

GOVERNMENT POLYTECHNIC KOLHAPUR
CIVIL ENGINEERING DEPARTMENT
SAMPLE PATH - H SCHEME -FIRST SEMESTER

Sr.no	Course Title	Abbreviation	Course Type	Course Code	Level	Total IKS Hrs. for Sem	Learning Scheme					Assessment Scheme					Based on LL & TL				Based on Self Learning		Total Marks			
							Actual Contact					Theory					Practical									
							CL	TL	LL	Self Learning (Activity/Assignment/MicroProject)	Notional Learning Hrs/Week	Credits	Paper Duration(Hrs)	FA-TH	SA-TH	Total	FA-PR	SA-PR	SLA	Total Marks						
							Max	Max	Max	min	Max	min	Max	min	Max	min	Max	min	Max	min						
1	CIVIL WORKSHOP PRACTICES	HWCE	SEC	CEH101	1	6	0	0	4	0	4	2	0	0	0	0	0	50	20	50	@	20	0	0	100	
2	ENGINEERING CHEMISTRY-B	HCHB	DSC	CCH104	1	4	4	0	2	2	8	4	1.5	30	70	**	100	40	25	10	25	@	10	25	10	175
3	BASIC MATHEMATICS	HBMT	AEC	CCH105	1	4	4	2	0	2	8	4	3	30	70		100	40	0	0	0		0	25	10	125
5	ENGINEERING GRAPHICS	HGRB	DSC	CCH106	1	2	2	0	4	0	6	3	4	30	70		100	40	50	20	0		0	0	0	150
4	COMMUNICATION SKILLS (ENGLISH)	HCMS	AEC	CCH201	2	0	4	0	2	2	8	4	3	30	70		100	40	25	10	0		0	25	10	150
6	FUNDAMENTALS OF ICT	HICT	SEC	CCH202	2	0	1	0	2	1	4	2		0	0		0	0	25	10	25	@	10	25	10	75
7	YOGA AND MEDITATION®	HYAM	VCE	CCH203	2	1	0	0	1	1	2	1		0	0		0	0	25	10	0		0	25	10	50
	TOTAL					17	15	2	15	8	40	20		120	280		400	160	200	80	100	0	40	125	50	825

@ INTERNAL ASSESMENT
EXTERNAL ASSESMENT

**GOVERNMENT POLYTECHNIC KOLHAPUR
CIVIL ENGINEERING DEPARTMENT
SAMPLE PATH - H SCHEME -SECOND SEMESTER**

Sr.no	Course Title	Abbreviation	Course Type	Course Code	Level	Total IKS Hrs. for Sem	Learning Scheme					Assessment Scheme					Based on LL & TL				Based on Self Learning		Total Marks			
							Actual Contact					Theory					Practical									
							CL	TL	LL	Self Learning (Activity/Assignment/MicroProject)	Notional Learning Hrs/Week	Credits	Paper Duration(Hrs)	FA-TH	SA-TH	Total					FA-PR	SA-PR		SLA		
							Max	Max		Max	min	Max	min	Max	min	Max	min	Max	min							
1	ENGINEERING PHYSICS-B	HPHB	DSC	CCH102	1	4	4	0	2	2	8	4	1.5	30	70	*#	100	40	25	10	25	@	10	25	10	175
2	APPLIED MECHANICS	HAPM	DSC	CCH108	1	2	4	0	2	2	8	4	3	30	70		100	40	25	10	25	@	10	25	10	175
3	APPLIED MATHEMATICS	HAMT	AEC	CCH301	3	2	4	2	0	0	6	3	3	30	70		100	40	0	0	0		0	0	0	100
4	SOCIAL AND LIFE SKILLS	HSLs	VEC	CCH204	2	0	0	0	1	1	2	1	0	0	0		0	0	0	0	0		0	50	20	50
5	BUILDING MATERIAL AND CONSTRUCTION	HBMC	DSC	CEH301	3	1	3	0	2	3	8	4	3	30	70		100	40	25	10	0		0	25	10	150
6	SURVEYING	HSVY	SEC	CEH302	3	1	3	0	4	1	8	4	3	30	70		100	40	25	10	50	#	20	25	10	200
		TOTAL				10	18	2	11	9	40	20		150	350		500	200	100	40	100	0	40	150	60	850

@ INTERNAL ASSESMENT
EXTERNAL ASSESMENT

GOVERNMENT POLYTECHNIC KOLHAPUR
CIVIL ENGINEERING DEPARTMENT
SAMPLE PATH - H SCHEME -FIRST SEMESTER

Sr.no	Course Title	Abbreviation	Course Type	Course Code	Level	Total IKS Hrs. for Sem	Learning Scheme					Assessment Scheme					Based on LL & TL				Based on Self Learning		Total Marks			
							Actual Contact					Theory					Practical									
							CL	TL	LL	Self Learning (Activity/Assignment/MicroProject)	Notional Learning Hrs/Week	Credits	Paper Duration(Hrs)	FA-TH	SA-TH	Total	FA-PR	SA-PR		SLA						
							Max	Max	Max	min	Max	min	Max	min	Max	min										
1	CIVIL WORKSHOP PRACTICES	HWCE	SEC	CEH101	1	6	0	0	4	0	4	2	0	0	0	0	0	50	20	50	@	20	0	0	100	
2	ENGINEERING CHEMISTRY-B	HCHB	DSC	CCH104	1	4	4	0	2	2	8	4	1.5	30	70	**	100	40	25	10	25	@	10	25	10	175
3	BASIC MATHEMATICS	HBMT	AEC	CCH105	1	4	4	2	0	2	8	4	3	30	70		100	40	0	0	0		0	25	10	125
5	ENGINEERING GRAPHICS	HGRB	DSC	CCH106	1	2	2	0	4	0	6	3	4	30	70		100	40	50	20	0		0	0	0	150
4	COMMUNICATION SKILLS (ENGLISH)	HCMS	AEC	CCH201	2	0	4	0	2	2	8	4	3	30	70		100	40	25	10	0		0	25	10	150
6	FUNDAMENTALS OF ICT	HICT	SEC	CCH202	2	0	1	0	2	1	4	2		0	0		0	0	25	10	25	@	10	25	10	75
7	YOGA AND MEDITATION®	HYAM	VCE	CCH203	2	1	0	0	1	1	2	1		0	0		0	0	25	10	0		0	25	10	50
		TOTAL				17	15	2	15	8	40	20		120	280		400	160	200	80	100	0	40	125	50	825

@ INTERNAL ASSESMENT
EXTERNAL ASSESMENT

COURSE ID : CE
Course Name : CIVIL WORKSHOP PRACTICES
Course Code : CEH101
Course Abbreviation : HWCE

A. LEARNING SCHEME:

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

B. ASSESSMENT SCHEME :-

Theory				Based on LL & TL				Based on Self Learning		Total Marks
				Practical						
FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	-	-	50	20	50@	20	-	-	100

(Total IKS Hrs for Sem. : 06 Hrs)

C. 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,*#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 microproject/ assignment/ other activities.(Provide list of all assignments here in tabular format At least 6 to 8 assignments to be given)

D. i) RATIONALE:

Civil Workshop Practices mainly deals with Fitting, Plumbing, Welding and Wood working. A technician has to work in such an environment with his peers, superiors and subordinates for a major part of his life. Therefore, the emphasis on the practical work is needed for the primary experience of working in the team.

ii) INDUSTRY / EMPLOYER EXPECTED OUTCOME

Use different engineering tools for performing site activities.

E. COURSE OUTCOMES:

CEH101-1: Practice safety in workshop and Use fire fighting tools and equipment.

CEH101-2: Prepare job using different tools in fitting shop

CEH101-3: Perform various operations using plumbing tools.

CEH101-4: Preparing simple components using carpentry tools.

CEH101-5: Produce simple job using different sheet metal operations.

CEH101-6: Produce simple job using different welding operations.

F. 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	PSO 1 Plan for collection of data prepare, design drawing & Estimate	PSO 2 Develop Supervisory & Middle Level Management Skills	PSO 3 Identify and solve problems on construction sites.
Competency	1	-	-	3	-	-	-	-	2	-
CEH101-1	1	-	-	3	-	-	-	-	2	-
CEH101-2	1	-	-	3	-	-	-	-	2	-
CEH101-3	1	-	-	3	-	-	-	-	2	-
CEH101-4	1	-	-	3	-	-	-	-	2	-
CEH101-5	1	-	-	3	-	-	-	-	2	-
CEH101-6	1	-	-	3	-	-	-	-	2	-

G. CONTENT - PRACTICAL WORK:

The students will submit the following.

Workshop record book showing the details of the job viz. Drawing, Raw material size, time required for completing the job. The journal consisting of the neat sketches, specifications, use of the hand tool, and hand operations based on the demonstration in all the trades during the practical work.

H. ASSESSMENT CRITERIA

i) Formative Assessment of Practical:-

Every practical 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 student has to perform one practical within 2 hours at term end practical which shall be assessed as per following criteria.

Sr. no	Criteria	Marks allotted
1	Preparedness for practical	10
2	Correct figures / diagrams	10
3	Skill (Finishing in dimensions)	20
4	Safety / use of proper tools	10
	Total	50

I. INSTRUCTIONAL STRATEGIES: -

- i) Demonstration during Practical's.
- ii) Workshop Record Book

J. TEACHING AND LEARNING RESOURCES: -

- i) Shop Demonstration

Sr. No.	Topics/ Sub-Topics	Skills/ Competencies to be developed	Practical (Hours)/ Evaluation (Marks)
Course outcome: CEH101-1			
01	<p>General Workshop Practice</p> <p>1.1 Safety Practices, Causes of accidents, General safety rules, Safety signs and symbols</p> <p>1.2 First Aid</p> <p>1.3 Fire, Causes of Fire, Basic ways of extinguishing the fire, Classification of fire, Class A,B,C,D, Fire fighting equipment, fire extinguishers, and their types.</p> <p>1.4 Workshop Layout</p> <p>1.5 Issue and return system of tools, equipment and consumables</p>	<p>A. Follow safety practices</p> <p>B. Explain the different types of fire extinguisher and their uses</p> <p>C. Use fire fighting equipment</p> <p>D. Locate various machines and equipment in workshop</p> <p>E. Follow good housekeeping</p>	04/–
Course outcome: CEH101-1 and 2			
02	<p>Fitting Shop</p> <p>2.1 Demonstration of different fitting tools-holding tools, marking & measuring tools, cutting tools, finishing tools, drilling and power tools and their specifications</p> <p>2.2 Demonstration of different operations like marking, filing, cutting, drilling, tapping, dieing, chipping, scraping, grinding, sawing, reaming etc.</p> <p>2.3 Demonstration of bending bars.</p> <p>2.4 Demonstration of stirrups.</p> <p>2.5 One simple job in aluminum window frame.</p> <p>2.6 One job in stirrups.</p> <p>2.7 Window frame.</p>	<p>A. Study of fitting tools, identifying materials</p> <p>B. Measuring dimensions</p> <p>C. Interpretation of drawing</p> <p>D. Selection of tools</p> <p>E. Time management and observing safety habits</p> <p>F. Operate drilling machine, saw machine</p> <p>G. Prepare utility article</p>	12/10
Course outcome: CEH101-1 and 3			
03	<p>Plumbing shop</p> <p>3.1 Demonstration of Plumbing tools -pipe vice, pipe bending equipment, pipe wrenches, dies and their Specifications</p> <p>3.2 Pipe fittings- bends, elbows, tees, cross, coupler, socket, reducer, cap, plug, nipple and their Specifications</p> <p>3.3 Operation of Machineries in plumbing shops- pipe bending machine there specifications and maintenance. Basic process cutting, threading.</p> <p>3.4 Demonstration of PVC pipe joint with various PVC fittings & accessories</p> <p>3.5 One job on simple pipe joint with nipple coupling for Standard pipe, Pipe threading using standard die set (One job per one group of 04 students)</p>	<p>A. Study of plumbing tools, identifying materials</p> <p>B. Interpretation of drawing</p> <p>C. Threading with dies on pipe</p> <p>D. Time management and observing safety habits</p> <p>E. Selection of pipe joint & fittings.</p>	12/10

	3.6 One job on T joint/elbow joint pipe fitting job as per given drawing.(One job per one group of 04 students)		
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Course outcome: CEH101-1 and 4

04	<p>Wood Working shop: -</p> <p>4.1 Demonstration of types of artificial woods such as plywood, block board, hardboard, laminated board, Veneer, fiber boards and their applications</p> <p>4.2 Demonstration of different wood working tools such as carpentry vice, marking and measuring tools, holding tools, planing tools, cutting tools, drilling and boring tools saws, claw hammer, mallet, chisels, jack plane, smoothing plane, etc.</p> <p>4.3 Demonstration of different wood working processes like marking, sawing, planing, chiseling, grooving, boring, Turning of wood etc.</p> <p>4.4 Operate different machines & equipments in carpentry shop, their specifications and maintenance, safe practices.</p> <p>4.5 One simple job involving measuring, marking, cutting, assembly etc. operations. (One job per one group of 04 students)</p> <p>4.6 One simple job involving cutting, planing, wood turning, joining, finishing, varnishing, etc. operations (One job per one group of 04 students)</p>	<p>A. Study of wood working tools, Identifying materials</p> <p>B. Measuring dimensions</p> <p>C. Interpretation of drawing</p> <p>D. Operating planing, cutting, drilling machines.</p> <p>E. Time management and observing safety habits</p> <p>F. Prepare furniture or article with carpentry joints</p>	12/10
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Course outcome: CEH101-1 and 5

05	<p>Sheet Metal Shop</p> <p>5.1 Demonstration of different sheet metal tools and machines.</p> <p>5.2 Demonstration of sheet metal operations like Sheet cutting, Bending, Edging, End curling, Lancing, Riveting etc.</p> <p>5.3 One Job involving sheet metal operations from Dustbin, Letter Box, Tray, Bucket etc. (One job per one group of 04 students)</p>	<p>A. Study of sheet metal tools, identifying materials</p> <p>B. Measuring dimensions</p> <p>C. Interpretation of drawing</p> <p>D. Operating sheet cutting bending machines</p> <p>E. Time management and observing safety habits</p> <p>F. Prepare utility article</p>	12/10
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Course outcome: CEH101-1 and 6			
06	Welding shop :- a) Demonstration of various welding tools, joints of metals, type of welding machines. b) Demonstration of arc welding techniques. c) How to use current setting, earthing connection etc. and any one job composite job involving Butt, Lap joint from the following pieces of work - i) Window frame. ii) Grill. iii) Sanitary window frame. iv) Supporting frame. v) Stool frame. vi) Bench frame etc.	a) Study of welding tools, Identifying materials b) Measuring dimensions c) Interpretation of drawing d) Operating welding machines. e) Time management and observing safety habits	12/10

ii) ii) Hands on training on machine

K. REFERENCE BOOKS:

Author	Title	Publisher
S. K. Hajra Chaudhary, Bose, Roy	Elements of workshop Technology – Volume I & II	Media Promoters and Publishers limited
B.S. Raghuvanshi	Elements of workshop Technology – Volume I & II	Dhanpat Rai & Co.

L. LEARNING WEBSITE & SOFTWARE

- i) <http://nptel.ac.in>
- ii) <https://www.vlab.co.in/>
- iii) <https://ecoursesonline.iasri.res.in/>
- iv) www.egr.msu.edu/~pkwon/me478

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COURSE ID : CCH 104
COURSE NAME : ENGINEERING CHEMISTRY.
COURSE CODE : CCH 104
COURSE ABBREVIATION : HCHB

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

(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)

CCH104-1 Apply the basic knowledge of atom, molecules and compounds in Engineering Chemistry.

CCH104-2 Apply the concepts of Electrochemistry to interpret the reasons of corrosion with its remedies.

CCH104-3 Select the relevant catalyst, alloys, insulators, adhesives, composite materials, plastic and rubber for different applications in the field of engineering.

CCH104-4 Use of water in Domestic purpose, Industrial purpose and its relevant treatment to solve industrial problems.

CCH104-5 Explain the method of Extraction of Iron.

CCH104-6 Choose appropriate with relevant method of lubrication to solve industrial problem and applications of Paint and Varnish.

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
CCH104-1 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
CCH104 - 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	-	-
CCH104 -3 CO-3 Select the relevant catalyst, alloys, 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	-	-
CCH104 – 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	-	-
CCH104-5 CO-5 Explain the method of Extraction of Iron.	3.0	1.0	-	-	2.0	1.0	3.0	-	-
CCH10- 6CO-6 Choose appropriate with relevant method of lubrication to solve industrial problem and applications of Paint and Varnish.	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	CCH104-1
2	Volumetric analysis of solution.	CCH104-1
3	Preparation of 1 N, 0.5 N & 0.1 N Solutions of different chemicals like NaOH, HCl, Oxalic acid, FeSO ₄ , etc.	CCH104-1
4	Titration of strong acid and strong bases (HCl X NaOH)	CCH104-1
5	Double titration of strong acid, strong base & weak acid (HCl X NaOH X H ₂ C ₂ O ₄ .H ₂ O)	CCH103-1
6	Titration of weak base , strong acid & strong base (Na ₂ CO ₃ X H ₂ SO 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	CCH103-6
10	Estimation of Ca in limestone.	CCH103-5
11	Titration of KMnO ₄ & FeSO ₄ (Redox titration)	CCH103-5
12	Estimation of % of Fe in given sample of steel.	CCH103-3
13	Determination of alkalinity of water.	CCH103-4
14	Determination of Electrochemical equivalent (ECE) by copper volt meter.	CCH104-2
15	To estimate volumetrically the percentage of copper in a given sample of Brass.	CCH104- 5
16	To demonstrate the different types of Solders.	CCH104-3

II) Theory

Section I

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO - CCH104-1 Apply the basic knowledge of atom, molecules and compounds in Engineering Chemistry.			
1	ATOMIC STRUCTURE AND CHEMICAL BONDING 1.1 Philosophy of atom by Acharya Kanad. 1.2 Atom, Fundamental particles, Nature of atom. 1.3 Atomic Number, Mass Number, Isotopes and isobars. 1.4 Bohr's theory of atom. 1.5 Statement of Aufbau's principle, Hund's rule of maximum multiplicity, Pauli's exclusion principle. 1.6 Lewis and Langmuir's concept of stable electronic configuration.	07	08

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
	1.7 Electrovalency and Co-valency. 1.8 Formation Of electrovalent compounds- NaCl, CaCl ₂ . 1.9 Formation of Covalent compounds- H ₂ O, CO ₂		
CO - CCH104-2 Apply the concepts of Electrochemistry to interpret the reasons of corrosion with its remedies.			
2	ELECTROCHEMISTRY AND CORROSION. 2.1 Definitions- Cathode, Anode, Conductor, Electrolyte, Electrode, Ionisation, Electrolysis. 2.2 Arrhenius Theory Of Ionisation. 2.3 Degree of Ionisation & Factors affecting degree of ionisation. 2.4 Statement of Faraday's first and second law of electrolysis. 2.5 Relation between CE and ECE. 2.6 Electrolysis of molten NaCl. 2.7 Electrolysis of CuSO ₄ solution by using Cu-Electrodes. 2.8 Industrial applications of electrolysis. 2.8.1 Electroplating. 2.8.2 Electro refining of Cu. 2.9 Definition & types of corrosion. 2.10 Dry or Atmospheric corrosion , Oxide Film Formation & its types, Factors affecting atmospheric corrosion. 2.11 Wet or electrochemical corrosion 2.12 Factors influencing immersed corrosion 2.13 Methods of protection of metal from corrosion - Hot dipping (Galvanizing & Tinning) ,Metal spraying, Metal cladding, Cementation or sherardizing.	10	10
CO - CCH104-3 Select the relevant catalyst, alloys, insulators, adhesives, composite materials, plastic and rubber for different applications in the field of engineering.			
3	CHEMISTRY OF ENGINEERING MATERIALS AND CATALYSIS. 3.1 INSULATORS 3.1.1 Definition & Characteristics of insulator. 3.1.2 Preparation, properties & uses of Glass wool, Thermocole. 3.2 COMPOSITE MATERIALS 3.2.1 Definition. 3.2.2 Classification, Properties & Application of composite materials. 3.3 PLASTICS	13	16

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

Section –II

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO - CCH104-4 Use of water in Domestic purpose, Industrial purpose and its relevant treatment to solve industrial problems.			
4	WATER 4.1 Impurities in natural water. 4.2 Hard water & Soft water. 4.3 Hardness of water- Temporary & Permanent. 4.4 Reactions of hard water with soap. 4.5 Disadvantages of hard water for domestic & Industrial purpose - Textile Industry, Sugar Industry, Paper Industry Dying Industry.	09	12

	<p>4.6 Sterilization of water - Chlorination -by Cl₂, bleaching powder, Chloramines with chemical reactions.</p> <p>4.7 Ion Exchange method to remove total hardness of Water.</p>		
CO - CCH104-5 Explain the method of Extraction of Iron.			
5	<p>METALLURGY AND ALLOYS</p> <p>5.1 Occurrence of metals, Definition of minerals, Ore, Flux, Gangue & Slag.</p> <p>5.2 Flow chart of metallurgical processes.</p> <p>5.3 Concentration of ores - Physical methods - 1. Gravity separation method 2. Electromagnetic separation method 3. Froth floatation method Chemical methods - 1. Calcination 2. Roasting</p> <p>5.4 Ores of Iron.</p> <p>5.5 Extraction of Iron from its ore - Blast furnace - Construction, working, reactions & Products.</p> <p>5.6 Definition of alloys.</p> <p>5.7 Classification & purposes of making of alloys.</p> <p>5.8 Composition, properties & engineering application of - Non-ferrous alloys - Duralumin, Monal metal & Woods metal. Ferrous alloys - Heat resisting steel, magnetic steel, Stainless steel.</p>	12	14
CO - CCH104-6 Choose appropriate with relevant method of lubrication to solve industrial problem and applications of Paint and Varnish.			
6	<p>LUBRICANTS, PAINT AND VARNISH</p> <p>6.1.1 Definition, Classification & Functions of lubricants.</p> <p>6.1.2 Characteristics of lubricants - Viscosity, Viscosity index, Oiliness, Volatility, Cloud point & Pour point, Flash & Fire point, Acid value.</p> <p>6.2 Oil paint - Definition & characteristics of oil paint.</p> <p>6.3 Purpose of using oil paint.</p> <p>6.4 Ingredients of oil paint with suitable example & its fuctions - Drying oil (Vehicle), Drier, Pigment, Thinner, Filler (Extenders), Plasticizer.</p> <p>6.5 Varnish - Definition, types, constituents,</p>	09	10

	Properties & applications. 6.6 Distinction between paint & varnish.		
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** No questions will be asked on IKS learning subtopics in any question papers.

G : List of Assignments under SLA

**** 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 1. Galvanizing, 2. Tinning, 3. Metal spraying, 4. Metal Cladding, 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 1. Gravity separation method. 2. Electromagnetic separation method. 3. Froth floatation method.	02
15	Explain ingredients present in Paints	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	CCH104-1
I / 2	Electrochemistry & Corrosion	4	4	2	10	CCH104-2
I / 3	Chemistry of Engineering materials & catalysis	6	6	4	16	CCH104-3
II / 4	Water	4	4	4	12	CCH104-4
II / 5	Metallurgy & Alloys	6	4	4	14	CCH104-5
II / 6	Lubricants, Paints & Varnish	4	4	2	10	CCH104-6
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/history-famous-people/indian-sage-acharya-kanad-001399

COURSE ID : CCH105
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	
	Laboratory Learning	-	
	SLH-Self Learning	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	MIN	
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	125
03	30	70	100	40			--	--	25	10	

(Total IKS Hrs for Sem.: 06 Hrs)

C: 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, *#OnLine 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.*15Weeks
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. (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. COURSE LEVEL LEARNING OUTCOMES (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 problems based 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 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		
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:

D) 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 & sub multiple 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	<p>1.1 LOGARITHMS 1.1.1 Concept and laws of logarithm 1.1.2 Simple examples based on laws of Logarithms</p> <p>1.2 MATRICES 1.2.1 Definition of a matrix, Types of matrices, Algebra of matrices, Equality of two matrices, Transpose of a matrix, 1.2.3 Adjoint and Inverse of a matrix 1.2.4 Solution of simultaneous equations having 3 unknowns using Matrix inversion method</p> <p>1.3 PARTIAL FRACTIONS 1.3.1 Definition of rational, proper and improper fractions 1.3.2 Various cases of Partial fractions and Examples</p> <p>1.4 Algebra of Indian Knowledge System: Solution of simultaneous equations using Vedic Mathematics</p>	12	16
CO: CCH105-2 : To Use techniques and methods of statistics to compare multiple sets of data			
Unit 2 Statistics	<p>MEASURES OF DISPERSION 2.1 Range, Coefficient of Range of Discrete and grouped data 2.2 Mean deviation and Standard Deviation about mean for Discrete & Grouped Data (except Assumed mean method and Step deviation method) 2.3 Variance and coefficient of Variance 2.4 Comparison of 2 sets of observations</p>	6	10
CO: CCH105-3 : Solve area specific engineering problems under given conditions of straight lines			
Unit 3 Coordinate Geometry	<p>THE STRAIGHT LINE 3.1 Slope, intercepts & various methods of finding slope 3.2 Conditions for two straight lines to be parallel and Perpendicular to each others 3.3 Various forms of straight line 3.4 Perpendicular distance of a point from a line 3.5 Distance between two parallel lines 3.6 Angle between two straight lines 3.7 Geometry in Sulabh sutras in Indian Knowledge System</p>	6	8

Section –II

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

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

Course Name : ENGINEERING DRAWING -1 (CE/ME/MT)
Course Code : CCH106
Course Abbreviation: HGRB
Course Type : DSC

A. LEARNING SCHEME:

Pre-requisite Course(s): Nil

Teaching Scheme:

Scheme component	Actual Contact Hours / week	Credits
Classroom Learning (CL)	02	3
Tutorial Learning (TL)	-	
Laboratory Learning (LL)	04	
Self-Learning Hours (SLH)	-	
Notional Learning (NLH)	06	

B. ASSESSMENT SCHEME:

Theory				Based on LL & TL				Based on Self Learning		Total Marks
				Practical				SLA		
FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
30	70	100	40	50	20	-	-	-	-	150

Total IKS Hrs for Sem: 2 Hrs

C. 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

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 5 assignments here in tabular format)

D. i) RATIONAL:

Engineering graphics is the language of engineers. The concepts of graphical language are used in expressing the ideas, conveying the instructions, which are used in carrying out the jobs on the sites, shop floor etc. This course is useful in developing drafting and sketching skills in the student. It covers the knowledge & application of drawing instruments & also familiarizes the

learner about Bureau of Indian Standards related to engineering drawing. The curriculum aims at developing the ability to draw and read various engineering curves, projections and dimensioning styles. The subject mainly focuses on use of drawing instruments, developing imagination and translating ideas into sketches. The course also helps to develop the idea of visualizing the actual object or part on the basis of drawings and blue prints. This preliminary course aims at building a foundation for the further courses related to engineering drawing and other allied courses in coming semesters

ii) INDUSTRY / EMPLOYER EXPECTED OUTCOME

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

Prepare simple engineering drawing manually using drawing instruments.

E. COURSE LEVEL LEARNING OUTCOMES (CO'S)

CCH106-1 Understand various fundamentals in engineering drawing.

CCH106-2 Produce different types of engineering curves.

CCH106-3 Produce the projection of point & lines inclined to one reference plane.

CCH106-4 Produce the projection of different planes.

CCH106-5 Produce orthographic drawing and sectional orthographic drawing from given pictorial view.

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 outcome POs and PSO's								
	PO 1 Basic and Discipline specific knowledge	PO 2 Problem Analysis	PO3 Design/development of solutions	PO 4 Engineering Tools, Experimentation & testing	PO 5 Engineering Practices for society, sustainability and Environment	PO 6 Project Management	PO 7 Life-long learning	PSO1 Work in mfg & service sector	PSO 2 Start entrepreneurial activity
CCH106-1	3	-	-	-	-	-	-	-	-
CCH106-2	3	-	1	-	-	-	-	-	-
CCH106-3	3	-	-	1	1	-	-	-	-
CCH106-4	3	-	1	-	-	-	-	-	-
CCH106-5	3	-	1	1	-	-	-	-	-

F. CONTENT:

i) Practical exercises

Practical Exercises and related skills to be developed:

The following practical exercises shall be conducted in the *Drawing Hall for Engineering drawing* in practical sessions of batches of about 20- 22 students:

Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
1	Draw horizontal, vertical, 30-degree, 45 degrees, 60 & 75-degrees lines using Tee and Set squares/ drafter.	2	CO1
2	Draw different types of lines, dimensioning styles	2	CO1
3	Draw one figure showing dimensioning techniques, two problems on redraw the figures. (Sketch Book)	2	CO1
4	Draw one figure showing dimensioning techniques, two problems on redraw the figures and one problem on Scales. (01 Sheet)	4	CO1
5	Draw any four Engineering Curves (Sketchbook)	2	CO2
6	Draw any four Engineering Curves – (01 Sheet)	4	CO2
7	Draw any four problems on Line parallel to both the principal planes Line parallel to one principal planes & perpendicular to other Principal planes using first angle method of projection. (Sketchbook)	2	CO3 CO5
8	Draw any four problems on Line parallel to one principal plane & inclined to other principal planes using first angle method of projection - (01 Sheet)	4	CO3 CO5
9	Draw any four problems on Plane parallel to one principal plane & perpendicular to another Principal plane, Plane perpendicular to both the principal planes using first angle method of projection. (Sketchbook)	4	CO4 CO5
10	Draw any four problems on Plane inclined to one principal plane and perpendicular to other principal plane using first angle method of projection - (01 Sheet)	4	CO4 CO5
11	Draw two problems on orthographic projections using first angle method of projection having plain surfaces, slanting surfaces and slots etc.	2	CO5
12	Draw two problems on orthographic projections using first angle method of projection having cylindrical surfaces, ribs etc. (Sketchbook)	2	CO5

13	Draw two problems on orthographic projections using first angle method of projection having plain surfaces, slanting surfaces cylindrical surfaces, ribs and slots etc.- (01 Sheet)	2	CO5
14	Draw different types of sections of simple objects (Sketchbook)	2	CO5 CO6
15	Draw two problems on sections of solids having ribs, cylindrical surface etc. (01 Sheet)	4	CO5 CO6
16	Correlate ancient Indian sculptures, Indian temples, Monuments, etc. with Engineering Graphics. (IKS)	2	CO1 CO2 CO3 CO4 CO5 CO6

ii) THEORY

SECTION – I

Sr. No	Topics	Teaching (Hours)	Theory Evaluation Marks
<i>Course Outcome CCH106-1 Understand various fundamentals in engineering drawing</i>			
1.	INTRODUCTION TO ENGINEERING DRAWING 1.1 Drawing Instruments and their uses 1.2 Standard sizes of drawing sheets as per ISO-A series, Layout of sheet. 1.3 Letters and numbers (single stroke vertical) Convention of lines and their applications. 1.4 Scale (reduced, enlarged & full size) Plain scale and Diagonal scale. 1.5 Dimensioning technique as per SP-46 (Latest Edition), Elements of dimensioning, Types and applications of chain, parallel and Co-ordinate dimensioning	04	06
<i>Course Outcome CCH106-2 Produce different types of engineering curves</i>			
2.	ENGINEERING CURVES 2.1 Conic sections and their applications 2.2 Ellipse by Arc's of circle method & Concentric circles method. 2.3 Parabola by Directrix and focus method & Rectangle method 2.4 Hyperbola by Transverse Axis focus Method & Rectangular hyperbola (Inclined axes). 2.5 Involute of circle, & pentagon, hexagon 2.6 cycloid, epicycloids, hypocycloid 2.7 Helix & Archimedean spiral.	09	18

Course Outcome CCH106-3 Produce the projection of point & lines inclined to one reference plane			
3.	PROJECTION OF POINT AND LINES 3.1 Projection of points when point is in first quadrant only 3.2 Orientation of Line with respect to principal planes (Both ends of line should be in first quadrant) <ul style="list-style-type: none"> • Line parallel to both the principal planes • Line parallel to one principal planes & perpendicular to other Principal planes • Line parallel to one principal plane & inclined to other principal planes 	05	10

SECTION – II

Sr. No	Topics	Teaching (Hours)	Theory evaluation Marks
Course Outcome CCH106-4 Produce the projection of different planes.			
4.	PROJECTION OF PLANES 4.1 Types of Planes - Circular, Square, Triangular, Rectangular, Pentagonal, Hexagonal. 4.2 Orientation of plane with respect to principal planes (Planes in First Quadrant Only) – <ul style="list-style-type: none"> • Plane parallel to one principal planes & perpendicular to another Principal plane • Plane perpendicular to both the principal planes • Plane inclined to one principal plane and perpendicular to other principal plane 	03	10
Course Outcome CCH106-5 Produce orthographic drawing and sectional orthographic drawing from given pictorial view.			
5.	ORTHOGRAPHIC PROJECTIONS 5.1 Introduction to Orthographic Projections -First and Third angle Projection Method, their symbols 5.2 Conversion of Pictorial view into Orthographic Views. (First angle Projection Method Only)	05	14
Course Outcome CCH106-5 Produce orthographic drawing and sectional orthographic drawing from given pictorial view			
6.	SECTIONAL VIEWS 6.1 Types of sections 6.2 Conversion of pictorial view into sectional Orthographic views. (First Angle Projection Method only)	04	12
Total		30	70
1. Summative assessment – Theory 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.			

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

G. SUGGESTED MICRO PROJECTS / ASSIGNMENTS/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING) UNDER SLA

- NOT APPLICABLE

H. 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	Introduction To Engineering Drawing	00	06	00	CCH106-1	06
2	Engineering curves	00	12	06	CCH106-2	18
3	Projection of Point and Lines	00	10	00	CCH106-3	10
4	Projection of Planes	00	00	10	CCH106-4	10
5	Orthographic Projection	00	00	14	CCH106-5	14
6	Sectional Views.	00	00	12	CCH106-5	12
	Total	00	28	42		70

I. Assessment Criteria

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

J. Instructional Methods:

- i) Lectures cum Demonstrations,
- ii) Class room practices.
- iii) Use of projector and soft material for demonstration

K. Teaching and Learning resources:

Chalk board, Power Point presentations and Demonstrative kits.

L. REFERENCE MATERIAL:

Sr. No.	Author	Title	Publisher
1.	N. D. Bhatt	Engineering Drawing	Charotar Publishing House 2010
2.	Amar Pathak	Engineering Drawing	Dreamtech Press, 2010
3.	D. Jolhe	Engineering Drawing	Tata McGraw Hill Edu., 2010
4.	M. B. Shah, B. C. Rana	Engineering Drawing	Pearson, 2010
5.	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age Publication, Reprint 2006
6.	IS Code, SP – 46	Engineering Drawing Practice	Bureau of Indian Standards

M. LEARNING WEBSITE & SOFTWARE: -

- i) <http://www.design-technology.info/IndProd/drawings/>
- ii) <http://graphicalcommunication.skola.edu.mt/syllabus/engineering-drawing/>
- iii) http://en.wikipedia.org/wiki/Engineering_drawing
- iv) <http://www.engineeringdrawing.org/>
- v) http://www.teachengineering.org/view_activity
- vi) www.howtoread.co.in/2013/06/how-to-read-ed.html
- vii) <http://www.slideshare.net/akhilrocker143/edp>
- viii) <http://www.24framesdigital.com/pstulpule>

* * *

COURSE ID : CCH201
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	
	Laboratory Learning	02	
	SLH-Self Learning	02	
	NLH-Notional Learning	08	

B. ASSESSMENT SCHEME :-

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

(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, *# On Line 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:-

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 carry out 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 / EMPLOYER EXPECTED OUTCOME

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

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

E. COURSE LEVEL LEARNING OUTCOMES (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 Engineerin g Tools, Experiment ation and Testing	PO 5 Engineering Practices for society, sustainability and Environment	PO 6 Project Manage ment	PO 7 Life- long Learnin g	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 and debate.	2	1	-	-	-	2	1		

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* developed by 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 Cycle and 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 1.1 Affixation: Prefix and Suffix, Definition and Examples, List of common Prefixes and Suffixes 1.2 Synonyms and antonyms: Vocabulary Expansion, Context and Usage 1.3 Homophones: Identifying Homophones, Meaning and Contest, Vocabulary Expansion 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 2.1 Definition and Importance of Communication 2.2 Model of Communication 2.3 Principles of Effective Communication 2.4 Types of Communication: Formal, Informal, Oral, Written, Verbal, Non-Verbal, Horizontal, Upward, Downward and Diagonal Communication 2.5 Barriers to communication: Physical, Mechanical, Psychological and Language Barriers	14	16
CO: CCH201-3: Prepare and participate in dialogue, conversation, elocution and debate.			
3	Oral Communication 3.1 Characteristics of Oral Communication. 3.2 Phonetics: IPA, Vowels(12), Consonants(24) and Diphthongs (12) 3.3 Tone, Pronunciation and Accents. 3.4 Spoken English: Prepared and Extempore speeches 3.5 Role Play: Conversation and Dialogue 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 4.1 Importance of Non-Verbal Communication. 4.2 Aspects of Body Language: Facial Expressions, Eye Contact, Vocalics, Gestures, Posture, Dress, Appearance and Personal Grooming and Haptics. 4.3 Non-Verbal Codes: Proxemics, chroemics, artefacts 4.4 Graphical Communication: 4.4.1 Advantages and Disadvantages of Graphical Communication. 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 5.1 Characteristics of Written Communication. 5.2 Letter Writing: Application with Resume, Enquiry Letter, Order Letter and Complaint Letter 5.3 Writing Reports: Accident, Fall in Production Reports and Micro Project 5.4 Email Writing 5.5 Technical Writing: Object Description, Picture Description, Diary Writing 5.6 Paragraph Writing: Narrative, Descriptive and Technical	16	20
CO: CCH201-6 Prepare and present effective media aided presentation.			
6	Media-Aided Presentations 6.1 Media aids for Presentation: Strengths and Precautions 6.2 Planning, Preparing and Making a Presentation 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	Marks allotted
1	Attendance at regular practical	NA
2	Preparedness for practical	NA
3	Neat & complete Diagram.	NA
4	Observations & handling of instrument.	NA
5	Oral Based on Lab work and completion of task	NA
TOTAL		

J) Instructional Methods:

1. Lecture cum Demonstration,
2. Class room 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 and 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 : 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	-	
	Laboratory Learning	02	
	SLH-Self Learning	01	
	NLH-Notional Learning	04	

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	MIN	
--	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	75
	--	--	--	--	25	10	25@	10	25	10	

(Total IKS Hrs for Sem:00 Hrs)

C: 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, *#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 these 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.

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/EMPLOYER EXPECTED 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. COURSE LEVEL LEARNING OUTCOMES (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/ps) 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	
CCH109-1 Use computer system and its peripherals for given purpose	1	-	-	-	-	-	1	1	1	
CCH109-2 Prepare 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/output devices, connections and peripherals of computer system. Work with Computer System, Input/output devices, and peripherals for Manages files and folders for data storage.	CCH109-1
2	Create and manage word document. Apply formatting features on text at line, paragraph and page level.	CCH109-2
3	Insert and edit images, shapes in a document file	CCH109-2
4	Insert table and apply various table formatting features on it.	CCH109-2
5	Apply page layout features in word processing. Print a document by applying various print options. Use mail merge in word processing.	CCH109-2
6	Enter and format data in a worksheet. Insert and delete cells, rows and columns. Apply alignment feature on cell	CCH109-3

Sr. no	Laboratory experiences	CO
7	Create formula and “If” condition on cell data. Apply various functions and named ranges in worksheet.	CCH109-3
8	Implement data Sorting, Filtering and Data validation features in a worksheet.	CCH109-3
9	Create charts using various chart options in spreadsheet.	CCH109-3
10	Print the worksheet by applying various print options for worksheet.	CCH109-3
11	Apply design themes to the given presentation. Insert pictures text/images/shapes in slide. Use pictures text/images/shapes editing options.	CCH109-4
12	Add tables and charts in the slides. Run slide presentation in different Modes. Print slide presentation as handouts/notes.	CCH109-4
13	Apply animation effects to the text and slides. Add/set audio and video files in the presentation.	CCH109-4
14	Configure internet connection on a computer system. Use different web services on internet	CCH109-5
15	Configure different browser settings. Use browsers for the given purpose.	CCH109-5
16	Create web forms for survey using different options.	CCH109-6
17	Create web forms for Quiz using different options.	CCH109-6

II) Theory

Section I

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

Sr. no.	Topics/Subtopics	Learning (Hours)
2	<p>Unit - II Word Processing</p> <p>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.</p> <p>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</p> <p>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</p> <p>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</p> <p>2.5 Working with Tables: Insert a table, Convert a table to text, Navigate and select text in a table, Resize table cells, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Repeat table headings on subsequent page</p> <p>2.6 Working with Columned Layouts and Section Breaks: a Columns, Section breaks, Creating columns, Newsletter style columns, Changing part of a document layout or formatting, Remove section break, Add columns to remainder of a document, Column widths Adjust.</p>	3
3	<p>Unit - III Spreadsheets</p> <p>3.1 Working with Spreadsheets: Overview of workbook and worksheet, Create Worksheet Entering sample data, Save, Copy Worksheet, Delete Worksheet, Close and open Workbook.</p> <p>3.2 Editing Worksheet: Insert and select data, adjust row height and column width, delete, move data, insert rows and columns, Copy and Paste, Find and Replace, Spell Check, Zoom In-Out, Special Symbols, Insert Comments, Add Text Box, Undo Changes, - Freeze</p> <p>3.3 Formatting Cells and sheet: Setting Cell Type, Setting Fonts, Text options, Rotate Cells, Setting Colors, Text Alignments, Merge and Wrap, apply Borders and Shades, Sheet Options, Adjust Margins, Page Orientation, Header and Footer, Insert Page Breaks</p> <p>3.4 Working with Formula: Creating Formulas, Copying Formulas, Common spreadsheet Functions such as sum, average, min, max, date, In, And, or, mathematical functions such as sqrt, power, applying conditions using IF.</p> <p>3.5 Working with Charts: Introduction to charts, overview of different types of charts, Bar, Pie, Line charts, creating and editing charts. Using chart options: chart title, axis title, legend, data labels, Axes, grid lines, moving chart in a separate sheet.</p> <p>3.6 Advanced Operations: Conditional Formatting, Data Filtering, Data Sorting, Using Ranges, Data Validation, Adding Graphics,</p>	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	<p>Unit - IV Presentation Tool</p> <p>4.1 Creating a Presentation: Outline of an effective presentation, Identify the elements of the User Interface, Starting a New Presentation Files, Creating a Basic Presentation, Working with textboxes, Apply Character Formats, Format Paragraphs, View a Presentation.</p> <p>4.2 Inserting Media elements: Adding and Modifying Graphical Objects to a Presentation - Insert Images into a Presentation, insert audio clips, video/animation, Add Shapes, Add Visual Styles to Text in a Presentation, Edit Graphical Objects on a Slide, Format</p> <p>4.3 Working with Tables: Insert a Table in a Slide, Format Tables and Import Tables from Other Office Applications.</p> <p>4.4 Working with Charts: Insert Charts in a Slide, Modify a Chart, Import Charts from Other Office Applications.</p>	4
5	<p>Unit - V Basics of Internet and Emerging Technologies</p> <p>5.1 World Wide Web: Introduction, Internet, Intranet, Cloud, Web Sites, web pages, URL, web servers, basic settings of web browsers- history, extension, default page, default search engine, creating and retrieving bookmarks, Use of search engines.</p> <p>5.2 Web Services: e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social Networking</p> <p>5.3 Emerging Technologies: IOT, AI and ML, Drone Technologies, 3D Printing.</p> <p>5.4 Tools: Docs, Drive, forms, quiz, Translate and other Apps</p>	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)

Sr.No	List of Assignment (under SLA)	Hrs Allotted										
1*	Prepare a chart showing different generations of computer along with advantages & disadvantages.	02										
2*	Prepare survey report for: There is usually a positive side and a negative side to each new technological improvement. 1. Select a technology you use every day and consider its benefits and risks. 2. What benefits does the technology provide? 3. Are there any risks involved and, if so, how can they be minimized?	02										
3	The following are the marks obtained by the students in three subjects Assume suitable data in following table: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ROLLNO</th> <th>NAME</th> <th>ME</th> <th>QT</th> <th>IOM</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </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	ROLLNO	NAME	ME	QT	IOM						02
ROLLNO	NAME	ME	QT	IOM								
4*	Principal Amount 2, 00,000Rate of Interest 5%Time Period 10 YearsAmount to be Paid? 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	02										
5	Prepare a PowerPoint presentation of at least 5 slide & perform 1. Add 2.delete 3.copy& paste 4.edit slide.	02										
6*	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. Investment Amount Percentage for Profit No of years 20000 10% 6 years 40000 20% 5 years 14000 30% 4 years 12000 15% 5 years	02										
7*	Conduct Survey of different IT Industry and prepare list of New Technology Trends in IT Industries.	02										
8*	Prepare a list and compare different desktop publishing software available in market.	04										

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	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. 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	
	Laboratory Learning	01	
	SLH-Self Learning	01	
	NLH-Notional Learning	2	

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	MIN	
	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-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(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 these 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

Diploma Graduate needs a sound body and mind to face the challenging situations in career as employee or as an entrepreneur. Yoga and Meditation brings about the holistic development of an individual and equips with necessary balance to handle the challenges. The age of polytechnic student is appropriate to get introduced to yoga practice as this will help them in studies as well as his professional life. Moreover, Yoga inculcates discipline in all walks of the life of student. Pranayama practice regulates breathing practices of the student 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 meditation as stress prevention measure. National Education Policy-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/EMPLOYER EXPECTED OUTCOME

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. COURSE LEVEL LEARNING OUT-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/ps) matrix

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

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	
CO1	-	-	-	-	3	-	1	-	-	
CO2	-	-	-	-	3	-	1	-	-	
CO3	-	-	-	-	3	-	1	-	-	

Legends: -High:03,Medium:02,Low:01,No Mapping:-
*PSOs are to be formulated at institute level

F. CONTENT:

I) Practical exercises

Sr No	LaboratoryExperiment/PracticalTitles/TutorialTitles	Learning hrs.	Relevant COs
1	Introduction:- 1.1 Introduction to AshtangYog 1.2 Presentations on Introduction to Yogaandits History, Omkar chanting, prayer, Padmasan, Siddhasan &Vajrasan 1.3 Lab Exp: 1. Perform warming up exercises to prepare the body from head totoeforYoga - 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, Lab Exp 3. Perform multiple Surya-Namaskar (Starting with three and gradually increasing it to twelve)in one go. (Experiment 2 to 4must be followed by shavasana for self relaxation.)	4	CCH110-1, CCH110-2
3	Lab Exp: 4 Perform Sarvangasna, Halasana, Kandharasana (setubandhasana) , Uttanpadasan, Pavanmuttasan. LabExp:5 Perform Bhujangasana, Naukasana, Mandukasana. LabExp:6PerformShalbhasan, Dhanurasan, Vakrasan,Goumukhasan,Paschimottasana, Ardhamasendrasan LabExp:7 PerformVeerasan, Veer-Bhadrasana, Vrukshasana, Trikonasana. (Follow up experiment 5to7 with shavasana for self relaxation)	4	CCH110-2
4	Lab Exp: 8 Perform Deepbrathing , Anulom Vilom Pranayam Kriya LabExp:9 Practice Kapalbhati Pranayam Kriya, Bhastrika 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. Introduction to Vipprasanna , Anappan & Chakras. (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	Marks allotted
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.swyam2.ac.in/aic23ge09/preview> - Yoga for Creativity
 2. https://onlinecourses.swyam2.ac.in/aic19_ed28/preview- introduction to Yoga and Applications of Yoga
 3. https://onlinecourses.swyam2.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.swyam2.ac.in/ncel9sc04/preview>-Food Nutrition for Healthy LivingCourse —Swayam
 6. <https://onlinecourses.swyam2.ac.in/aic23e06/> preview- yoga for memory development
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GOVERNMENT POLYTECHNIC KOLHAPUR
CIVIL ENGINEERING DEPARTMENT
SAMPLE PATH - H SCHEME -SECOND SEMESTER

Sr.no	Course Title	Abbreviation	Course Type	Course Code	Level	Total IKS Hrs. for Sem	Learning Scheme					Assessment Scheme					Based on LL & TL				Based on Self Learning		Total Marks			
							Actual Contact			Self Learning (Activity/Assignment/MicroProject)	Notional Learning Hrs/Week	Credits	Paper Duration(Hrs)	Theory			Practical				SLA					
							CL	TL	LL					FA-TH	SA-TH	Total	FA-PR	SA-PR	Max	min	Max	min				
													Max	Max		Max	min	Max	min	Max	min	Max	min			
1	ENGINEERING PHYSICS-B	HPHB	DSC	CCH102	1	4	4	0	2	2	8	4	1.5	30	70	*#	100	40	25	10	25	@	10	25	10	175
2	APPLIED MECHANICS	HAPM	DSC	CCH108	1	2	4	0	2	2	8	4	3	30	70		100	40	25	10	25	@	10	25	10	175
3	APPLIED MATHEMATICS	HAMT	AEC	CCH301	3	2	4	2	0	0	6	3	3	30	70		100	40	0	0	0	0	0	0	0	100
4	SOCIAL AND LIFE SKILLS	HSLS	VEC	CCH204	2	0	0	0	1	1	2	1	0	0	0		0	0	0	0	0	0	0	50	20	50
5	BUILDING MATERIAL AND CONSTRUCTION	HBMC	DSC	CEH301	3	1	3	0	2	3	8	4	3	30	70		100	40	25	10	0	0	25	10	150	
6	SURVEYING	HSVY	SEC	CEH302	3	1	3	0	4	1	8	4	3	30	70		100	40	25	10	50	#	20	25	10	200
		TOTAL				10	18	2	11	9	40	20		150	350		500	200	100	40	100	0	40	150	60	850

@ INTERNAL ASSESMENT
EXTERNAL ASSESMENT

COURSE ID : CCH102
COURSE NAME : ENGINEERING PHYSICS (CE/ME/MT)
COURSE CODE : CCH102
COURSE ABBREVIATION : HPHB

A. LEARNING SCHEME:

Scheme component		Hours	Credits
Actual Contact Hours / week	Classroom Learning	04	4
	Tutorial Learning	-	
	Laboratory Learning	02	
	SLH-Self Learning	02	
	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	MIN	
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	175
1.5	30*#	70*#	100	40	25	10	25@	10	25	10	

(Total IKS Hrs for Sem.: 04 Hrs)

C: 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,*# 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.*15Weeks
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 microproject / assignment / other activities. (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/ EMPLOYER EXPECTED OUTCOME

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. COURSE LEVEL LEARNING OUTCOMES (COS)

CCH102-1 Estimate errors in measurement of physical quantities.

CCH102-2 Express importance of semiconductors and nanotechnology.

CCH102-3 Select proper material in engineering industry by analysis of its physical properties.

CCH102-4 Apply principles of electricity and magnetism to solve engineering problems.

CCH102-5 Apply principles of optics to solve engineering problems.

CCH102-6 Apply principles of acoustics and ultrasonics for related engineering applications.

Course outcomes and programme outcomes/ programme specific outcomes (co-po/ps) 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 Analyses	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
CCH102-1 Estimate errors in measurement of physical quantities.	3	1	-	1	1	1	1		
CCH102-2 Express importance of semiconductors and nanotechnology	3	-	-	-	1	1	1		
CCH102-3 Select proper material in engineering industry by analysis of its physical properties	3	1	-	1	1	1	1		
CCH102-4 Apply principles of electricity and magnetism to solve engineering problems	3	1	-	1	1	1	1		
CCH102-5 Apply principles of optics to solve engineering problems.	3	1	-	-	1	1	1		
CCH102-6 Apply principles of acoustics and ultrasonics 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	CCH102-1
2	To measure the diameter of bob and thickness of plate by using Vernier Caliper	CCH102-1
3	To measure the diameter of bob and thickness of plate by using Micrometer screw gauge	CCH102-1
4	To determine forbidden energy band gap in semiconductors	CCH102-2
5	To determine the viscosity of liquid by Stokes method.	CCH102-3
6	To determine the buoyancy force on a solid immersed in a liquid	CCH102-3
7	To measure unknown resistance of wire by Ohm’s law	CCH102-4

Sr. no	Laboratory experiences	CO
8	To verify series law of resistances	CCH102-4
9	To verify parallel law of resistances	CCH102-4
10	To draw magnetic lines of force for given magnet by using magnetic compass	CCH102-4
11	To verify Snell's law using glass slab	CCH102-5
12	To study variation of δ with i for a prism by pin method	CCH102-5
13	To determine velocity of sound by resonance tube	CCH102-6
14	To measure distance using ultrasonic meter	CCH102-6
15	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: CCH102-1 Estimate errors in measurement in Physical quantities.			
1	UNITS AND MEASUREMENT 1.1 Unit, Physical Quantities : Fundamental and Derived Quantities and their units 1.2 Systems of units : CGS, MKS, FPS and SI 1.3 Errors , Types of errors : Instrumental, Systematic and Random error, Estimation of errors : Absolute, Relative and percentage errors 1.4 Significant figures 1.5 Ancient Astronomical Instruments : Chakra, Dhanuryantra, Yasti and Phalaka yantra (IKS learning) 1.6 Simple Numerical problems	10	12
CO: CCH102-2 Express the importance of Semiconductors and nanotechnology.			
2	INTRODUCTION TO SEMICONDUCTORS AND NANOTECHNOLOGY 2.1 SEMICONDUCTORS 2.1.1 Conductors, insulators and semiconductors 2.1.2 Energy bands 2.1.3 Intrinsic and extrinsic semiconductors 2.1.4 Minority and majority charge carriers 2.1.5 P and N type semiconductors 2.1.6 Properties of semiconductors 2.1.7 Applications of semiconductors No numericals on above topic	08 (06)	08 (06)

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
	<p>2.2 Nanotechnology 2.2.1 Definition of nanoscale, nanometer, nanoparticle 2.2.2 Definition and examples of nanostructured materials 2.2.3 Applications of nanotechnology in electronics, automobile, textile, space, medicine, cosmetics and environment No numericals on above topic</p>	(02)	(02)
CO: CCH102-3 Select proper material in engineering industry by analysis of its physical properties.			
3	<p>PROPERTIES OF MATTER</p> <p>3.1 ELASTICITY 3.1.1 Definitions of elasticity, plasticity, rigidity, deforming force, restoring force 3.1.2 Stress, Strain and their types 3.1.3 Elastic Limit, Statement of Hooke's law 3.1.4 Modulus of elasticity and its types, Relation between Y, K and η (No derivation) 3.1.5 Ultimate stress, breaking stress, Working stress, Factor of safety 3.1.6 Applications of elasticity 3.1.7 Simple Numerical problems</p> <p>3.2 VISCOSITY 3.2.1 Definition and meaning of viscosity, velocity gradient 3.2.2 Newton's law of viscosity, Coefficient of viscosity 3.2.3 Stokes law 3.2.4 Derivation of expression for coefficient of viscosity of liquid by Stokes method 3.2.5 Effect of temperature and adulteration on viscosity of liquids 3.2.6 Applications of viscosity No numericals on above topic</p>	<p>12</p> <p>(06)</p> <p>(06)</p>	<p>14</p> <p>(10)</p> <p>(04)</p>

Section –II

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO: CCH102-4 Apply principles of electricity and magnetism to solve engineering problems			
4	<p>ELECTRICITY AND MAGNETISM</p> <p>4.1 ELECTRICITY 4.1.1 Concept of charge, Coulomb's inverse square law, 4.1.2 Electric field, Electric field intensity 4.1.3 Electric potential and potential difference 4.1.4 Electric current, Resistance, Ohm's law 4.1.5 Specific resistance 4.1.6 Resistances in series and parallel 4.1.7 Simple Numerical problems</p> <p>4.2 MAGNETISM 4.2.1 Magnetic field and magnetic field intensity and its units 4.2.2 Magnetic lines of force, magnetic flux No numericals on above topic</p>	<p>10</p> <p>(06)</p> <p>(04)</p>	<p>12</p> <p>(08)</p> <p>(04)</p>
CO: CCH102-5 Apply principles of optics to solve engineering problems			
5	<p>OPTICS</p> <p>5.1 PROPERTIES OF LIGHT 5.1.1 Refraction of light 5.1.2 Laws of Refraction of Light, Snell's law 5.1.3 Refraction through glass prism 5.1.4 Dispersion & Dispersive Power (in terms of angles of deviation only) 5.1.5 Simple Numerical problems</p> <p>5.2 LASER 5.2.1 Introduction of LASER 5.2.2 Properties of laser 5.2.3 Spontaneous and stimulated emission 5.2.4 Population inversion and optical pumping 5.2.5 Applications of LASER No numericals on above topic</p> <p>5.3 X-RAYS 5.3.1 Nature and properties of x-rays. 5.3.2 Production of x-rays by Coolidge tube 5.3.3 Applications of x-rays No numericals on above topic</p>	<p>14</p> <p>(06)</p> <p>(04)</p> <p>(04)</p>	<p>18</p> <p>(08)</p> <p>(06)</p> <p>(04)</p>

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO: CCH102-6 Apply principles of acoustics and ultrasonics for related engineering applications.			
6	<p>ACOUSTICS AND ULTRASONICS</p> <p>6.1 ACOUSTICS 6.1.1 Echo and reverberation of sound 6.1.2 Sabine's formula 6.1.3 Requirements of good acoustics 6.1.4 Acoustical planning of an auditorium No numericals on above topic</p> <p>6.2 ULTRASONICS 6.2.1 Limits of audibility 6.2.2 Ultrasonic waves 6.2.3 Ultrasonic transducers : Piezoelectric and Magnetostriction 6.2.4 Applications of ultrasonic waves No numericals on above topic</p>	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	Collect information using internet about ancient acoustic architecture. (For CE/ME/MT 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	Write the information of factors to be considered while planning of an auditorium. (For CE/ME/MT students).	02
AND		
Sr.No	List of Activity (Compulsory activity under SLA)	Hrs Allotted
	Write importance and significance of calibration of measuring instruments. Collect information of related industries in nearby industrial areas.	02

****One microproject/ assignment and 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	CCH102-1
I / 2	Introduction to Semiconductors and Nanotechnology	2	2	4	08	CCH102-2
I / 3	Properties of matter (Elasticity and Viscosity)	4	2	8	14	CCH102-3
II / 4	Electricity and Magnetism	2	4	6	12	CCH102-4
II / 5	Optics (Properties of light, Laser & X-rays)	6	6	6	18	CCH102-5
II / 6	Acoustics and Ultrasonics	2	2	2	06	CCH102-6
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	Marks allotted
1	Attendance at regular practical	05
2	Preparedness for practical	05
3	Neat & complete Diagram / 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	Marks allotted
1	Attendance	05
2	Preparedness and 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

COURSE ID :**COURSE NAME : APPLIED MECHANICS (CE/ME/MT)****COURSE CODE :CCH108****COURSE ABBREVIATION :HAPM****A. LEARNING SCHEME:**

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

B. LEARNING SCHEME

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

(Total IKS hours for sem: 02 hours)

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.

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.RATIONALE:

The role of an engineer is to dream a mechanism for the present and the future generation. Understand the concept of existing mechanism thoroughly. An engineer in his initial stages of learning need to understand the basics of components of the machine, then forces in those components, interaction of these forces resulting in an engineering marvel or a mechanism. The contents of this most versatile basic course for engineering curriculum aims at providing fundamental meaning of various engineering principles and concept in engineering applications .The contents also forms basic or primary set for higher level of subject such as strength of material, analysis of structures and design of steel structures and RCC structures. The subject being first and foremost entry level curriculum for the various programs in engineering it acts as gateway for engineering career. With the learning outcomes of the subject, learner can get clues for various fields such as mechanical, civil, metallurgical and varied courses like aerodynamics, space mechanics, marine structures .The subject being interdisciplinary in nature it comes under allied department applied mechanics.

Competency identified for the course:

The MPEC 2020 curriculum design based on MSBTE K curriculum guideline and NEP2020 policy incorporates all salient features such as notional hours and non-national hours of learning. Indian knowledge system through 2 hours in a semester is aimed at exploring ancient traditional technical knowledge prevailing in the country. Subject is given 4 hrs. Of class room learning, 2hrs of practicals (lab learning) and 2 hrs. of self-leaning. All these hrs. Of learnings including IKS learning are aimed at achieving following skills sets.

Cognitive	psychomotor	Affective domain
<p>Understanding force concepts in various mechanics through FBD for various physical situations</p> <p>Solving for equilibrium condition of various force system and appreciating the mechanism analytically.</p> <p>Understanding the kinematics geometry of motion in rectilinear and circular motion</p> <p>Solving static equilibrium and dynamic equilibrium condition(kinetics) and lifting machines.</p> <p>Formative assessment is employed through two unit test., end semester exam (specification table) (30 marks)and progressive assessment format for lab work is to be followed .(10 marks)</p>	<p>Practicals with hands on experience on force system to verify Lamis theorem ,law of polygon of forces ,parallelogram of forces ,beam reactions on force table or similar set up.</p> <p>Lifting machines are operated to establish law of machine and compute efficiency .</p> <p>By performing motion of bodies with different surfaces in contact , frictional resistance is evaluated .</p> <p>By simulating areas to forces centroid for different laminae is graphically found.</p> <p>progressive assessment format for lab work is to be followed(10marks) .</p>	<p>All practical systematically executed to understand the principles, appreciate the inferences with the set of observations conducting lab learning in a small group where every individual gets ample opportunity, essence of team work is developed, result oriented performance is appreciated and time bound activity is scheduled . the neatness and presentation skills are appreciated in formative progressive assessment format for lab work is to be followed (5marks).</p>

E. COURSE LEVEL LEARNING OUTCOMES (COs):

CCH108-1 Understanding mechanisms for the interaction of various forces in their components with types and corresponding effects. With due focus on rigid body concept, principle of superposition resolution and composition of forces.

CCH108-2 Study of equilibrium for concurrent and non-concurrent force system and finding resultant and equilibrant graphically and analytically.

CCH108-3 Problems on equilibrium condition involving friction and support reactions in beams graphically and analytically.

CCH108-4 Knowing simple lifting mechanisms establishing law of machine, evaluating efficiency for set of loads.

CCH108-5 Studying equations of motion for rectilinear and circular motion, establishing relation between linear and angular motion parameters.

CCH108-6 Understanding effect of force for executing work, energy principles and conservation of energy concept.

**Competency, 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”]

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 Civil /Mechanical/metallurgy mechanisms – understanding	PSO2 Civil /Mechanical/metallurgy mechanisms – understanding-innovation	
Competency: Applied Mechanics	3	2	2	2	3	1	2	2	2	
CCH108-1 Understanding mechanisms for the interaction of various forces in their components with types and corresponding effects. With due focus on rigid body concept, principle of superposition resolution and composition of forces.	3	2	1	2	-	1	2	2	1	
CCH108-2 Study of equilibrium for concurrent and non-concurrent force system and finding resultant and equilibrant graphically and analytically.	3	2	1	2	-	1	2	3	1	
CCH108-3 Problems on equilibrium condition involving	3	2	1	2	-	1	2	3	1	

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 Civil /Mechanical/metallurgy mechanics – understanding	PSO2 Civil /Mechanical/metallurgy mechanics – understanding-innovation
friction and support reactions in beams graphically and analytically.									
CCH108-4 Knowing simple lifting mechanisms establishing law of machine, evaluating efficiency for set of loads.	3	2	1	3	2	1	2	2	2
CCH108-5 Studying equations of motion for rectilinear and circular motion, establishing relation between linear and angular motion parameters.	2	1	1	2	-	1	2	1	1
CCH108-6 Understanding effect of force for executing work, energy principles and conservation of energy concept.	2	2	1	2	-	1	2	2	2

Note : typical matrix assessment based on previous records—for continuous analysis improvement .

F. CONTENT:**I) LABORATORY WORK**

Practical Exercise and related skills to be developed

The following exercises shall be conducted as practical work as detailed in laboratory manual for Applied Mechanics developed by the institute in practical sessions of batches of about 20-22 students.

In the list, Expt. No.1 to7 exercises are compulsory and from 8 to 12, any three exercises shall be conducted. in all 10 experiments are mandatory.

Sr no	Title of practical exercise	Course Outcome
1	Verification Law of parallelogram of forces	CCH108-1
2	Verification Law of polygon of forces	CCH108-1
3	Verification of Lamis theorem	CCH108-2
4	Determination of Beam reaction (Graphically and Analytically)	CCH108-2
5	Graphic statics (To find resultant of concurrent and non-concurrent force system)	CCH108-2
6	Determination of centroid (regular and irregular laminas)	CCH108-2
7	Determination of coefficient of friction between different surfaces	CCH108-3
8	Simple lifting machine introduction of basic terms Study of differential axle and wheel	CCH108-4
9	Screw jack Application and finding efficiency and its law	CCH108-4
10	Study of worm and worm wheel	CCH108-4
11	Gear mechanism (Either single or double)	CCH108-4
12	Experiment on simple pendulum to know dynamic characteristics	CCH108-5

II) THEORY:**Section I**

Sr no	Course content	Lecture hours (class room learning)	Theory Assessment marks
CO: CCH108-1 Understanding mechanisms for the interaction of various forces in their components with types and corresponding effects. With due focus on rigid body concept, principle of superposition resolution and composition of forces.			
1	Force systems and principles 1.1 Rigid body concepts, physical quantities and their units 1.2 Free body diagram for various mechanisms 1.3 Force characteristics, definition, force and force system-principles and laws 1.4 Different type of actions and their representation, with their effect (resultant moment, couple etc.) 1.5 Application on force system – numerical on law of parallelogram of forces, law of polygon of forces	8 hours	12 marks
CO: CCH108-2 Study of equilibrium for concurrent and non-concurrent force system and finding resultant and equilibrant graphically and analytically.			
2	Equilibrium of bodies 2.1 Two force system resultant and equilibrium inference 2.2, Lami's theorem for three force system and its application 2.3 Varignon's principle and its application 2.4 Solving graphically and analytically beams with roller and hinge support 2.5 Definition of centroid and centroid for standard areas /sections. Its determination experimentally for irregular areas	12 hours	12 marks
CO: CCH108-3 Problems on equilibrium condition involving friction and support reactions in beams graphically and analytically.			
3	Friction on bodies and beam statics 3.1 Laws of dry friction 3.2 Free body diagram to derive expression for μ_s & μ_k 3.3 Problems on block and ladder friction 3.4 Reaction in beams carrying point load and udl with hinge and roller support. 3.5 Beam carrying transverse loads and couple	10 hours	10 marks
Total		30	34

Section II

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO: CCH108-4 Knowing simple lifting mechanisms establishing law of machine, evaluating efficiency for set of loads.			
4	Simple Lifting machines 4.1 Basic definition of terms involved in lifting mechanisms. 4.2 Different types of simple lifting machines such as simple gears differential axial and wheel, screw jack 4.3 Inclined plane and evaluating coefficient of static friction	12 hours	14 marks
CO: CCH108-5 Studying equations of motion for rectilinear and circular motion, establishing relation between linear and angular motion parameters.			
5	Kinematics and kinetics 5.1 Kinematics and kinetic equations of motion 5.2 D'Alembert's principle for dynamic equilibrium 5.3 Kinetics for circular motion 5.4 Evaluating dynamic characteristics of simple pendulum	10 hours	12 marks
CO: CCH108-6 Understanding effect of force for executing work, energy principles and conservation of energy concept			
6	Work, power and energy 6.1 Definition of work done and dot product of force and displacement vectors 6.2 Energy types and law of conservation of energy 6.3 Collision of bodies and problem solving 6.4 Power and its interpretation in different mechanism	8 hours	10 marks
Total		30	36

G. List of Assignments/Microprojects under SLA

**assignments/Microproject are to be completed during the semester.

Sr.No	List of Microproject objectives	Format	Assessment criteria
1	Mechanism –free body diagrams, force equations and efficiency	Title:	Objectives: 5 marks
2	Equilibrium of static force systems - Buildings, Dams, Engineering structures case studies	Objectives:	Methodology:10 marks
3	Gear systems –case studies	Study scheme: 2* 15 = 30 hours planning	Presentation /inferences:10 marks
4	Rope drives, weighing machines case studies	Procedure: theory/ modeling	
5	Rolling, sliding friction field applications.	Observations:	
6	Machine foundation aspects	Inference:	
7	Vibration analysis of simple motions	Conclusion	
8	Motion of bodies, projectile, space mechanics preliminary studies	Bibliography	
9	Energy principles, fly wheel machine concept and applications		

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	Force systems and principles	4	4	4	12	CCH108-1
I / 2	Equilibrium of bodies	4	4	4	12	CCH108-2
I / 3	Friction on bodies and beam statics	4	2	4	10	CCH108-3
II / 4	Simple Lifting machines	4	2	8	14	CCH108-4
II / 5	Kinematics and kinetics	4	4	4	12	CCH108-5
II / 6	Work,power and energy	4	2	4	10	CCH108-6
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	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

iii) Assessment of SLA: -

Every Self-learning assignment/microproject shall be assessed for 25 marks as per assessment shown in table of criteria G.

J. Instructional Methods:

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

K. Teaching and Learning resources:

1. Chalk board
2. LCD presentations
3. Demonstrative kits
4. Demonstrative charts
5. Question Bank
6. Digital learning resources

L. REFERENCE BOOKS

a) Book / journals / IS code

Sr no	Name of Book	Author	Publication
1	Engineering Mechanics	S Timoshenko and young	McGraw- Hill,1995
2	Vector Mechanics for Engineer	Beer, Johnston	McGraw- Hill,1995
3	Engineering Mechanics	S S BHAVIKATTI S.S and Rajashekharappa K.G.	New age international publisher
5	Engineering Mechanics	K L KUMAR	Tata McGraw- Hill Publishing company Limited
6	Text book on engineering mechanics	Khurmi R .S.	S. Chand Publications, New Delhi
7	Engineering Mechanics	Singer F.L.	Harper and Row Pub. York.

M. Learning Website & Software

- a. www.nptel.com/iitm/
- b. www.howstuffworks.com/
- c. www.vlab.com
- d. [https:// en.wikipedia.org/wiki/applied_mechanics](https://en.wikipedia.org/wiki/applied_mechanics)

COURSE ID :
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	
	Laboratory Learning	-	
	SLH-Self Learning	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	MIN	
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	100
03	30	70	100	40	--	--	--	--	--	--	

(Total IKS Hrs for Sem.: 02 Hrs)

C: 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, *#OnLine 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.*15Weeks
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. (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. COURSE LEVEL LEARNING OUTCOMES (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

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 variable separable 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 falsi and 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 1.1 Definition, Standard formulae 1.2 Rules of Integration (without proof), Examples 1.3 Integration by substitution 1.4 Integration by parts 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 2.1 Definition, Examples 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 4.1 Definition of differential equation 4.2 Order & degree of Differential equations 4.3 Methods of solving Differential equations of first order & first degree of following types: 4.3.1 Variable separable form 4.3.2 Exact Differential equations 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	Numerical Methods 4.1 Numerical solution of Algebraic Equations 4.1.1 Bisection Method 4.1.2 Regula- Falsi Method	10	14

I Methods	4.1.3 Newton –Raphson method. 4.2 Numerical solution to simultaneous equations 4.2.1 Jacobi’s Method 4.2.2 Gauss-Seidel method Bakhshali iterative method for finding approximate square root.(IKS)		
CO: CCH301-4:- To solve problems on Probability distributions			
Unit 5 Probability Distribution	Probability Distribution 5.1 Binomial distribution 5.2 Poisson’s distribution 5.3 Normal distribution	8	8
CO: CCH301-5:- Solve examples on Laplace Transform .			
Unit 6 Laplace Transform	Laplace Transform 6.1 Definition , Linearity property 6.2 Laplace Transforms of Standard functions (without proof) and examples 6.3 First shifting property and examples 6.4 Examples on Multiplication by t^n 6.5 Inverse Laplace Transform, Definition 6.6 Standard formulae(without proof) and examples 6.7 Inverse L.T.by using First shifting property 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 10 th 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 : CCH204
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	MIN	
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	50
00	00	00	00	00	00	00	-	-	50	20	

(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 to easily 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 and eventually 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

- CCH204-1 - Develop ability to adapt to new challenges.
- CCH204-2 - Manage emotions effectively.
- CCH204-3 - Follow workplace ethics and practices
- CCH204-4 - Manage time effectively.
- CCH204-5 - 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 Engineerin g Tools, Experiment ation and Testing	PO 5 Engineering Practices for society, sustainability and Environment	PO 6 Project Manage ment	PO 7 Life- long Learnin g	PSO1	PSO2
Competency: Apply principles of communication to communicate in formal and informal scenario.									
CCH204-1 Develop self-confidence and positive attitude towards work.							2		
CCH204-2 Set personal and professional goals.							2		
CCH204-3 Develop ability to manage emotions and to handle stress.							2		
CCH204-4 Manage time effectively.						2	2		
CCH204-5 Demonstrate effective interpersonal and leadership skills.							2		
CCH204-6 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 local problems	Unit - I MODULE I : Activities Under Unnat Maharashtra Abhiyan (UMA) 1.1 Introduction to Societal Needs and respective stakeholders : Regional societal issues that need engineering intervention 1.2 Multidisciplinary approach-linkages of	Implementation Methodology: Considering the nature of the course designed, following points shall be considered while implementing the course.

	<p>TLO 1.3 Design a methodology for fieldwork</p> <p>TLO 1.4 Select the attributes of engineering and social system for measurement, quantification, and documentation</p> <p>TLO 1.5 Measure & quantify the quantities / systems parameters</p> <p>TLO 1.6 Write a report using information collected. Study the data collected from fieldwork and conclude the observations.</p>	<p>academia, society and technology</p> <p>1.3 Stakeholders' involvement</p> <p>1.4 Introduction to Important secondary data sets available such as census, district economic surveys, cropping pattern, rainfall data, road network data etc</p> <p>1.5 Problem Outline and stakeholders : Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal)</p> <p>1.6 Key attributes of measurement</p> <p>1.7 Various instruments used for data collection - survey templates, simple measuring equipments</p> <p>1.8 Format for measurement of identified attributes/ survey form and piloting of the same</p> <p>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</p> <p>1.10 Analysis and Report writing Report writing containing-</p> <ol style="list-style-type: none"> 1. Introduction of the topic 2. Data collected in various formats such as table, pie chart, bar graph etc <p>Observations of field visits and data collected.</p>	<p>i) Regroup in the batches of 5-6 students for conducting the fieldwork from the bigger group.</p> <p>ii) Assign a few batches of the students for this course to all the faculty members.</p> <p>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.</p> <p>iv) The group of course teachers will 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.</p> <p>v) The course will be implemented in eight sessions and fieldwork.</p> <ol style="list-style-type: none"> a) Session I - Introduction to development paradigm, fieldwork and case study as pedagogy b) Session II - VII - Society, stakeholders and value creation, measurements, rudimentary analysis and reporting c) Session VIII - Final closure session feedback and assessment d) Field work - <ol style="list-style-type: none"> 1. Pilot Visit - Pilot of survey instrument Survey Visit 1 - Data gathering / Information Collection 3. Survey Visit 2
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			- 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

	<p>TLO 4.3 Responsibility TLO 4.4 Gratitude and Appreciations TLO 4.5 Determination & Persistence TLO 4.6 Respect TLO 4.7 Team Spirit TLO 4.8 Caring & Sharing TLO 4.9 Honesty TLO 4.10 Forgive and Forget</p>	<p>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 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 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, Topics for Public Speaking, Placement Process , OCSEM-E-Newspaper, Critical Thinking to overcome challenges 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 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 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 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 , 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</p>	
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		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 TLO 5.2 Literacy About Financial Planning TLO 5.3 Literacy About Transactions TLO 5.4 Literacy About Income, expenditure and budgeting TLO 5.5 Literacy About Inflation TLO 5.6 Literacy About Loans TLO 5.7 Literacy About the Importance of Insurance TLO 5.8 Literacy About the Dos and Don'ts in finances	Unit - V MODULE-V : Financial Literacy 5.1 Introduction - Life Goals and financial goals 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 5.3 Retirement planning 5.4 Cashless transactions 5.5 Income, expenditure and budgeting – Concepts and Importance 5.6 Inflation- Concept, effect on financial planning of an individual 5.7 Loans – Types, Management of loans, Tax benefits 5.8 Insurance – Types, Advantages, selection Dos and Don'ts in Financial planning and Transactions	i) Online/Offline Mode of Instructions ii) Video Demonstrations iii) Presentations iv) Case Study v) Chalk-Board 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 heritage among 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 educating people 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 the community;
 - (iii) creating awareness among women that there is no occupation or vocation which is not open to them provided they acquire 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 of patients 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 for instruction 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 Health and 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 Control Board, Government of India)
- h. <http://www.mahapwd.com/#> (A Website of Public Works Department, 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)

COURSE ID :
COURSE NAME : BUILDING MATERIAL & CONSTRUCTION
COURSE CODE : CEH301
COURSE ABBREVIATION : HBMC

A. LEARNING SCHEME:

Scheme component		Hours	Credits
Actual Contact Hours / week	Classroom Learning	03	4
	Tutorial Learning	00	
	Laboratory Learning	02	
	SLH-Self Learning	03	
	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	MIN	
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
03	30	70	100	40	25	10	-	-	25	10	150

(Total IKS Hrs for Sem. :01Hrs)

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.

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.*15Weeks
 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.

D. i) RATIONALE:-

Building Materials and Construction is the key element in the construction project. It is a challenging job for the civil engineer to select relevant material for construction which is durable, economical and eco-friendly along with the construction procedure. At diploma level, students are expected to develop their understanding, performance-oriented abilities in order to apply their knowledge in construction industry. This course essentially imparts the knowledge of construction technology along with the processes involved in it and various construction materials used for economic and effective execution of various construction activities. This knowledge shall be used for effective and efficient utilization of these materials during the building construction..

ii) INDUSTRY/EMPLOYER EXPECTED OUT COME

Undertake safe building construction practices with relevant building materials.

E. COURSE LEVEL LEARNING OUTCOMES (COS)

CO1-Identify relevant type of construction materials for the given type of building.

CO2-Use the relevant type of special purpose construction materials in the given situation.

CO3-Undertake the given type of building construction activity for the given component of Building structure.

CO4-Design the relevant means of communication for the given building structure.

CO5-Use the relevant type of material for finishing purpose in the given situation.

CO6-Use the relevant type of special construction techniques in the given situation.

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 Plan & Design	PSO2 Construction & Maintenance	PSO3 Problem Solving on field
CEH301-CO1 Identify relevant type of construction materials for the given type of building.	2	1	.	1	1	1	1			

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 Plan & Design	PSO2 Construction & Maintenance	PSO3 Problem Solving on field
CEH301-CO2 Use the relevant type of special purpose construction materials in the given situation.	2	1	.	1	2	1	1			
CEH301-CO3 Undertake the given type of building construction activity for the given component of building structure.	3	2	1	2	2	1	2			
CEH 301-CO4 Design the relevant means of communication for the given building structure.	3	2	1	2	2	1	2			
CEH301- CO5 Use the relevant type of material for finishing purpose in the given situation.	3	2	1	2	1	1	2			
CEH301-CO6 Use the relevant type of special construction techniques in the given situation.	3	2	1	2	1	1	2			

F. CONTENT:-

I) Practical exercises

Practical Exercises and related skills to be developed:

The following practical exercises shall be conducted as practical sessions of batches of about 20-22 students: Continuous assessment work is dividing three parts as below –

I. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
Practical:-			
1	Identify the different Construction materials used in building construction	2	CO1
2	Perform field test on given sample of brick.	2	CO2
3	Assemble one and half Brick thick wall in a English Bond and prepare a report on it.	2	CO3
4	Practice to hold plumb-bob, tube level and transferring the levels ex. Lintel level for doors and windows.	2	CO3
5	Setting out a simple residential building (Line out of a framed structure)	2	CO3
Field Visits:-			
1	Prepare a visit report with labeled sketches of inspected RCC footing, beam, column, slab, chajja etc construction during site visit.	2	CO3
2	Prepare a visit report with sketches/photos of construction site with respect scaffolding, formwork and centering work.	2	CO6
3	Prepare a visit report with labeled sketches of inspected building components like masonry work, staircase, doors, windows, and flooring and roofing materials during site visit.	2	CO3-CO5
4	Prepare a visit report with sketches/photos by observing the process of plastering; pointing and painting work at construction site.	2	CO5
5	Prepare a visit report with sketches/photos by observing brick kiln/ stone quarry/ stone crusher.	2	CO1
6	Prepare a visit report with sketches/photos by observing different types of woods & sawing of wood.	2	CO1
Market Survey:-			
Market survey for types, cost, sizes, specifications etc of following materials. (Each of five)			
1	Wall tiles, flooring tiles, natural stones like polished granite, marble, kadapa etc.	CO1,CO2,CO5	
2	Plumbing materials : GI,PVC, APVC, CPVC etc		
3	Aluminum / structural steel / gas lines etc		
4	Fixtures and fastening of doors and windows		
5	Plywood, sun mica, fore-mica etc.		

II) Theory

Section I			
Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CEH301-CO1 Identify relevant type of construction materials for the given type of building.			
1	<p>Overview of construction Materials</p> <p>1.1 Introduction to National Building Code-Part III (2005) Group A to I.</p> <p>1.2 Types of Constructions- Load Bearing Structures, Framed Structures, Composite Structures.</p> <p>1.3 Broad classification of materials–Sources of materials, Natural, Artificial -special, finishing and recycled.</p> <p>1.4 Natural Building Construction Materials- Types, uses and applications of: - Stone, Timber, Soil, Sand and Coarse Aggregates, Bitumen (IKS-Materials used in Ancient Buildings-Stone , Lime)</p> <p>1.5 Artificial Building Construction Materials– Types, uses and applications of :- Cement, Clay Brick, Flooring Tiles, Concrete Blocks, Plywood, particle board, Veneers, laminated board and Glass:.</p>	8	10
CEH301-CO2 Use the relevant type of special purpose construction materials in the given situation.			
2	<p>Special Building Construction Materials</p> <p>2.1 Water proofing methods- Introduction to Brick bat Coba, Acrylic Polymer modified water proofing,</p> <p>2.2 Termite proofing - Introduction and applications</p> <p>2.3 Acoustic materials- Introduction and applications</p> <p>2.4 Geo polymer cement- uses and applications.</p>	3	6
CEH301-CO3 Undertake the given type of building construction activity for the given component of building structure.			

3	<p>Construction of substructure & Superstructure</p> <p>3.1 Building Components: Building Components & their Function: Substructure, Superstructure</p> <p>3.2 Earthwork: Excavation For Foundation, Timbering and Strutting Earthwork for Embankment Material for Plinth Filling</p> <p>3.3 Foundation: Functions, Types: hallow Foundation-Stepped Footing, Wall footing, Column Footing, Isolated and Combined Column Footing, Raft Foundation. Deep Foundation-Pile Foundation, Well foundation and Caissons, Pumping Methods of Dewatering, Deep wells, Cofferdams.</p> <p>3.4 Stone Masonry: Terms used in stone masonry- facing, backing, hearting, through stone, cornerstone, cornice. Type of stone masonry: Rubble masonry, Ashlar Masonry and their types .Selection of Stone Masonry .Precautions to be observed in Stone Masonry Construction.(IKS- Ancient heritage building-stone masonry work</p> <p>3.5 Brick masonry: Terms used in brick masonry- header, stretcher, closer, quoins, course, face, back, hearting, bat bond, joints, lap, frog, line, level and plumb. Bonds in brick masonry, header bond, stretcher bond, English bond and Flemish bond, Requirements of good brick masonry. Precautions to be observed in Brick Masonry Construction.</p> <p>3.6 Comparison between stone masonry and Brick Masonry, Tools and plants required for construction of stone masonry and brick masonry.</p>	12	20
	TOTAL	23	36
Section II			
CEH 301-CO4 Design the relevant means of communication for the given building structure.			
4	<p>Building Communication</p> <p>4.1 Horizontal Communication: Doors–Components of Doors, Types of Doors: Fully Paneled Doors, Partly Paneled and Glazed Doors, Flush Doors, Collapsible Doors, Rolling Shutters, Revolving Doors, Glazed Doors. Sizes of Door recommended by BIS.</p> <p>4.2 Windows: Component of windows, Types of Windows: Fully Paneled, Partly Paneled and Glazed, Wooden, Steel, Aluminum Windows, Sliding Windows. Sizes of Windows recommended by BIS and Ventilators</p> <p>4.3 Fixtures and fastenings for doors and windows.</p>	8	12

	<p>4.4 Vertical Communication - Staircase, Ramps, Elevator and types of Escalators (excluding mechanism). Terms used in staircase, Types of staircases- Straight, doglegged, open well, Circular, Quarter turn. Calculation of no of flight's, dimensions of rise and trade.</p>		
<p>CEH301- CO5 Use relevant type of material for finishing purpose in the given situation.</p>			
5	<p>Building Finishes</p> <p>5.1 Types of Floor Finishes, laying process and its suitability- Shahabad, Kota, Marble, Granite, Kadapa, Ceramic Tiles, Vitrified, Pavement Blocks, Concrete Floors, Wooden Flooring (Introduction) ,Skirting and dado, Mezzanine floors- location and use.</p> <p>5.2 Roofs - Necessity of Roofs, Types: Pitched & flat, component parts of pitched roof, requirements of good roof.</p> <p>5.3 Plastering–Necessity, Procedure, rough finish, Neeru finishing.</p> <p>5.4 Pointing – Necessity, Procedure and types (Sketches).</p> <p>5.5 Special Plasters- Stucco Plaster, sponge finish, rough cast finish, pebbles finish. Plaster Board and Wall claddings.</p> <p>5.6 Painting –Necessity, types of External paint and Internal paint, Surface Preparation for painting, Methods of Application, Selecting suitable painting material,</p>	10	14
<p>CEH301-CO6 Use the relevant type of special construction techniques in the given situation.</p>			
6	<p>Formwork and Allied Techniques</p> <p>6.1 Formwork: Definition, requirements, materials used types and removal of formwork.</p> <p>6.2 Scaffolding, Shoring and Underpinning: Necessity, types, application. Process of Erection and Dismantling.</p> <p>6.3 Re-barring technique- necessity.</p> <p>6.4 Causes of cracks in building, repair of cracks,</p> <p>6.5 Guniting And Grouting - Definition and application</p>	4	8
	TOTAL	22	34

I. SUGGESTED MICROPROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

- a. Collect the market rates for following construction materials from various dealers/suppliers of local market for different brands. i. Bricks. ii. Stone / aggregate (20 mm, 40 mm and 80 mm) iii. Teak wood. iv. Flooring tiles. v. Ordinary Portland Cement vi. Oil paint vii. Cement Paint viii. Plaster of Paris ix. Plastic paints x. Recent types of paint.
- b. Collect the technical brochures of following construction materials. i. Ordinary Portland cement ii. Vittrified flooring tiles. iii. Particle boards used for aluminum partitions. iv. Paints.
- c. Undertake a market survey for the cost and technical specification of different brands of following construction Materials and prepare comparison chart. i. Cement ii. Tiles iii. Glass iv. Paints.
- d. Collection of information related to recent technologies used in building construction.
- e. Identify the different types of cracks and remedial measures (Case Study).
- f. Collection of information related to different techniques of demolition of existing structure.
- g. Visit to the site to check different construction activities as per the checklist.

Assignment

Other than the classroom and laboratory learning, following are the suggested student-related co-curricular activities which should be undertaken to accelerate the attainment of the various outcomes in this course:

Students should prepare **ASSIGNMENT ON EACH UNIT**.

SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Overview of construction Materials.	CO1	8	4	2	4	10
2	II	Special Building Construction Materials.	CO2	3	2	2	2	6
3	III	Construction of substructure & Superstructure.	CO3	12	4	6	10	20
4	IV	Building Communication.	CO4	8	2	4	6	12
5	V	Building Finishes.	CO5	10	4	4	6	14
6	VI	Formwork and Allied Techniques.	CO6	4	2	2	4	08
Grand Total				45	18	20	32	70

I. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning) - Term work, Self-Learning (Assignment) , Question Answer in Classroom, Quiz and Group Discussion.

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

Summative Assessment (Assessment of Learning - Pen Paper test / Oral Exam/ Practical Exam

Instructional Methods:

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

Teaching and Learning resources:

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

II. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Ghose, D. N.	Construction Materials	Tata McGraw Hill, New Delhi, 2014 ISBN: 9780074516478
2	Rangwala, S.C.	Engineering Materials	Charotar publisher, Ahemdabad, 2015, ISBN: 9789385039171
3	S. P. Arora and Bindra	Building Construction	Dhanpat Rai Publication, Delhi Edition 2013, ISBN: 9788189928803
4	S. C. Rangawala	Building Construction	Charotar Publication, Dist-Anand ISBN-10: 8185594856 ISBN-13: 978-8185594859
5	Sushil Kumar	Building Construction	Standard Publication, Edition 2010, ISBN: 9788180141683, 8180141683
6	BIS	National Building Code	Bureau of Indian Standard, New Delhi
7	BIS	BIS 962-1989 Code of Architectural and Building Drawing	Bureau of Indian Standard, New Delhi
8	BIS	BIS 1038- 1983 Steel Doors, Windows and Ventilators	Bureau of Indian Standard, New Delhi

LEARNING WEBSITES & PORTAL

Sr.No	Link / Portal	Description
1	https://www.youtube.com/watch?v=XsFeVuVQE-E	Introduction to Building Materials
2	https://www.youtube.com/watch?v=C6x_ersOn_o	Building Blocks of Bharat
3	https://www.youtube.com/watch?v=3XGt-p-hpdU	Brick Masonry Construction
4	https://www.youtube.com/watch?v=L-VGe2j53NU	15 Essential Tips for Building a 4" Thick Brick Masonry Wall: Expert Construction Guide
5	https://www.youtube.com/watch?v=Yg4Bly7f-iI	Introduction to fix formwork for column at site
6	https://www.youtube.com/watch?v=fDKRtQqKzJM	Steps of Plastering

COURSE ID : CEH 302
COURSE NAME : SURVEYING
COURSE CODE : CEH 302
COURSE ABBREVIATION : HSVY

A. LEARNING SCHEME:

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

B. ASSESSMENT SCHEME :-

PAPER DURATION IN HRS	THEORY				BASED ON LL&TL				BASED ON SLA		TOTAL
	<i>Practical</i>								MAX	MIN	
03	FA-TH	SA-TH	TOTAL		FA -PR		SA-PR				25
	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MIN			
	30	70	100	40	25	10	50#	20			

(Total IKS Hrs for Sem. : 01 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

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:-

Surveying is generally used to make land maps and boundaries. The development of engineering survey is the basic foundation to ensure the quality of the project, because it can provide accurate data for the subsequent construction. Surveying is involved in everything right from accurately drawing boundaries between private and public land, to inspecting bridges and other critical infrastructure. Without surveying, the placement security, and safety of projects cannot be assured. Therefore, the students are required to develop such competency to carry out the given type of survey using relevant equipment's so as to prepare the plan to interpret the information to take the appropriate decisions. This course will help the students in achieving in above mentioned goal.

ii) INDUSTRY / EMPLOYER EXPECTED OUTCOME

Prepare plans and Contour maps using Surveying Equipment's and Techniques.

E. COURSE LEVEL LEARNING OUTCOMES (COS)

CEH302-1 State the importance of survey

CEH302-2 Determine distances with various linear instruments & Calculation of area.

CEH302-3 Setting up plane table and finding out area and distance.

CEH302-4 Determine reduced levels by different methods & Draw contour by interpolation & other methods.

CEH302-5 Measurement of horizontal and vertical angles by theodolite.

Competency, course outcomes and programme outcomes/programme specific outcomes (cp-co-po/ps) 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 Plan and Design	PSO2 Construction and Maintenance	P Problem Solving on fieldSO3
Competency: Apply principles of surveying-1 to solve engineering problems	3	3	2	2	1	1	1	1	1	1
CEH302 CO-1 State the importance of survey	3	3	2	3	2	1	2	1	2	2
CEH302 CO-2 Determine distances	3	3	2	2	1	1	1	1	1	3

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 Plan and Design	PSO2 Construction and Maintenance	P Problem Solving on fieldSO3
with various linear instruments & Calculation of area.										
CEH302 CO-3 Setting up plane table and finding out area and distance.	3	3	2	2	1	2	1	1	2	1
CEH302 CO-4 Determine reduced levels by different methods & Draw contour by interpolation & other methods.	3	3	2	2	2	1	1	3	2	2
CEH302 CO-5 Measurement of horizontal and vertical angles by theodolite.	3	3	2	2	1	2	1	1	2	1

F. CONTENT:-

I) Practical exercises

The following practical exercises shall be conducted in practical sessions of batches of about 20- 22 students:

Sr. no	Laboratory experiences	CO
1	*Measure the distance between two intervisible survey stations using chain, tape and ranging rods.	CEH302-2
2	*Determine area of open field using chain and cross staff survey.	CEH302-2
3	Determine area of irregular field using Digital Planimeter	CEH302-2
4	*Measure Fore Bearing and Back Bearing of survey lines of open traverse using Prismatic Compass	CEH302-2
5	*Measure Fore Bearing and back bearing of a closed traverse of 5 to 6 sides and correct the bearings and included angles.	CEH302-2
6	*Prepare plans and locate details by using Radiation Method.	CEH302-3
7	*Prepare plans and locate details by Intersection Method	CEH302-3

Sr. no	Laboratory experiences	CO
8	*Prepare traverse using Plane table Surveying	CEH302-3
9	Prepare plan to establish plant nursery	CEH302-3
10	*Determine Reduced Level by Height of Instrument Method	CEH302-4
11	*Determine Reduced Level by Rise and Fall Method	CEH302-4
12	*Perform Fly Levelling to check levelling work	CEH302-4
13	Undertake differential leveling by using dumpy level/Auto Level and leveling staff for Installation of irrigation pipelines	CEH302-4
14	Prepare Contour Plan/map using Block Contouring for the area of 40m x 40m to draw its contour plan	CEH302-4
15	Prepare Contour plan for control farming using block contouring method	CEH302-4
16	Measure Horizontal angle by using Transit Theodolite by Direct Method	CEH302-5
17	*Measure Horizontal angle by using Transit Theodolite by method of Repetition	CEH302-5
18	*Measure vertical angle using Transit Theodolite	CEH302-5
PROJECTS		
1	*Profile leveling and cross-sectioning for a road length of 300 m with cross-section at 20 m interval. (Compulsory).	CEH302-4
2	*Plotting contour map using block contouring method for a block of 150m x 150m with grid of 10m x 10m for given land parcel. (Compulsory).	CEH302-4
3	*Use transit theodolite to carry out Survey Project for closed traverse for minimum 5 sides (Compulsory).	CEH302-5
<p>Note : Out of above suggestive LLOs - '*' Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes.</p>		

II) Theory

Section I

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO CEH302: 1: State the importance of survey			
1	<p>Overview and Classification of Surveying</p> <p>1.1 Surveying: Introduction, Purpose, use and Principles.</p> <p>1.2 Types of surveying- Primary and Secondary classification, Plane, Geodetic, Cadastral, Hydrographic, Photogrammetry Aerial, Layout survey, Control survey, Topographical survey, Route survey, Reconnaissance survey.</p> <p>1.3 Conventional sign and symbols</p>	04	06
CO CEH302:2: Determine distances with various linear instruments & Calculation of area.			
2	<p>Cross Staff and Compass Surveying</p> <p>2.1 Linear Measurement Instruments: Metric Chain, Tapes, Arrow, Ranging rod, Open cross staff (IKS)</p> <p>2.2 Chain survey Station, Base line, Check line, Tie line, Offset, Tie station, Types of offsets: Perpendicular and Oblique</p> <p>2.3 Ranging: Direct and Indirect Ranging.</p> <p>2.4 Area Calculations of field by cross staff (Numerical problems)</p> <p>2.5 Compass Traversing: open, closed.</p> <p>2.6 Technical Terms: Geographic/True Magnetic and Arbitrary Meridians and Bearings, Meridian and Bearing,</p> <p>2.7 Whole Circle Bearing System and Reduced Bearing System . Numerical on conversion of given bearing to another bearing (from one form to another), Fore Bearing and Back Bearing,</p> <p>2.8 Calculation of internal and external angles from bearings at a station.</p> <p>2.9 Components of Prismatic Compass and their Functions (No sketch) Temporary adjustments and observing bearings</p> <p>2.10 Local attraction, Methods of correction of observed bearings- Correction at station and correction to included angles</p> <p>2.11 Methods of plotting a traverse and closing error, Graphical adjustment of closing error.</p>	14	20

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO CEH302: -3: Setting up plane table and finding out area and distance.			
3	Plane Table Surveying 3.1 Principle of plane table survey. 3.2 Accessories of plane table and their use, Telescopic alidade. 3.3 Setting of plane table; Orientation of plane table - Back sighting and Magnetic meridian method 3.4 Methods of plane table surveys- Radiation, Intersection and Traversing. 3.5 Merits and demerits of plane table survey.	06	08

Section –II

Sr. no.	Topics/Subtopics	Learning (Hours)	Classroom learning evaluation Marks
CO CEH302:-4: Determine reduced levels by different methods & Draw contour by interpolation & other methods.			
4	Levelling and Contouring 4.1 Terminologies: Level surfaces, level line, Horizontal and vertical surfaces, Datum, Bench Marks- GTS, Permanent, Arbitrary and Temporary, Reduced Level, Line of collimation, Back sight, Fore sight, intermediate sight, Change point, Height of instruments 4.2 Types of levels: Dumpy, Auto level, Digital level, Fundamental axis of Dumpy Level. Temporary adjustments of Level. 4.3 Types of Levelling Staffs: Self-reading staff and Target staff. 4.4 Reduced level by Plane of collimation method and Rise/ Fall Method 4.5 Find the R. L. by H.I. method with necessary checks (Numerical problems) 4.6 Find the R.L by Rise and Fall method with necessary checks. (Numerical problems) 4.7 Types of Leveling : Simple, Differential, Fly, Profile and Reciprocal Levelling 4.8 Contour, contour interval, horizontal equivalent.	12	20

	4.9 Contour maps: Characteristics and uses of Contour maps 4.10 Methods of Locating Contour: Direct and Indirect		
CO CEH302 -5: Measurement of horizontal and vertical angles by theodolite.			
5	Theodolite Surveying 5.1 Types and uses of Theodolite; Component parts of transit Theodolite and their functions, Reading the Vernier of transit Theodolite 5.2 Technical terms- Swinging, Transiting, Face left, Face right 5.3 Fundamental axes of transit Theodolite and their relationship 5.4 Temporary adjustment of transit Theodolite 5.5 Measurement of horizontal angle- Direct and Repetition method, Errors eliminated by method of repetition 5.6 Measurement of vertical Angle 5.7 Theodolite traversing by included angle method and deflection angle method 5.8 Checks for open and closed traverse, Calculations of bearing from angles 5.9 Traverse computation-Latitude, Departure, Consecutive coordinates, independent coordinates, Balancing the traverse by Bowditch's rule and Transit rule, Gale's Traverse table computation	12	16

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

G : List of Assignments under SLA

Sr.No	List of Assignment (under SLA)	Hrs Allotted
1	Explain one method each to measure the distance between points on either side of obstacles in case of following: River, Lake, Building.	2
2	Set the alignment of proposed road using Theodolite	2
3	Interpret the given contour maps.	2
4	Draw the representative contour maps for the following: Ridge of a mountain, Hillock, Valley, Pond/lake, Gent slope, Very Steep Slope, Plain Surface	2
5	Determine the reservoir capacity from a give contour map of reservoir. Measure area of small open ground by plane tabling.	4
6	Measure the height of the flag post using Theodolite.	2
7	Determine the reservoir capacity from a give contour map of reservoir.	4

List of Micro Projects (Under SLA)		
1	Collect the contour maps of different terrains available with various authorities & prepare a report on its interpretation.	
2	Determine the RLs of the components of existing structures like Plinth, lintels, chajja, slab, and beam etc	
3	Prepare a flex chart to explain one method of plane tabling.	
4	Compare Traversing with plane table and compass method.	
5	Perform reconnaissance survey for plotting the alignment of road	
6	Observe Topographical maps and interpret the details	
7	Carry out comparative study of following survey instruments of different make and brands : Auto level and Dumpy Level	
8	Collect the map of city /town and calculate the ward wise and total area using digital planimeter.	
9	Collect the information of survey instruments available in the market with their specifications.	
Note : “These are the just suggestive topics. Faculty must design Microproject/Activities/ Assignments based on Course Outcome requirements”.		

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	Overview and Classification of Surveying	2	4	0	06	CEH302-1
I / 2	Cross Staff and Compass Surveying	4	4	12	20	CEH302-2
I / 3	Plane Table Surveying	4	4	0	08	CEH302-3
II / 4	Levelling and Contouring	2	6	12	20	CEH302-4
II / 5	Theodolite Surveying	2	2	12	16	CEH302-3
		14	20	30		
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	Attendance/Discipline and 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	Marks allotted
1	Knowledge about the course	05
2	Preparedness for practical /Oral	05
3	Neat & complete Diagram/write up	05
4	Observations/Handling of instrument/ Communication/Presentation	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

K) Teaching and Learning resources:

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

L) Reference Books:

S.N.	Name of Book	Author	Publication
1	Surveying and Levelling volume I	Kanetkar T. P.; Kulkarni, S. V.	Pune Vidyarthi Gruh Prakashan, Pune; ISBN:978-81-858-2511-3
2	Surveying and Levelling	Basak, N. N.	McGraw Hill Education, New Delhi ISBN 93-3290-153-8
3	Survey I	S. K. Duggal	McGraw Hill Education, New Delhi, ISBN: 978-00-701-5137-6
4	Surveying I	Punmia, B.C, Jain, Ashok Kumar Jain, Arun Kumar	Laxmi Publications., New Delhi. ISBN: 8-17- 008853-4
5	Surveying and Levelling, Volume 1	Bhavikatti, S. S.	I. K. International, New Delhi ISBN: 978-81- 906-9420-9

M) Learning Website & Software

Sr.No	Link / Portal	Description
1	https://archive.nptel.ac.in/courses/105/104/105104101/	Introduction to Surveying, Principles of surveying, and Classification of Surveying
2	https://lnct.ac.in/wp-content/uploads/2020/03/UNIT-4B.pdf	Theodolite Surveying
3	https://www.slideshare.net/gauravhtandon1/plane-table-survey-27614680	Plane Table Surveying-accessories and methods
4	http://www.pkace.org/Lecture_Notes/Survey-lecture-notes.pdf	Levelling-methods of levelling and types of levels
5	https://dspmuranchi.ac.in/pdf/Blog/Survey.pdf	Surveying and Levelling
6	https://civilplanets.com/compass-surveying/	Compass Surveying and its types, Temporary adjustments
7	http://ecoursesonline.iasri.res.in/mod/page/view.php?id=128285	Traversing by Prismatic Compass, WCB and RB conversion and Terms in Compass Surveying
8	https://www.youtube.com/watch?v=x9ZPMxrlS3U	Measurement of bearing by prismatic compass
9	https://youtu.be/j8poe2vvD2Q	Temporary adjustment of auto level
10	https://www.youtube.com/watch?v=c9U0xlmCzGI	10
11	https://youtu.be/L54T4uvpMTg	Levelling operation by using Dumpy Level
12	https://www.youtube.com/watch?v=boPrQFZE9A	Radiation method by plane table surveying
13	https://www.youtube.com/watch?v=PQfr1LABZWg	Contouring and its characteristics, Methods of Contouring
14	https://www.youtube.com/watch?v=-mkf7uJG8DI	Intersection method of Plane Table