3 | |

| Prerequisites if any: | | | |
|---|---|---|---|
| Code No | Course Name | Description | Semester |
| NA | NA | NA | NA |

| | |
|---|---|
| Content delivery: | Chalk & Board |

**COURSE SYLLABUS:**

| ModuleNo | Contents of Module | Hrs | COs |
|---|---|---|---|
| 1 | Signals and systems as seen in everyday life, and in various branches of engineering and science, energy and power signals, continuous and discrete time signals, continuous and discrete amplitude signals, system properties: linearity, additivity and homogeneity, shift-invariance, causality, stability, realizability. | **8** | **CO1** |
| 2 | Linear shift-invariant (LSI) systems, impulse response and step response, convolution, input-output behaviour with aperiodic convergent inputs, characterization of causality and stability of linear shift invariant systems, system representation through differential equations and difference equations, Periodic and semi-periodic inputs to an LSI system, the notion of a frequency response and its relation to the impulse response | **8** | **CO2** |
| 3 | Fourier series representation, Fourier transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality , Discrete-Time Fourier Transform (DTFT) and the Discrete Fourier transform (DFT), Parseval's Theorem, the idea of signal space and orthogonal bases, the Laplace transform, notion of Eigen functions of LSI systems, a basis of Eigen functions, region of convergence, poles and zeros of system, Laplace domain analysis, solution to differential equations and system behaviour. | **8** | **CO3** |
| 4 | The z-Transform for discrete time signals and systems-Eigen functions, region of convergence, z-domain analysis. | **8** | **CO4** |
| 5 | The sampling theorem and its implications- spectra of sampled signals, reconstruction: ideal interpolator, zero-order hold, first-order hold, and so on, aliasing and its effects, relation between continuous and discretetime systems. | **8** | **CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| KEC-403.1 | Explain different types of signals and system properties. |
| KEC-403.2 | Apply the concept of convolution to find the response of LSI system for different types of inputsand represent the system through differential and difference equations. |
| KEC-403.3 | Explain the idea of Eigen functions, Fourier series representation and different frequency transformation techniques like FT, DTFT, DFT, Z- transform and Laplace transform. |
| KEC-403.4 | Analyze the behavior of discrete and continuous time LSI Systems by using respective frequency transformation techniques and convolution. |
| KEC-403.5 | Explain the process and techniques of sampling and reconstruction, effect of under sampling and relation between continuous and discrete time systems. |

**Mapping of CO v/s PO**:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KEC-403.1 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| KEC-403.2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| KEC-403.3 | 2 | 2 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 |
| KEC-403.4 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 1 |
| KEC-403.5 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| **Average** | ***1.6*** | ***1.2*** | ***1.4*** | ***1.0*** | ***1.4*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***0.0*** | ***1.0*** | ***1.8*** | ***1.4*** | **1.0** |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

| | |
|---|---|
| **Gap in the syllabus** | NA |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | NA |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |
| 6 | Employers feedback | Indirect |

# LESSON PLAN

| Lecture # | Module# | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | Reference | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Signals and systems as seen in everyday life, and in various branches of engineering and science | L2 | CO1 | | | | | |
| 2 | | Signals and systems as seen in everyday life, and in various branches of engineering and science | | | | | | | |
| 3 | | energy and power signals | | | | | | | |
| 4 | | continuous and discrete time signals | | | | | | | |
| 5 | | continuous and discrete amplitude signals | | | | | | | |
| 6 | | **Tutoria1** | | | | | | | |
| 7 | | System properties | | | | | | | |
| 8 | | linearity, additivity and homogeneity | | | | | | | |
| 9 | | linearity, additivity and homogeneity | | | | | | | |
| 11 | | shift-invariance, causality, stability, realizability. | | | | | | | |
| 12 | | shift-invariance, causality, stability, realizability. | | | | | | | |
| 13 | | **Tutorial 2** | | | | | | | |
| 14 | | Linear shift-invariant (LSI) systems | | | | | | | |
| 15 | | impulse response and step response | | | | | | | |
| 16 | | convolution | | | | | | | |
| 17 | 2 | input-output behavior with aperiodic convergent inputs | L2 | CO2 | | | | | |
| 18 | | characterization of causality and stability of linear shift invariant systems | | | | | | | |
| 19 | | **Tutorial 3** | | | | | | | |
| 20 | | system representation through differential equations and difference equations | | | | | | | |
| 21 | | Periodic and semi-periodic inputs to an LSI system | | | | | | | |
| 22 | | the notion of a frequency response and its relation to the impulse response | | | | | | | |
| 23 | | Fourier series representation | | | | | | | |
| 24 | | Fourier series representation | | | | | | | |
| 25 | | **Tutorial 4** | | | | | | | |
| 26 | | convolution/multiplication and their effect in the frequency domain. | | | | | | | |
| 27 | | convolution/multiplication and their effect in the frequency domain. | | | | | | | |
| 28 | | magnitude and phase response | | | | | | | |
| 29 | | Fourier domain duality | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **30** | | Discrete-Time Fourier Transform (DTFT) | | | | | | | |
| **31** | | **Tutorial 5** | | | | | | | |
| **32** | | Discrete-Time Fourier Transform (DTFT) | | | | | | | |
| **33** | | Discrete Fourier transform (DFT) | | | | | | | |
| **34** | | Discrete Fourier transform (DFT) | | | | | | | |
| **35** | | Parseval's Theorem | | | | | | | |
| **36** | | the idea of signal space and orthogonal bases | | | | | | | |
| **37** | | **Tutorial 6** | | | | | | | |
| **38** | | the Laplace transform | | | | | | | |
| **39** | | the Laplace transform | | | | | | | |
| **40** | | the Laplace transform | | | | | | | |
| **41** | **3** | notion of Eigen functions of LSI systems | **L3** | **CO3** | | | | | |
| **42** | | a basis of Eigen functions | | | | | | | |
| **43** | | **Tutorial 7** | | | | | | | |
| **44** | | region of convergence | | | | | | | |
| **45** | | poles and zeros of system | | | | | | | |
| **46** | | Laplace domain analysis | | | | | | | |
| **47** | | Laplace domain analysis | | | | | | | |
| **48** | | Solution to differential equations and system behaviour. | | | | | | | |
| **49** | | **Tutorial 8** | | | | | | | |
| **50** | | Solution to differential equations and system behaviour. | | | | | | | |
| **51** | | The z-Transform for discrete time signals | | | | | | | |
| **52** | | The z-Transform for discrete time signals | | | | | | | |
| **53** | **4** | The z-Transform for discrete time signals | **L3** | **CO4** | | | | | |
| **54** | | systems-Eigen functions | | | | | | | |
| **55** | | **Tutorial 9** | | | | | | | |
| **56** | | region of convergence | | | | | | | |
| **57** | | z-domain analysis | | | | | | | |
| **58** | | The sampling theorem and its implications | | | | | | | |
| **59** | | spectra of sampled signals | | | | | | | |
| **60** | | ideal interpolator | | | | | | | |
| **61** | | **Tutorial 10** | | | | | | | |
| **62** | | zero-order hold | | | | | | | |
| **63** | | first-order hold | | | | | | | |
| **64** | | aliasing and its effects, | | | | | | | |
| **65** | **5** | relation between continuous and discrete time systems. | **L3** | **CO5** | | | | | |
| **66** | | relation between continuous and discrete time systems. | | | | | | | |
| **67** | | Revision | | | | | | | |
| **68** | | Revision | | | | | | | |
| **69** | | Revision | | | | | | | |
| **70** | | Revision | | | | | | | |

| Sessional | Syllabus |
|---|---|
| CT1 | Class 1- Class 18 |
| CT2 | Class 19- Class 44 |
| Pre - AKTU | Full Syllabus |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

## Literature:

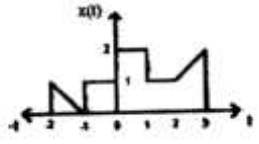
**Text Books:**

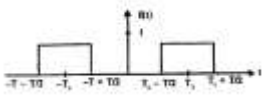
1. RP SINGH "Communication System- Modern Digital and Analog' 3rd edition TMH India, 2006

**Reference Books:**

2. Taub H. and Schilling D.L., "Principles of Communication Systems, " RP SINGH Tata McGraw Hill,2001.
3.Haykin S., "Communications Systems," John Wiley and Sons, 2001

Sample Questions:

| Question No. | Questions |
|---|---|
| 1 | What are the different types of Signals? |
| 2 | Explain discrete-time system |
| 3 | What is unit ramp |
| 4 | Define continuous time system. |
| 5 | Discuss the unit impulse and unit step signals with suitable example. |
| 6 | Distinguish between energy and power signals. |
| 7 | Sketch the discrete time signal $x(n) = 2_{-n}$ for $-3<n<3$ and obtain $Y(n) = x(n) + u(-n + 2)$. |
| 8 | Explain the principle of linearity of DT system. |
| 9 | State and prove sampling theorem. |
| 10 | State and prove final and initial value theorem of Laplace transform. |
| 11 | State and prove frequency shifting theorem of DTFT. |
| 12 | What is aliasing? |
| 13 |  Plot the signal $y(t) = x\left(\left(-\frac{t}{2}\right)+3\right)$ where x(t) is given as |
| 14 | State Parseval's theorem. Illustrate it with prper example. |

| | |
|---|---|
| 15 | Solve the differential equation using z-Transform method x(n – 2) –9x (n – 1) + 18 x(n) =<br>0. Initial conditions are x(–1) = 1, x(–2) =9. |
| 16 | Describe the convolution integral with the help of an example.signal |
| 17 | What do understand by the one-sided Laplace Transform of signal? Explain. Also find the Laplace Transform of the signal $x(t) = e^{-3t}u(t) + e^{-2t}u(t)$ and find ROC. |
| 18 | Write a note on s-plane to z-plane mapping with appropriate example. |
| 19 | Explain the causality and stability with reference to a system with example. |
| 20 | Find fourier transform of the signal shown.<br>  |
| 21 | Find Laplace transform of the following function $F(s) = \frac{3s^2 + 8s + 6}{(s+2)(s^2 + 2s + 1)}$ |
| 22 | Find the response of the following difference equation for step input. Assume zero initial conditions.<br>$y[n] - \frac{5}{6}y[n-1] + \frac{1}{6}y[n-2] = x[n] - \frac{1}{2}x[n-1]$ |
| 23 | **What is a LTI system ? Check whether the system $y(t) = x^2(t)$ is a LTI system.** |
| 24 | **Find the z-transform of $x[n] = \sin w_0 n\, u[n]$** |
| 25 | **Find the Fourier transform of the Signal**<br>**$X(t) = e^{at}u(-t)$, $a > 0$.** |

**Assessment rubrics that is going to be adopted for direct attainment is depicted in below table**

| Level of Achievement | Elaboration on Course Grading Description | Bench Mark Set (Out of 100) |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | **75** |
| **Good (B)** | The student's performance is good in most of the intended course learning outcomes. | **60** |
| **Marginal (C)** | The student's performance is barely satisfactory. It marginally meets the intended course learning outcomes | **45** |
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | **35** |

**NOTE:** Have different Assessment pattern for tests, assignments, quizzes etc.

**Staff In-charge** **HOD**

# Buddha Institute of Technology

Gorakhpur

Department of Applied Science & Humanities - II

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session: April - July 2023

| | |
|---|---|
| Name Of The Staff | Praveen Yadav |
| Area of Specialization | Human Resource Management and Marketing |
| Subject Allotted | Technical Communication |

| Sl. # | Course Code | Course Title | Semester | Theory |
|---|---|---|---|---|
| 1 | KAS401 | Technical Communication | 4 | |

**HOD**

# Course Outcome and Programme Outcome

| | |
|---|---|
| Program | **: B.TECH** |
| Branch | **: C.E, M.E, C.S.E , IT , E.C (A) & E.C(B) .** |
| Semester | **: IV** |
| Session | **: 2022-2023 (April to August )** |
| Name of the Course | **: TECHNICAL COMMUNICATION** |
| Code | **: KAS 401** |
| Name of the Course Instructor | **: Praveen Yadav** |
| Designation | **: Lecturer** |
| Department | **: C.E, M.E, C.S.E , IT , E.C (A) & E.C(B)** |

## Description of the Course Outcome:

| CO | After completion of the course students will be able to: |
|---|---|
| KAS 301.1 | use the nature and objective of Technical Communication relevant for the work place as Engineers. |
| KAS 301.2 | implement the technical writing for the purposes of Technical Communication and its exposure in various dimensions. |
| KAS 301.3 | use inputs by presentation skills to enhance confidence in face of diverse audience. |
| KAS 301.4 | implement the vast know-how of the application of the learning to promote their technical competence and use it in their professional career. |
| KAS 301.5 | use their efficacy as fluent & efficient communicators by learning the voice-dynamics. |

| | | | | |
|---|---|---|---|---|
| Buddha Institute of Technology | | | | |
| Department: Electronic and communication engineering. | | | | |
| Academic Semester: April.-July2023 | | | | |
| Semester: 3rd | Section: A & B | Course Code: KAS 301 | Course Technical Communication | |
| Course Instructor: Praveen Yadav | | Contact Hours /week: 2+1 | # of credits: 02 | |
| CIE Marks: 50 | | SEE Marks: 100 | Exam Hours: 3 | |

| Prerequisites if any: | | | |
|---|---|---|---|
| Code No | Course Name | Description | Semester |
| NOT APPLICABLE | | | |

| | |
|---|---|
| Content delivery: | Chalk & Board, DLP, System/Laptop with social media videos |

**COURSE SYLLABUS:**

| Module No | Contents of Module | Hrs | COs |
|---|---|---|---|
| 1 | **Fundamentals of Technical Communication:** Technical Communication: Features; Distinction between General and Technical Communication; Language as a tool of Communication; Dimensions of Communication: Reading & comprehension; Technical writing: sentences; Paragraph; Technical style: Definition, types & Methods; The flow of Communication: Downward; upward, Lateral or Horizontal; Barriers to Communication. | **3** | **CO1** |
| 2 | **Forms of Technical Communication:** Technical Report: Definition & importance; Thesis/Project writing: structure & importance; synopsis writing: Methods; Technical research Paper writing: Methods & style; Seminar & Conference paper writing; Expert Technical Lecture: Theme clarity; Analysis & Findings; 7 Cs of effective business writing: concreteness, completeness, clarity, conciseness, courtesy, correctness, consideration, C.V./Resume writing; Technical Proposal: Types, Structure & Draft. | **3** | **CO2** |
| 3 | **Technical Presentation:** Strategies & Techniques Presentation: Forms; interpersonal Communication; Class room presentation; style; method; Individual conferencing: essentials: Public Speaking: method; Techniques: Clarity of substance; emotion; Humour; Modes of Presentation; Overcoming Stage Fear; Audience Analysis & retention of audience interest; Methods of Presentation: Interpersonal; Impersonal; Audience Participation: Quizzes & Interjections. | **6** | **CO3** |
| 4 | **Technical Communication Skills:** Interview skills; Group Discussion: Objective & Method; Seminar/Conferences Presentation skills: Focus; Content; Style; Argumentation skills: Devices: Analysis; Cohesion & Emphasis; Critical thinking; Nuances: Exposition narration & Description; effective business communication competence: Grammatical; Discourse competence: | **6** | **CO4** |

| | | | |
|---|---|---|---|
| | combination of expression & conclusion; Socio-linguistic competence: Strategic competence: Solution of communication problems with verbal and non verbal means. | | |
| 5 | **Dimensions of Oral Communication & Voice Dynamics:** Code and Content; Stimulus & Response; Encoding process; Decoding process; Pronunciation Etiquette; Syllables; Vowel sounds; Consonant sounds; Tone: Rising tone; Falling Tone; Flow in Speaking; Speaking with a purpose; Speech & personality; Professional Personality Attributes: Empathy; Considerateness; Leadership; Competence. | **4** | **CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| **CO** | **After completion of the course students will be able to:** |
|---|---|
| KAS 401.1 | understand the nature and objective of Technical Communication relevant for the work place as Engineers. |
| KAS 401.2 | utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions. |
| KAS 401.3 | imbibe inputs by presentation skills to enhance confidence in face of diverse audience. |
| KAS 401.4 | create a vast know-how of the application of the learning to promote their technical competence. |
| KAS 401.5 | evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics. |

**Mapping of CO v/s PO**:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KAS 401.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| KAS 401.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| KAS 401.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| KAS 401.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| KAS 401.5 | - | - | - | - | - | - | - | - | - | - | - | - |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

**Mapping of CO v/s PSO**:

| | PSO1 | PSO2 | PSO3 |
|---|---|---|---|
| CSE641.1 | | | |
| CSE641.2 | | | |
| CSE641.3 | | | |
| CSE641.4 | | | |
| CSE641.5 | | | |
| CSE641.6 | | | |

| | |
|---|---|
| **Gap in the syllabus** | Practical approach |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | NA |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |
| 6 | Employers feedback | Indirect |

## LESSON PLAN

| Lecture # | Module# | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | **1** | Technical Communication: Features; Distinction between General and Technical Communication; Language as a tool of Communication; Dimensions of Communication: | **L2** | **CO1** | | | | |
| 2 | | Reading & Comprehension; Technical writing: sentences; Paragraph; Technical style: Definition, types & Methods; | | | | | | |
| 3 | | The Flow of Communication: Downward; Upward, Lateral or Horizontal; Barriers to Communication. | | | | | | |
| 4 | **2** | Technical Report: Definition & importance; | **L2** | **CO2** | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Thesis/Project writing: structure & importance; Synopsis Writing: Methods; Technical Research Paper Writing: Methods & Style; | | | | | | |
| 5 | | Seminar & Conference Paper Writing; Key-Note Speech: Introduction & Summarization; Expert Technical Lecture: Theme Clarity; | | | | | | |
| 6 | | Analysis & Findings; 7 Cs of Effective Business Writing: Concreteness, Completeness, Clarity, Conciseness, Courtesy, Correctness, Consideration. | | | | | | |
| 7 | **3** | Presentation: Forms; Interpersonal Communication; Class Room Presentation; Style; Method; | **L3** | **CO3** | | | | |
| 8 | | Individual conferencing: essentials: Public Speaking: method; Techniques: Clarity of Substance; Emotion; Humour; | | | | | | |
| 9 | | Modes of Presentation; Overcoming Stage Fear: Confident Speaking; | | | | | | |
| 10 | | Audience Analysis & Retention of Audience Interest; Methods of Presentation: Interpersonal; | | | | | | |
| 11 | | Methods of Presentation : Impersonal; Audience Participation: Quizzes & Interjections. | | | | | | |
| 12 | **4** | Interview Skills; Group Discussion: Objective & Method; | **L2** | **CO4** | | | | |
| 13 | | Seminar/Conferences | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Presentation Skills: Focus; Content; Style; | | | | | | |
| 14 | | Argumentation skills: Devices: Analysis; | | | | | | |
| 15 | | Cohesion & Emphasis; Critical Thinking; Nuances: Exposition narration & Description; Nuances: Exposition narration & Description; | | | | | | |
| 16 | | Discourse Competence: combination of expression & conclusion; Socio-linguistic Competence, | | | | | | |
| 17 | | Strategic Competence: Solution of communication problems with verbal and non verbal means. | | | | | | |
| 18 | | Kinesics: Definitions; Importance; Features of Body Language; | | | | | | |
| 19 | **5** | Voice Modulation: Quality, Pitch; | **L3** | **CO5** | | | | |
| 20 | | Rhythm; intonation; Pronunciation; Articulation; | | | | | | |
| 21 | | Stress & Accent; | | | | | | |
| 22 | | Linguistic Features Of Voice Control: Vowel & Consonant Sounds. | | | | | | |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

**Literature:**

**Books and References:**


1. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2007, New Delhi.

2. Personality Development and Soft Skills by Barun K. Mitra, OUP, 2012, New Delhi.

3. Spoken English- A Manual of Speech and Phonetics by R.K.Bansal & J.B.Harrison, Orient Blackswan, 2013, New Delhi.

4. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.

5. Practical Communication: Process and Practice by L.U.B. Pandey; A.I.T.B.S.

Publications India Ltd.; Krishan Nagar, 2014, Delhi.

6. Modern Technical Writing by Sherman, Theodore A (et.al); Apprentice Hall; New Jersey; U.S.

7. A Text Book of Scientific and Technical Writing by S.D. Sharma; Vikas Publication, Delhi.

8. Skills for Effective Business Communication by Michael Murphy, Harward University,U.S.

9. Business Communication for Managers by Payal Mehra, Pearson Publication, Delhi.

**Sample Questions:**

1. Define Technical Communication.
2. What is barrier to communication?
3. What do you mean by vocalization and sub-vocalization?
4. What is unity of paragraph writing?
5. Explain the term Comprehension.
6. What are the characteristics of Technical Communication? Differentiate between General Communication and Technical Communication.
7. Define technical writing and explain : a) User Manual b) Executive Summaries c) Employment Documents
8. Discuss the importance of language as a tool of communication.
9. Describe the various types of sentences. What are the salient features of sentence construction?
10. What are the requirements or features of writing a good paragraph?
11. What are the benefits of reading skills and how to improve the reading speed?
12. Explain in detail the different levels of communication and discuss the various types of the flow of communication.
13. What do you mean by barriers to communication? Describe in details the different types of barriers to communication.
14. Discuss the strategies for developing reading skills and also explain the strategies for improved comprehension reading.
15. Explain the 7 Cs of an effective communication.
16. What is AIDA structure of presentation? What are the different modes of presentation?
17. Explain the importance of critical thinking? Discuss the skills required for developing critical thinking.
18. Describe the various vocal cues in an effective communication.
19. Explain how to give an effective presentation.
20. What are the professional personality attributes of an effective speaker?

Assessment rubrics that is going to be adopted for direct attainment is depicted in below table

| Level of Achievement | Elaboration on Course Grading Description | Bench Mark Set (Out of 25) |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | 21 to 25 |
| **Good (B)** | The student's performance is good in most of the intended course learning outcomes. | 15 to 20 |
| **Marginal (C)** | The student's performance is barely satisfactory. It marginally meets the intended course learning outcomes | 12 to 14 |

| | | |
|---|---|---|
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | Less than 12 |

# Buddha Institute of Technology

Gorakhpur

Department of Electronic and Communication Engineering

ALLOTTMENT BASED ON COMPETENCY SKILLS

Academic Session: April – July 2023

| | |
|---|---|
| Name of the Staff | Pallavi Dixit |
| Area of Specialization | Software engineering |
| Subject Allotted | Python Programming |

| Sl. # | Course Code | Course Title | Semester | Theory |
|---|---|---|---|---|
| 1. | KNC-402 | Python Programming | IV | Theory |

**HOD**

# Course Outcome and Programme Outcome

| | |
|---|---|
| Program | **: B.Tech** |
| Branch | **: EC** |
| Semester | **: IV** |
| Session | **: 2022-23** |
| Name of the Course | **: Python Programming** |
| Code | **: KNC-402** |
| Name of the Course Instructor | **: Pallavi Dixit** |
| Designation | **: Assistant Professor** |
| Department | **: Electronic and Communication Engineering** |

**Description of the Course Outcome:**

| **CO** | **After completion of the course students will be able to:** |
|---|---|
| CO-1 | Understand why Python is a useful scripting language for developers. |
| CO-2 | To learn how to design and program Python applications. |
| CO-3 | To learn how to use lists, tuples, and dictionaries in Python programs. |
| CO-4 | To learn how to use class inheritance in Python for reusability. |
| CO-5 | To do searching, sorting and merging in Python. |

| | | | | |
|---|---|---|---|---|
| Buddha Institute of Technology, Gorakhpur | | | | |
| Department: Electronic and communication engineering. | | | | |
| Academic Semester: April.-July2023 | | | | |
| Semester: IV | Section: A+B | Course Code: KNC-402 | Course: Python Programming | |
| Course Instructor: Pallavi dixit | | Contact Hours /week: 04 | # of credits: 0 | |
| CIE Marks: 25 | | SEE Marks: 50 | Exam Hours: 03 | |

| Prerequisites if any: | | | |
|---|---|---|---|
| Code No | Course Name | Description | Semester |
| | | | |

| | |
|---|---|
| Content delivery: | Chalk & Board |

**COURSE SYLLABUS:**

| ModuleNo | Contents of Module | Hrs | COs |
|---|---|---|---|
| 1 | **Introduction:** The Programming Cycle for Python , Python IDE, Interacting with Python Programs , Elements of Python, Type Conversion. Basics: Expressions, Assignment Statement, Arithmetic Operators, Operator Precedence, Boolean Expression. | **6 Hrs** | **CO1** |
| 2 | **Conditionals:** Conditional statement in Python (if-else statement, its working and execution), Nested-if statement and Elif statement in Python, Expression Evaluation & Float Representation. Loops: Purpose and working of loops , While loop including its working, For Loop , Nested Loops , Break and Continue. | **5 Hrs** | **CO2** |
| 3 | **Function:** Parts of A Function , Execution of A Function , Keyword and Default Arguments ,Scope Rules. Strings : Length of the string and perform Concatenation and Repeat operations in it. Indexing and Slicing of Strings. Python Data Structure : Tuples , Unpacking Sequences , Lists , Mutable Sequences , List Comprehension , Sets , Dictionaries Higher Order Functions: Treat functions as first class Objects , Lambda ExpressionsSieve of Eratosthenes: generate prime numbers with the help of an algorithm given by the Greek Mathematician named Eratosthenes, whose algorithm is known as Sieve of Eratosthenes. File I/O : File input and output operations in Python Programming. | **5 Hrs** | **CO3** |
| 4 | **Modules :** Introduction , Importing Modules , Abstract Data Types : Abstract data types and ADT interface in Python Programming. Classes : Class definition and other operations in the classes , Special Methods ( such as _init_, _str_, comparison methods and Arithmetic methods etc.) , Class Example , Inheritance , Inheritance and OOP**.** | **4 Hrs** | **CO4** |
| 5 | **Iterators & Recursion:** Recursive Fibonacci , Tower Of Hanoi Search : Simple Search and Estimating Search Time , Binary Search and Estimating Binary Search Time Sorting & Merging: Selection Sort , Merge List , Merge Sort , Higher Order Sort. | **4 Hrs** | **CO5** |

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

| | |
|---|---|
| CO-1 | Understand why Python is a useful scripting language for developers. |
| CO-2 | To learn how to design and program Python applications. |
| CO-3 | To learn how to use lists, tuples, and dictionaries in Python programs. |
| CO-4 | To learn how to use class inheritance in Python for reusability. |
| CO-5 | To do searching, sorting and merging in Python. |

**Mapping of CO v/s PO**:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KNC-402 | 2 | 1 | 1 | 1 | - | | - | | | - | - | - |
| KNC-402 | 2 | 1 | 1 | 1 | 1 | | - | | | - | - | - |
| KNC-402 | 3 | 2 | 2 | 1 | 1 | | - | | | - | - | - |
| KNC-402 | 2 | 1 | 1 | 1 | 1 | | - | | | - | - | - |
| KNC-402 | 2 | 1 | 1 | 1 | 1 | | - | | | - | - | - |

**Correlation levels: 1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

**Mapping of CO v/s PSO**:

| | PSO1 | PSO2 |
|---|---|---|
| KNC-402 | 2 | 1 |
| KNC-402 | 2 | 1 |
| KNC-402 | 3 | 2 |
| KNC-402 | 2 | 1 |
| KNC-402 | 2 | 1 |

| | |
|---|---|
| **Gap in the syllabus** | NO |

| | |
|---|---|
| **Topics to be covered beyond syllabus** | 1. Introduction of different software.<br>2. Goals And Objectives<br>3. Unrealistic Deadlines<br>4. Finding The Right Project Management Software<br>5. Miscommunication Cause Conflicts<br>6. Risk Management<br>7. Challenges of Teamwork<br>8. Lack of Accountability<br>9. Earn Value Analysis<br>10. CASE Tools<br>11. Risk Breakdown Structure<br>12. Bar charts |

**Assessment Methodologies:**

| Sl. No. | Description | Type |
|---|---|---|

| | | |
|---|---|---|
| 1 | Student Assignment | Direct |
| 2 | Internal assessment | Direct |
| 3 | University exam | Direct |
| 4 | Student feedback | Indirect |
| 5 | Alumni feedback | Indirect |
| 6 | Employers feedback | Indirect |

## LESSON PLAN

| Lecture # | Module # | Topics | RBT Levels | Course Outcome Mapping | Planned Date | Actual Date | Faculty Sign | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Definition of Python? The Programming Cycle for Python and Python IDE | L3 | CO1 | | | | |
| 2 | | Interacting with Python Programs and Elements of Python | | | | | | |
| 3 | | Type Conversion, Expressions | | | | | | |
| 4 | | Assignment Statement | | | | | | |
| 5 | | Arithmetic Operators | | | | | | |
| 6 | | Operator Precedence & Boolean Expression | | | | | | |
| 7 | 2 | Conditional statement in Python (if-else statement, its working and execution) | L2 | CO2 | | | | |
| 8 | | Nested-if statement and Elif statement in Python | | | | | | |
| 9 | | Expression Evaluation & Float Representation | | | | | | |
| 10 | | Purpose and working of loops, For Loop & Nested Loops | | | | | | |
| 11 | | Break and Continue | | | | | | |
| 12 | 3 | Parts of A Function, Execution of A Function | L2 | CO3 | | | | |
| 13 | | Keyword and Default Arguments, Scope Rules, Strings | | | | | | |
| 14 | | Tuples, Unpacking Sequences , List Comprehension | | | | | | |
| 15 | | Lists , Mutable Sequences , Sets , Dictionaries | | | | | | |
| 16 | | Lambda Expressions & | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | File input and output operations in Python Programming | | | | | | |
| 17 | 4 | Modules, Importing Modules | L2 | CO4 | | | | |
| 18 | | Abstract data types, ADT & Classes | | | | | | |
| 19 | | Special Methods, Inheritance | | | | | | |
| 20 | | 00P | | | | | | |
| 21 | 5 | Recursive Fibonacci | L3 | CO5 | | | | |
| 22 | | Tower Of Hanoi, Simple Search, Estimating Search Time | | | | | | |
| 23 | | Binary Search, Estimatng Binary Search Time | | | | | | |
| 24 | | Selection Sort , Merge List, Merge Sort, Higher Order Sort | | | | | | |

**Syllabus for Sessionals:**

| | |
|---|---|
| **CT1 Class 1** | **1- Class 20** |
| **CT2 Class 21** | **21- Class 47** |
| **Pre - AKTU** | **Full Syllabus** |

***L1 – Remembering; L2 – Understanding; L3 – Applying; L4 – Analysing; L5 – Evaluating; L6 - Creating**

## Literature:

**Text Books**


1. **Pearson, "Introduction to Programming in Python"**

2. **Paul Gries, An Introduction to Computer Science using Python .**


**Reference Books**


1 . Charles Dierbach, —Introduction to Computer Science using Python: A Computational ProblemSolving Focus, Wiley India Edition, 2013.

2. Timothy A. Budd, —Exploring Python||, Mc-Graw Hill Education (India) Private Ltd.,, 2015


## Sample Questions:

| Question No. | Questions |
|---|---|

| | |
|---|---|
| 1 | What is Python? |
| 2 | How Python is interpreted? |
| 3 | What is the difference between list and tuple? |
| 4 | How Python is interpreted? |
| 5 | What type of language is python? |
| 6 | What are the local variables and global variables in Python? |
| 7 | What are Python decorators? |
| 8 | What is lambda in Python? |
| 9 | Why lambda forms in python does not have statements? |
| 10 | How you can convert a number to a string? |
| 11 | What is module and package in Python? |
| 12 | Explain how can you make a Python Script executable on Unix? |
| 13 | Explain how to delete a file in Python? |
| 14 | Explain how can you access a module written in Python from C? |
| 15 | Mention five benefits of using Python? |
| 16 | Mention the use of the split function in Python**?** |
| 17 | You are having multiple Memcache servers running Python, in which one of the memcacher server fails, and it has your data, will it ever try to get key data from that one failed server? |
| 18 | Explain how you can access sessions in Flask? |
| 19 | Explain what is Flask & its benefits**?** |
| 20 | What is pickling and unpickling? |
| 21 | How Python is interpreted? |
| 22 | What is the difference between list and tuple? |
| 23 | Mention the use of the split function in Python**?** |
| 24 | How you can convert a number to a string? |
| 25 | What is module and package in Python? |

Assessment rubrics that is going to be adopted for direct attainment is depicted in below table

| **Level of Achievement** | **Elaboration on Course Grading Description** | **Bench Mark Set (Out of 50)** |
|---|---|---|
| **Excellent (A)** | The Student's performance is outstanding in almost all the intended course learning outcomes | 40 to 50 |

| | | |
|---|---|---|
| **Good (B)** | The student's performance is good in most of the intended course learning outcomes. | 35 to 40 |
| **Marginal (C)** | The student's performance is barely satisfactory. It marginally meets the intended course learning outcomes | 25 |
| **Fail (F)** | The Students performance is inadequate. Student fails to meet many of the intended course learning outcomes | Less than 20 |

## Lab Name- Communication Engineering Lab (KEC-451)

| Sl. # | Experiment / Program |
|---|---|
| **1.** | To study DSB/ SSB amplitude modulation & determine its modulation factor & power in side bands. |
| **2.** | To study amplitude demodulation by Envelope detector |
| **3.** | To study frequency modulation and determine its modulation factor. |
| **4.** | To study sampling and reconstruction of Pulse Amplitude modulation system. |
| **5.** | To Study of Pulse Width Modulation and Demodulation. |
| **6** | To Study of Pulse code modulation (PCM) and its demodulation |
| **7.** | Study of delta modulation and demodulation. |
| **8.** | Study of Amplitude shift keying modulator and demodulator. |
| **9.** | Study of Frequency shift keying modulator and demodulator. |

**Lab Name- Analog Circuits Lab (KEC 452)**

| Sl. # | Experiments |
|---|---|
| 1 | Study of BJT in CE configuration |
| 2 | Study Frequency response of single stage BJT amplifiers in CE configurations |
| 3 | Measurement of OP-AMP parameters |
| 4 | Application of OP-AMP as Integrator & Differentiator |
| 5 | Application of OP-AMP as summer and difference amplifier |
| 6 | To measure frequency of Wein Bridge Oscillator |
| 7 | To measure frequency and voltage of Phase Shift Oscillator |
| 8 | Study of Single stage common source FET amplifier |

**Lab Name- Signal System Lab (KEC-453)**

| Sl. # | Experiment / Program |
|---|---|
| **1.** | Introduction to MATLAB<br>a. To define and use variables and functions in MATLAB.<br>b. To define and use Vectors and Matrices in MATLAB.<br>c. To study various MATLAB arithmetic operators and mathematical functions.<br>d. To create and use m-files. |
| **2.** | Basic plotting of signals<br>a. To study various MATLAB commands for creating two and three dimensional plots.<br>b. b. Write a MATLAB program to plot the following continuous time and discrete time signals.<br>i. Step Function<br>ii. Impulse Function<br>iii. Exponential Function<br>iv. Ramp Function<br>v. Sine Function |
| **3.** | Time and Amplitude transformations Write a MATLAB program to perform amplitude-scaling, time-scaling and timeshifting on a given signal. |
| **4.** | Convolution of given signals Write a MATLAB program to obtain linear convolution of the given sequences. |
| **5.** | Autocorrelation and Cross-correlation<br>a. Write a MATLAB program to compute autocorrelation of a sequence x(n) and verify the property.<br>b. Write a MATLAB program to compute cross-correlation of sequences x(n) and y(n) and verify the property. |
| **6** | Fourier Series and Gibbs Phenomenon<br>a. To calculate Fourier series coefficients associated with Square Wave.<br>b. To Sum the first 10 terms and plot the Fourier series as a function of time. |

| | |
|---|---|
| | c. To Sum the first 50 terms and plot the Fourier series as a function of time. |
| **7.** | Calculating transforms using MATLAB<br>a. Calculate and plot Fourier transform of a given signal.<br>b. Calculate and plot Z-transform of a given signal. |
| **8.** | Impulse response and Step response of a given system<br>a. Write a MATLAB program to find the impulse response and step response of a system form its difference equation.<br>b. Compute and plot the response of a given system to a given input. |
| **9.** | Pole-zero diagram and bode diagram<br>a. Write a MATLAB program to find pole-zero diagram, bode diagram of a given system from the given system function.<br>b. Write a MATLAB program to find, bode diagram of a given system from the given system function. |
| **10** | Frequency response of a system Write a MATLAB program to plot magnitude and phase response of a given system. |
| **11** | Checking linearity/non-linearity of a system using SIMULINK<br>a. Build a system that amplifies a sine wave by a factor of two.<br>b. Test the linearity of this system using SIMULINK. |