# GOVERNMENT POLYTECHNIC, KOLHAPUR

(An Autonomous Institute of Government of Maharashtra)

Curriculum Document

**CURRICULUM: MPECS-2023**

(Outcome Based Curriculum)

For

**DIPLOMA IN INFORMATION TECHNOLOGY**

| Asst. Member Secretary PBOS | Member Secretary PBOS | Chairman |
|---|---|---|

Programme wise Board of Studies (PBOS)

Information Technology Programme

Government Polytechnic, Kolhapur

## Government Polytechnic Kolhapur

## Learning and Assessment Scheme for Post S.S.C Diploma Courses

**ProgrammeName :Diploma In Information Technology**

| | | | |
|---|---|---|---|
| **Programme Code** | **:IF(06)** | **With Effect From Academic Year** | **: 2023-24** |
| **Duration Of Programme** | **: 6 Semester** | **Duration** | **: 16 WEEKS** |
| **Semester** | **: First** | **Scheme** | **: H** |

| Sr No | CourseTitle | Abbrevation | Level | Course Type | CourseCode | Total IKS Hrs forSem. | Learning Scheme | | | | | Credits | Assessment Scheme | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ActualContact Hrs./Week | | | Self Learning( Activity/ Assignment /MicroProject) | Notional Learning Hrs/Week | | PaperDuration (hrs.) | Theory | | | | Based on LL&TL | | | | Based onSelf Learning | | Total Marks |
| | | | | | | | | | | | | | | | | | | Practical | | | | | | |
| | | | | | | | CL | TL | LL | | | | | FA-TH | SA-TH | Total | | FA-PR | | SA-PR | | SLA | | |
| | | | | | | | | | | | | | | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | |
| 1 | BASIC MATHEMATICS | HBMT | I | AEC | CCH105 | 6 | 4 | 2 | - | 2 | 8 | 4 | 3 | 30 | 70 | 100 | 40 | - | - | - | - | 25 | 10 | 125 |
| 2 | ENGINEERING PHYSICS | HPHA | I | DSC | CCH101 | 4 | 4 | - | 2 | 2 | 8 | 4 | 1.5 | 30*# | 70*# | 100 | 40 | 25 | 10 | 25@ | 10 | 25 | 10 | 175 |
| 3 | FUNDAMENTAL OF ELECTRONICS | HFOE | I | AEC | ITH102 | 0 | 2 | - | 2 | 2 | 6 | 3 | - | - | - | - | - | 50 | 20 | 50 | 20 | 25 | 10 | 125 |
| 4 | WEB PAGE DESIGN | HWPD | I | DSC | ITH101 | 2 | 3 | - | 2 | 1 | 6 | 3 | 3 | 30 | 70 | 100 | 40 | 25 | 10 | 25@ | 10 | 25 | 10 | 175 |
| 5 | ITWORKSHOP PRACTICE'S | HWIT | I | SEC | ITH103 | 0 | - | - | 4 | 2 | 6 | 3 | - | - | - | - | - | 25 | 10 | 50@ | 20 | 25 | 10 | 100 |
| 6 | FUNDAMENTALSOF ICT | HICT | I | SEC | CCH202 | 0 | 1 | - | 2 | 1 | 4 | 2 | - | - | - | - | - | 25 | 10 | 25@ | 10 | 25 | 10 | 75 |
| 7 | YOG AAND MEDITATION | HYAM | I | VEC | CCH203 | 1 | - | - | 1 | 1 | 2 | 1 | - | - | - | - | - | 25 | 10 | - | - | 25 | 10 | 50 |
| | **Total** | | | | | **13** | **14** | **2** | **13** | **11** | **40** | **20** | - | **90** | **210** | **300** | | **175** | | **175** | | **175** | | **825** |

**Abbreviations:**CL-ClassroomLearning,TL-TutorialLearning,LL-LaboratoryLearning,FA-FormativeAssessments-SummativeAssessment,IKS-IndianKnowledgeSystem,SLA-SelfLearningAssessment

**Legends:** @ InternalAssessment, # ExternalAssessment, *# On Line Examination , @$ Internal Online Examination

**Note :**

1. FA-THrepresentsaverageoftwoclasstestsof30markseachconductedduringthesemester.
2. IfcandidateisnotsecuringminimumpassingmarksinFA-PRofanycoursethenthecandidateshallbedeclaredas"Detained"inthatsemester.
3. If candidate is not securing minimum passing marks in SLAof any course then the candidate shall be declared as fail and will have to repeat and resubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. *SelflearninghoursshallnotbereflectedintheTimeTable.

**CourseCategory:**DisciplineSpecific CourseCore(DSC): 2, DisciplineSpecificElective (DSE):0,ValueEducation Course(VEC):1, Intern./Apprenti./Project./Community(INP):0,AbilityEnhancementCourse (AEC) : 2, Skill Enhancement Course (SEC) : 2, GenericElective (GE) : 0

**COURSE ID :**
**COURSE NAME :BASIC MATHEMATICS**
**COURSE CODE : CCH105**
**COURSE ABBREVIATION : HBMT**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 04 | 4 |
| | Tutorial Learning | 02 | |
| | LaboratoryLearning | - | |
| | SLH-SelfLearning | 02 | |
| | NLH-Notional Learning | **08** | |

## B: ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tutorial | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | **30** | **70** | **100** | **40** | | | **--** | **--** | **25** | **10** | **125** |

**(TotalIKSHrsforSem.:06Hrs)**

**C: ABBREVIATIONS:-**CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:**@InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination( TNR 12 font)

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredas fail and will have to repeat and resubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(The list of all assignments are given in tabular format. At least 6 to 8 assignments to be given)

## D. i)RATIONALE:-

Mathematics is an important prerequisite for the development and understanding of engineering and technological concepts. For an engineer and technologist, knowledge of mathematics is an effective tool to pursue and master the applications in the engineering and technological fields. Algebra provides the language and abstract symbols of mathematics. The topic Matrices is helpful for finding optimum solution of system of simultaneous equations which are formed in the various branches of engineering using different parameters .Trigonometry is the study of triangles and angles. Contents of this subject will form foundation for further study in mathematics. Statistics can be defined as a type of mathematical analysis which involves the method of collection and analyzing the data and summing of the data in numerical form for a given set of real world observations.Calculus is a branch of mathematics that calculates how matter ,particles and heavenly bodies actually move.Derivatives are useful to find maxima & minima of a function,velocity &acceleration are also useful for many engineering problems.Hence the course provides the insight to analyze engineering problems scientifically using logarithms,matrices,trigonometry,straight line ,differential calculus and statistics.

**ii)Competency:**
Apply principles of Basic Mathematics to solve industry based technology problems.

**1.Cognitive:** To understand the mathematical concepts
**2. Psychomotor:** Proper handling of scientific calculator
**3. Affective :** Attitude of accuracy, punctuality, proper reasoning and presentation

## E. COURSELEVELLEARNINGOUTCOMES(COS)

CCH105-1 : To Apply concepts of algebra to solve engineering related problems

CCH105-2 : To Use techniques and methods of statistics to compare multiple sets of data

CCH105-3 : Solve area specific engineering problems under given conditions of straight lines

CCH105-4:- To memorize trigonometric formulae and solve problemsbased on them.

CCH105-5:-To solve the problems of maxima, minima, radius of curvature and geometrical applications.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** | **PSO2** |
| Competency: Use DC machines and transformers. | 3 | 2 | 1 | - | 1 | - | 2 | | |
| CCH105-1-CO-1 : To Apply concepts of algebra to solve engineering related problems | 3 | 1 | - | - | - | - | 1 | | |
| CCH105-2-CO-2 : To Use techniques and methods of statistics to compare multiple sets of data | 3 | 1 | - | - | 1 | - | 1 | | |
| CCH105-3-CO-3 : Solve area specific engineering problems under given conditions of straight lines | 3 | - | - | - | - | - | 1 | | |
| CCH105-4-CO-4:- To memorize trigonometric formulae and solve problems based on them. | 3 | 1 | 1 | - | - | - | 1 | | |
| CCH105-5-CO-5:- To solve the problems of maxima, minima, radius of curvature and geometrical applications. | 3 | 2 | 1 | - | 1 | - | 1 | | |

# F. CONTENT:

## I) Tutorial exercises

Any **TEN** of the following Tutorial exercises shall be conducted in the Tutorial room in tutorial sessions of batches of about 20- 22 students:

| Sr. no | Tutorial experiences | CO |
|---|---|---|
| 1 | Solve Simple problems of Logarithms based on given application | CCH105-1 |
| 2 | Solve elementary problems on Algebra of Matrices | CCH105-1 |
| 3 | Solve simultaneous equations using Matrix inversion method | CCH105-1 |
| 4 | Resolve into Partial Fractions using linear non repeated, repeated and irreducible quadratic factors | CCH105-1 |
| 5 | Practice problems on equation of straight lines using different forms, Solve problems on perpendicular distance,distance between two parallel lines and angle between two lines | CCH105-3 |
| 6 | Solve problems on finding range, coefficient of range and mean deviation | CCH105-2 |
| 7 | Solve problems on Standard deviation, coefficient of variation and comparison of two sets | CCH105-2 |
| 8 | Solve problems on Allied & Compound angles | CCH105-4 |
| 9 | Solve problems on Multiple & submultiple angles | CCH105-4 |
| 10 | Solve problems on factorization & De- factorization formulae | CCH105-4 |
| 11 | Solve problems on Inverse Trigonometric Functions | CCH105-4 |
| 12 | Solve examples on functions & rules of derivatives | CCH105-5 |
| 13 | Solve examples on Derivative of composite function ,inverse & parametric functions, | CCH105-5 |
| 14 | Solve examples on Derivative of exponential,implicit and logarithmic functions | CCH105-5 |
| 15 | Solve examples on Application of Derivatives | CCH105-5 |

## II)Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH105-1 : To Apply concepts of algebra to solve engineering related problems | | | |
| Unit 1 Algebra | ***1.1 LOGARITHMS***<br>1.1.1 Concept and laws of logarithm<br>1.1.2 Simple examples based on laws of Logarithms<br>***1.2 MATRICES***<br>1.2.1 Definition of a matrix, Types of matrices, Algebra of matrices, Equality of two matrices, Transpose of a matrix,<br>1.2.3 Adjoint and Inverse of a matrix<br>1.2.4 Solution of simultaneous equations having 3 unknowns using Matrix inversion method<br>***1.3 PARTIAL FRACTIONS***<br>1.3.1 Definition of rational, proper and improper fractions<br>1.3.2 Various cases of Partial fractions and Examples<br>1.4 Algebra of Indian Knowledge System: Solution of simultaneous equations using Vedic Mathematics | 12 | 16 |
| CO: CCH105-2 : To Use techniques and methods of statistics to compare multiple sets of data | | | |
| Unit 2 Statistics | ***MEASURES OF DISPERSION***<br>2.1 Range,Coefficient of Range of Discrete and grouped data<br>2.2 Mean deviation and Standared Deviation aboutmean for Discrete & Grouped Data (except Assumed mean method and Step deviation method)<br>2.3Variance and coefficient of Variance<br>2.4 Comparison of 2 sets of observations | 6 | 10 |
| CO: CCH105-3 : Solve area specific engineering problems under given conditions of straight lines | | | |
| Unit 3 Coordinate Geometry | ***THE STRAIGHT LINE***<br>3.1 Slope, intercepts & various methods of finding slope<br>3.2 Conditions for two straight lines to be parallel and Perpendicular to each others<br>3.3 Various forms of straight line<br>3.4 Perpendicular distance of a point from a line<br>3.5 Distance between two parallel lines<br>3.6 Angle between two straight lines<br>3.7 Geometry in Sulabh sutras in Indian Knowledge System | 6 | 8 |

**Section –II**

| Sr. no. | **Topics/Subtopics** | Learning Hours | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH105-4:- To memorize trigonometric formulae and solve problemsbased on them. | | | |
| Unit 4 Trigonometry | ***TRIGONOMETRY***<br><br>4.1 Fundamental Identities(Only state,No examples)<br>4.2 Conversion of degree into radian and vice versa of standard angles<br>4.3 Trigonometric ratios of Compound Angles(Without Proof) , Examples<br>4.4 Trigonometric ratios of Allied Angles (Without Proof) , Examples<br>4.5 Trigonometric ratios of Multiple and Submultiple Angles (Without Proof) , Examples<br>4.6 Factorization and De-Factorization Formulae (Without Proof) , Examples<br>4.7 Inverse Trigonometric ratios , Principle values and simple problems<br>4.8 Trigonometry in Indian Knowledge System : The evolution of sine function in India<br>4.9 Trigonometry in Indian Knowledge System : Indian Trigonometry-From ancient beginning to Nilakantha<br>4.10 Trigonometry in Indian Knowledge System : Ancient Indian Astronomy<br>4.11 Trigonometry in Indian Knowledge System: Pythagorean to triples in Sulabhsutras | 14 | 14 |
| CO: CCH105-5:- To solve the problems of maxima, minima, radius of curvature and geometrical applications. | | | |
| Unit 5 Differential Calculus | 5.1 **Functions**:Concept of Functions and simple examples<br>5.2 **Limits**:Concept of Limits without examples<br><br>5.3 **Derivatives:**<br>5.3.1 Derivative of sum, difference, product and quotient of two or more functions<br>5.3.2 Derivative of composite functions<br>5.3.3 Derivative of Inverse functions<br>5.3.4 Derivative of Implicit functions<br>5.3.5 Derivative of Parametric functions<br>5.3.6 Derivative of exponential and logarithmic functions<br>5.3.7 Calculus in Indian Knowledge system " Discovery of Calculus by Indian Astronomers ( Indian Mathematics) | 16 | 16 |

| CO: CCH105-5:- To solve the problems of maxima, minima, radius of curvature and geometrical applications. | | | |
|---|---|---|---|
| Unit 6 Application of Derivatives | ***APPLICATIONS OF DERIVATIVES***<br><br>6.1 Second Order Derivatives(without examples)<br>6.2 Equation of Tangent & Normal<br>6.3 Maxima & Minima(only for algebraic functions)<br>6.4 Radius of curvature | 06 | 06 |

** No questions will be asked on IKS related subtopics in any question paper

## G : List of Microproject /Assignments under SLA

| Sr.No | List of Assignment (under SLA) | Hrs Allotted |
|---|---|---|
| 1 | Create a function that takes a matrix as input and returns its inverse matrix if it exists. Also implement a program that finds the inverse of a square matrix. | |
| 2 | Collect the Data of Marks obtained by your class in mid semester test.Compute the variance and coefficient of variance of the data and interpret the result using the free open source software ORANGE. | |
| 3 | Prepare models using matrices to solve simple problems based on cryptography. | |
| 4 | Collect Model on quality control analysis ,energy efficiency assessment ,environmental monitoring ,and process optimization for these models,analyse data and calculate variance and S.D. ,make a presentation including short videos. | |
| 5 | Prepare a model using the concept of tangent and normal, bending of curves in case of sliding of a vehicle.Express geometrically the same through any open sourse software | |
| 6 | Prepare charts of grouped and ungrouped data. | |
| 7 | Collect statistical data on real world problems and find Mean Deviation & S.D. | |
| 8 | Collect at least 10 examples based on real world applications which will be used to find S.D. /Variance. | |
| 9 | Prepare models to explain different concepts. | |
| 10 | Prepare a model using concept of radius of curvature of bending of railway tracks. | |
| 11 | A window in the form of rectangle surmounted by a semicircular opening . The total perimeter the window to admit maximum | |

| | | |
|---|---|---|
| | light through the whole opening ,prepare a model using concept of Maxima & Minima for the above problem and verify the result. | |
| 12 | Collect applications of radius of curvature on lens design and optics, mirror and reflective surface properties , road and highway design , structural behavior, roller coaster track design & make a video of 5- minutes duration. | |
| 13 | Design a puzzle based on matrices . Create a grid of numbers and operations. | |
| 14 | Develop a math game based on operations of matrices. | |
| 15 | Collect examples based on real world applications of logarithm and prepare a pdf file. | |
| 16 | Measure height of trees/buildings in surrounding locations using trigonometry and prepare presentation. | |
| 17 | Apply trigonometric principles to calculate angles ,distances, dimensions relevant to the chosen area and make a poster presentation. | |
| 18 | Find height of room or distance between two pillars by using concept of straight line. | |
| | | |

****Attempt any 10-12 Micro Projects, out of the given list.**

## H : Specification table for setting question paper for semester end theory examination

| Section / Topic no. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Algebra | 2 | 6 | 6 | 14 | CCH105-1 |
| I / 2 | Statistics | 2 | 4 | 6 | 8 | CCH105-2 |
| I / 3 | Coordinate Geometry | 2 | 2 | 4 | 8 | CCH105-3 |
| II /4 | Trigonometry | 2 | 6 | 6 | 14 | CCH105-4 |
| II /5 | Differential Calculus | 2 | 6 | 8 | 20 | CCH105-5 |
| II/6 | Application of Derivatives | 2 | 2 | 2 | 6 | CCH105-5 |
| | Total Marks | | | | 70 | |

## I) Instructional Methods:

1. Lectures cum Demonstrations,
2. Classroom practices.
3. Use of projector and soft material for demonstration

## J) Teaching and Learning resources:

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## K) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Electrical Technology Vol-II | Theraja B.L. | S. Chand, New Delhi, 2012 or latest |
| 2 | Electrical Machines | Despande M.V. | PHI Learning,, New Delhi, 2012 or latest |
| 3 | Electrical Technology | Uppal, S.L. | Khanna Publication, New Delhi, 2012 or latest |
| 4 | Electrical Machine | Nagrath I.J. a Kothari, D.P. | Tata McGraw Hill, New Delhi, 2012 or latest |
| 5 | Electrical Machine-I | Gupta, J. B. | S. K. Kataria& Sons, New Delhi, 2012 or latest |

## L) Learning Website & Software

a. www.nptel.com/iitm/
b. www.howstuffworks.com/
c. www.vlab.com
d. www.sskphdmm.com
e. http://www.youtube.com/watch?v=RAc1RYilugI

**COURSE ID :**
**COURSE NAME :ENGINEERING PHYSICS (EE/ET/IT)**
**COURSE CODE :CCH101**
**COURSE ABBREVIATION :HPHA**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 04 | 4 |
| | Tutorial Learning | - | |
| | LaboratoryLearning | 02 | |
| | SLH-SelfLearning | 02 | |
| | NLH-Notional Learning | 08 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL Practical | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 1.5 | 30*# | 70*# | 100 | 40 | 25 | 10 | 25@ | 10 | 25 | 10 | 175 |

**(TotalIKSHrsforSem.:04Hrs)**

**C: ABBREVIATIONS:-**CL-ClassroomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment
**Legends:**@InternalAssessment,#ExternalAssessment,*#OnlineExamination,@$InternalOnlineExamination

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i)RATIONALE:-

Physics is the foundation of engineering and technology. The development of all engineering areas requires good understanding of fundamental principles in physics. Studying physics develops scientific methodology and technical aptitude in the students. Applications of principles of physics in engineering fields create interest and motivate the students.

## ii)INDUSTRY/EMPLOYEREXPECTEDOUTCOME

Apply principles of Physics to solve engineering problems as follows:

**Cognitive** : i) Understanding and applying principles and laws of Physics to simple practical problems/ situations. ii) Observing iii) Classifying iv) Interpreting

**Psychomotor** : Handling of instruments, apparatus and tools

**Affective** : Skill of i) working in team ii) curiosity, interest and self-confidence

## E. COURSELEVELLEARNINGOUTCOMES(COS)

**CCH101-1** Estimate errors in measurement of physical quantities.

**CCH101-2** Express importance of semiconductors and nanotechnology.

**CCH101-3** Select proper material in engineering industry by analysis of its physical properties.

**CCH101-4** Apply principles of electricity and magnetism to solve engineering problems.

**CCH101-5**Apply principles of optics to solve engineering problems.

**CCH101-6** Apply principles of fiber optics for related engineering applications.

**Course outcomes and programme outcomes/programme specific outcomes (co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| COs | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** | **PSO2** |
| CCH101-1 Estimate errors in measurement of physical quantities. | 3 | 1 | - | 1 | 1 | 1 | 1 | | |
| CCH101-2 Express importance of semiconductors and nanotechnology | 3 | - | - | - | 1 | 1 | 1 | | |
| CCH101-3 Select proper material in engineering industry by analysis of its physical properties | 3 | 1 | - | 1 | 1 | 1 | 1 | | |
| CCH101-4 Apply principles of electricity and magnetism to solve engineering problems | 3 | 1 | - | 1 | 1 | 1 | 1 | | |
| CCH101-5Apply principles of optics to solve engineering problems. | 3 | 1 | - | - | 1 | 1 | 1 | | |
| CCH101-6 Apply principles of fiber optics for related engineering applications | 3 | - | - | - | 1 | 1 | 1 | | |

# F. CONTENT:

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for Physics developed* by the Institute in practical sessions of batches of about 20- 22 students:

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | To measure internal and external dimensions of hollow cylinder by using Vernier Caliper | CCH101-1 |
| 2 | To measure the diameter of bob and thickness of plate by using Vernier Caliper | CCH101-1 |
| 3 | To measure the diameter of bob and thickness of plate by using Micrometer screw gauge | CCH101-1 |
| 4 | To determine forbidden energy band gap in semiconductors | CCH101-2 |
| 5 | To determine the viscosity of liquid by Stokes method. | CCH101-3 |

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 6 | To determine the buoyancy force on a solid immersed in a liquid | CCH101-3 |
| 7 | To measure unknown resistance of wire by Ohm's law | CCH101-4 |
| 8 | To verify series law of resistances | CCH101-4 |
| 9 | To verify parallel law of resistances | CCH101-4 |
| 10 | To draw magnetic lines of force for given magnet by using magnetic compass | CCH101-4 |
| 11 | To verify Snell's law using glass slab | CCH101-5 |
| 12 | To study variation of δ with i for a prism by pin method | CCH101-5 |
| 13 | To study Total Internal Reflection using glass slab | CCH101-6 |
| 14 | To be added by the subject teacher as per requirement | |

## II) Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH101-1 Estimate errors in measurement in Physical quantities. | | | |
| 1 | **UNITS AND MEASUREMENT**<br>1.1 Unit, Physical Quantities : Fundamental and Derived Quantities and their units<br>1.2 Systems of units : CGS, MKS, FPS and SI<br>1.3 Errors , Types of errors : Instrumental, Systematic and Random error, Estimation of errors : Absolute, Relative and percentage errors<br>1.4 Significant figures<br>1.5 Ancient Astronomical Instruments : Chakra, Dhanuryantra, Yasti and Phalaka yantra(IKS learning)<br>1.6 **SimpleNumerical problems** | **10** | **12** |
| CO: CCH101-2Express the importance of Semiconductors and nanotechnology. | | | |
| 2 | **INTRODUCTION TO SEMICONDUCTORS AND NANOTECHNOLOGY**<br>**2.1 SEMICONDUCTORS**<br>2.1.1 Conductors, insulators and semiconductors<br>2.1.2 Energy bands<br>2.1.3 Intrinsic and extrinsic semiconductors<br>2.1.4 Minority and majority charge carriers<br>2.1.5 P and N type semiconductors<br>2.1.6 Properties of semiconductors<br>2.1.7 Applications of semiconductors<br>**No numericals on above topic** | **08**<br>(06) | **08**<br>(06) |

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| | **2.2 Nanotechnology**<br>2.2.1 Definition of nanoscale, nanometer, nanoparticle<br>2.2.2 Definition and examples of nanostructured materials<br>2.2.3 Applications of nanotechnology in electronics, automobile, textile, space, medicine, cosmetics and environment<br>**No numericals on above topic** | (02) | (02) |
| CO: CCH101-3Select proper material in engineering industry by analysis of its physical properties. | | | |
| 3 | **PROPERTIES OF MATTER** | **12** | **14** |
| | **3.1 ELASTICITY**<br>3.1.1 Definitions of elasticity, plasticity, rigidity, deforming force, restoring force<br>3.1.2 Stress, Strain and their types<br>3.1.3 Elastic Limit, Statement of Hooke's law<br>3.1.4 Modulusof elasticity and its types, Relation between Y, K and η (No derivation)<br>3.1.5 Ultimate stress, breaking stress, Working stress, Factor of safety<br>3.1.6 Applications of elasticity<br>3.1.7 **SimpleNumerical problems** | (06) | (10) |
| | **3.2 VISCOSITY**<br>3.2.1 Definition and meaning of viscosity, velocity gradient<br>3.2.2 Newton's law of viscosity, Coefficient of viscosity<br>3.2.3 Stokes law<br>3.2.4 Derivation of expression for coefficient of viscosity of liquid by Stokes method<br>3.2.5 Effect of temperature and adulteration on viscosity ofliquids<br>3.2.6 Applications of viscosity<br>**No numericals on above topic** | (06) | (04) |

## Section –II

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH101-4 Apply principles of electricity and magnetism to solve engineering problems | | | |
| 4 | **ELECTRICITY AND MAGNETISM**<br><br>**4.1 ELECTRICITY**<br>4.1.1 Concept of charge, Coulomb's inverse square law,<br>4.1.2 Electric field, Electric field intensity<br>4.1.3 Electric potential and potential difference<br>4.1.4 Electric current, Resistance, Ohm's law<br>4.1.5 Specific resistance<br>4.1.6 Resistances in series and parallel<br>4.1.7**SimpleNumerical problems**<br><br>**4.2 MAGNETISM**<br>4.2.1 Magnetic field and magnetic field intensity and its units<br>4.2.2 Magnetic lines of force,magnetic flux<br>**No numericals on above topic** | **10**<br><br>(06)<br><br>(04) | **12**<br><br>(08)<br><br>(04) |
| CO: CCH101-5 Apply principles of optics to solve engineering problems | | | |
| 5 | **OPTICS**<br><br>**5.1 PROPERTIES OF LIGHT**<br>5.1.1 Refraction of light<br>5.1.2 Laws of Refraction of Light, Snell's law<br>5.1.3 Refraction through glass prism<br>5.1.4 Dispersion & Dispersive Power (in terms of angles of deviation only)<br>5.1.5 **SimpleNumerical problems**<br><br>**5.2 LASER**<br>5.2.1 Introduction of LASER<br>5.2.2 Properties of laser<br>5.2.3 Spontaneous and stimulated emission<br>5.2.4 Population inversion and optical pumping<br>5.2.5 Applications of LASER<br>**No numericals on above topic**<br><br>**5.3 X-RAYS**<br>5.3.1 Nature and properties of x-rays.<br>5.3.2 Production of x-rays by Coolidge tube<br>5.3.3 Applications of x-rays<br>**No numericals on above topic** | **14**<br><br>(06)<br><br>(04)<br><br>(04) | **18**<br><br>(08)<br><br>(06)<br><br>(04) |

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH101-6 Apply principles of fiber optics for related engineering applications | | | |
| 6 | **FIBER OPTICS**<br>6.1 Optical communication link<br>6.2 Principle of optical fiber (TIR)<br>6.3 Structure of optical fiber<br>6.4 Propagation of light in optical fiber<br>6.5 Advantages of optical fibers over conventional metal conductors<br>6.6 Applications of optical fibers<br>**No numericals on above topic** | **06** | **06** |

** No questions will be asked on IKS learning subtopics in any question papers.

## G : List of Microprojects/Assignments/Other Activities under SLA

| Sr.No. | List of Microprojects (any one of the following under SLA) | Hrs Allotted |
|---|---|---|
| 1 | Prepare chart showing multipliers required for converting units of physical quantities. | 02 |
| 2 | Prepare prototype vernier caliper of desired least count using card sheet. | 02 |
| 3 | Collect information about ancient astronomical instruments like Chakra, Dhanuryantra, Yasti and Phalaka yantra. | 02 |
| 4 | Collect different materials such as metal, plastic, glass etc and prepare models to show their electrical conductivity. | 02 |
| 5 | Collect different sizes of same material (eg. sugar, salt etc) and list the physical/elerical/optical/chemical/mechanical characteristics for each of them. | 02 |
| 6 | Prepare chart showing the three types of modulus of elasticity developed in a material. | 02 |
| 7 | Prepare working model to differentiate liquids on the basis of viscosity. | 02 |
| 8 | Prepare chart/models to demonstrate magnetic lines of force of different types of magnets. | 02 |
| 9 | Prepare chart/models for series and parallel combination of resistances of different values. | 02 |
| 10 | Prepare a model to demonstrate the variation of angle of refraction with respect to angle of incidence. | 02 |
| 11 | Use keychain laser to differentiate laser with ordinary light. | 02 |
| 12 | Prepare a presentation for application of x-rays in different fields. | 02 |
| 13 | Prepare a model to demonstrate total internal reflection. (For EE/ET/IT students) | 02 |

| | OR | |
|---|---|---|
| Sr.No | List of Assignment (any one of the following under SLA) | Hrs Allotted |
| 1 | Write fundamental and derived Physical quantities with their SI units | 02 |
| 2 | Enlist the rules used to decide significant figures in measurements. | 02 |
| 3 | Write points to differentiate conductors, semiconductors and insulators on the basis of energy band diagram. | 02 |
| 4 | List applications of semiconductors in Civil, Mechanical, Electrical, Information Technology, Electronics and Telecommunication, Metallurgical Engineering etc. | 02 |
| 5 | Write down the applications of nanotechnology in the field of electronics, cosmetics, textile, environment, medical, space and defense, automobiles. | 02 |
| 6 | Write applications of elasticity. | 02 |
| 7 | Explain free fall of a sphere in a liquid column. | 02 |
| 8 | Write information of electric lines of force and magnetic lines of force. | 02 |
| 9 | Explain conversion of galvanometer into ammeter/voltmeter of desired range. | 02 |
| 10 | Draw ray diagrams showing different phenomena of light (reflection, refraction, dispersion etc). | 02 |
| 11 | Enlist the properties and applications of laser. | 02 |
| 12 | Explain production of X-rays using Coolidge tube. | 02 |
| 13 | Draw and explain of optical fiber communication link. (For EE/ET/IT students). | 02 |
| | OR | |
| Sr.No | List of Activity (any one of the following under SLA) | Hrs Allotted |
| | Any course related activity assigned by the course teacher. | 02 |

****One microproject/ assignment/ given activity is to be completed during the semester.**

## H : Specification table for setting question paper for semester end theory examination

| Section / Topic no. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Units and measurements | 2 | 4 | 6 | 12 | CCH101-1 |
| I / 2 | Introduction to Semiconductors and Nanotechnology | 2 | 2 | 4 | 08 | CCH101-2 |
| I / 3 | Properties of matter (Elasticity and Viscosity) | 4 | 2 | 8 | 14 | CCH101-3 |
| II /4 | Electricity and Magnetism | 2 | 4 | 6 | 12 | CCH101-4 |
| II /5 | Optics (Properties of light, Laser & X-rays) | 6 | 6 | 6 | 18 | CCH101-5 |
| II / 6 | Fiber Optics | 2 | 2 | 2 | 06 | CCH101-6 |
| | Total Marks | | | | 70 | |

# I :-Assessment Criteria

### i) Formative Assessment of Practical:-

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Domain | Particulars | Marks out of 25 |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Presentation ( Observations, calculations & Result table) | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing skills (Neat & complete circuit Diagram / schematic Diagram) | 05 |
| Affective | Discipline and punctuality | 05 |
| **TOTAL** | | **25** |

### ii) Summative Assessment of Practical :

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Sr.no | Criteria | Marksallotted |
|---|---|---|
| 1 | Attendanceatregularpractical | 05 |
| 2 | Preparednessforpractical | 05 |
| 3 | Neat& completeDiagram / observation table | 05 |
| 4 | Observations / Calculations / Result / Graph | 05 |
| 5 | Safety / use of proper tools | 05 |
| **TOTAL** | | **25** |

### iii) Assessment of SLA :-

Every Self-learning assignment shall be assessed for 25 marks as per following criteria:

| Sr.no | Criteria | Marksallotted |
|---|---|---|
| 1 | Attendance | 05 |
| 2 | Preparednessand workmanship | 05 |
| 3 | Presentation (neat figures/ diagrams/ tables/ graphs etc.) | 05 |
| 4 | Conclusion / Inference | 05 |
| 5 | Oral Based on microproject/ assignment/ activity | 05 |
| **TOTAL** | | **25** |

# J) Instructional Methods:

1. Lectures cum Discussions
2. Regular Home Assignments
3. Laboratory work

4.Use of projector and soft material for demonstration

# K) Teaching and Learning resources:

1. Chalk board 2. Video clips 3.Slides 4. Item Bank 5. Charts

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Text book of Physics for class XI & XII (Part-I, II) | Narlikar | N.C.E.R.T Delhi |
| 2 | Engineering Physics | P.V.Naik. | Pearson Edu. Pvt. Ltd, New Delhi. |
| 3 | Concepts in Physics, Vol. I & II. | Narkhede, Pawar, Sutar | Bharti Bhawan Ltd, New Delhi. |
| 4 | Principles of Physics. | Walker, Halliday, Resnik | Wiley Publication. , New Delhi. |
| 5 | Engineering Physics | B.L. Theraja | S. Chand Publishers – New Delhi |
| 6 | Concept of modern physics | Beiser | Tata Mc-Graw Hill |
| 7 | Physics for Technicians | E. Zebro Wski | Tata Mc-Graw Hill |
| 8 | Engineering Physics | V. Rajendran | Tata McGraw-Hill Publications |
| 9 | The Archaic and The Exotic : Studies in the history of Indian astronomical instruments | Steeramula Rajeswara Sarma | Manohar Book Services |
| 10 | The Surya Siddhanta | Aryabhatta | Baptist Mission Press, Calcutta |

## M) Learning Website & Software

1) http://www.physicsclassroom.com
2) http://scienceworld.wolfram.com/physics/
3) http://physics.about.com/
4) http://nptel.ac.in/course.php?disciplineId=115
5) http://nptel.ac.in/course.php?disciplineId=104
6) www.fearofphysics.com
7) www.science.howstuffworks.com
8) www.iksindia.org

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## COURSE ID:

**Course Name : FUNDAMENTALS OF BASIC ELECTRONICS**
**Course Code : ITH 102**
**Course Abbreviation : HFOE**

## TEACHING AND EVALUATION SCHEME:

**Pre-requisite Course(s) : Semiconductor physics**

### 1. TEACHING-LEARNING & ASSESSMENT SCHEME :

| Course Code | Course Title | Abbr | Course Category/s | Learning Scheme | | | | | Credits | Assessment Scheme | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration | Theory | | | | Based on LL & TSL | | | | Based on SL | | Total Marks |
| | | | | | | | | | | | | | | | Practical | | | | | | |
| | | | | CL | TL | LL | | | | | FA-TH | SA-TH | Total | | FA-PR | | SA-PR | | SLA | | |
| | | | | | | | | | | | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | |
| ITH 102 | FUNDAMENTALS of Basic Electronics | HFOE | AEC | 2 | - | 2 | 2 | 6 | 3 | - | - | - | - | - | 50 | 20 | 50@ | 20 | 25 | 10 | 125 |

## RATIONALE:

In today's world most of the consumer appliances are based on electronic circuits and devices. The foundation for working of computer or any of its peripherals are based on electronics. This course has been designed to develop skills to understand and test simple electronic components and circuits. After studying this course students will develop aninsight to identify, build and troubleshoot simple electronic circuits.

## COMPETENCY:

**Maintain electronic circuits in computer systems comprising of discrete electronicscomponents**

**Cognitive:** Identify and illustrate the operation of basic electronics devices.

**Psychomotor:** Maintain and operate simple basic electronics circuit.

**Affective:** Attitude of i) Identify ii) Draw iii) Operate v) Test

## COURSE OUTCOMES:

**ITH102-1:** Identify electronic component in electronic circuits

**ITH102-2:** Identify and handle semiconductor diodes.

**ITH102-3:** Examine and operate DC regulated power supply.

**ITH102-4:** Conversion of number systems and operate logic gates.

## COMPETENCY, COURSE OUTCOMES AND PROGRAMME OUTCOMES (CP-CO-PO)MATRIX:

**[Note: Correlation levels: 1**: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "-": no correlation]

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1 Design and development** | **PSO2 Database and Network management** |
| **Competency : Maintain electronic circuits in computer systems comprising of discrete electronics components** | | | | | | | | | |
| ITH102-1 | | | | | | | | | |
| ITH102-2 | | | | | | | | | |
| ITH102-3 | | | | | | | | | |
| ITH102-4 | | | | | | | | | |



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**LABORATORY WORK:**

**Laboratory experiments and related skills to be developed:**

| Sr No. | Title of Practical Exercise | Skills / Competencies to be Developed | Course Outcome |
|---|---|---|---|
| 1. * | Identification and operate electronic equipment in basic electronics laboratory | 1) Identify and operate different electronic equipment for voltage measurement.<br>2) Operate DMM, Regulated power supply,<br>3) Illustrate the use of breadboard | ITH102-1 |
| 2* | Identification electronic equipment in basic electronics laboratory | 1) Identify and operate different electronic equipment for voltage and frequency measurement.<br>2) CRO, function generation. | ITH102-1 |
| 3. * | Test different types of resistors and inductors | 1) Identify different types of resistor and inductors<br>2) Find value of different types of resistor and inductors using color code and Multimeter/LCR meter and compare them | ITH102-1 |
| 4. * | Test different types of capacitors. | 1) Identify different types of capacitors<br>2) Find value of different types of capacitors using LCR meter and color code and compare them | ITH102-1 |
| 5. * | Test the performance of PN junction diode | 1) Build the circuit as per circuit diagram<br>2) Record the observed readings in observation table<br>3) Draw the forward & reverse characteristics of PN junction diode | ITH102-2 |
| 6. * | Test Zener voltage regulator for given voltage | 1) Build the circuit as per circuit diagram<br>2) Record the readings in observation table<br>3) Plot the graph for line and load regulation | ITH102-2 |
| 7. | Test the full wave center-tapped rectifier circuiton breadboard | 1) Construct the circuit as per circuit diagram<br>2) Record the waveform displayed on the oscilloscope according to the setting of VOLT/DIV | ITH102-3 |



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| | | | |
|---|---|---|---|
| | | 3) Record readings measured in observation table | |
| 8. | Test the full wave bridge rectifier circuit. | 1) Construct the circuit as per circuit diagram<br>2) Record the waveform displayed on the oscilloscope according to the setting of VOLT/DIV | ITH102-3 |
| 9. * | Test the full wave bridge circuit rectifier with C-filter | 1) Construct the circuit as per circuit diagram<br>2) Record the waveform displayed on the oscilloscope according to the setting of VOLT/DIV | ITH102-3 |
| 10. * | Test the performance of Regulator IC's: IC 78XX | 1) Build the circuit as per circuit diagram for regulator ICs<br>2) Record the reading in observation table | ITH102-3 |
| 11. | Test the performance of Regulator IC's: IC 79XX. | 3) Build the circuit as per circuit diagram for regulator ICs<br>4) Record the reading in observation table | ITH102-3 |
| 12.* | Test the working of the BJT as a switch | 1) Construct the circuit as per circuit diagram<br>2) Test the BJT as ON switch<br>3) Test the BJT as OFF switch. | ITH102-4 |
| 13.* | Test the working of the BJT as a inverter | 1) Construct the circuit as per circuit diagram<br>2) Observe the working of BJT as Inverter | ITH102-4 |
| 14* | Test Basic Logic Gates and verify Truth Table. | Realize of Basic logic gates and verify their truth table | ITH102-5 |
| 15* | Test NAND and NOR Gates and verify Truth Table. | Testing NAND and NOR gates and verify their truth table | ITH102-5 |

**CONTENT:**

**C. Suggested Practical's/ Exercise**

**Practical Exercises and related skills to be developed:**

The following practical exercises shall be conducted as practical and assess the student for attainment of the competency (any 12 experiments).The experiments numbered from 08 onwards can be demonstrated by using simulation software or virtual labs.

**"*" Indicates compulsory experiments to be conducted**



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**D. THEORY:**

**SECTION-I**

| Sr. No. | Topics / Sub-topics | Lectures (Hours) | Theory Evaluation (Marks) |
|---|---|---|---|
| *ITH102-1 Identify electronic component in electronic circuits* | | | |
| **01** | **Electronics components (R,L,C)**<br>1.0Components definition-discrete, non discrete, Active, passive<br>1.1Resistor:<br>1.2.1 Definition<br>1.2.2 General Symbol, Unit<br>1.2.3 Working Principle of Resistor<br>1.2.4Classification of resistors (No description)<br>1.2.5Resistors general specifications-Maximum voltage rating, power rating ,temperature coefficient ,tolerance , ohmic range, operating Temperature<br>1.2.6Resistor color coding with three, four, fiveBands<br>1.2.7 Applications<br>1.2 Capacitor<br>1.2.1 Definition<br>1.2.2 General Symbol, Unit<br>1.2.3 Working Principle of capacitor<br>1.2.4 Classification of capacitors (No description)<br>1.2.5 Color code of capacitor<br>1.2.6 Applications<br>1.3 Inductor<br>1.3.1 General Symbol, Unit<br>1.3.2 Inductor specifications –Self-inductance, Mutual inductance<br>1.3.3 Types of inductor (No description)<br>1.3.4 Color Coding of inductor<br>1.3.5 Applications | **05** | |



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| *ITH102-2 Identify and handle semiconductor diode and operate DC regulated power supply* | | | |
|---|---|---|---|
| **2** | **DC regulated power supply**<br><br>**2.1 P.N. junction diode: Ge & Si**<br>2.1.1Constructional features.<br>2.1.2Operating principle.<br>2.1.3 V-I Characteristics.<br>2.1.4 Applications.<br>**2.2 Rectifiers:**<br>2.2.1 Definition: Rectification, rectifier<br>2.2.2 Need of rectification<br>2.2.3 Classification of rectifier<br>2.2.4 Half wave rectifier and full wave rectifier (Center-tapped and bridge): Circuit diagram, Operation and waveforms,<br>2.2.5 Parameters its definition and values for corresponding rectifier:<br>(i) Average output voltage and current<br>(ii) Ripple factor<br>(iii) Rectifier efficiency<br>(iv) Peak Inverse Voltage<br>(v) Transformer Utilization Factor<br>2.2.6 Comparison of rectifier<br>**2.3 Filter**<br>2.3.1Need of filter<br>2.3.2 Types of filter-<br>(i) Shunt capacitor<br>(ii)Series inductor<br>(iii) LC Filter<br>(iv) CLC filter<br>Operation of shunt capacitor filter w.r.t full wave bridge Rectifier only<br>**2.4 Zener diode**<br>2.4.1 Break down mechanism in semiconductors: Zener breakdown and Avalanche breakdown<br>2.4.2 Constructional features<br>2.4.3 Operating principle<br>2.4.4 V-I characteristics<br>2.4.5 Application: Zener as a voltage regulator<br>**2.5 Voltage regulators**<br>2.5.1 Need of regulators<br>2.5.2 Line regulation<br>2.5.3 Load regulation<br>2.5.4 Block diagram of regulated power supply<br>2.5.5I C78XX and IC 79XX series voltage regulators | **10** | |



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| | | | |
|---|---|---|---|
| | ***ITH102-3 Illustrate use bipolar junction transistor in electronic circuits*** | | |
| **3.** | **Bipolar Junction Transistor(BJT)**<br>3.1 BJT-Types, symbols<br>3.2 Construction of BJT.<br>3.3 Operating principles of NPN transistor<br>3.4 Transistor configurations<br>3.5Modes of operation: Active, Cut-off, Saturation<br>3.6Transistor Biasing<br>3.6.1 Need of Transistor biasing<br>3.6.2Types of biasing (only types, no description)<br>3.7Single stage amplifier<br>3.7.1 Circuit Diagram<br>3.7.2 Working principle with input and output waveforms<br>3.7.3Applications:<br>**i)** Operation of transistor as a switch<br>**ii)** Operation of transistor as a inverter | **06** | |
| | ***ITH102-4 Identify and illustrate use bipolar junction transistor in electronic circuits*** | | |
| **4** | **Number System and Logic Gates**<br>4.0 Terms Bit, Nibble, Byte, Word, Double Word<br>4.1 Introduction to Number systems-<br>4.1.1 Binary Number System<br>4.1.2Decimal Number System<br>4.1.3 Octal Number System<br>4.1.4Hexadecimal Number System<br>4.2 Conversion of one number system to another number system (integer and fractions)<br>4.3 Binary arithmetic addition, subtraction (1's and 2's complement)<br>4.4 Binary Multiplication, Binary Division<br>4.5 Logic Gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR (Logic diagram, Boolean Expression and Truth Table) | **09** | |
| | **Total** | **30** | |
| | Semester end exam question paper should be such that total marks of questionson each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only | | |


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**Specification table for setting question paper for semester end theory examination:**

| Topic No. | Name of topic | Distribution of marks (Cognitive level-wise) | | | Course Outcome | Total Marks |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Application | | |
| 1 | Electronics Components | | | | | |
| 2 | DC regulated power supply | | | | | |
| 3 | Bipolar Junction Transistor | | | | | |
| 4 | Number System | | | | | |
| | **Total >>** | | | | | |

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attemptquestions of the above allotted marks only.

## ASSESSMENT CRITERIA FOR PRACTICAL ASSIGNMENTS AND PRACTICALEXAMINATION

### b) Assessment Criteria for Practical Assignments :

#### i) Continuous Assessment of Practical Assignments:

Every practical assignment shall be assessed for 25 marks as per criteria given in *Laboratory Manual*

| Domain | Particulars | Marks out of 25 |
|---|---|---|
| Cognitive | Preparation for practical | 05 |
| Psychomotor | Operating skills | 05 |
| | Observation/Result | 05 |
| Affective | Discipline and punctuality | 05 |
| | Procedure/Safety Measures/Presentation | 05 |
| **TOTAL** | | **25** |

#### ii) Progressive Skill Test:

One mid-term *Progressive Skill Test* of 25 marks shall be conducted as per criteriagiven Final marks of term work shall be awarded as per *Assessment Pro-forma II.*

| Sr. No. | Criteria | Marks allotted |
|---|---|---|



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| | | |
|---|---|---|
| 1 | Neat & complete circuit Diagram / schematic Diagram. | 05 |
| 2 | Observations & Result Table | 05 |
| 3 | Sample Calculations with relevant Formulae. | 05 |
| 4 | Proper Graphs & Procedure / workmanship Safety measures | 05 |
| 5 | Oral Based on Term Work | 05 |
| | **Total** | **25** |


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**b) Assessment Criteria for Term-end Practical Examination:**

Every student has to perform one practical within 3 hours at semester end practicalexam which shall be assessed as per following criteria.

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1 | Preparedness for practical | 10 |
| 2 | Correct figures / diagrams | 10 |
| 3 | Observation Table | 10 |
| 4 | Result / calculations / graphs | 10 |
| 5 | Safety / use of proper tools / workmanship | 10 |
| | **Total** | **50** |

**Assessment at semester end practical exam as per Pro-forma II.*

## INSTRUCTIONAL STRATEGIES:

**Instructional Methods:**

1. Lectures cum Discussions 2. Regular Home Assignments. 3. Laboratory work

**Teaching and Learning Resources:**

1. Chalk board 2. Video clips 3.PPT 4. Item Bank 5. Charts

## REFERENCE MATERIAL :

**a) Books / Journals / IS Codes**

| Sr. No. | Author | Title | Publisher |
|---|---|---|---|
| 1. | V. K. Mehta | Principles of Electronics | S.Chand |
| 2. | B. L. Theraja | Basic Electronics | S.Chand |
| 3. | R.S.Sedha | A text book of Applied Electronics | S.Chand |
| 4. | G. K. Mithal | Applied Electronics | Khanna Publication |
| 5. | A. Motershed | Electronics Devices & Circuits | PHI Publication |
| 6. | Malvino | Electronics Principles | McGraw Hill |
| 7. | Bell, Devid | Fundamental of Electronics Devices and circuits | Oxford University |
| 8. | R P Jain | Modern Digital Electronics | Tata McGraw Hill Education, New Delhi,2016ISBN(13):978-0-07-066911-6 |



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**b) Websites**

i. www.nptel.iitm.ac.in
ii. www.learningaboutelectronics.com
iii. www.futurlec.com
iv. www.bis.org.in
v. www.electrical4u.com
vi. www.cadsoft.io
vii. www.electronics-tutorials.com

**c)** Mobile Apps:

i) Neso Academy
ii) EveryCiruit

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**COURSE ID: 04**

**Course Name : WEB PAGE DESIGN**

**Course Code : ITH 101**

**Course Abbreviation : HWPD**

## 1. TEACHING AND EVALUATION SCHEME:

**Pre-requisite Course(s) : NIL**

**Teaching Scheme: MPECS 2023**

| Scheme component | Hours / week | Credits |
|---|---|---|
| Theory | 3 | 3 |
| Practical | 2 | |

**Evaluation Scheme:**

| Course Code | Course Title | Abbr | Course Category /s | Learning Scheme | | | | | Credits | Assessment Scheme | | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration | Theory | | | | Based on LL &TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | | Practical | | | | | | |
| | | | | CL | TL | LL | | | | | FA-TH | SA-TH | Total | | FA-PR | | SA-PR | | SLA | | |
| | | | | | | | | | | | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | |
| ITH101 | WEB PAGE DESIGN | HWPD | DSC | 3 | - | 2 | 1 | 6 | 3 | 3 | 30 | 70 | 100 | 40 | 25 | 10 | 25@ | 10 | 25 | 10 | 175 |

(Total IKS Hrs for Sem. : 02 Hrs)

## 2. RATIONALE:

Web site design is a broad term that encompasses a wide variety of tasks, all involved in the format ion of web pages. There are essentially two types of web design approaches, which are dynamic and static design. Static web design is typically based on basic HTML code, it is essential for diploma student to learn HTML since the task of static website design is performed by using HTML coding. Even in dynamic websites, the task of presentation of content is handled through HTML coding. This course introduce web page design using HTML5 and also give emphasis on learning Cascading Style Sheets (CSS) which is a style sheet language used for describing the presentation of a document written in a markup language for formatting and styling of content, This learning enables students to design static websites and host it on Internet/Intranet.

## 3. COMPETENCY

- **Develop static interactive websites**

**Cognitive**: i) Design and write code simple web pages.

ii) Describe characteristics of CSS for effective formatting web pages.

**Psychomotor:** i) Surfing different types of web sites.

ii) Implementation of different types of websites.

**Affective:** Attitude of i) precision ii) accuracy iii) safety iv) punctuality

## 4. COURSE OUTCOMES:

**ITH101-1:** Describe web design Principles.

**ITH101-2:** Design web pages using different types of HTML tags.

**ITH101-3:** Apply HTML Programming concepts on web page.

**ITH101-4:** Organize content using table and frames and form.

**ITH101-5:** Apply presentation scheme on content using CSS.

**ITH101-6:** Publish website on internet or intranet

## 5. COMPETENCY, COURSE OUTCOMES AND PROGRAMME OUTCOMES (CP-CO-PO) MATRIX

**[Note: Correlation levels:** 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "-": no correlation]

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1 Design and development** | **PSO2 Database and Network management** |
| **Competency: Develop static interactive website** | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | - |
| **ITH101-1:** | 2 | 1 | - | - | 1 | - | 2 | 1 | - |
| **ITH101-2** | - | 2 | 1 | 1 | 1 | - | - | 1 | - |
| **ITH101-3:** | 1 | 2 | 2 | 1 | - | - | - | 1 | - |
| **ITH101-4:** | - | 2 | 2 | 2 | 1 | 1 | 1 | 2 | - |
| **ITH101-5:** | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | - |
| **ITH101-6:** | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | - |

## 6. LABORATORY WORK:

**Laboratory experiments and related skills to be developed:**

**(Practical's marked in * are compulsory and others are optional)**

| Sr. No | Title of Experiment | Skills to be developed | Course outcome |
|---|---|---|---|
| 1* | Create a simple web page using structure tags | 1.To write code of a simple web page using HTML | ITH101-2 |
| 2* | Design a web page and apply block level tags and HR tags. | 1. To apply various block level tags in web pages.<br>2. Create a web page for displaying a paragraph using block level tags, HR tags. | ITH101-2 |
| 3* | Create a web page and apply text level tags. | Create a Web Page using Text level tags and Special Characters | ITH101-2 |
| 4* | To include Lists in web page | Create a web page for implementing different types of Lists.<br>1.Ordered List<br>2.Unordered List | ITH101-3 |
| 5* | Design webpage with various hyperlinks | To add hyperlinks -<br>1. To document in the same folder.<br>2. To document in the different folder.<br>3. To document on the web.<br>4. To specific section within the document.<br>5. To set colors for hyperlinks, active links and visited link | ITH101-3 |
| 6* | Create webpage to include images with different alignments | 1. To understand concept of various attributes of <IMG> tag.<br>2. To use image as a hyperlink | ITH101-3 |
| 7* | Design webpage using MARQUEE tag and embed tag. | Apply multimedia effect to a webpage. | ITH101-3 |
| 8* | To create HTML table, format contents in a table cells and span the rows and columns. | 1. To understand use of <TABLE> tag and its attributes.<br>2. Apply formatting contents in tables on web page<br>3 Apply colors in tables on web page<br>4. Merging cells in tables on web page | ITH101-4 |
| 9* | Create basic frames using different attributes<br>And design a web page using iframe tag | 1. To understand use of frames in layout of web page.<br>2. Apply <iFRAME> tag and its attributes | ITH101-4 |
| 10* | To create a basic login form using form controls | 1. To understand use of <FORM> element and its attributes. | ITH101-4 |

| | | | |
|---|---|---|---|
| | | 2. Apply form input controls like text field, password field and multiple line text field controls.<br>3. To use pull down menu in web pages<br>4. To use buttons in web pages | |
| 11* | To use table to layout form with the different form controls and generalized buttons. | 1. To understand concept of <TABLE> tag and its attributes.<br>2. Apply table tags to layout form with different form controls | ITH101-4 |
| 12* | To create web page and apply internal style sheet properties | 1. To understand the concept of style sheet.<br>2. Adding style sheets to a document, linking to a Style Sheet.<br>3.Use font, text and box properties of style sheets | ITH101-5 |
| 13 | To create web page and apply external style sheet properties | 1. Adding style sheets to a document, linking to a Style Sheet.<br>2.Use font, text and box properties of style sheets | ITH101-5 |
| 14* | Design webpage using HTML5 semantic elements and html5 graphics and canvas elements | 1.Use HTML5 semantics:<br>Marking Text, Indicating Dates and Time, Inserting Figures, Specifying Navigation<br>2.Apply HTML5 Graphic and Multimedia Element <SVG> , <canvas>, <audio>,<Video> | ITH101-6 |
| 15 | Install web server and publish website. | Install a web server and publish a website on Intranet. | ITH101-6 |
| 16* | Development of Mini Project(Static website)<br>Host this website on free hosting servers. | 1. Development of static informative websites as per user requirement.<br>For example- 1) Website for Hotel<br>2) Website for Universities, Tourism | ITH101-6 |

## 7. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING SKILLS DEVELOPMENT (SELF LEARNING)

**Self-Learning**

Following are some suggestive self-learning topics: 1) Use ChatGPT/any other AI tool to explore new ideas for web development. 2) Browse and observe features of different types of websites. 3) Identify different host servers for hosting static website

**Assignment**

Prepare journal of practical performed in the laboratory.

**Micro project**

The micro project has to be industry application based, internet-based, workshop-based, and laboratory-based as suggested by Teacher.

a. Website for Universities and Colleges

b. Website for book shop, grocery store and others.

c. Web site for any Vehicle Showroom.

d. Website for Hospital facilities.

e. Website for Travel and Tourism Agency.

f. Website related to any sports. (Ex. Cricket, Tennis)

## 8. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

| Sr.No | Equipment Name with Broad Specifications |
|---|---|
| 1 | a) Computer System with all necessary Peripherals and Internet connectivity. b) Any Text editor and Browser c) Web server |

## 9. CONTENT:

### SECTION I

| Sr. No. | Topics / Sub-topics | Lectures (Hours) | Theory Evaluation (Marks) |
|---|---|---|---|
| **Course Outcome ITH101-1*:* Describe web design Principles** | | | |
| **1** | **Introduction to Web**<br>1.1 Basic principles involved in developing a web site, Planning Process, Five Golden rules of web designing, Web standards, Audience requirement.<br>1.2 **Web Terminologies:** Internet, ISP, Web Browser, URL, WWW, HTTP, Web page, Web Server, Search Engine, URL, Domain, Hyperlink and Static vs. dynamic websites.<br>1.3 HTML History, Components of HTML: Tags – closed tags and open tags, Attributes, Elements | 07 | 10 |
| **Course Outcome ITH101-2: Design Web pages using different types of HTML tags.** | | | |
| **2** | **Basics of HTML**<br>2.1 **Structure Tags:** !DOCTYPE, HTML, HEAD, TITLE, BODY tags<br>2.2 **Block Level Elements:** Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Types of Address<br>2.3 **Text Level Elements:** Bold, Italic, Teletype, Underline, Strikethrough, Superscript, subscript, DIV tag.<br>2.4 Horizontal Rules, Special characters (HTML Symbols), Adding comments, | 07 | 12 |
| **Course Outcome ITH101-3: Apply HTML Programming Concepts on web Page** | | | |
| **3** | **HTML Programming**<br>3.1 **List:** Ordered, Unordered Lists, Definition Lists and Nested Lists.<br>3.2 **URL :** Types of URLs, Absolute URLs, Relative URLs<br>The Anchor Tag: Linking various documents for internal & external use.<br>3.3 **Images:** Image Formats, Inserting Image using IMG tag, alternate text, image alignment, HSPACE, VSPACE, wrapping text, height and width of images, image as a link, image maps.<br>3.4 **Multimedia:** MARQUEE Tag, EMBED tag.<br>3.5 **Colors and Backgrounds:** Text color, Background color, Font color, link color, inserting image as page background | 08 | 12 |

**SECTION II**

| Sr. No. | Topics / Sub-topics | Lectures (Hours) | Theory Evaluation (Marks) |
|---|---|---|---|
| **Course Outcome ITH101-*4:* Organize Contents Using Tables, Frames and Forms** | | | |
| **4** | **Advanced HTML**<br>**4.1 Table:** Table tag with attributes, TABLE, TR, TH, TD tags, Border, cell spacing, cell padding, width, align, bgcolor attributes,rowspan,colspan attributes, CAPTION tag.<br>**4.2 Frames:** Types of Frames with their of attributes, FRAMESET tag with its attributes, Use of NOFRAMES tag, concept of iframes<br>**4.3 Forms:** Form tag, action and method attribute, Form Fields: Single line text field, password field, multiple line text area, Radio buttons, and check boxes, SELECT and OPTION tags, Submit, Reset button. | 08 | 12 |
| **Course Outcome ITH101-*5: Apply presentation scheme on content using CSS*** | | | |
| **5** | **Introduction to Cascading Style Sheets**<br>**5.1 Cascading Style Sheet:** Different Types of Style sheets, Benefits of Using CSS **,**adding style to the document: Linking to style sheets, Embedding style sheets, Using Inline style,Selectors:CLASS rules, ID rules<br>**5.2 Style Sheet Properties:** Font,Text,box,color and background Properties**,** Creating and Using a simple external CSS file, Using the internal and inline CSS, background and color gradients in CSS setting font and text in style sheet using table layout.. | 07 | 12 |
| **Course Outcome ITG102-5: Publish website on internet or intranet** | | | |
| **6** | **Introduction of HTML 5 and Web site Hosting**<br>6.1 **Introducing HTML5**: features, removed old elements list, new elements list with features, new attributes in HTML5, adding semantics: Marking Text, Indicating Dates and Time, Inserting Figures, Specifying Navigation,HTML5 Graphics and Multimedia Elements: <SVG>,<canvas>, <audio>,<Video> tags.<br>6.2 **Website Hosting**: Concept of Internet and Intranet, Publishing website on Intranet, Installing and configuring web server, Uploading files on intranet site, access intranet based website, Publishing website on Internet, hiring web space, Uploading files using FTP, Virtual Hosting, access Internet based website. | 08 | 12 |

## 10. SPECIFICATION TABLE FOR SETTING QUESTION PAPER FOR SEMESTER END THEORY EXAMINATION:

| Section / Topic no. | Name of topic | Distribution of marks (Cognitive level-wise) | | | Course Outcome | Total marks |
|---|---|---|---|---|---|---|
| | | **Remember** | **Understand** | **Application** | | |
| I / 1 | Introduction To Web | 2 | 4 | 4 | ITH101-1 | 10 |
| I / 2 | Basics of HTML | 2 | 4 | 4 | ITH101-2 | 12 |
| I / 3 | HTML Programming | 2 | 4 | 6 | ITH101-3 | 12 |
| II/ 4 | Advanced HTML | 4 | 4 | 6 | ITH101-4 | 12 |
| II / 5 | Introduction to CSS | 4 | 4 | 6 | ITH101-4 | 12 |
| II/6 | HTML5 and Website Hosting | - | 4 | 6 | ITH101-5 | 12 |
| **TOTAL** | | **14** | **24** | **32** | **----** | **70** |

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

## 11. ASSESSMENT CRITERIA FOR TERM WORK AND PRACTICAL EXAMINATION

**a) Assessment Criteria for Term work :**

**i) Continuous Assessment of Practical Assignments:**

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Domain | Particulars | Marks out of 50 |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| Affective | Discipline and punctuality | 05 |
| | Decency and presentation | 05 |
| **TOTAL** | | **25** |

**b) Progressive Skills Test :**

**Criteria for Continuous Assessment of Practical work and Progressive skill Test:**

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1 | Attendance at regular practical | 05 |
| 2 | Preparedness for practical | 02 |
| 3 | Neat & complete Diagram. | 04 |
| 4 | Observations & computer handling skill | 02 |
| 5 | Use of toolbar, menu bar and short cut keys. | 04 |
| 6 | Logical thinking and approach | 04 |
| 7 | Oral Based on Lab work and completion of task | 04 |
| | TOTAL | 25 |

Assessment at semester end practical exam as per Pro-forma II.

**Criteria for assessment at semester end practical exam:**

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1. | Technical ability | 20 |
| 2. | Communication skill | 10 |
| 3. | Logical approach | 20 |
| | **TOTAL.** | 50 |

## 12. INSTRUCTIONAL STRATEGIES:

**Instructional Methods:**

1. Lectures cum Discussions
2. Regular Home Assignments.
3. Laboratory experiences and laboratory interactive sessions

**Teaching and Learning resources:**

1. Chalk board 2.Slides(PPT) 3. Self-learning Online Tutorials

## 13. REFERENCE MATERIAL:

### a) Books / Codes

| S. No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1. | HTML and XHTML – The complete reference | Powell, Thomas | Tata McGraw Hill, New Delhi, 2014, ISBN: 9780070701946 |
| 2. | Learning Web Design | Robbins | O'Reilly, London, 2012 ISBN 10:1-4493-1927-0 |
| 3. | Teach Yourself HTML & CSS in 24 Hours | SAMS | Pearson Education Publication, New Delhi, 2015, **ISBN:** 978-672336140 |
| 4. | HTML,XHTML and CSS | Bohem, Anne | Murach's Publication, New York, 2013, ISBN 13: 978-1890774578 |
| 5. | HTML 5 Black Book(second edition) | DT Editorial services | Dreamtech Publication, New Delhi, **ISBN:** 978-9350040959 |

### b) Websites

i. http://www.w3schools.com/html
ii. https://www.tutorialspoint.com/html/index.htm
iii. http://www.html.net/
iv. http://www.2createawebsite.com
v. http://webdesign.about.com

***

**COURSE ID: 05**

**Course Name : IT WORKSHOP PRACTICE'S**

**Course Code : ITH103**

**Course Abbreviation: HWIT**

## 1. TEACHING AND EVALUATION SCHEME:

**Pre-requisite Course(s) : Nil**

**Teaching Scheme: MPECS 2023**

| Scheme component | Hours / week | Credits |
|---|---|---|
| Theory | 0 | 4 |
| Practical | 4 | |

**Evaluation Scheme:**

| Mode of Evaluation | Progressive Assessment | | | | | | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Theory | | | | Based on LL& TSL PRACTICAL | | | | Based on SL SLA | | Total Marks |
| | FA-TH | SA-TH | TOTAL | | FA-PR | | SA-PR | | | | |
| | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| Details of Evaluation | -- | -- | -- | -- | 25 | 10 | 50@ | 20 | 25 | 10 | 100 |

Total IKS Hrs for Sem. : 0 Hrs

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA - Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

## 2. RATIONALE:

A diploma engineer's day-to-day work involves interacting with computers, peripherals, and other business-related tools and equipment in a conventional office setting. They must be able to operate and care for the equipment properly. The ability to utilize and maintain certain system peripherals authentically is required for diploma graduates. Additionally, they must be capable of doing fundamental preventative and breakdown maintenance, interacting with peripheral devices, installing new devices, and assembling desktop computers. The purpose of this course is to help them acquire these crucial abilities through a variety of workshop-based activities.

## 3. COMPETENCY

**Apply Fundamental knowledge of computer system to work with simple applications.**

**Cognitive: i**) State the basic parts of a computer system and relationships among component.
ii) Describe characteristics and functions of CPU's, motherboard, RAM, Storage devices

**Psychomotor: i**) Identify computer system and Network ii) Perform simple computer maintenance operations

**Affective: Attitude** of i) Precision ii) Accuracy iii) Safety iv) Punctuality

## 4. COURSE OUTCOMES:

**ITH103-1***:* Carry-out elementary level maintenance of a PC.
**ITH103-2**: Create partitions and format hard disk drive.
**ITH103-3:** Install and configure Operating system.
**ITH103-4**: Configure different types of peripheral devices.
**ITH103-5**: Setup small Local Area Network.
**ITH103-6**: Use diagnostic software for fault finding in Computer system.

## 5. COMPETENCY, COURSE OUTCOMES AND PROGRAMME OUTCOMES (CP-CO-PO) MATRIX

**[ Note : Correlation levels :** 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "-" : no correlation **]**

| Competency And COs | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PO 1 Basic and discipline specific knowledge | PO 2 Problem analysis | PO 3 design/ development of solutions | PO 4 Engineering Tools, experimentation and testing | PO 5 Engineering practice for society, sustainability and environment | PO 6 Project management | PO 7 Life-long learning | PSO1 Design and development | PSO2 Database and Network management |
| **Competency: Perform simple maintenance operations on computer system, peripherals and Network. Set up small LAN** | 1 | 2 | 1 | 2 | 1 | - | 1 | - | 1 |
| **ITH103-1** | 1 | 1 | - | 3 | - | - | - | - | - |
| **ITH103-2** | 1 | - | - | 2 | - | - | - | 1 | - |
| **ITH103-3** | 1 | - | - | 2 | - | - | 1 | 1 | - |
| **ITH103-4** | - | - | - | 2 | - | - | 1 | - | - |
| **ITH103-5** | 1 | 1 | 1 | 2 | - | - | - | - | 1 |
| **ITH103-6** | - | 2 | 1 | 2 | - | - | - | - | 1 |

**6.CONTENT:**

**A) SUGGESTED PRACTICAL'S/ EXERCISE**

**A.1 Laboratory experiments and related skills to be developed:**

| Sr. No. | Title of Experiment | Skills to be developed | Number of hrs. | Course outcome |
|---|---|---|---|---|
| 1. | Desktop/laptop/server type identification and its specification | 1. Identify desktop/laptop by its type and verify its specifications<br>2. Identify type of server and verify its Specification | 2 | ITH103-1 |
| 2. | Identification and cleaning of Components | 1.Open PC Panel and Identify Components<br>2. Clean inside PC - Boards and Slots | 4 | ITH103-1 |
| 3. | Preventive Maintenance of PC | 1. Undertake Preventive Maintenance of PC using vacuum cleaner and simple tools | 2 | ITH103-1 |
| 4. | Perform Internal socket connections | 1. Connect/disconnect power socket and controller socket to disk drives and motherboard. | 2 | ITH103-1 |
| 5. | Perform BIOS settings | 1. Configure different BIOS settings in computer system | 2 | ITH103-1 |
| 6. | | 1. Partition and manage hard disk | | |

| | | | | |
|---|---|---|---|---|
| | Manage a Hard disk | 2. Format hard drives with different file systems. | 2 | ITH103-2 |
| 7. | Installation of Windows Operating System | 1. Install Operating System – Windows family (such as Windows 10, 11) | 2 | ITH103-3 |
| 8. | Installation of Unix family Operating System | 1. Install Operating System –Unix family (such as Linux/Ubuntu/Centos) | 2 | ITH103-3 |
| 9. | Peripheral devices cleaning | 1. Clean peripheral devices and connect it to computer | 4 | ITH103-4 |
| 10. | Installation of local and Network printer | 1. Install local printer by applying various types of configuration settings<br>2. Remove and mount cartridge, troubleshoot paper jam | 2 | ITH103-4 |
| 11. | Share devices, files and folders | 1. Share the printer, devices, folders on a network | 4 | ITH103-4 |
| 12. | Installation of scanner | 1.Install and configure scanner | 2 | ITH103-4 |
| 13. | Set Input/output devices | 1.Set and configure monitor/display, Speaker, Microphone and LCD Projector | 2 | ITH103-4 |
| 14. | Make CAT5, CAT6 Cable | 1. Prepare and test crossover and straight cable, CAT5, CAT6 Cable, using connector, crimping tools, splicer | 2 | ITH103-5 |
| 15. | Connect devices to external port | 1. Connect/disconnect LAN Cable, External Hard disk, Modem, LCD/DLP Projector | 2 | ITH103-5 |
| 16. | Networking devices connection | 1. Connect Modem, Hub/Switches/routers and verify the connection | 2 | ITH103-5 |
| 17. | Fiber optic cable construction | 1. Check different types of fiber optic cable's construction and connectivity | 2 | ITH103-5 |
| 18. | Connection of Switches/Hubs | 1. Connect two Switches/Hubs using normal and uplink port | 2 | ITH103-5 |
| 19. | Setup Wi-Fi environment | 1. Configure devices to setup Wi-Fi environment | 2 | ITH103-5 |
| 20. | Setup wired network environment | 1. Create a small wired network environment | 4 | ITH103-5 |
| 21. | Setup wireless I/O devices | 1. Set and configure blue tooth based wireless mouse, keyboard and other devices | 2 | ITH103-5 |
| 22. | Fault diagnostics | 1. Use diagnostic software for PC fault finding | 4 | ITH103-6 |
| 23. | Anti-viruses installation | 1. Install Antivirus and Configure various settings | 2 | ITH103-6 |
| 24. | Component replacement | 1. Replace internal components of PC | 4 | ITH103-6 |

## 7. MAJOR EQUIPMENT / INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will used in uniformity in conduct of experiments , as well as aid to procure equipment by authorities concerned.

| Sr. No | Equipment Name with broad specification |
|---|---|
| 1 | Computer system with all necessary components like: motherboard, random access memory (RAM), read- only memory (ROM), Graphics cards, sound cards, internal hard disk drives, DVD drive, network interface card |
| 2 | LCD/DLP Projector ( Epson EB-X49 XGA Projector Brightness: 3600lm with HDMI Port (Optional Wi-Fi). |
| 3 | Modems, hubs, switches, Router |
| 4 | Wi-Fi set-up with access point and repeater |
| 5 | Bluetooth based wireless mouse and keyboard or any other device |
| 6 | Cat5/Cat6 cable, with RJ 45 Connectors, LAN tester |
| 7 | Fiber optic cable with SC, ST, LC Connectors |
| 8 | Laser Printer |
| 9 | Scanner |
| 10 | Hub/Switches/Routers |
| 11 | Fault finding software, antivirus |
| 12 | Operating System, Hard Disk |
| 13 | Computer Maintenance kit |
| 14 | EXternal Hard Disk( 500 GB/1 TB) |
| 15 | Light vacuum cleaner, approx. 200 watts with brushes and accessories |

**8. CONTENT:**

**SECTION I / II**

| Sr. No. | Topics / Sub-topics | Lectures (Hours) | Theory evaluation Marks |
|---|---|---|---|
| | --- | --- | --- |

**9. ASSESSMENT CRITERIA FOR PRACTICAL ASSIGNMENTS AND PRACTICAL EXAMINATION**

**a) Assessment Criteria for Practical Assignments :**

**i) Continuous Assessment of Practical Assignments:**

Every practical assignment shall be assessed for 25 marks as per criteria given in *Laboratory Manual*

| Domain | Particulars | Marks out of 25 |
|---|---|---|
| Cognitive | Technical preparedness for practical | 05 |
| Psychomotor | Operating skills/Algorithm/ flowchart | 05 |
| | Observation/Logic/ Program/Result | 05 |
| Affective | Discipline and punctuality | 05 |
| | Procedure/ Decency/ Presentation | 05 |
| **TOTAL** | | **25** |

**ii)Progressive Skills Test :**

One mid-term *Progressive Skill Test* of 25 marks shall be conducted as per criteria given Final marks of term work shall be awarded as per *Assessment Pro-forma X.*

**b) Criteria for Continuous Assessment of Practical work and Progressive skill Test:**

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1 | Attendance at regular practical | 05 |
| 2 | Logical thinking and approach ,procedure followed to achieve the result | 05 |

| | | |
|---|---|---|
| 3 | Neat & complete Diagram and Output | 05 |
| 4 | Use of editors, frameworks | 05 |
| 5 | Oral Based on Lab work and completion of task | 05 |
| | TOTAL | 25 |

Assessment at semester end practical exam as per Pro-forma III.

**a) Assessment Criteria for Term-end Practical Examination:**

Every student has to perform one practical at semester end practical exam which shall be assessed as per following criteria.

**Criteria for assessment at semester end practical exam:**

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1. | Algorithm/ Flowchart and Program | 20 |
| 2. | Results/Observations/Output | 10 |
| 3. | Logical thinking and approach | 10 |
| 4. | Oral | 10 |
| | **TOTAL.** | 50 |

**Assessment at semester end practical exam as per Pro-formaIII*

## 10. INSTRUCTIONAL STRATEGIES:

**Instructional Methods:**

1. Lectures cum Discussions
2. Regular Home Assignments.
3.Laboratory experiences and laboratory interactive sessions

**Teaching and Learning resources:**

1. Chalk board 2.Slides(PPT) 3. Self-learning Online Tutorials 4. Computer Hardware parts.

## 11. REFERENCE MATERIAL:

**a) Books / Codes**


| Sr. No. | Author | Title | Publisher |
|---|---|---|---|
| 1. | James, K.L. | 1 The computer hardware installation, interfacing, troubleshooting and maintenance | PHI Learning, New Delhi, 2014 ISBN: 978-81-203-4798-4 |
| 2. | Minasi, Mark | The Complete PC Upgrade And maintenance Guide | BPB Publication, New Delhi ISBN:978-81-265- |

| | | | |
|---|---|---|---|
| | | | 0627-9 |
| 3. | Kadam, Sachin | Computer Architecture and Maintenance Vol.1 | Shroff Publication, Mumbai ISBN: 978-9350230244 |
| 4. | Craig Zacker, John Rourke | The Complete Reference PC Hardware | Mc Graw Hill Education ISBN- 13:978-0070436060 |

**b) Websites**

i) http://www.ciscopress.com/articles/article.asp?p=2086239&seqNum=4Essential Introduction to Computer
ii) http://www.instructables.com/id/Computer-Assembly/
iii) http://www.liutilities.com/how-to/operate-a-laptop-computer/
iv) https://video.search.yahoo.com/search/video?fr=mcafee&ei=UTF-8&p=hardware+maintenance+and+troublesho
v) geeksforgeeks.org/how-to-set-up-a-LAN-network
vi) https://www.youtube.com/watch?v=cc2fyg-B5WE

***

**COURSE ID: 06**
**COURSE NAME : FUNDAMENTALS OF ICT (CE/ME/EE/MT/ET/IT)**
**COURSE CODE : CCH202**
**COURSE ABBREVIATION : HICT**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 01 | 2 |
| | Tutorial Learning | - | |
| | LaboratoryLearning | 02 | |
| | SLH-SelfLearning | 01 | |
| | NLH-Notional Learning | 04 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL Practical | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| -- | -- | -- | -- | -- | 25 | 10 | 25@ | 10 | 25 | 10 | 75 |

**(Total IKS Hrs for Sem:00 Hrs)**

**C: ABBREVIATIONS:-** CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:**@InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Self learning includes micro project/ assignment/other activities.

## D. i)RATIONALE:-

In any typical business setup in order to carry out routine tasks related to create business documents, perform data analysis and its graphical representations and making electronic slide show presentations, the student need to learn various software as office automation tools like word processing applications, spreadsheets and presentation tools. They also need to use these tools for making their project reports and presentations. The objective of this course is to develop the basic competency in students for using these office automation tools to accomplish the job. This course also presents an overview of emerging technologies so that students of different discipline can appraise the applications of these technologies in their respective domain.

## ii)INDUSTRY/EMPLOYEREXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry identified outcome through various teaching learning experiences: 1) Use computers for Internet services, Electronics Documentation, Data Analyze and Slide Presentation. 2) Appraise Application of ICT based Emerging Technologies in different domain

## E. COURSELEVELLEARNINGOUTCOMES(COS)

CCH109-1 - Use computer system and its peripherals for given purpose
CCH109-2 - Prepare Business document using Word Processing Tool
CCH109-3 - Analyze Data and represent it graphically using Spreadsheet
CCH109-4 - Prepare professional Slide Show presentations
CCH109-5–Illustrate the Use different types of Web Browsers, Apps and Emerging Technologies

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PO 1 Basic and Discipline specific knowledge | PO 2 Problem Analysis | PO 3 Design / Development of solutions | PO 4 Engineering Tools, Experimentation and Testing | PO 5 Engineering Practices for society, sustainability and Environment | PO 6 Project Management | PO 7 Life-long Learning | PSO1 Design and Development | PSO2 Networking and Database Management |
| **Competency:**Use ICT based Emerging Technologies.in different domain. | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CCH109-1Use computer system and its peripherals for given purpose | 1 | - | - | - | - | - | 1 | 1 | 1 |
| CCH109-2Prepare Business document | - | - | - | 3 | - | - | 1 | 2 | - |

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PO 1 Basic and Discipline specific knowledge | PO 2 Problem Analysis | PO 3 Design / Development of solutions | PO 4 Engineering Tools, Experimentation and Testing | PO 5 Engineering Practices for society, sustainability and Environment | PO 6 Project Management | PO 7 Life-long Learning | PSO1 Design and Development | PSO2 Networking and Database Management |
| using Word Processing Tool | | | | | | | | | |
| CCH109-3 Analyze Data and represent it graphically using Spreadsheet | - | 2 | 1 | 3 | - | - | 1 | 2 | - |
| CCH109-4 Prepare professional Slide Show presentations | - | - | - | 3 | - | - | 1 | 2 | - |
| CCH109-5 Use different types of Web Browsers and Apps | 1 | - | - | 3 | - | - | 3 | - | 1 |
| CCH109-6 Explain concept and applications of Emerging Technologies | 1 | - | - | 3 | - | - | 3 | 1 | 1 |

# F. CONTENT:

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for Fundamentals of ICT developed* by the Institute in practical sessions of batches of about 20- 22 students:

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | Identify various Input/outputdevices, connections and peripherals ofcomputer system. Work with Computer System,Input/output devices, and peripherals for Manages files and folders for data storage. | CCH109-1 |
| 2 | Create and manage worddocument.Apply formatting features on textat line, paragraph and page level. | CCH109-2 |
| 3 | Insert and edit images, shapes in adocument file | CCH109-2 |
| 4 | Insert table and apply various tableformatting features on it. | CCH109-2 |
| 5 | Apply page layout features in wordprocessing.Print a document by applying various print options. Use mail merge in word processing. | CCH109-2 |
| 6 | Enter and format data in aworksheet.Insert and delete cells, rows and columns.Apply alignment feature on cell | CCH109-3 |

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 7 | Create formula and "If" conditionon cell data. Apply various functions and named ranges in worksheet. | CCH109-3 |
| 8 | Implement data Sorting, Filteringand Data validation features in a worksheet. | CCH109-3 |
| 9 | Create charts using various chartoptions in spreadsheet. | CCH109-3 |
| 10 | Print the worksheet by applyingvarious print options for worksheet. | CCH109-3 |
| 11 | Apply design themes to the givenpresentation. Insert pictures text/images/shapes In slide. Use pictures text/images/shapesediting options. | CCH109-4 |
| 12 | Add tables and charts in theslides.Run slide presentation in different Modes. Print slide presentation ashandouts/notes. | CCH109-4 |
| 13 | Apply animation effects to thetext and slides. Add/set audio and video files in the presentation. | CCH109-4 |
| 14 | Configure internet connection ona computer system. Use different web services on internet | CCH109-5 |
| 15 | Configure different browsersettings. Use browsers for the givenpurpose. | CCH109-5 |
| 16 | Create web forms for surveyusing different options. | CCH109-6 |
| 17 | Create web forms for Quiz usingdifferent options. | CCH109-6 |

## II) Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| **1** | **Unit - I Introduction to Computer System**<br>**1.1** Basics of Computer System: Overview Hardwareand Software Block diagram of Computer System: Input/Output unit CPU, Control Unit, Arithmetic logic Unit (ALU), Memory Unit<br>**1.2 Internal components:** processor, motherboards, randomaccess memory (RAM), read-only memory (ROM), video cards, sound cards and internal hard disk drives)<br>**1.3 External Devices:** Types of input/output devices, types of monitors, keyboards, mouse, printers: Dot matrix, Inkjet and LaserJet, plotter and scanner, external storagedevices CD/DVD, Hard disk and pen drive<br>**1.4 Application Software:** word processing, spreadsheet, database management systems, control software,measuring software, photo-editing software, video-editingsoftware, graphics manipulation software SystemSoftware compilers, linkers, device drivers, operating system.<br>**1.5 Network environments:** network interface cards, hubs, switches, routers and modems, concept of LAN, MAN,WAN, WLAN, Wi-Fi and Bluetooth<br>**1.6 Working with Operating Systems:** Create and managefile and folders, Copy a file, renaming and deleting of filesand folders, Searching files and folders, applicationinstallation, creating shortcut of application on thedesktop. | **2** |

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| **2** | **Unit - II Word Processing**<br>**2.1 Word Processing:** Overview of Word processor Basics of Font type, size, colour, Effects like Bold, italic, underline, Subscript and superscript, Case changing options, Previewing a document, Saving a document,Closing a document and exiting application.<br>**2.2 Editing a Document:** Navigate through a document, Scroll through text, Insert and delete text, Select text, Undo and redo commands, Use drag and drop to move text, Copy, cut and paste, Use the clipboard, Clear formatting, Format and align text, Formatting<br>**2.3 Changing the Layout of a Document:** Adjust page margins, Change page orientation, Create headers and footers, Set and change indentations, Insert and clear tabs<br>**2.4 Inserting Elements to Word Documents:** Insert and delete a page break, Insert page numbers, Insert the date and time, Insert special characters (symbols), Insert a picture from a file, Resize and reposition a picture<br>**2.5 Working with Tables:** Insert a table, Convert a table totext, Navigate and select text in a table, Resize table cells,Align text in a table, Format a table, Insert and deletecolumns and rows, Borders and shading, Repeat tableheadings on subsequent page<br>**2.6 Working with Columned Layouts and Section Breaks:**a Columns, Section breaks, Creating columns, Newsletterstyle columns, Changing part of a document layout orformatting, Remove section break, Add columns toremainder of a document, Column widths Adjust. | **3** |
| **3** | **Unit - III Spreadsheets**<br>**3.1Working with Spreadsheets:** Overview of workbookand worksheet, Create Worksheet Entering sample data,Save, Copy Worksheet, Delete Worksheet, Close and openWorkbook.<br>**3.2 Editing Worksheet**: Insert and select data, adjust rowheight and column width, delete, move data, insert rowsand columns, Copy and Paste, Find and Replace, SpellCheck, Zoom In-Out, Special Symbols, Insert Comments,Add Text Box, Undo Changes, - Freeze<br>**3.3 Formatting Cells and sheet**: Setting Cell Type, SettingFonts, Text options, Rotate Cells, Setting Colors, TextAlignments, Merge and Wrap, apply Borders and Shades,Sheet Options, Adjust Margins, Page Orientation, Headerand Footer, Insert Page Breaks<br>**3.4 Working with Formula:** Creating Formulas, CopyingFormulas, Common spreadsheet Functions such as sum,average, min, max, date, In, And, or, mathematicalfunctions such as sqrt, power, applying conditions usingIF.<br>**3.5 Working with Charts:** Introduction to charts, overviewof different types of charts, Bar, Pie, Line charts, creatingand editing charts. Using chart options: chart title, axistitle, legend, data labels, Axes, grid lines, moving chart ina separate sheet.<br>**3.6 Advanced Operations:** Conditional Formatting, DataFiltering, Data Sorting, Using Ranges, Data Validation,Adding Graphics, | **3** |

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| | Printing Worksheets, print area, margins, header, footer and other page setup options. | |

## Section –II

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| **4** | **Unit - IV Presentation Tool**<br>4.1 **Creating a Presentation:** Outline of an effectivepresentation, Identify the elements of the User Interface,<br>Starting a New Presentation Files, Creating a BasicPresentation, Working with textboxes, Apply Character<br>Formats, Format Paragraphs, View a Presentation.<br>**4.2 Inserting Media elements**: Adding and ModifyingGraphical Objects to a Presentation - Insert Images into a<br>Presentation, insert audio clips, video/animation, AddShapes, Add Visual Styles to Text in a Presentation, Edit<br>Graphical Objects on a Slide, Format<br>**4.3 Working with Tables:** Insert a Table in a Slide, Format<br>Tables and Import Tables from Other Office Applications.<br>**4.4 Working with Charts:** Insert Charts in a Slide, Modify<br>a Chart, Import Charts from Other Office Applications. | **4** |
| **5** | **Unit - V Basics of Internet and Emerging Technologies**<br>**5.1 World Wide Web:** Introduction, Internet, Intranet,Cloud, Web Sites, web pages, URL, web servers, basicsettings of web browsers- history, extension, default page,<br>default search engine, creating and retrieving bookmarks,<br>Use of search engines.<br>**5.2Web Services:** e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social<br>Networking<br>**5.3 Emerging Technologies:** IOT, AI and ML, Drone<br>Technologies, 3D Printing.<br>**5.4 Tools:** Docs, Drive, forms, quiz, Translate and other<br>Apps | **3** |

** No Questions will be asked on IKS learning subtopics in any question papers.

## G: List of Assignments under SLA

**(Assignments Marked in * are compulsory)**

<table>
<tr><th>Sr.No</th><th>List of Assignment (under SLA)</th><th>Hrs Allotted</th></tr>
<tr><td>1*</td><td>Prepare a chart showing different generations of computer along with advantages & disadvantages.</td><td>02</td></tr>
<tr><td>2*</td><td>Prepare survey report for:<br>There is usually a positive side and a negative side to each new technological improvement.<br>1. Select a technology you use every day and consider its benefits and risks.<br>2. What benefits does the technology provide?<br>3. Are there any risks involved and, if so, how can they be minimized?</td><td>02</td></tr>
<tr><td>3</td><td>The following are the marks obtained by the students in three subjects<br>Assume suitable data in following table:
<table>
<tr><td>ROLLNO</td><td>NAME</td><td>ME</td><td>QT</td><td>IOM</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Using Conditional Formatting list out students who secured( a) Less than 50 in QT, ( b ) More than 65 in IOM, ( c ) Between 60 and 80 in ME</td><td>02</td></tr>
<tr><td>4*</td><td>Principal Amount 2, 00,000Rate of Interest 5%Time Period 10 YearsAmount to be Paid?<br>From the above , Calculate the amount payable per annum and also show the effect on amount by changing a) Rate of Interest to 3% and 8%b) Time Period to 5 Years and 3 Years</td><td>02</td></tr>
<tr><td>5</td><td>Prepare a PowerPoint presentation of at least 5 slide & perform<br>1. Add 2.delete 3.copy& paste 4.edit slide.</td><td>02</td></tr>
<tr><td>6*</td><td>A person wants to start a business and he has four schemes to invest money according to profit and years. Find out which scheme is the most profitable.<br>Investment Amount Percentage for Profit No of years<br>20000 10% 6 years<br>40000 20% 5 years<br>14000 30% 4 years<br>12000 15% 5 years</td><td>02</td></tr>
<tr><td>7*</td><td>Conduct Survey of different IT Industry and prepare list of New Technology Trends in IT Industries.</td><td>02</td></tr>
<tr><td>8*</td><td>Prepare a list and compare different desktop publishing software available in market.</td><td>04</td></tr>
</table>

## H : Specification table for setting question paper for semester end theory examination

**Nil**

## I :-Assessment Criteria

### i) Formative Assessment of Practical:-

Every assignment shall be assessed for 25 marks as per following criteria:

| Domain | Particulars | Marks out of 25 |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing / drafting skills | 05 |
| Affective | Discipline and punctuality | 05 |
| **TOTAL** | | **25** |

### ii) Summative Assessment of Practical:

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Sr.no | Criteria | Marksallotted |
|---|---|---|
| 1 | Attendanceatregularpractical | 05 |
| 2 | Preparednessforpractical | 05 |
| 3 | Neat& completeDiagram. | 05 |
| 4 | Observations& handling of instrument. | 05 |
| 5 | Oral Based on Lab work and completion of task | 05 |
| **TOTAL** | | **25** |

## J) Instructional Methods:

1. Lectures cum Demonstrations,
2. Classroom practices.
3. Use of projector and soft material for demonstration

## K) Teaching and Learning resources:

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Goel Anita | Computer Fundamentals | Pearson Education, New Delhi, 2014, ISBN-13: 978-8131733097 |
| 2 | Miller Michael | Computer Basics Absolute Beginner's Guide, Windows 10 | QUE Publishing; 8th edition August 2015, ISBN: 978-0789754516 |

| | | | |
|---|---|---|---|
| 3 | Alvaro Felix | Linux: Easy Linux for Beginners | CreatevSpace Independent Publishing Platform- 2016, ISBN-13: 978-1533683731 |
| 4 | Johnson Steve | Microsoft Office 2010: On Demand | Pearson Education, New Delhi India, 2010. ISBN :9788131770641 |
| 5 | Schwartz Steve | Microsoft Office 2010 for Windows: Visual Quick Start | Pearson Education, New Delhi India, 2012, ISBN : 9788131766613 |

## M) Learning Website & Software

a. https://www.microsoft.com/en-in/learning/office-training.aspx
b. http://www.tutorialsforopenoffice.org/
c. https://www.tutorialspoint.com/computer_fundamentals/index.htm
d. https://www.javatpoint.com/powerpoint-tutorial
e. https://www.techtarget.com/iotagenda/definition/Internet-of-Things-IoT
f. https://www.skillrary.com/blogs/read/introduction-to-drone-technology
g. https://support.google.com/a/users/answer/9389764?hl=en

**COURSE ID:**
**COURSE NAME : YOGA &MEDITATION.**
**COURSE CODE : CCH203**
**COURSE ABBREVIATION : HYAM**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 00 | 01 |
| | Tutorial Learning | 00 | |
| | LaboratoryLearning | 01 | |
| | SLH-SelfLearning | 01 | |
| | NLH-Notional Learning | 2 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL Practical | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| -NA- | -NA-- | --NA- | --NA- | -NA- | 25 | 10 | --NA- | --NA- | 25 | 10 | 50 |

(TotalIKSHrsforSemester:01Hr)

**C: ABBREVIATIONS:-** CL-Class-RoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:**@InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination( TNR 12 font)

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i)RATIONALE

Diploma Graduate needs a sound body and mind to face the challenging situationsin career as employee or as an entrepreneur. Yogaand Meditation brings about the holistic development of an individual and equips with necessary balance to handle the challenges. Theage of polytechnic student is appropriate to get introduced to yoga practice as this will help them in studies as well as his professionallife. Moreover, Yoga inculcates discipline in all walks of the life of student. Pranayama practice regulates breathing practices of thestudent to improve stamina, resilience. Meditation empowers a student to focus and keep calm to get peace of mind. World Health Organization (WHO) has also emphasized the role of yoga and meditations stresspreventionmeasure.NationalEducationPolicy-2020 highlights importance of yoga and meditation amongst students of all ages. Therefore, this course for Diploma students is designed for the overall well being of the student and aims to empower students to adopt and practice Yoga in daily life.

### ii)INDUSTRY/EMPLOYEREXPECTEDOUTCOME

By practicing basic yoga and pranayam in daily life, candidate should have attained the state of sound physique and balance mind to execute daily duties.

## E. COURSELEVELLEARNINGOUT-COMES(COs)

Students will be able to achieve & demonstrate the following
On completion of course based learning-
CCH110_1 Practice basic Yoga and Pranayam in daily life to maintain physical and mental fitness.
CCH110_2- Practice meditation regularly for improving concentration and better handling of stress and anxiety.
CCH110_3- Follow healthy diet and hygienic practices for maintaining good health.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Course Outcomes(COs) | ProgrammeOutcomes(POs) | | | | | | | ProgrammeSpecificOutcomes*(PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PO-1BasicandDisciplineSpecificKnowledge | PO-2 ProblemAnalysis | PO-3 Design/DevelopmentofSolutions | PO-4 EngineeringTools | PO-5 EngineeringPracticesforSociety,SustainabilityandEnvironment | PO-6Project Management | PO-7 LifeLong Learning | PSO-1 | PSO-2 | |
| CO1 | - | - | - | - | 3 | - | 1 | - | - | |
| CO2 | - | - | - | - | 3 | - | 1 | - | - | |
| CO3 | - | - | - | - | 3 | - | 1 | - | - | |
| Legends:-High:03,Medium:02,Low:01,NoMapping:-<br>*PSOsaretobeformulatedatinstitute level | | | | | | | | | | |

# F. CONTENT:

## I) Practical exercises

| Sr No | LaboratoryExperiment/PracticalTitles/TutorialTitles | Learning hrs. | Relevant COs |
|---|---|---|---|
| 1 | Introduction:-<br>1.1 Introduction to AshtangYog<br>1.2 Presentations on Introduction to Yogaandits History, Omkar chanting, prayer, Padmasan, Siddhasan &Vajrasan<br>1.3 Lab Exp: 1. Perform warming up exercises to prepare the body from head totoeforYoga -<br>i)Nack Movement ii)Shoulder Movement iii) Trunk Movement iv)Knee Movement v)Ankle Movement | 03 | CCH110-1 |
| 2 | Lab Exp: 2. Afterwarmup, perform all the postures of Surya Namaskar one by one in a very slow pace,<br>Lab Exp 3. Perform multiple Surya-Namaskar (Starting with three and gradually increasing it to twelve)in one go.<br>(Experiment 2 to 4must be followed by shavasana for self relaxation.) | 4 | CCH110-1, CCH110-2 |
| 3 | Lab Exp: 4<br>Perform Sarvangasna, Halasana, Kandharasana (setubandhasana) ,<br>Uttanpadasan, Pavanmuttasan.<br>LabExp:5 Perform Bhujangasana, Naukasana, Mandukasana.<br>LabExp:6PerformShalbhasan, Dhanurasan, Vakrasan,Goumukhasan,Paschimottasana, Ardhamasendrasan<br>LabExp:7 PerformVeerasan, Veer-Bhadrasana, Vrukshasana, Trikonasana.<br>(Follow up experiment 5to7 with shavasana for self relaxation) | 4 | CCH110-2 |
| 4 | Lab Exp: 8 Perform Deepbrathing , Anulom Vilom Pranayam Kriya<br>LabExp:9 Practice Kapalbhati Pranayam Kriya, Bhastrika<br>LabExp:10 Practice Bhramary Pranayam and Sheetali Pranayam | 2 | CCH110-3 |
| 5 | Lab Exp: 11 Perform sitting in Dhyan Mudra and meditating. Start with five minute and slowly increasing to higher durations.<br>Introduction to Vippasanna , Anappan & Chakras.<br>(Trainerwill explainthe benefits of Meditation before practice) | 2 | CCH110-3 |

## II) Theory : (Not Applicable )

**Section I NA**

**Section –II NA**

** No questions will be asked on IKS learning subtopics in any question papers.

## G: List of Assignments under SLA

## **Candidate has to complete at least one major assignment from the given during his or her a single semester.

Maintain a diary indicating date wise practiced one by the student with a photograph of self in yogi c posture. Prepare Diet for and nutrition chart self

**Assignment:**

- Prepare Diet for and nutrition chart for your self
- Self-**Learning**
  - Practiceatleast thrice aweek.
  - Read books on different methods to maintain health, wellness and to enhance mood
  - WatchvideosonYogaPractices.

## H: Specification table for setting question paper for semester end theory examination: NA

## I:-Assessment Criteria

| Sr.No. | List of Assignment (under SLA) | Hrs Allotted |
|---|---|---|
| 1 | Maintain a diary indicating date-wise practice done by the student with a photograph of self-yogi c posture | 02 |
| 2 | Prepare Diet for and nutrition chart self | 01 |
| 3 | Practice at least thrice a week. | 02 |
| 4 | Read books on different methods to maintain health, wellness and to enhance mood | 02 |
| 5 | Watch videos on Yoga Practices. | 01 |
| 6 | Post your selfie with one asana on social media | 02 |
| 7 | Post your selfie with meditation posture on social media FB | 02 |
| 8 | Create your short video clip while performing one or two asanas | 02 |
| 9 | Create your short video performing Sun Salutation (Suyranamaskar) | 01 |
| | Total | 15hrs |
| | | |

**i) Formative Assessment of Practical:-**

Every assignment shall be assessed for 25 marks as per the following criteria

| Domain | Particulars | Marks out of 25 |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Performance Skills | 10 |
| Affective | Discipline and Mind Balance | 05 |
| | **TOTAL** | **25** |

**ii) Summative Assessment of Practical: NA**

Every practical assignment shall be assessed for - marks as per following criteria:

| Sr.no | Criteria | Marksallotted |
|---|---|---|
| NA | NA | NA |
| NA | NA | NA |
| NA | NA | NA |
| NA | NA | NA |
| NA | NA | NA |
| **TOTAL** | | **NA** |

## J) Instructional Methods:

1. Lectures cum Demonstrations
2. Laboratory practices.
3. Use of third party audio visual material for demonstration

4.Demonstration Chart

## K) Teaching and Learning resources:

Presentations, Yoga kits, Demonstrative charts, Actual Practice demonstration

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Patanjalis Yoga Sutras | Swami Vivekananda | Fingerprint Publishing (2023) Prakash BooksIndiaPvtLtd,NewDelhiISBN-13?:?978-9354407017 |
| 2 | Yoga for Every Body: A beginner's guide to the practice of yoga postures, breathing Exercises and me | Luisa Ray, Angus Sutherland | VitalLifeBooks (2022) ISBN-13?:?978-1739737009 |
| 3 | Mudras for Modern Living: 49inspiring cards to boost your health, enhance your yoga and deepen your mind | Swami Saradananda | WatkinsPublishing(2019) ISBN-13?:?978-1786782786 |
| 4 | The Relaxation and Stress Reduction Workbook | Martha Davis, Elizabeth Robbins, MatthewMcKay, Eshelman MSW | ANewHarbingerSelf-HelpWorkbook(2019) |
| 5 | Science of Yoga: Understand the Anatomy and Physiology to Perfect Your Practice | Ann Swanson | ISBN-13?:?978-1465479358 |

## M) Learning Website & Software

1. https://onlinecourses.swayam2.ac.in/aic23ge09/preview - Yoga for Creativity
2. https://onlinecourses.swayam2.ac.in/aic19_ed28/preview- introduction to Yoga and Applications of Yoga
3. https://onlinecourses.swayam2.ac.in/aic23 e05/preview- Yoga for Creativity
4. https://onlinecourses.nptel.ac.in/noc2lhs29/preview- Psychology of Stress, Health and Well-being
5. https://onlinecourses.swayam2.ac.in/ncel9sc04/preview-Food Nutrition for Healthy LivingCourse —Swayam
6. https://onlinecourses.swayam2.ac.in/aic23e06/ preview- yoga for memory development

**Government Polytechnic Kolhapur**

**Learning and Assessment Scheme for Post S.S.C Diploma Courses**

**ProgrammeName :Diploma In Information Technology**

| | | | |
|---|---|---|---|
| **Programme Code** | **:IF(06)** | **WithEffectFromAcademicYear** | **: 2023-24** |
| **Duration Of Programme** | **: 6 Semester** | **Duration** | **: 16 WEEKS** |
| **Semester** | **: Second** | **Scheme** | **: H** |

| Sr No | CourseTitle | Abbrevation | Level | Course Type | Course Code | Total IKS Hrsfor Sem. | Learning Scheme | | | | | Credits | Assessment Scheme | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ActualContact Hrs./Week | | | Self Learning( Activity/ Assignment /MicroProject) | Notional Learning Hrs/Week | | PaperDuration (hrs.) | Theory | | | | Based on LL&TL | | | | Based onSelf Learning | | Total Marks |
| | | | | | | | | | | | | | | | | | | Practical | | | | | | |
| | | | | | | | CL | TL | LL | | | | | FA-TH | SA-TH | Total | | FA-PR | | SA-PR | | SLA | | |
| | | | | | | | | | | | | | | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | |
| 1 | APPLIED MATHEMATICS | HAMT | III | AEC | CCH301 | 2 | 4 | 2 | - | - | 6 | 3 | 3 | 30 | 70 | 100 | 40 | - | - | - | - | - | - | 100 |
| 2 | ENGINEERING CHEMISTRY | HCHA | I | AEC | CCH103 | 4 | 4 | - | 2 | 2 | 8 | 4 | 1.5 | 30*# | 70*# | 100 | 40 | 25 | 10 | 25@ | 10 | 25 | 10 | 175 |
| 3 | COMMUMNICATION SKILL | HCMS | II | AEC | CCH201 | 0 | 4 | - | 2 | 2 | 8 | 4 | 3 | 30 | 70 | 100 | 40 | 25 | 10 | - | - | 25 | 10 | 150 |
| 4 | LINUX BASICS | HLIX | III | DSC | ITH301 | 0 | 2 | - | 2 | 2 | 6 | 3 | - | - | - | - | - | 50 | 20 | 25@ | 10 | 25 | 10 | 100 |
| 5 | PROGRAMMING IN C | HPIC | I | DSC | ITH105 | 0 | 3 | - | 4 | 1 | 8 | 4 | 3 | 30 | 70 | 100 | 40 | 50 | 20 | 50@ | 20 | 25 | 10 | 225 |
| 6 | ELEMENTS OF PRACTICAL ELECTRICITY | HEPE | I | AEC | ITH104 | 0 | - | - | 2 | 0 | 2 | 1 | - | - | - | - | - | 25 | 10 | 25@ | 10 | - | - | 50 |
| 7 | SOCIAL AND LIFE SKILLS | HSLS | II | VEC | CCH204 | - | - | - | - | 2 | 2 | 1 | - | - | - | - | - | - | - | - | - | 50 | 20 | 50 |
| | **Total** | | | | | **06** | **17** | **2** | **12** | **9** | **40** | **20** | - | **120** | **280** | **400** | | **175** | | **125** | | **150** | | **850** |

**Abbreviations:**CL-ClassroomLearning,TL-TutorialLearning,LL-LaboratoryLearning,FA-FormativeAssessments-SummativeAssessment,IKS-IndianKnowledgeSystem,SLA-SelfLearningAssessment

**Legends:** @ InternalAssessment, # ExternalAssessment, *# On Line Examination , @$ Internal Online Examination

**Note :**

1. FA-THrepresentsaverageoftwoclasstestsof30markseachconductedduringthesemester.
2. IfcandidateisnotsecuringminimumpassingmarksinFA-PRofanycoursethenthecandidateshallbedeclaredas"Detained"inthatsemester.
3. If candidate is not securing minimum passing marks in SLAof any course then the candidate shall be declared as fail and will have to repeat and resubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. *SelflearninghoursshallnotbereflectedintheTimeTable.

**CourseCategory:**DisciplineSpecificCourseCore(DSC): 2,DisciplineSpecificElective (DSE):0,ValueEducation Course(VEC):1, Intern./Apprenti./Project./Community(INP):0,AbilityEnhancementCourse (AEC) : 4, Skill Enhancement Course (SEC) : 0, GenericElective (GE) : 0

**COURSE ID : CE/ME/IT/EE/ET/MT**
**COURSE NAME : APPLIED MATHEMATICS**
**COURSE CODE : CCH301**
**COURSE ABBREVIATION : HAMT**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 04 | 3 |
| | Tutorial Learning | 02 | |
| | LaboratoryLearning | - | |
| | SLH-SelfLearning | 00 | |
| | NLH-Notional Learning | **06** | |

## B: ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tutorial | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | **30** | **70** | **100** | **40** | **--** | **--** | **--** | **--** | **--** | **--** | **100** |

**(TotalIKSHrsforSem.: 02Hrs)**

**C: ABBREVIATIONS:-**CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:**@InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination( TNR 12 font)

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshall bedeclaredas fail and will have to repeat and resubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(The list of all assignments are given in tabular format. At least 6 to 8 assignments to be given)

## D. i)RATIONALE:-

Mathematics is an important pre-requisite for the development and understanding of engineering and technological concepts. For an engineer and technologist, knowledge of Mathematics is an effective tool to pursue and to master the applications in the engineering and technological fields. Applied mathematics is designed for its applications in engineering and technology. It includes integration, differential equation,. The connection between applied mathematics and its applications in real life can be understood and appreciated. Integral calculus helps in finding the area . Differential equation is used in finding curve, rectilinear motion. Statistics and probability will help a student to analyze data of large volume in their higher studies. The fundamentals of these topics are directly useful in understanding engineering applications in various fields.

**ii)Competency:**

The course should be taught and implemented with the aim to develop the course outcomes (CO's) for the student to acquire the competency needed to apply the mathematical techniques for engineering subjects.

**1.Cognitive:**Understanding and applying principles of mathematics to engineering problems
**2. Psychomotor:**To prepare charts displaying the area of irregular shapes using the concept of integration,prepare charts to displaying grouped and ungrouped data.
**3. Affective :**discipline, consistency, hard work , to concentrate ,accuracy, punctuality, aesthetics

## E. COURSELEVELLEARNINGOUTCOMES(COS)(TNR 14)

CCH301-1 :To solve examples on integration using various techniques

CCH301-2 :To solve Differential equation of first order and first degree by various methods

CCH301-3 :To find approximate solution of algebraic equations and simultaneous equations by various methods.

CCH301-4:- To solve problems on Probability distributions

CCH301-5 :- Solve examples on Laplace Transform

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** Maintain various types of electrical equipments | **PSO2** Maintain various sections of electrical power systems |
| Competency: Use DC machines and transformers. | 3 | 2 | 1 | - | 1 | - | 2 | | |
| CCH301-1-CO-1 : To solve examples on integration using various techniques | 3 | 1 | - | - | 1 | - | 1 | | |
| CCH301-2-CO-2 : To solve Differential equation of first order and first degree by various methods | 3 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| CCH301-3-CO-3 : To find approximate solution of algebraic equations and simultaneous equations by various methods. | 2 | 3 | 1 | 1 | 1 | 1 | 1 | | |
| CCH301-4-CO-4:- To solve problems on Probability distributions | 2 | 2 | 2 | 2 | 2 | 1 | 2 | | |
| CCH301-5-CO-5:- Solve examples on Laplace Transform | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | |

# F. CONTENT:

## I) Tutorial exercises

Any **TEN** of the following Tutorial exercises shall be conducted in the Tutorial room in tutorial sessions of batches of about 20- 22 students:

| Sr. no | Tutorial experiences | CO |
|---|---|---|
| 1 | Solve simple problems of Integration by substitution. | CCH301-1 |
| 2 | Solve integration using by parts. | CCH301-1 |
| 3 | Solve examples on Definite Integral based on given methods. | CCH301-1 |
| 4 | Solve problems on properties of definite integral. | CCH301-1 |
| 5 | Solve given problems for finding the area under the curve and area between two curves .(Only for civil and mechanical engg. group) | CCH301-1 |
| 6 | Solve examples on mean value and root mean square value.(only for Computer, Electrical and Electronics engg. group) | CCH301-1 |
| 7 | Solve first order first degree differential equation using variableseparable method. | CCH301-2 |
| 8 | Solve first order first degree differential equation using exact differential equation and linear differential equation. | CCH301-2 |
| 9 | Solve engineering application problems using differential equation. | CCH301-2 |
| 10 | Solve problems on Bisection method, Regula falsiand Newton-Raphson method. | CCH301-3 |
| 11 | Solve problems on Jacobi's method and Gauss Seidel method. | CCH301-3 |
| 12 | Use Bakshali iterative methods for finding approximate value of square root.(IKS) | CCH301-3 |
| 13 | Solve engineering problems using Binomial Distribution,Poisson Distribution and Normal Distribution. | CCH301-4 |
| 14 | Solve problems on Laplace transform and properties of Laplace transform. | CCH301-5 |
| 15 | Solve problems on Inverse Laplace transform and properties of Inverse Laplace transform. | CCH301-5 |

## II)Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH301-1 :To solve examples on integration using various techniques. | | | |
| **Unit 1 Indefinite Integration** | **Indefinite Integration**<br>1.1 Definition, Standard formulae<br>1.2 Rules of Integration(without proof), Examples<br>1.3 Integration by substitution<br>1.4 Integration by parts<br>1.5 Integration by partial fractions(only linear non repeated factors at denominator of proper fraction) | 14 | 16 |
| CO: CCH301-1 : To solve examples on integration using various techniques | | | |
| **Unit 2 Definite Integration** | **Definite Integration**<br>2.1 Definition, Examples<br>2.2 Properties of Definite Integration ( without proof), Examples based on properties | 8 | 8 |
| CO: CCH301-2 : To solve Differential equation of first order and first degree by various methods | | | |
| **Unit 3 Differential equation** | **Differential equation**<br>4.1 Definition of differential equation<br>4.2 Order & degree of Differential equations<br>4.3 Methods of solving Differential equations of first order & first degree of following types:<br>4.3.1 Variable separable form<br>4.3.2 Exact Differential equations<br>4.3.3 Linear Differential Equations | 8 | 10 |

**Section –II**

| Sr. no. | **Topics/Subtopics** | Learning Hours | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH301-3 :- To find approximate solution of algebraic equations and simultaneous equations by various methods. | | | |
| **Unit 4 Numerical Methods** | **Numerical Methods**<br>4.1Numerical solution of Algebraic Equations<br>4.1.1 Bisection Method<br>4.1.2 Regula- Falsi Method<br>4.1.3 Newton –Raphson method. | 10 | 14 |

| | | | |
|---|---|---|---|
| | 4.2 Numerical solution to simultaneous equations<br>4.2.1 Jacobi's Method<br>4.2.2 Gauss-Seidel method<br>Bakhshali iterative method for finding approximate square root.(IKS) | | |
| CO: CCH301-4:- To solve problems on Probability distributions | | | |
| **Unit 5**<br>**Probability Distribution** | **Probability Distribution**<br>5.1Binomial distribution<br>5.2 Poisson's distribution<br>5.3Normal distribution | 8 | 8 |
| CO:CCH301-5:- Solve examples on Laplace Transform . | | | |
| Unit 6<br>**Laplace Transform** | **Laplace Transform**<br>6.1 Definition ,Linearity property<br>6.2 Laplace Transforms of Standard functions(without proof) and examples<br>6.3 First shifting property and examples<br>6.4 Examples on Multiplication by $t^n$<br>6.5 Inverse Laplace Transform, Definition<br>6.6 Standard formulae(without proof) and examples<br>6.7 Inverse L.T.by using First shifting property<br>6.8 Inverse L.T. by using Partial fraction method | 12 | 14 |

** No questions will be asked on IKS related subtopics in any question paper

## G : Specification table for setting question paper for semester end theory examination

| Section / Topic no. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Indefinite Integration | 4 | 6 | 6 | 16 | CCH301-1 |
| I / 2 | Definite Integration | - | 4 | 4 | 8 | CCH301-1 |
| I / 3 | Differential equation | 2 | 4 | 4 | 10 | CCH301-2 |
| II /4 | Numerical Methods | 2 | 4 | 8 | 14 | CCH301-3 |
| II /5 | Probability Distribution | - | 4 | 4 | 8 | CCH301-4 |
| II/6 | Laplace **Transform** | 2 | 6 | 6 | 14 | CCH301-5 |
| | Total Marks | | | | 70 | |

## H:-Assessment Criteria

**i) Formative Assessment (Assessment for Learning)**

- **Tests**

**ii) Summative Assessment (Assessment of Learning)**

- **End term exam**

## I) Instructional Methods:

1. Lectures cum Demonstrations
2. Classroom practices
3. Use of projector and soft material for demonstration
4. Use of softwares such as Geogebra

## J) Teaching and Learning resources:

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## K) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Higher Engineering Mathematics | Grewal B.S. | Khanna publication New Delhi,2013 ISBN:8174091955 |
| 2 | A textbook of Engineering Mathematics | Dutta.D. | New age publication New Delhi,2006 ISBN:978-81-224-1689-3 |
| 3 | Advance Engineering Mathematics | Kreysizg,Ervin | Wiley publication New Delhi,2016 ISBN:978-81-265-5423-2 |
| 4 | Advance Engineering Mathematics | Das H.K. | S Chand publication New Delhi,2008 ISBN:978-81-219-0345-5 |
| 5 | Introductory Methods of Numerical Analysis | S.S.Sastry | PHI Learning Private Limited,New Delhi.ISBN:978-81-203-4592-8 |
| 6 | Studies in the History of Indian Mathematics | C.S.Seshadri | Hindustan Book Agency (India) P 19 Green Park Extension New Delhi.ISBN 978-93-80250-06-9 |
| 7 | Calculus & Its Applications | Marvin L.Bittinger David J.Ellenbogen Scott A. Surgent | Addison-Wesley 10th Edition ISBN-13:978-0-321-69433-1 |
| 8 | An Introduction to Statistical Learning with Application in R | Gareth James,Hastie Robert &Tibshirani | Springer New York Heidelberg Dordrecht London ISBN:978-1-4614-7138-7(eBook) |

## L) Learning Website & Software

a)http://nptel.ac.in/courses/106102064/1
b) https://www.woframalpha.com/
c)http://www.sosmath.com/
d)http://mathworld.wolfram.com
e)https://www.brilliant.org/
f)https://ocw.mit.edu/index.htm

**COURSE ID:**
**COURSE NAME : ENGINEERING CHEMISTRY.**
**COURSE CODE : CCH 103**
**COURSE ABBREVIATION : HCHA**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 04 | 4 |
| | Tutorial Learning | 00 | |
| | Laboratory Learning | 02 | |
| | SLH-Self Learning | 02 | |
| | NLH-Notional Learning | 08 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL Practical | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | 30 *# | 70*# | 100 | 40 | 25 | 10 | 25 @ | 10 | 25 | 10 | 175 |

**(Total IKS Hrs for Sem. : 04** Hrs)

**C: ABBREVIATIONS:-** CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

**Legends:** @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination.( TNR 12 font)

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as"Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL) hrs.* 15 Weeks
5. 1(one) credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.

* Self learning includes micro project / assignment / other activities. (Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i) RATIONALE:-

Basic science such as Chemistry is the fundamental of Engineering & technology. It is most essential to learn the basic science to understand the fundamental concepts in Engineering & technology. Engineering chemistry deals with the study of structure, composition & properties of the materials, which form the core of the fundamental science. Many processes are based on principle of Chemistry in various industries. Topics such as Water, Electrochemistry, Corrosion, & protection of metals from corrosion are some of the direct applications of chemistry in engineering. Hence, the knowledge of chemistry is essential to the aspiring engineers of all branches in their field. Engineering materials like Steel, Rubber, Plastic, Thermocole, Glass wool, Paints, Lubricants are the backbone of various industries, machines, equipment & processes.

## ii) INDUSTRY / EMPLOYER EXPECTED OUTCOME

Apply principles of advanced chemistry to solve engineering problems.

**Cognitive:** Understanding concepts of chemistry for applications in the area of engineering.

**Psychomotor:**

i) Sketching and labeling the diagrams for extraction of copper
ii) Experimentally analyzing the water samples for preparing portable water by different methods.
iii) Preparing chart of showing percentage, composition, properties and industrial applications of solders.
iv) Handling & use of glassware & chemicals.

**Affective:** i) Accuracy ii) Safety iii) Punctuality iv. Attitude.

## E. COURSE LEVEL LEARNING OUTCOMES (COS)

**CCH103-1** Apply the basic knowledge of atom, molecules and compounds in Engineering Chemistry.

**CCH103-2** Apply the concepts of Electrochemistry to interpret the reasons of corrosion with its remedies.

**CCH103-3** Select the relevant catalyst, insulators, adhesives, composite materials, plastic and rubber for different applications in the field of engineering.

**CCH103-4** Use of water in Domestic purpose, Industrial purpose and its relevant treatment to solve industrial problems.

**CCH103-5** Explain the method of Extraction of Copper and select proper types of alloys, solders for various purposes.

**CCH103-6** Apply the basic knowledge of Cells and Batteries in Industrial applications.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** | **PSO2** |
| CCH103-1 CO-1 Apply the basic knowledge of atom, molecules and compounds in Engineering Chemistry. | 3.0 | 2.0 | - | 1.0 | 3.0 | 1.0 | 3.0 | 1.0 | 1.0 |
| CCH103 -2 CO-2 Apply the concepts of Electrochemistry to interpret the reasons of corrosion with its remedies. | 3.0 | 2.0 | - | 1.0 | 2.0 | 1.0 | 3.0 | - | - |
| CCH103 -3 CO-3 Select the relevant catalyst, insulators, adhesives, composite materials, plastic and rubber for different applications in the field of engineering. | 3.0 | 1.0 | - | - | 2.0 | 1.0 | 3.0 | - | - |
| CCH103 – 4 CO-4 Use of water in Domestic purpose, Industrial purpose and its relevant treatment to solve industrial problems. | 3.0 | 2.0 | - | 1.0 | 3.0 | 1.0 | 3.0 | - | - |
| CCH103-5 CO-5 Explain the method of Extraction of Copper and select proper types of alloys, solders for various purposes. | 3.0 | 1.0 | - | - | 2.0 | 1.0 | 3.0 | - | - |
| CCH103- 6 CO-6 Apply the basic knowledge of cells and Batteries in Industrial applications. | 3.0 | 2.0 | - | 1.0 | 2.0 | 1.0 | 3.0 | - | - |

# F. CONTENT:

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for Engineering Chemistry developed* by the Institute in practical sessions of batches of about 20- 22 students:

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | Introduction to Chemistry laboratory | CCH103-1 |
| 2 | Volumetric analysis of solution. | CCH103-1 |
| 3 | Preparation of 1 N, 0.5 N & 0.1 N Solutions of different chemicals like NaOH, HCI, Oxalic acid, $FeSO_4$, etc. | CCH103-1 |
| 4 | Titration of strong acid and strong bases ( HCl X NaOH) | CCH103-1 |
| 5 | Double titration of strong acid, strong base & weak acid (HCI X NaOH X $H_2C_2O_4.H_2O$) | CCH103-1 |
| 6 | Titration of weak base , strong acid & strong base ($Na_2CO_3$ X $H_2SO_4$ X KOH) | CCH103-1 |
| 7 | Estimation of chloride content in water by Mohr' s method | CCH103-4 |
| 8 | Determination of amount of Ca and Mg ions present in given sample of water by E.D.T.A method | CCH103-4 |
| 9 | Estimation of viscosity of oils/solutions by Ostwald's method | CCH103-1 |
| 10 | Estimation of Ca in limestone. | CCH103-4 |
| 11 | Titration of $KMnO_4$ & $FeSO_4$ (Redox titration) | CCH103-1 |
| 12 | Estimation of % of Fe in given sample of steel. | CCH103-1 |
| 13 | Determination of alkalinity of water. | CCH103-4 |
| 14 | Determination of Electrochemical equivalent (ECE) by copper volt meter. | CCH103-2 |
| 15 | To estimate volumetrically the percentage of copper in a given sample of Brass. | CCH103- 5 |
| 16 | To demonstrate the different types of Solders. | CCH103-5 |

## II) Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO - CCH103-1 Apply the basic knowledge of atom, molecules and compounds in Engineering Chemistry. | | | |
| 1 | **ATOMIC STRUCTURE AND CHEMICAL BONDING**<br>1.1 Philosophy of atom by Acharya Kanad.<br>1.2 Atom, Fundamental particles, Nature of atom.<br>1.3 Atomic Number, Mass Number, Isotopes and isobars.<br>1.4 Bohr's theory of atom.<br>1.5 Statement of Aufbau's principle, Hund's rule of maximum multiplicity, Pauli's exclusion principle. | **07** | **08** |

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| | 1.6 Lewis and Langmuir's concept of stable electronic configuration.<br>1.7 Electrovalency and Co-valency.<br>1.8 Formation Of electrovalent compounds- NaCl, $CaCl_2$.<br>1.9 Formation of Covalent compounds- $H_2O$, $CO_2$. | | |
| CO - CCH103-2 Apply the concepts of Electrochemistry to interpret the reasons of corrosion with its remedies. | | | |
| 2 | **ELECTROCHEMISTRY AND CORROSION.**<br>2.1Definitions- Cathode, Anode, Conductor, Electrolyte, Electrode, Ionisation, Electrolysis.<br>2.2 Arrhenius Theory Of Ionisation.<br>2.3 Degree of Ionisation & Factors affecting degree of ionisation.<br>2.4 Statement of Faraday's first and second law of electrolysis.<br>2.5 Relation between CE and ECE.<br>2.6 Electrolysis of molten NaCl.<br>2.7 Electrolysis of CuSO4 solution by using Cu-Electrodes.<br>2.8 Industrial applications of electrolysis.<br>2.8.1 Electroplating.<br>2.8.2 Electro refining of Cu.<br>2.9 Definition & types of corrosion.<br>2.10 Dry or Atmospheric corrosion , Oxide Film Formation & its types, Factors affecting atmospheric corrosion.<br>2.11Wet or electrochemical corrosion<br>2.12 Factors influencing immersed corrosion<br>2.13 Methods of protection of metal from corrosion - Hot dipping (Galvanizing & Tinning) ,Metal spraying, Metal cladding, Cementation or sherardizing. | **10** | **10** |
| CO - CCH103-3 Select the relevant catalyst, insulators, adhesives, composite materials, plastic and rubber for different applications in the field of engineering. | | | |
| 3 | **CHEMISTRY OF ENGINEERING MATERIALS AND CATALYSIS.**<br><br>**3.1 INSULATORS**<br>3.1.1 Definition & Characteristics of insulator.<br>3.1.2 Preparation, properties & uses of Glass wool, Thermocole.<br><br>**3.2 COMPOSITE MATERIALS**<br>3.2.1 Definition.<br>3.2.2 Classification, Properties & Application of composite materials. | **13** | **16** |

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| | **3.3 PLASTICS**<br>3.3.1Definition of Polymer, Polymerization.<br>3.3.2Types of polymerization –<br>Addition & Condensation polymerization.<br>3.3.3Classification of plastic - Thermosoftening & Thermosetting plastic.<br>3.3.4 Engineering properties & applications of plastic.<br>**3.4 RUBBER**<br>3.4.1 Elastomer<br>3.4.2 Drawbacks of Natural rubber.<br>3.4.3 Vulcanization of rubber.<br>3.4.4 Engineering properties & uses of rubber.<br>**3.5 ADHESIVES**<br>3.5.1 Definition of adhesives.<br>3.5.2 Characteristics of good adhesive.<br>3.5.3 Properties of adhesive.<br>**3.6 CATALYSIS**<br>3.6.1 Definition.<br>3.6.2 Types of Catalyst with example.<br>- Positive catalyst<br>- Negative catalyst<br>3.6.3 Types of Catalysis.<br>- Homogeneous catalysis.<br>- Heterogeneous catalysis<br>3.6.4 Catalytic Promoters.<br>3.6.4 Catalytic Inhibitors<br>3.6.5 Autocatalysis. | | |

**Section –II**

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO - CCH103-4 Use of water in Domestic purpose, Industrial purpose and its relevant treatment to solve industrial problems. | | | |
| 4 | **WATER**<br>4.1 Impurities in natural water.<br>4.2 Hard water & Soft water.<br>4.3 Hardness of water- Temporary & Permanent.<br>4.4 Reactions of hard water with soap.<br>4.5 Disadvantages of hard water for domestic & Industrial | **09** | **12** |

| | | | |
|---|---|---|---|
| | purpose - Textile Industry, Sugar Industry, Paper Industry Dying Industry.<br>4.6 Sterilization of water - Chlorination –by $Cl_2$, bleaching powder, Chloramines with chemical reactions.<br>4.7 Ion Exchange method to remove total hardness of Water. | | |
| CO - CCH103-5 Explain the method of Extraction of Copper and select proper types of alloys, solders for various purposes. | | | |
| 5 | **METALLIC CONDUCTORS AND SOLDERS**<br>**5.1 METALLIC CONDUCTORS**<br>5. 1.1 Occurrence of metals<br>5.1.2 Distinction between mineral & ore<br>5.1.3 Definition of flux, Gangue & Slag<br>5.1.4 Steps involved in metallurgy-Flow chart<br>Concentration of ores—<br>A) Physical Methods<br>1. Gravity Separation Method<br>2. Electromagnetic separation<br>3. Froth floatation method<br>B) Chemical Methods<br>1. Calcination<br>2. Roasting .<br>5.1.6 Important ores of copper<br>Metallurgy of copper-Extraction of copper from copper pyrites by concentration, roasting, smelting, Bessemerisation, Electrorefining.<br>5.1.7 Physical properties & uses of Copper.<br><br>**5.2 SOLDERS**<br>5.2.1 Definition of alloy, classification of alloys & purposes of making alloy.<br>5.2.2 Composition, properties & applications of Soft solder.<br>A) Tinmann's solder,<br>B) Brazing alloy ,<br>C) Plumber's solder<br>D) Rose metal<br>E) Woods metal | **14** | **16** |
| CO - CCH103-6 Apply the basic knowledge of Cells and Batteries in Industrial applications. | | | |
| 6 | **CELL AND BATTERIES**<br>5.1Definition of Electrochemical cell, Battery, Charge, Discharge, Closed Circuit Voltage, Electrochemical couple, Internal resistance, Open Circuit Voltage, Separator, E.M.F.<br>5.2 Classification of Batteries such as – Primary & Secondary Batteries<br>5.3 Construction, Working and Applications of a | **07** | **08** |

| | | | |
|---|---|---|---|
| | Primary Cell such as Dry Cell ,<br>Secondary Cell such as Lead Acid<br>Storage Cell<br>5.4 Charging and Discharging of Lead Acid<br>Storage Cell<br>5.5 Hydrogen-Oxygen fuel cell, its chemical reactions & advantages<br>5.6 Introduction of solar cell | | |

** No questions will be asked on IKS learning subtopics in any question papers.

## G : List of Assignments under SLA (25 marks)

## ** From the above any two assignments to be completed by the students.

| Sr.No | List of Assignment (under SLA) (Any one of the following) | Hrs Allotted |
|---|---|---|
| 1 | Prepare distinguish chart for Isotopes & Isobars, Electrovalent & Covalent bond | 02 |
| 2 | Prepare Charts of Bohr's Theory, Lewis & Langmuir's theory. | 02 |
| 3 | Faraday's First & Second law statements & formula. | 02 |
| 4 | Electroplating & Electrorefining with diagram | 02 |
| 5 | Note on corrosion due to Oxygen & its types | 02 |
| 6 | With neat labelled diagram explain the process of<br>1. Galvanizing, 2. Tinning, 3. Metal spraying, 4. Metal Cladding,<br>5. Sherardizing | 02 |
| 7 | Properties of Plastics, rubber, insulator, composite materials & adhesives. | 02 |
| 8 | Uses/Applications of Plastics, rubber, insulator, composite materials & adhesives. | 02 |
| 9 | Draw diagram of Ion Exchange method | 02 |
| 10 | Note on Impurities present in Natural Water. | 02 |
| 11 | Disadvantages of hard water in Domestic purposes | 02 |
| 12 | Disadvantages of hard water in Industrial purposes | 02 |
| 13 | Flow chart of Metallurgical processes | 02 |
| 14 | With neat labelled diagram explain<br>1. Gravity separation method.<br>2. Electromagnetic separation method.<br>3. Froth floatation method. | 02 |
| 15 | Distinguish between Calcination & Roasting | 02 |
| 16 | Smelting process of Copper with diagram | 02 |
| 17 | Bessemerisation of Copper with diagram | 02 |
| 18 | Physical properties & uses of copper. | 02 |
| 19 | Definition & classification of alloys | 02 |
| 20 | Purposes of making of alloys | 02 |
| 21 | Composition, properties & applications of<br>1. Soft solder, 2. Tinmann's solder, 3. Brazing alloy, 4. Plumber's solder,<br>5. Rose metal, 6. Wood's metal | 02 |

| | | |
|---|---|---|
| 22 | Definitions of Electrochemical cell, Battery, Charge, Discharge, Closed circuit voltage, Open circuit voltage, Electrochemical couple, internal resistance, Separator, EMF. | 02 |
| 23 | Distinguish between Primary & Secondary batteries | 02 |
| 24 | Construction of Dry cell | 02 |
| 25 | Working & applications of Dry cell | 02 |
| 26 | Construction of Lead acid storage cell | 02 |
| 27 | Working & applications of Lead acid storage cell | 02 |
| 28 | Construction of $H_2$-$O_2$ fuel cell with Chemical reactions & advantages | 02 |
| 29 | Construction & working of solar cell | 02 |

## H : Specification table for setting question paper for semester end theory Examination.

| Section / Topic no. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Atomic Structure and Chemical Bonding | 4 | 2 | 2 | 08 | CCH103-1 |
| I / 2 | Electrochemistry & Corrosion | 4 | 4 | 2 | 10 | CCH103-2 |
| I / 3 | Chemistry of Engineering materials & catalysis | 6 | 6 | 4 | 16 | CCH103-3 |
| II /4 | Water | 4 | 4 | 4 | 12 | CCH103-4 |
| II /5 | Metallic conductors & solders | 6 | 6 | 4 | 16 | CCH103-5 |
| II / 6 | Cell & Batteries | 4 | 2 | 2 | 8 | CCH103-6 |
| | Total Marks | | | | 70 | |

## I :-Assessment Criteria

### i) Formative Assessment of Practical / Self learning assessment :-

Every assignment shall be assessed for 25 marks as per following criteria:

| **Domain** | **Particulars** | **Marks out of 25** |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing / drafting skills | 05 |
| Affective | Discipline and punctuality | 05 |
| **TOTAL** | | **25** |

**ii) Summative Assessment of Practical :-**

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Sr. no | Criteria | Marks allotted |
|---|---|---|
| 1 | Attendance at regular practical | 05 |
| 2 | Preparedness for practical | 05 |
| 3 | Neat & complete Diagram. | 05 |
| 4 | Observations & handling of instrument. | 05 |
| 5 | Oral Based on Lab work and completion of task | 05 |
| **TOTAL** | | **25** |

## J) Instructional Methods:

1. Lectures cum Demonstrations,
2. Class room practices.
3. Use of projector and soft material for demonstration
4. Charts
5. Simulation videos

## K) Teaching and Learning resources:-

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## L) Reference Books:


| Sr. No. | Author | Title | Publisher |
|---|---|---|---|
| 1. | Jain & Jain | Engineering chemistry | Dhanpatrai publishing co. |
| 2. | S. C. Rangawala | Engineering materials | Engineering publication |
| 3. | Jain & Agarwal | Metallurgical Analysis | Agarwal publications |
| 4. | O. P. Khanna | Material science & technology | Khanna publication on 2006 |
| 5. | Rollason | Metallurgy for Engineers | ASM publication |
| 6. | J. C. Kuriacose | Chemistry in Engineering & Vol. 1 & 11 | - |
| 7. | P. C. Jain | Chemistry of Engineering Materials | - |
| 8 | S. S. Dara | A text of Engineering Chemistry | - |
| 9. | R.Gopalan, D.Venkappa | Engineering Chemistry | Vikas Publishing House. |

## M) Learning Website & Software

a. www.substech.com
b. www.kentchemistry.com
c. www.chemcollective.org
d. www.wqa.org
e. www.chemistryteaching.com
f. www.ancient-origins.net/hisotry-famous-people/indian-sage-acharya-kanad-001399

**COURSE ID :**
**COURSE NAME : COMMUNICATION SKILLS**
**COURSE CODE : CCH201**
**COURSE ABBREVIATION : HCMS**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 04 | 4 |
| | Tutorial Learning | 00 | |
| | LaboratoryLearning | 02 | |
| | SLH-SelfLearning | 02 | |
| | NLH-Notional Learning | 08 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL Practical | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | 30 | 70 | 100 | 40 | 25 | 10 | - | - | 25 | 10 | 150 |

**(TotalIKSHrsforSem.:00Hrs)**

**C: ABBREVIATIONS:-** CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:**@InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination.

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i)RATIONALE:-

Communication, being an integral part of every human activity, plays a fundamental role in education, science and technology. The communication skills are essential for engineering professionals to carryout routine tasks at workplace. These skills are also required for professional activities like dialogue, persuasion and negotiation. Considering the age group and socio-economical background of the students of the Institute, this course has been designed with a skill-oriented content with some necessary theoretical foundation. Thus, this course has been designed to enhance the skills to communicate effectively and skillfully at workplace.

## ii)INDUSTRY/EMPLOYEREXPECTED OUTCOME

Theaimofthiscourseistohelpthestudenttoattainthefollowingindustryidentifiedoutcomethroughvariouslearningexperiences:

1."Communicate in written and oral form of English effectively at workplace."

## E. COURSELEVELLEARNINGOUTCOMES(COs)

CCH201-1 Use Contextual words in English appropriately.
CCH201-2 Comprehend the concept of communication and identify communication barriers.
CCH201-3 Prepare and participate in dialogue, conversation, elocution and debate.
CCH201-4 Make effective use of body language & graphical communication.
CCH201-5 Write letters, reports, e-mails and technical description in correct language.
CCH201-6 Prepare and present effective media aided presentation.

**COMPETENCY, COURSE OUTCOMES AND PROGRAMME OUTCOMES (CP-CO-PO) MATRIX:**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| | PO 1 Basic and Discipline specific knowledge | PO 2 Problem Analysis | PO 3 Design / Development of solutions | PO 4 Engineering Tools, Experimentation and Testing | PO 5 Engineering Practices for society, sustainability and Environment | PO 6 Project Management | PO 7 Life-long Learning | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|
| **Competency:** Apply principles of communication to communicate in formal and informal scenario. | 2 | - | - | - | - | 1 | 2 | | |
| CCH201-1 Use Contextual words in English appropriately. | 1 | 1 | - | - | - | 2 | 1 | | |
| CCH201-2 Comprehend the concept of communication and identify communication barriers | 2 | 1 | - | - | - | 2 | 2 | | |
| CCH201-3 Prepare and participate in dialogue, conversation, elocution | 2 | 1 | - | - | - | 2 | 1 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| and debate. | | | | | | | | | |
| CCH201-4 Make effective use of body language & graphical communication. | 2 | - | - | - | - | 2 | 2 | | |
| CCH201-5 Write letters, reports, e-mails and technical description in correct language. | 2 | - | - | - | - | 2 | 1 | | |
| CCH201-6 Prepare and present effective media aided presentation. | 1 | 1 | - | - | - | 1 | 1 | | |

# F. CONTENT:

## I) Practical Exercises

The following practical exercises shall be conducted in the Laboratory for *Communication Skills* developedby the Institute in practical sessions of batches of about 20- 22 students:

| Sr No. | Title of Practical Exercise | Course Outcome |
|---|---|---|
| 1. | Vocabulary Building: Affixation | CCH201-1 |
| 2. | Vocabulary Building: Homophones | CCH201-1 |
| 3. | Vocabulary Building: Synonyms-Antonyms and Collocations | CCH201-1 |
| 4. | Communication Cycleand Communication Barriers | CCH201-2 |
| 5. | Oral Communication: Transcription | CCH201-3 |
| 6. | Oral Communication: Prepared Speech | CCH201-3 |
| 7. | Oral Communication: Conversation | CCH201-3 |
| 8. | Oral Communication: Group Discussion | CCH201-3 |
| 9. | Oral Communication: Group Debate | CCH201-3 |
| 10. | Non-verbal Communication: Graphic Communication | CCH201-4 |
| 11. | Non-verbal Communication: Body Language | CCH201-4 |
| 12. | Written Communication: Writing formal Letters | CCH201-5 |
| 13. | Written Communication: Writing Reports | CCH201-5 |
| 14. | Written Communication: Drafting of E-mail | CCH201-5 |
| 15. | Written Communication: Technical Writing | CCH201-5 |
| 16. | Presentation Aids | CCH201-6 |

## II) Theory

## Section I

| Sr. No. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH201-1 Use Contextual words in English appropriately. | | | |
| 1 | Vocabulary Building<br>1.1 Affixation: Prefix and Suffix, Definition and Examples, List of common Prefixes and Suffixes<br>1.2 Synonyms and antonyms: Vocabulary Expansion, Context and Usage<br>1.3 Homophones: Identifying Homophones, Meaning and Contest, Vocabulary Expansion<br>1.4 Collocation: Definition and Identification, Types of Collocations | 8 | 08 |
| CO: CCH201-2 Comprehend the concept of communication and identify communication barriers. | | | |
| 2 | Introduction to Communication<br>2.1 Definition and Importance of Communication<br>2.2 Model of Communication<br>2.3 Principles of Effective Communication<br>2.4 Types of Communication: Formal, Informal, Oral, Written, Verbal, Non-Verbal, Horizontal, Upward, Downward and Diagonal Communication<br>2.5 Barriers to communication: Physical, Mechanical, Psychological and LanguageBarriers | 14 | 16 |
| CO: CCH201-3: Prepare and participate in dialogue, conversation, elocution and debate. | | | |
| 3 | Oral Communication<br>3.1 Characteristics of Oral Communication.<br>3.2 Phonetics: IPA, Vowels(12), Consonants(24) and Diphthongs (12)<br>3.3 Tone, Pronunciation and Accents.<br>3.4 Spoken English: Prepared and Extempore speeches<br>3.5 Role Play: Conversation and Dialogue<br>3.6 Group Discussion and Debate | 8 | 10 |

## Section II

| Sr. No. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| CO: CCH201-4: Make effective use of body language & graphical communication. | | | |
| 4 | Non-verbal Communication<br>4.1 Importance of Non-Verbal Communication.<br>4.2 Aspects of Body Language: Facial Expressions, Eye Contact, Vocalics, Gestures, Posture, Dress, Appearance and Personal Grooming and Haptics.<br>4.3 Non-Verbal Codes: Proxemics, chroemics, artefacts<br>4.4 Graphical Communication:<br>4.4.1 Advantages and Disadvantages of Graphical Communication.<br>4.4.2 Tabulation of Data and its depiction in the form of Bar Graphs and Pie Charts | 08 | 12 |
| CO: CCH201-5 Write letters, reports, e-mails and technical description in correct language. | | | |
| 5 | Written Communication<br>5.1 Characteristics of Written Communication.<br>5.2 Letter Writing: Application with Resume, Enquiry Letter, Order Letter and Complaint Letter<br>5.3 Writing Reports: Accident, Fall in Production Reports and Micro Project<br>5.4 Email Writing<br>5.5 Technical Writing: Object Description, Picture Description, Diary Writing<br>5.6 Paragraph Writing: Narrative, Descriptive and Technical | 16 | 20 |
| CO: CCH201-6 Prepare and present effective media aided presentation. | | | |
| 6 | Media-Aided Presentations<br>6.1 Media aids for Presentation: Strengths and Precautions<br>6.2 Planning, Preparing and Making a Presentation<br>6.3 Use of Presentation Media | 06 | 04 |

** No questions will be asked on IKS learning subtopics in any question papers.

## G : List of Assignments/Activities/Micro-project under SLA

**A learner should complete at least on major activity mentioned in the above list under the guidance of subject teacher.

| Sr. No | List of Assignment (under SLA) | Hrs Allotted |
|---|---|---|
| 1 | Report different types of episodes and anecdotes | 02 |
| 2 | Seminar preparation and Presentation | 04 |
| 3 | Make a pod cost episode based on Indian freedom fighters. | 02 |
| 4 | Present summary of the editorial column of English news paper | 02 |
| 5 | Write review of on any one: short story, novel, film | 02 |
| 6 | Prepare a booklet on Indian scientist/ eminent persons | 04 |
| 7 | Prepare blog, vlogs and pod cast | 04 |
| 8 | Prepare questionnaire for interview on any one: industry personnel, social worker, entrepreneur and conduct interview. | 02 |
| 9 | Prepare charts/tables of vowels, diphthongs, consonant, organs of speech, vocabulary in English | 02 |
| 10 | Prepare charts/tables of types of communication, barrier in communication, aspects of body language | 02 |
| 11 | Prepare a micro project on a given topic. | 04 |

## H: Specification Table for Setting Question Paper for Semester End Theory Examination

| Section/ Topic No. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Vocabulary Building | 02 | 02 | 04 | 08 | CCH201-1 |
| I / 2 | Introduction to Communication | 04 | 06 | 06 | 16 | CCH201-2 |
| I / 3 | Oral Communication | 04 | 02 | 04 | 10 | CCH201-3 |
| II /4 | Non-verbal Communication | 04 | 02 | 06 | 12 | CCH201-4 |
| II /5 | Written Communication | 04 | 04 | 12 | 20 | CCH201-5 |
| II / 6 | Media-aided Presentations | - | 02 | 02 | 04 | CCH201-6 |
| | Total Marks | | | | 70 | |

## I:-Assessment Criteria

### i) Formative Assessment of Practical:-

Every assignment shall be assessed for 25 marks as per following criteria:

| **Domain** | **Particulars** | **Marks out of 25** |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing / drafting skills | 05 |

| | | |
|---|---|---|
| Affective | Discipline and punctuality | 05 |
| **TOTAL** | | **25** |

**ii) Summative Assessment of Practical:**

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Sr.No. | Criteria | Marksallotted |
|---|---|---|
| 1 | Attendanceatregularpractical | NA |
| 2 | Preparednessforpractical | NA |
| 3 | Neat& completeDiagram. | NA |
| 4 | Observations& handlingofinstrument. | NA |
| 5 | OralBasedonLabworkandcompletionoftask | NA |
| **TOTAL** | | |

## J) Instructional Methods:

1. Lecture cum Demonstration,
2. Classroom practices.
3. Use of projector and soft material for demonstration

## K) Teaching and Learning Resources:

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Communication Skills | Sanjay Kumar ad Pushp Lata | Oxford University Press |
| 2 | Personality Development and Soft Skills | Brun K. Mitra | Oxford University Press |
| 3 | Effective Communication Skills | M Ashraf Rizvi | Tata McGraw-Hill |
| 4 | Human Communication | Burgoon Michael | SAGE Publication Inc. |
| 5 | 101 Ways to Better Communication | Elizabeth Hiemey | Pustak Mahal |
| 6 | Technical Writing and Professional Communication | Thomas Huckin and Leslie | McGraw-Hill College Division |

## M) Learning Website & Software

a. www.nptel.com/iitm/
b. https://www.britishcouncil.in/english/learn-online
c. https://www.vocabulary.com
d. www.newagegolden.com
e. https://www.internationalphoneticassociation.org

**COURSE ID: 06**
**COURSE NAME : LINUX BASICS**
**COURSE CODE : TH301**
**COURSE ABBREVIATION : HLIX**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 02 | 3 |
| | Tutorial Learning | - | |
| | LaboratoryLearning | 02 | |
| | SLH-SelfLearning | 02 | |
| | NLH-Notional Learning | 06 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Practical | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| -- | -- | -- | -- | -- | 50 | 20 | 25@ | 10 | 25 | 10 | 100 |

**(Total IKS Hrs for Sem:00 Hrs)**

**C: ABBREVIATIONS:-** CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment

**Legends:** @InternalAssessment,#ExternalAssessment,*#OnLine Examination,@$InternalOnlineExamination

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Self learning includes micro project/ assignment/other activities.

## D. i)RATIONALE:-

Linux Operating System is Open source and freely distributed Operating System (O.S). Apart from the fact that it's freely distributed, Linux's functionality, adaptability, and robustness make it highly suitable for the server platform. The course aims to provide knowledge in the basics of Linux, shell, and command line essentials.

### ii)INDUSTRY/EMPLOYEREXPECTED OUTCOME

The aim of this course is to help the student to attain the following industry-identified outcomes through various teaching-learning experiences:

1) To understand the basics of Linux operating system fundamentals and its open-source nature.
2) Basic Scripting Skills for automating tasks and creating custom shell scripts.
3) Ability to perform file operations and manipulate directories.

## E. COURSELEVELLEARNINGOUTCOMES(COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1 - Install Linux operating system.
CO2 - Execute general purpose commands of the Linux operating system.
CO3 - Manage files and directories in Linux operating system.
CO4 - Use vi editor in Linux operating system.
CO5 - Write programs using shell script.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1 Design and Development** | **PSO2 Networking and Database Management** |
| **Competency:**Use Basic Scripting Skills for automating tasks and creating custom shell scripts. | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| ITH301-1 Install Linux operating system | 3 | 2 | 2 | 3 | 1 | - | 3 | - | - |
| ITH301-2 Execute general purpose commands of the Linux operating system | 3 | - | 1 | 3 | 1 | - | 3 | 2 | - |
| ITH301-3 Manage files and directories in Linux | 3 | - | 1 | 3 | 1 | - | 3 | 2 | - |

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PO 1 Basic and Discipline specific knowledge | PO 2 Problem Analysis | PO 3 Design / Development of solutions | PO 4 Engineering Tools, Experimentation and Testing | PO 5 Engineering Practices for society, sustainability and Environment | PO 6 Project Management | PO 7 Life-long Learning | PSO1 Design and Development | PSO2 Networking and Database Management |
| operating system | | | | | | | | | |
| ITH301-4 Use vi editor in Linux operating system | 3 | 2 | 2 | 3 | 1 | - | 3 | 2 | - |
| ITH301-5 Write programs using shell script | 3 | 2 | 2 | 3 | 1 | - | 3 | - | 1 |

# F. CONTENT:

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for Linux Basics developed* by the Institute in practical sessions of batches of about 20- 22 students:

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | *Install and configure the Linux operating system.. | ITH301-1 |
| 2 | *Execute general purpose Linux commands.<br>1) cal 2) date 3) echo 4) printf 5) bc 6) script 7) mailx 8) man 9) clear | ITH301-2 |
| 3 | *Execute general-purpose Linux commands.<br>1) passwd 2) who 3) whoami 4) uname 5) tty 6) stty 7) ps 8) kill 9) sleep | ITH301-2 |
| 4 | *Execute file and Directory manipulation commands.<br>1) pwd 2) cd 3) mkdir 4) rmdir 5) ls 6) cat 7) rm 8) mv 9) cp | ITH301-3 |
| 5 | *Execute file and Directory manipulation commands.<br>1) touch 2) more 3) lp 4) file 5) wc 6) cmp 7) comm 8) diff 9) split | ITH301-3 |
| 6 | *Execute Linux commands for compressing, decompressing, and archiving files.<br>1) gzip 2) gunzip 3) tar 4) tar -c 5) tar -x 6) zip 7) unzip | ITH301-3 |
| 7 | *Change file and directory permissions.<br>1) ls -l, ls - ld 2) chmod (with all options) 3) chown 4) chgrp | ITH301-3 |
| 8 | *Use the vi editor to create and edit files. | ITH301-4 |
| 9 | Use wildcard characters (e.g., *, ?, []) to list and manipulate specific sets of files within the directory. | ITH301-4 |
| 10 | a) Create a text file with various lines of text.<br>b) Create a complex pipeline by chaining multiple commands together using pipes (\|). | ITH301-4 |

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 11 | *Execute input and output redirection in Linux | ITH301-4 |
| 12 | *Execute the following filters commands in Linux. 1) pr 2) head 3) tail 4) cut 5) paste 6) sort 7) uniq 8) tr | ITH301-5 |
| 13 | *Execute commands grep, egrep and sed in Linux | ITH301-5 |
| 14 | Read user input, exit and exit status commands, expr, and logical operators in shell scripts. | ITH301-5 |
| 15 | *Write the Shell script by using the "if" statement | ITH301-5 |
| 16 | *Write a Shell script by using the "while" loop. | ITH301-5 |
| 17 | *Write a Shell script by using the "for"- loop | ITH301-5 |

## II) Theory

### Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| **1** | **Unit - I Introduction to Linux Operating System**<br>1.1 Introduction to Operating System and Linux.<br>1.2 History, Overview of Linux<br>1.3 Shell: Bourne, Korn, Cshell.<br>1.4 Linux releases, Linux File Systems (ext) and versions | **3** |
| **2** | **Unit - II General Purpose Utilities**<br>2.1 cal: The calendar, date: Displaying the system date, echo: Displaying message, printf: An alternative to echo, bc: The calculator, script: Recording your session<br>2.2 Email basics, mailx: The universal mailer<br>2.3 passwd: Changing your password, who: Who are the users?, uname: Knowing your machine characteristics<br>2.4 tty: Knowing your terminal, stty: Displayig and setting terminal charactristics | **5** |
| **3** | **Unit - III File Management in Linux**<br>3.1 The file: Ordinary file, Directory file, Device file, File name, The parent-child relationship, UNIX file system tree, The Unix file system, The home directory<br>3.1.1 pwd: Checking your current directory, cd: Changing the current directory, mkdir: Making directories, rmdir: Removing directories, ls: Listing directory contents<br>3.2 Absolute pathnames, Relative pathnames<br>3.3 Handling ordinary files, cat: Displaying and creating files, cp: Copying file, rm: Deleting files, mv: Renaming files, more: Paging output<br>3.4 The lp subsystem: printing a file, file: knowing the file types<br>3.5 wc: Counting lines, words and characters, od: Displaying data in octal, cmp: Comparing two files, comm: What is common?, diff: Converting one file to other<br>3.6 gzip and gunzip: Compressing and decompressing files, tar: The archival program, zip and unzip: Compressing and archiving together 3.7 | **7** |

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| | Basic file attributes, ls -l: Listing file attributes, the -d option: Listing directory attributes<br>3.8 File ownership, File permissions, chmod: Changing file permissions, directory permission, Changing file ownership, chown: Changing file owner, chgrp: Changing group owner | |

## Section –II

| Sr. no. | Topics/Subtopics | Learning (Hours) |
|---|---|---|
| **4** | **Unit - IV The vi Editor and Shell**<br>4.1 The vi Editor: vi Command, Input, and Line Editing Modes.<br>4.2 Creating, Saving and Quitting a File in vi, Managing Editing Modes in vi.<br>4.3 vi Editing Commands: Common Operations.<br>4.4 Navigation: Movement in the four direction (h, j, k and l), Word navigation ( b, e and w), Moving to Line extremes (0, \| and $), Scrolling ([Ctrl-f], [Ctrl-b], [Ctrl-d] and [Ctrl-u], Absolute Movement (G)<br>4.5 Searching for a pattern( / and ?), Repeating the last pattern search (n and N)<br>4.6 The Shell: The Shell's interpretive cycle, Shell offerings, Pattern matching: The wild-cards, Escaping and quoting, Redirection: The three standard files, /dev/null and /dev/tty: Two special files<br>4.7 Pipes, tee: Creating a tee, Common substitution, Shell Variables | **7** |
| **5** | **Unit - V Filters, Regular Expressions and Shell Programming**<br>5.1 Simple Filters: The sample database, pr: Paginating files, head: Displaying the beginning of a file, tail: Displaying the end of a file, cut: Splitting a file vertically, paste: Pasting files, sort: Ordering file, uniq: Locate repeated and nonrepeated lines,tr: Translating characters<br>5.2 Filters using regular expressions, grep: Searching for a pattern, Basic regular expression (BRE)- An introduction, Extended regular expressions (ERE) and egrep, sed: The stream editor<br>5.3 Essential Shell programming, Shell scripts, read: Making scripts interactive, Using command line arguments, exit and Exit status of command, The logical operators && and \|\|- Conditional executions<br>5.4 The if conditional, Using test and [ ] to evaluate expressions, the case conditional, expr: Computation and string handling, $0: Calling a script by different names<br>5.5 while: Looping, for: Looping with a list | **8** |

** No Questions will be asked on IKS learning subtopics in any question papers.

## G: List of Assignments under SLA

**(Assignments Marked in * are compulsory)**

| Sr.No | List of Assignment (under SLA) | Hrs Allotted |
|---|---|---|
| 1* | Prepare a chart showing different Open source Opearing Systems. | **06** |
| 2* | Install Any Open source Opearing System | **06** |
| 3* | Write a shell script that accept a file name starting and ending line numbers as arguments and display all the lines between given line no | **06** |
| 4* | Write a Shell script that displays list of all the files in the current directory to which the user has read, write and execute permissions.? | **06** |
| 5* | .Write a Shell script to list all of the directory files in a directory. | **06** |

## H : Specification table for setting question paper for semester end theory examination

**Nil**

## I :-Assessment Criteria

### i) Formative Assessment of Practical:-

Every assignment shall be assessed for 50 marks as per following criteria:

| **Domain** | **Particulars** | **Marks out of 50** |
|---|---|---|
| Cognitive | Understanding | 10 |
| | Application | 10 |
| Psychomotor | Operating Skills | 10 |
| | Drawing / drafting skills | 10 |
| Affective | Discipline and punctuality | 10 |
| **TOTAL** | | **50** |

### ii) Summative Assessment of Practical:

Every practical assignment shall be assessed for 25 marks as per following criteria:

| **Sr.no** | **Criteria** | **Marksallotted** |
|---|---|---|
| 1 | Attendance at regular practical | 05 |
| 2 | Preparedness for practical | 05 |
| 3 | Neat & complete Diagram. | 05 |
| 4 | Observations & handling of instrument. | 05 |
| 5 | Oral Based on Lab work and completion of task | 05 |
| **TOTAL** | | **25** |

## J) Instructional Methods:

1. Lectures cum Demonstrations,
2. Classroom practices.
3. Use of projector and soft material for demonstration

## K) Teaching and Learning resources:

1. Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.
2. Computer system with all necessary components like; motherboard, random access memory(RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard, and open-source operating System. (RedHat, Ubuntu etc.).

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Linux The Complete Reference | Richard Petersen | McGraw Hill, 6th edition ISBN Number 978-0071492478 |
| 2 | Linux command line and shell scripting | Richard Blum | Wiley India ISBN Number 978-1118983843 |
| 3 | Linux Lab: Hands on Linux | Prof. Dayanand Ambawade | Dreamtech Press ISBN Number 9789350040003 |
| 4 | Unix Concepts and Applications | Sumitabha Das | McGraw-Hill Education (India) Pvt Limited, 2006 ISBN Number 978-0070635463 |

## M) Learning Website & Software

a. https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners
b. https://www.guru99.com/must-know-linux-commands.html
c. https://www.shellscript.sh/
d. https://www.tutorialspoint.com/unix/shell_scripting.html
e. https://spoken-tutorial.org/tutorial/

**COURSE ID:05**
**COURSE NAME : PROGRAMMING IN C**
**COURSE CODE : ITH105**
**COURSE ABBREVIATION : HPIC**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 03 | 4 |
| | Tutorial Learning | - | |
| | LaboratoryLearning | 04 | |
| | SLH-SelfLearning | 01 | |
| | NLH-Notional Learning | 08 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Practical | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | 30 | 70 | 100 | 40 | 50 | 20 | 50@ | 20 | 25 | 10 | 225 |

**(TotalIKSHrs.forSem.:00**Hrs.)

## C: ABBREVIATIONS: -

CL-ClassroomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment
**Legends:**@InternalAssessment,#ExternalAssessment,*#onLine Examination,@$InternalOnlineExamination.

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshall bedeclaredas fail and will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities

## D. i)RATIONALE:-

'C' programming language helps to build a strong foundation for computer programming. This course will help to solve beginner level problems such as mathematical operations, string processing, data structure and data structure related processing, with the help of basic concepts, control flow structures, and principles of C. This course is basically designed to create a base to develop foundation skills of procedure - oriented programming.

## ii)INDUSTRY/EMPLOYEREXPECTED OUTCOME

The aim of this course is to help the students to attain the following industry identified outcome through various teaching learning experiences: Develop 'C' programs that address issues with processing strings, mathematic operations, and data structures.

## E. COURSELEVEL LEARNINGOUTCOMES(COS)

**ITH105-1:**Develop C program using input - output functions and arithmetic expressions.
**ITH105-2:**Develop C program involving branching and looping statements.
**ITH105-3:**Implement Arrays and Strings using C programs.
**ITH105-4:**Develop C program using user-defined functions
**ITH105-5:**DevelopC program using structures.
**ITH105-6:** Write C program using pointer.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** Design and Development | **PSO2** Database and Network Management |
| **Competency:** Develop 'C' programs that address issues with processing strings, mathematic operations, and data structures | | | | | | | | 2 | - |
| ITH105-1 CO-1 | 3 | 2 | 2 | 1 | - | - | 1 | 1 | - |
| ITH105-2 CO-2 | 2 | 3 | 3 | 2 | - | - | 2 | 1 | - |
| ITH105-3 CO-3 | 2 | 3 | 3 | 3 | - | 2 | 2 | 1 | - |
| ITH105-4 CO-4 | 1 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | - |
| ITH105-5 CO-5 | 2 | 3 | 3 | 3 | - | 2 | 3 | 3 | - |
| ITH105-5 CO-6 | 1 | 3 | 3 | 3 | 1 | 1 | 3 | 3 | - |

# F. CONTENT:

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for Web Page Design* by the Institute in practical sessions of batches of about 20- 22 students:

**(Practical's Marked in * are compulsory)**

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | *Install and study the C programming environment | ITH105-1 |
| 2 | Implement C programs using Constants and Variables | ITH105-1 |
| 3 | *Implement C programs using arithmetic operators to solve given arithmetic operations | ITH105-1 |
| 4 | Implement C programs using implicit and Explicit data type conversion | ITH105-1 |
| 5 | *Write well commented C programs using formatted Input/output statements. | ITH105-1 |
| 6 | *Implement minimum two C programs using Relational and conditional operator. | ITH105-1 |
| 7 | *Implement minimum two C programs using Logical Operators | ITH105-1 |
| 8 | Implement minimum two C programs using Bitwise Operators | ITH105-1 |
| 9 | Implement minimum two C programs using simple If statement and if..else statement. | ITH105-2 |
| 10 | * Implement minimum two C programs using nested If..else statement and if.. else if ladder e.g. - Write and Execute the C program to print the grades of students based on percentage.<br>Grade: Distinction If per>=75<br>Grade: A If per>=60 and Per<75<br>Grade: B If per>=55 and Per<br>Grade: Pass If per>=40 and Per<55<br>Grade: Fail If per<40 | ITH105-2 |
| 11 | * Develop C program using Switch statements | ITH105-2 |
| 12 | * Write a C program to print English Calendar months as per given number(eg: If input is 4 then print "April") using Switch statement | ITH105-2 |
| 13 | * Implement minimum two C programs using 'while' loop and 'do...while' loop statements. | ITH105-2 |
| 14 | Implement C programs using for loop statement (e.g.- Write a C Program to print numbers from 1 to 100) | ITH105-2 |
| 15 | * Print various patterns using loops. e.g. - Write C Program to print following or similar pattern<br>*<br>* *<br>* * *<br>* * * * | ITH105-2 |
| 16 | * Implement C programs using One Dimensional Array. (e.g.-Write C program to input 5 numbers using array and display sum of it) | ITH105-3 |
| 17 | * Implement C programs using Two Dimensional Array. (e.g.-Write C program to calculate addition of two 3X3 matrices.) | ITH105-3 |
| 18 | * Write C program to perform following operations without using standard string functions. i) Calculate Length of given string ii) Print reverse of given string. | ITH105-3 |
| 19 | * Develop C program using in-built mathematical and string functions. | ITH105-4 |

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 20 | * Write C program to demonstrate User defined Functions | ITH105-4 |
| 21 | Implement recursive functions in C program. | ITH105-4 |
| 22 | *Implement 'Structure' in C ( e.g. –Accept and Display information of one student using structure.) | ITH105-5 |
| 23 | * Implement ' Array of Structure' in C (e.g.-Accept and Display 10 Employee information using structure) | ITH105-5 |
| 24 | * Write C Program to print addresses and values of variables using Pointer. (e.g.- Write C program to access and display address of variables.) | ITH105-6 |
| 25 | * Implement C Programs to perform arithmetic operations using Pointer. | ITH105-6 |

## II) Theory

## Section I

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| **CO: ITH105-1:** Develop C program using input - output functions and arithmetic expressions. | | | |
| 1 | **Basics of 'C' Programming**<br>1.1 Fundamentals of algorithms: Notion of algorithm, Notations used for assignment statements and basic control structures.<br>1.2 Introduction to 'C': General structure of 'C' program, Header file, 'main ()' function.<br>1.3 Fundamental constructs of 'C': Character set, tokens, keywords, Identifiers, Constants - number constants, character constants, string constants, Variables. Data types in 'C': Declaring variables, data type conversion.<br>1.4 Basic Input and Output functions: input and output statements using printf (), scanf () functions.<br>1.5 Assignments and expressions: simple assignment statements, arithmetic operators, shift operators, bitwise operators, sizeof operator. | **6** | **10** |
| **CO: ITH105-2:** Develop C program involving branching and looping statements. | | | |
| 2 | **Control structures**<br>2.1 Conditional statements: Relational operators, logical operators, if statement, if-else statements, nested if-else statements, if-else ladder, switch statement.<br>2.2 Looping statements: while loop, do… while loop, for loop.<br>2.3 Branching Statements: goto statement, use of 'break' and 'continue' statements. | **8** | **12** |

| | | | |
|---|---|---|---|
| **ITH105-3:**Implement Arrays and Strings using C programs. | | | |
| 3 | **Arrays and Strings**<br>3.1 Characteristics of an array, One dimension and two dimensional arrays, concept of multi-dimensional arrays.<br>3.2 Array declaration and Initialization.<br>3.3 Operations on Arrays.<br>3.4 Character and String input/output and String related operations. | **8** | **12** |

## Section –II

| Sr. no. | Topics/Subtopics | Learning (Hours) | Classroom learning evaluation Marks |
|---|---|---|---|
| **ITH105-4:** Develop C program using user-defined functions. | | | |
| 4 | **Functions**<br>4.1 Concept and need of functions.<br>4.2 Library functions: Math functions, String handling functions, other miscellaneous functions such as getchar(), putchar()<br>4.3 Writing User defined functions - function definition, functions declaration, function call, scope of variables - local variables, global variables.<br>4.4 Function parameters: Parameter passing- call by value & call by reference, function return values, function return types, declaring function return types, The 'return' statement.<br>4.5 Recursive functions. | 10 | 14 |
| **ITH105-5:**Develop C program using structures. | | | |
| 5 | **Structures**<br>3.1 Introduction and Features of Structures<br>3.2 Declaration and Initialization of Structures<br>3.3 Array of structures. | **7** | **12** |
| **ITH105-6:** Write C program using pointer. | | | |
| 6 | **Pointers**<br>5.1 Introduction to Pointers: Definition, use of pointers, '*' and '&' operators, declaring, initializing, accessing pointers.<br>5.2 Pointer arithmetic.<br>5.3 Pointer to array.<br>5.4 Pointer and Text string. | **6** | **10** |

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## G: List of Assignments under SLA

| Sr.No | List of Assignment (under SLA) | Hrs. Allotted |
|---|---|---|
| 1 | Complete any one course related to Programming in C on Infosys Springboard | 04 |
| 2 | Prepare a simple calculator to perform mathematical operations. Accept values and operations to be performed from user. Allow only numeric values else show appropriate messages to user. | 04 |
| 3 | Prepare menu driven program for Invoice management system. Accept user inputs and generate receipt and calculate amounts as per purchased items | 04 |
| 4 | Develop employee leave management system to display leave related information of employee. | 04 |
| 5 | Develop food menu card for restaurant. Display food items. Accept food menu, quantity and generate bill for the same. | 04 |

## H: Specification table for setting question paper for semester end theory examination

| Section / Topic no. | Name of topic | Distribution of marks (level wise) | | | Total marks | CO |
|---|---|---|---|---|---|---|
| | | Remember | Understand | Apply | | |
| I / 1 | Basics of 'C' Programming | 4 | 2 | 4 | 10 | ITH105-1 |
| I / 2 | Control structures | 4 | 4 | 4 | 12 | ITH105-2 |
| I / 3 | Arrays and Strings | 4 | 4 | 4 | 12 | ITH105-3 |
| II /4 | Functions | 4 | 4 | 6 | 14 | ITH105-4 |
| II /5 | Structure | 2 | 4 | 6 | 12 | ITH105-5 |
| II / 6 | Pointers | 2 | 4 | 4 | 10 | ITH105-6 |
| | Total Marks | | | | 70 | |

## I:-Assessment Criteria

### i) Formative Assessment of Practical:-

Every assignment shall be assessed for 25 marks as per following criteria:

| **Domain** | **Particulars** | **Marks out of 25** |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing / drafting skills | 05 |
| Affective | Discipline and punctuality | 05 |
| **TOTAL** | | **25** |

**ii) Summative Assessment of Practical:**

Every practical assignment shall be assessed for 25 marks as per following criteria:

| Sr.no | Criteria | Marksallotted |
|---|---|---|
| 1 | Attendanceatregularpractical | 05 |
| 2 | Preparednessforpractical | 05 |
| 3 | Neat& completeAlgorithm and flowcharts | 05 |
| 4 | Logical Approach&Programmingskill | 05 |
| 5 | OralBasedonLabworkandcompletionoftask | 05 |
| **TOTAL** | | **25** |

## J) Instructional Methods:

1. Lectures cum Demonstrations.
2. Classroom practices.
3. Use of projector and soft material for demonstration
4. Laboratoryexperiencesandlaboratoryinteractivesessions
5. RegularHomeAssignments

## K) Teaching and Learning resources:

Chalk board, LCD presentations, Self-Learning Online Tutorials, Demonstrative charts.

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Programming in ANSI 'C' | E. Balaguruswamy | Mcgraw Hill Publications ISBN 0070534772 |
| 2 | Let us 'C' | YashwantKanetkar | BPB Publication ISBN 9788183331630 |
| 3 | Head First C | David Griffiths, Dawn Griffiths | O'Reilly Media, Inc. ISBN: 9781449345013 |

## M) Learning Website & Software

1. https://nptel.ac.in/courses/106104128
2. https://jsommers.github.io/cbook/control.html
3. https://www.learn-c.org/en/Functions
4. https://www.simplilearn.com/tutorials/c-tutorial/pointers-in
5. https://www.w3schools.com/c/
6. https://www.javatpoint.com/c-programming-language
7. https://www.programiz.com/c-programming
8. https://www.programiz.com/c-programming/onlinecompiler/

***

**COURSE ID :**
**COURSE NAME : ELEMENTS OF PRACTICAL ELECTRICITY**
**COURSE CODE : ITH104**
**COURSE ABBREVIATION : HEPE**

**A. LEARNING SCHEME:**

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 00 | 1 |
| | Tutorial Learning | 00 | |
| | LaboratoryLearning | 02 | |
| | SLH-SelfLearning | 00 | |
| | NLH-Notional Learning | 00 | |

**B. ASSESSMENT SCHEME :-**

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Practical | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA -PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 03 | 00 | 00 | 00 | 00 | 25 | 10 | 25 | 10 | 00 | 00 | 50 |

## (Total IKS Hrs for Sem. :00Hrs)

**C:** Abbreviations:CL-ClassRoomLearning,TL-TutorialLearning,LL-LaboratoryLearning,SLH-SelfLearningHours,NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA -Self LearningAssessment
Legends:@InternalAssessment,#ExternalAssessment,*#OnLineExamination,@$InternalOnline Examination Note : ( TNR 11 font)

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidateisnotsecuringminimumpassing marksinFA-PRofanycourse thenthecandidateshallbedeclared as"Detained"in that semester.
3. IfcandidateisnotsecuringminimumpassingmarksinSLAofanycoursethenthecandidateshallbedeclaredasfailand will have to repeat andresubmit SLAwork.
4. NotionalLearninghoursforthesemesterare(CL+LL+TL+SL)hrs.*15Weeks
5. 1(one)creditisequivalentto30Notionalhrs.
6. *Selflearning hoursshall notbe reflectedin theTimeTable.

*Selflearningincludesmicroproject/assignment/otheractivities.(Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i)RATIONALE:-

A person working in any field needs to be aware of the mode / ways of application of electricity in his field. He must be well conversant with the basic skills of maintaining the supply system to the machines used by him. This becomes much more important for an information technologist as this reduces his dependence on others for trivial works of electricity to be carried out such as replacing the fuse, calculating the load, inspecting a power supply, deciding wiring systems along with the components & load requirements etc.

This course arms the candidate with basic knowledge & skills in using electricity and related components for his machines such as computers and related device.

### ii) INDUSTRY/EMPLOYEREXPECTEDOUTCOME

Theaimofthiscourseistohelpthestudenttoattainthefollowingindustryidentifiedoutcomethroughvariouslearningexperiences:

1.Identify the primary level issues related to power supply of computers and related devices

## E. COURSE LEVELLEARNING OUTCOMES (COS)

ITH104-1: Use basic principles of electrical engineering related to computer supply systems.

ITH104-2: Use relevant supply system and electrical component for computer.

ITH104-3: Use the measuring instruments in computer laboratories.

ITH104-4: Use the relevant computer peripheral motors and transformer.

**Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/pso) matrix**

[ Note: Correlation levels :1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| Competency and Cos | Programme Outcomes POs and PSOs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PO 1 Basic and Discipline specific knowledge** | **PO 2 Problem Analysis** | **PO 3 Design / Development of solutions** | **PO 4 Engineering Tools, Experimentation and Testing** | **PO 5 Engineering Practices for society, sustainability and Environment** | **PO 6 Project Management** | **PO 7 Life-long Learning** | **PSO1** Design and development | **PSO2** Database and Network management |
| ITH104-1: Use basic principles of electrical engineering related to computer supply systems. | 2 | -- | -- | 2 | 1 | -- | 1 | - | - |
| ITH104-2: Use relevant supply system and electrical component for computer. | 2 | -- | -- | 2 | 2 | -- | 1 | - | - |
| ITH104-3: Use the measuring instruments in computer laboratories. | 2 | - | -- | 2 | 1 | -- | 1 | - | - |
| ITH104-4: Use the relevant computer peripheral motors and transformer. | 2 | -- | -- | 2 | 2 | -- | 1 | - | - |

# F. CONTENT:-

## I) Practical exercises

The following practical exercises shall be conducted in the *Laboratory for basic electrical engineering developed* by the Institute in practical sessions of batches of about 20- 22 students:

| Sr. no | Laboratory experiences | CO |
|---|---|---|
| 1 | Verify Ohm's law. | ITH104-1 |
| 2 | Measure the current, voltage of given single phase socket. | ITH104-2 |
| 3 | To measure the resistance and inductance of given coil using Voltmeter, Ammeter & Multimeter | ITH104-1 |
| 4 | To Measure power of single phase circuit using Wattmeter. | ITH104-2 |
| 5 | Prepare specification of SMPS, Inverter, UPS (any one) | ITH104-3 &ITH104-1 |
| 6 | Use of different electrical simple tools e.g. Screw driver, Tester, Pliers, Wire stripper, drill machine, Test lamp, Fish tape, Electrical Gloves, Soldering Iron, crimping Tools. | ITH104-3 |
| 7 | To measure voltage & current of single transformer in laboratory. | ITH104-4 |
| 8 | To study the earthing arrangement of computer laboratory. | ITH104-2 |
| 9 | To measure earthing resistance of electronic devices or computer. | ITH104-2 & ITH104-3 |
| 10 | To study energy bill. | ITH104-4 |

# G:-Assessment Criteria

**i) Proforma No. I & II**

**ii) Formative Assessment of Practical:-**

Every assignment shall be assessed for 25 marks as per following criteria:

| **Domain** | **Particulars** | **Marks out of 25** |
|---|---|---|
| Cognitive | Understanding | 05 |
| | Application | 05 |
| Psychomotor | Operating Skills | 05 |
| | Drawing / drafting skills | 05 |
| Affective | Attendance/Disciplineand punctuality | 05 |
| **TOTAL** | | **25** |

**ii) Summative Assessment of Practical:**

At the time of Practical Examination assessed for 25 marks as per following criteria:

| **Sr.no** | **Criteria** | **Marksallotted** |
|---|---|---|
| 1 | Knowledge about the course | 05 |

| | | |
|---|---|---|
| 2 | Preparednessforpractical /Oral | 05 |
| 3 | Neat& completeDiagram/write up | 05 |
| 4 | Observations/Handling of instrument/ Communication/Presentation | 05 |
| 5 | OralBasedonLabworkandcompletionoftask | 05 |
| **TOTAL** | | **25** |

## H) Instructional Methods:

1.Laboratory experiments and laboratory interactive session

## I) Teaching and Learning resources:

1.Chalk board
2.Lab manual
3.Self-learning Online Tutorials
4.Virtual lab

## J) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | B. L. Theraja A. K.Theraja | A Text Book of Electrical Technology Vol-I | S. Chand and Co. |
| 2 | V. N. Mittle | Basic Electrical Engg. | Tata McGraw-Hill |
| 3 | V.K.Mehta | Electrical Technology | S. Chand and Co. |

## K) Learning Website & Software

i) www.electrical4u.com
ii) www.vlab.co.in
iii) www.circuitglobe.com

***

**COURSE ID :**
**COURSE NAME : SOCIAL AND LIFE SKILLS**
**COURSE CODE : CCH204**
**COURSE ABBREVIATION : HSLS**

## A. LEARNING SCHEME:

| Scheme component | | Hours | Credits |
|---|---|---|---|
| Actual Contact Hours / week | Classroom Learning | 00 | 1 |
| | Tutorial Learning | 00 | |
| | Laboratory Learning | 00 | |
| | SLH-Self Learning | 02 | |
| | NLH-Notional Learning | 02 | |

## B. ASSESSMENT SCHEME :-

| PAPER DURATION IN HRS | THEORY | | | | BASED ON LL&TL | | | | BASED ON SLA | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Practical | | | | | | |
| | FA-TH | SA-TH | TOTAL | | FA –PR | | SA-PR | | | | |
| | MAX | MAX | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | |
| 00 | 00 | 00 | 00 | 00 | 00 | 00 | - | - | 50 | 20 | 50 |

**(Total IKS Hrs for Sem. : 00 Hrs)**

**C: ABBREVIATIONS:-** CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment
**Legends:** @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination.

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as"Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1(one) credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.

* Self learning includes micro project / assignment / other activities. (Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

## D. i) RATIONALE:-

Life skills can be defined as abilities that enable an individual to deal effectively with the demands and challenges of life. Social skills are a subset of life skills that are needed for successful, healthy relationships toeasily adapt when moving from one social situation to the next. They help regulate our emotions effectively and develop enduring, supportive relationships, we're happier and healthier. This is why developing life skills andeventually social skills is key not only to being successful in life, it's key for our health and well-being. Thus,Teaching of Social and life skills provide students with essentials of knowing, understanding attitudes, values,morals, social skills and better equip them to handle stress and build their self-efficacy, self-esteem and self-confidence.

Note: The course offers four different alternatives (modules) for achieving above outcomes. Students must complete any one module from the following given options.

A) MODULE-I : Unnat Maharashtra Abhiyan (UMA)
B) MODULE-II : National Service Scheme (NSS)
C) MODULE-III : Universal Human Values
D) MODULE-IV: Value Education (Unati Foundation)
E) MODULE-V : Financial Literacy (NABARD)

The institute can choose to offer any one MODULE to the groups of the students by taking into consideration the resources required and resources available in the institute. Different group of students may be offered different MODULE based on their choices.

## ii) INDUSTRY / EMPLOYER EXPECTED OUTCOME

Exhibit psychosocial competencies, workplace ethics, resilience, positive attitude, integrity and self-confidence

## E. COURSE LEVEL LEARNING OUTCOMES (COs)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

CCH114-1 - Develop ability to adapt to new challenges.
CCH114-2 - Manage emotions effectively.
CCH114-3 - Follow workplace ethics and practices
CCH114-4 - Manage time effectively.
CCH114-5 - Increased self-confidence to handle stress.

**COMPETENCY, COURSE OUTCOMES AND PROGRAMME OUTCOMES (CP-CO-PO) MATRIX:**

[ Note : Correlation levels : 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), "0"

| | PO 1 Basic and Discipline specific knowledge | PO 2 Problem Analysis | PO 3 Design / Development of solutions | PO 4 Engineering Tools, Experimentation and Testing | PO 5 Engineering Practices for society, sustainability and Environment | PO 6 Project Management | PO 7 Life-long Learning | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|
| **Competency:** Apply principles of communication to communicate in formal and informal scenario. | | | | | | | | | |
| CCH114-1 Develop self-confidence and positive attitude towards work. | | | | | | | 2 | | |
| CCH114-2 Set personal and professional goals. | | | | | | | 2 | | |
| CCH114-3 Develop ability to manage emotions and to handle stress. | | | | | | | 2 | | |
| CCH114-4 Manage time effectively. | | | | | | 2 | 2 | | |
| CCH114-5 Demonstrate effective interpersonal and leadership skills. | | | | | | | 2 | | |
| CCH114-6 Identify and handle different types of conflicts. | | | | | | 2 | 2 | | |

## F. CONTENT:

### I) Practical Exercises:
**Not Applicable**

### II) Theory

| Sr. No. | Theory Learning Outcomes (TLOs) Aligned to COs. | Learning content mapped with Theory Learning Outcomes (TLO's) and CO's. | Suggested Learning Pedagogies. |
|---|---|---|---|
| | TLO 1.1 Explain developmental needs and connection of various stakeholders TLO 1.2 Enlist the localproblems | **Unit - I MODULE I : Activities UnderUnnat Maharashtra Abhiyan (UMA)**<br>1.1 Introduction to Societal Needs and respective stakeholders :<br>Regional societal issues that need engineering intervention<br>1.2 Multidisciplinary approach-linkages of | Implementation Methodology: Considering the nature of the course designed, following points shall be considered while implementing the course. |

| | | | |
|---|---|---|---|
| | TLO 1.3 Design a methodology for fieldwork<br>TLO 1.4 Select the attributes of engineering and socialsystem for measurement, quantification, and documentation<br>TLO 1.5 Measure & quantify the quantities /systems parameters<br>TLO 1.6 Write a report using information collected. Study the data collected from fieldwork and conclude the observations. | academia, society and technology<br>1.3 Stakeholders' involvement<br>1.4 Introduction to Important secondary data sets available such as census, district economic surveys, cropping pattern, rainfall data, road network data etc<br>1.5 Problem Outline and stakeholders : Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal)<br>1.6 Key attributes of measurement<br>1.7 Various instruments used for data collection - survey templates, simple measuringequipments<br>1.8 Format for measurement of identified attributes/ survey form and piloting of the same<br>1.9 Fieldwork : Measurement and quantifications of local systems such as agriculture produce, rainfall, Road network, production in local industries, Produce /service which moves from A to B<br>1.10 Analysis and Report writing<br>Report writing containing-<br>1. Introduction of the topic<br>2. Data collected in various formats such as table, pie chart, bar graph etc<br>Observations of field visits and datacollected. | i) Regroup in the batches of 5-6 students for conducting the fieldwork from the bigger group.<br><br>ii) Assign a few batches of the students for this course to all thefaculty members.<br><br>iii) A group of course teachers will visit local governance bodies such as Municipal Corporations, Village Panchayats, Zilla Parishads, Panchayat Samitis to assess the small technological / engineering needs in their area of work.<br><br>iv) The group of course teacherswill carry out initial field visits to evaluate the various possibilities of field visits / various scenarios wherein students can conduct field work to measure / quantify the parameters / attributes.<br><br>v) The course will be implemented in eight sessionsand fieldwork.<br>a) Session I - Introduction to development paradigm, fieldwork and case study as pedagogy<br>b) Session II - VII - Society, stakeholders and value creation, measurements, rudimentary analysis and reporting<br>c) Session VIII - Final closure session feedback and assessment<br>d) Field work -<br>1. Pilot Visit - Pilot of surveyinstrument<br>Survey Visit 1 - Data gathering / Information Collection<br>3. Survey Visit 2 |

| | | | |
|---|---|---|---|
| | | | - Datagathering Summary Visit - Closure afteranalysis |
| **2** | TLO 2.1 Adoption of Village or Slum TLO 2.2 Survey and Problem IdentificationTLO 2.3 Conduct Project / Programs in the selected village / slum TLO 2.4 Undertake Special Camping Programme | **Unit - II MODULE II : National Service Scheme (NSS)** 2.1 Contacting Village/Area Leaders 2.2 Primary socio economic survey of few villages in the vicinity of the institute. 2.3 Selection of the village for adoption - conduct of activities 2.4 Comprehensive Socio Economic Survey of the Village/Area 2.5 Identification of Problem(s) 2.6 Dissemination of information about the latest developments in agriculture, watershed management, wastelands development, non-conventional energy, low cost housing, sanitation, nutrition and personal hygiene, schemes for skill development, income generation, government schemes, legal aid, consumer protection and allied fields. A liaison between government and other development agencies for the implementation of various development schemes in the selected village / slum. | (i) The teachers should visit the village / slum before adopting it for NSS activities. (ii) The selected area should be compact. (iii) The community people should be receptive to the ideas of improving their living standard. They should also be ready to coordinate and involve in the projects undertaken by theNSS for their up-liftment (iv) The areas where political conflicts are likely to arise should be avoided by the NSS units. The area should be easily accessible to the NSS volunteers to undertake frequent visits to slums; |
| **3** | TLO 3.1 Love and Compassion (Prem andKaruna) TLO 3.2 Truth (Satya) TLO 3.3 Non-Violence (Ahimsa) TLO 3.4 Righteousness (Dharma) TLO 3.5 Peace (Shanti)TLO 3.6 Service (Seva)TLO 3.7 Renunciation (Sacrifice) Tyaga TLO 3.8 Gender Equality and Sensitivity | **Unit - III MODULE-III : Universal Human Values** 3.1 Love and Compassion (Prem and Karuna): Introduction, Practicing Love and Compassion (Prem and Karuna) 3.2 Truth (Satya) : Introduction, Practicing Truth (Satya) 3.3 Non-Violence (Ahimsa) : Introduction, Practicing Non-Violence (Ahimsa) 3.4 Righteousness (Dharma) : Introduction, Practicing Righteousness (Dharma) 3.5 Peace (Shanti) : Introduction, Practicing Peace (Shanti) 3.6 Service (Seva) : Introduction, Practicing Service (Seva) 3.7 Renunciation (Sacrifice) Tyaga : Introduction, Practicing Renunciation (Sacrifice) Tyaga Gender Equality and Sensitivity: Introduction, Practicing Gender Equality andSensitivity | i) Lectures ii) Demonstration iii) Case Study iv) Role Play v) Observations vi) Portfolio Writing vii) Simulation viii) Motivational talks byPractitioners Site/Industry Visit |
| **4** | TLO 4.1 Punctuality TLO 4.2 Cleanliness, Hygiene and Orderliness | **Unit - IV MODULE-IV: Value Education (Unnati Foundation)** 4.1 Punctuality, Icebreaker and Simple Greeting, Understanding & Managing Emotions, Introducing Self, The power of a Positive Attitude, Talking about one's Family, Talking | i) Video Demonstrations ii) Flipped Classroom iii) Case Study iv) Role Play v) Collaborative learning vi) Chalk-Board |

| | | | |
|---|---|---|---|
| | TLO 4.3 Responsibility<br>TLO 4.4 Gratitude andAppreciations<br>TLO 4.5 Determination& Persistence<br>TLO 4.6 Respect<br>TLO 4.7 Team Spirit<br>TLO 4.8 Caring & Sharing<br>TLO 4.9 Honesty<br>TLO 4.10 Forgive andForget | about one's Family, Making a Positive Impression, Give word list for a Word based 4.2 Cleanliness , Hygiene and Orderliness , Likes and Dislikes, Developing Confidence in Self and Others, Strengths and Weaknesses, Listening Skills , Greeting gestures, Gender Equality and Sensitivity<br>4.3 Responsibility, OCSEM- Visual Comprehension and Word Based Learning, Goal Setting – Make it happen, Follow, Like &Share Unnati Social Media - Facebook / Instagram/ Twitter Introducing Others, Time Management, Talking about the daily routine, Money Management<br>4.4 Gratitude and Appreciation , Asking Simple Questions & Asking for the price , Stress Management, Student Referral process ,Comprehending & Paraphrasing Information,A Plate of Rice and Dignity of Labour, Topicsfor Public Speaking, Placement Process , OCSEM-E-Newspaper, Critical Thinking to overcome challenges<br>4.5 Determination and Persistence, Guiding and Giving Directions, Language Etiquette & Mannerism, . Unnati Philosophy , b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Simple instructions to follow procedures, Assertiveness, Give topics for Debate, Describing a person/Objects, Refusal Skills, Word List for Word based Learning<br>4.6 Respect, Comparing , OCSEM - Public Speaking, Student referral process, Attending a phone call, Being a Good Team Player , Placement Process, At a Restaurant, Workplace ethics<br>4.7 Team Spirit, Inviting someone, OCSEM - Picture Reading & Word, a. Unnati Philosophy& b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Apologizing, Apologizing, Dealing effectively with Criticism, Introduce Importance of Self Learning and up skilling<br>Caring and Sharing , Handling Customer queries, Flexibility & Adaptability, Student referral process, Writing a Resume, OCSEM-Public Speaking, Placement Process, Meditation/ Affirmation & OCSEM-Debate, Introduce Certif-ID, how to create Certif-ID Project ,<br>4.9 Honesty, Email etiquette & Official Email communication, Alcohol & Substance use & abuse, Describing a known place , Leadership Skills, Describing an event, OSCEM-Picture Reading & Visual Comprehension | |

| | | | |
|---|---|---|---|
| | | Forgive and Forget, Facing and Interview, OSCEM-Public Speaking , Attending a telephonic/Video interview & Mock Interview , Affirmation , Pat-a-Back & Closure (Valediction , Unnati Branding, Student Testimonials), Meditation/ Affirmation & Sponsor connect (Speak to UNXT HO) | |
| **5** | TLO 5.1 Literacy About Savings and Investments<br>TLO 5.2 Literacy About Financial Planning<br>TLO 5.3 Literacy About Transactions<br>TLO 5.4 Literacy About Income, expenditure and budgeting<br>TLO 5.5 Literacy About Inflation<br>TLO 5.6 Literacy About Loans<br>TLO 5.7 Literacy About the Importanceof Insurance<br>TLO 5.8 Literacy About the Dos and Don'ts in finances | **Unit - V MODULE-V : Financial Literacy**<br>5.1 Introduction - Life Goals and financial goals<br>5.2 Savings and Investments - Three pillars of investments, Popular asset classes, Government schemes, Mutual Funds, Securities markets (Shares and bonds), Gold, Real Estate, Do's and Don'ts of investments<br>5.3 Retirement planning<br>5.4 Cashless transactions<br>5.5 Income, expenditure and budgeting – Concepts and Importance<br>5.6 Inflation- Concept, effect on financial planning of an individual<br>5.7 Loans – Types, Management of loans, Tax benefits<br>5.8 Insurance – Types, Advantages, selection<br>Dos and Don'ts in Financial planning and Transactions | i) Online/Offline Mode ofInstructions<br>ii) Video Demonstrations<br>iii) Presentations<br>iv) Case Study<br>v) Chalk-Board<br>Collaborative learning |

** No questions will be asked on IKS learning subtopics in any question papers.

## G : List of Assignments/Activities/Micro-project under SLA

**Suggestive list of activities during Regular as well as Special Camping (NSS Activities)**

Following list is only an illustrative list of the type of activities that can be undertaken. Under the programme it would be open to each NSS Unit to undertake one of these programmes or any other activity which may seem desirable to them according to local needs. The NSS Unit should aim at the integrated development of the area selected for its operation which could be a village or a slum. It has also to be ensured that at least a part of the programme does involve manual work.

(a) Environment Enrichment and Conservation:

The activities under this sub-theme would inter-alia, include:
(i) plantation of trees, their preservation and upkeep
(ii) Construction & maintenance of village streets, drains
(iii) Cleaning of village ponds and wells;
(iv) Popularization and construction of Gobar Gas Plants, use of non-conventional energy;
(v) Disposal of garbage & composting;
(vi) Prevention of soil erosion and work for soil conservation,
(vii) Watershed management and wasteland development
(viii) Preservation and upkeep of monuments, and creation of consciousness about the preservation of cultural heritageamong the community.

(b) Health, Family Welfare and Nutrition Programme:

(i) Programme of mass immunization;
(ii) Working with people in nutrition programmes with the help of Home Science and medical college students;
(iii) Provision of safe and clean drinking water;
(iv) Integrated child development programmes;
(v) Health education, AIDS Awareness and preliminary health care.
(vi) Population education and family welfare programme;
(vii) Lifestyle education centres and counselling centres.
© Programmes aimed at creating an awareness for improvement of the status of women: (i) programmes of educatingpeople and making them aware of women's rights both constitutional and legal;
(ii) creating consciousness among women that they too contributed to economic and social well-being of thecommunity;
(iii) creating awareness among women that there is no occupation or vocation which is not open to them provided theyacquire the requisite skills; and
(iv) imparting training to women in sewing, embroidery, knitting and other skills wherever possible.

(d) Social Service Programmes:

(i) work in hospitals, for example, serving as ward visitors to cheer the patients, help the patients, arranging occupational or hobby activities for long term patients; guidance service for out-door-patients including guiding visitors about hospital's procedures, letter writing and reading for the patients admitted in the hospital; follow up ofpatients discharged from the hospital by making home visits and places of work, assistance in running dispensaries etc.
(ii) work with the organisations of child welfare;
(iii) work in institutions meant for physically and mentally handicapped;
(iv) organising blood donation, eye pledge programmes;
(v) work in Cheshire homes, orphanages, homes for the aged etc.;
(vi) work in welfare organisations of women;
(vii) prevention of slums through social education and community action;

(e) Production Oriented Programmes:

(i) working with people and explaining and teaching improved agricultural practices;
(ii) rodent control land pest control practices;
(iii) weed control;

(iv) soil-testing, soil health care and soil conservation;
(v) assistance in repair of agriculture machinery;
(vi) work for the promotion and strengthening of cooperative societies in villages;
(vii) assistance and guidance in poultry farming, animal husbandry, care of animal health etc.;
(viii) popularisation of small savings and assistance in procuring bank loans

(f) Relief & Rehabilitation work during Natural Calamities:

(i) assisting the authorities in distribution of rations, medicine, clothes etc.;
(ii) assisting the health authorities in inoculation and immunisation, supply of medicine etc.;
(iii) working with the local people in reconstruction of their huts, cleaning of wells, building roads etc.;
(iv) assisting and working with local authorities in relief and rescue operation;
(v) collection of clothes and other materials, and sending the same to the affected areas;

(g) Education and Recreations: Activities in this field could include:

(i) adult education (short-duration programmes);
(ii) pre-school education programmes;
(iii) programmes of continuing education of school drop outs, remedial coaching of students from weaker sections;
(iv) work in crèches;
(v) participatory cultural and recreation programmes for the community including the use of mass media forinstruction and recreation, programmes of community singing, dancing etc.;
(vi) organisation of youth clubs, rural land indigenous sports in collaboration with Nehru Yuva Kendras;
(vii) programmes including discussions on eradications of social evils like communalism, castism, regionalism,untouchability, drug abuse etc.;
(viii) non- formal education for rural youth and
(ix) Legal-literacy, consumer awareness.

## H: Specification Table for Setting Question Paper for Semester End Theory Examination: Not Applicable

## I:-Assessment Criteria

### i) Formative Assessment of Practical:-

Formative assessment (Assessment for Learning) report and presentation of fieldwork activities, self-learning (Assignment)

### ii) Summative Assessment of Practical:

(Assessment of Learning)

## J) Instructional Methods:

1. Group Discussion, Flipped Classroom
2. Demonstration, Case Study, Role Play, Collaborative Learning, Cooperative Learning
3. Field Visit, Survey
4. Use of projector and soft material for Demonstration (ppt, audio ,video etc)

## K) Teaching and Learning Resources:

Chalk board, LCD presentations, Demonstrative kits, Demonstrative charts.

## L) Reference Books:

| S.N. | Name of Book | Author | Publication |
|---|---|---|---|
| 1 | Compendium of Training Materials for the Capacity Building of the Faculty and Students of Engineering Colleges on 'IMPROVING THE PERFORMANCE OF RURAL WATER SUPPLY AND SANITATION SECTOR IN MAHARASHTRA' Districts Economic survey reports | IRAP, Hyderabad, CTARA, IIT Bombay and UNICEF, Mumbai | UNICEF |
| 2 | Central Public Healthand Environmental Engineering Organisation | Manual on Water Supply and Treatment | Ministry of Urban Development, New Delhi |
| 3 | Specifications And Standards Committee | Indian Standards (IS) Codes and Indian Roads Congress (IRC) Codes | Bureau of Indian Standards and The Indian Road Congress |
| 4 | Prepared by each district administration | Districts Economic survey reports | Govt. of Maharashtra |
| 5 | Local college students,UMA staffs | Sample Case Studies on UMA website | IITB-UMA team |

## M) Learning Website & Software

a. https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201601131501523808.pdf (Government Resolution of Government of Maharashtra regarding Unnat Maharashtra Abhiyan)
b. https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201606151454073708.pdf (Government Resolution of Government of Maharashtra regarding Unnat Maharashtra Abhiyan Guidelines)
c. https://censusindia.gov.in/census.website/ (A Website of Census of India)
d. https://gsda.maharashtra.gov.in/english/ (A Website of Groundwater Survey and Development Agency, GoM)
e. https://mrsac.gov.in/MRSAC/map/map (A Website where district-wise mapsshowcasing

different attributes developed by Maharashtra Remote Sensing Applications Centre.)

f. https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx (A Website of Jal Jivan Mission, Government of India)
g. https://cpcb.nic.in/ (A Website of Central Pollution ControlBoard, Government of India)
h. http://www.mahapwd.com/# (A Website of Public WorksDepartment, GoM)
i. http://tutorial.communitygis.net/ (A Website for GIS data sets developed by Unnat Maharashtra Abhiyan)
j. https://youtu.be/G71maumVZ1A?si=TzDTxKUpLYaRos7U (A video record of lecture by Prof. Milind Sohoni, IIT Bombay, on Engineering, Development and Society)
k. https://youtu.be/TUcPNwtdKyE?si=wnSWrhGc9dJTC-ac (A keynote talk by Prof. Milind Sohoni,IIT Bombay, on Interdisciplinary Engineering: The Road Ahead)