



Shri Vile-Parle Kelavani Mandal's
Shri Bhagubhai Mafatlal Polytechnic, Mumbai

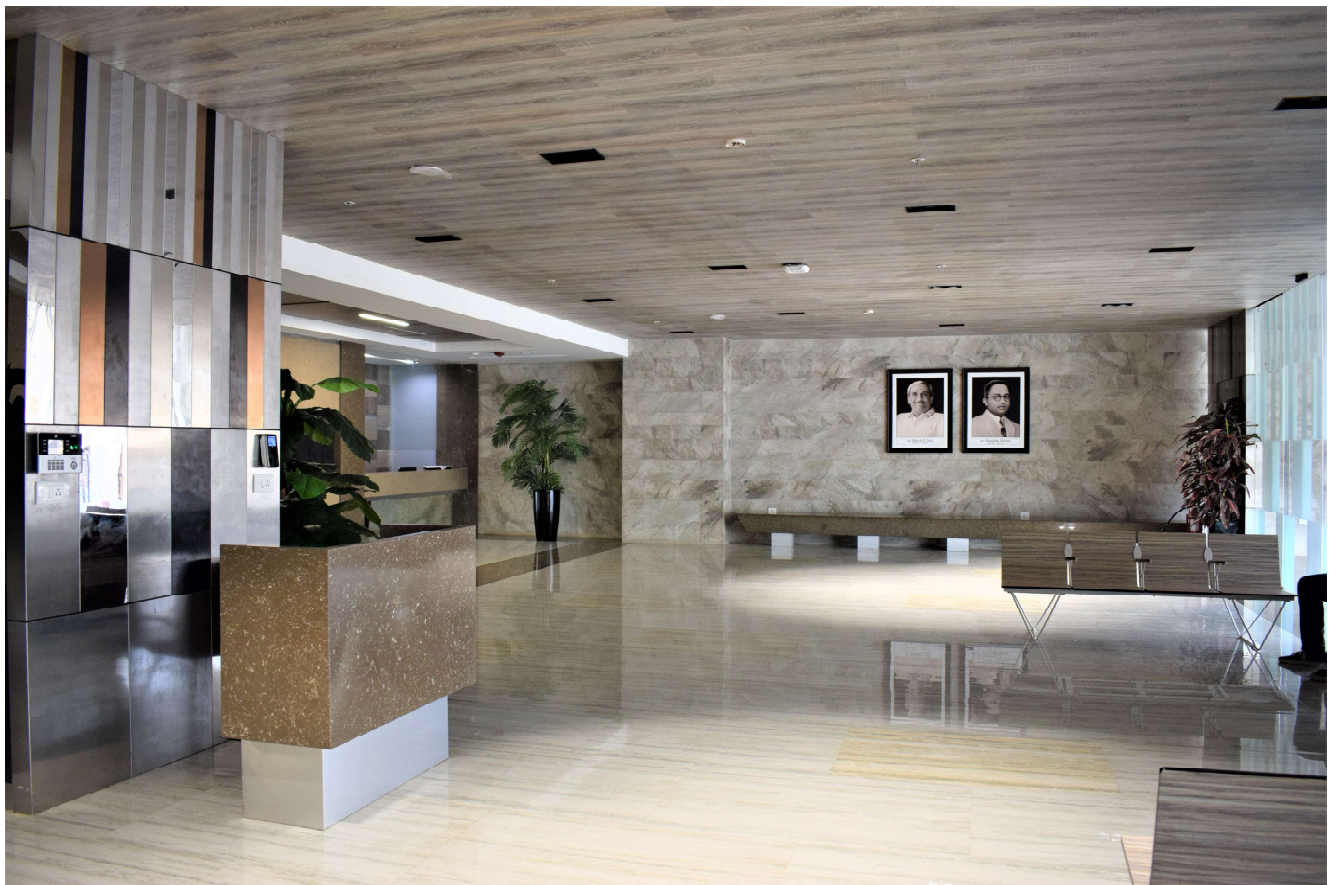


(AN ACADEMICALLY AUTONOMOUS GRANT-IN AID INSTITUTE)

CURRICULUM 2019

DIPLOMA PROGRAMME IN

CIVIL ENGINEERING



Yamini

Head, Civil Engineering Department
 Shri Bhagubhai Mafatlal Polytechnic
 Vile Parle (west), Mumbai- 400056



[Signature]

PRINCIPAL
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Curriculum Co-Ordinator / COE

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PREFACE

SHRI BHAGUBHAI MAFATLAL POLYTECHNIC started three years diploma programs and was affiliated to the Board of Technical Examinations, Maharashtra State, in 1963. The institute has been conferred an academic autonomous status since 1969 by Government of Maharashtra because of excellent performance, which enabled it to design the curriculum and examination scheme and to introduce inplant training, which involved industry-institute interaction. Thus, four years semester sandwich pattern came into existence. Since 1978-79, academic freedom was extended to all the full-time diploma programs. In 1989-90 full autonomy was granted to all the seven full-time diploma programs.

As a further development to the above, the Multi Point Entry and Credit System (MPECS) was initiated in 1981 on progressive basis. In this scheme students can regulate their pace of studies within the rules prescribed.

From 1993-94, full academic autonomy was extended to all the nineteen programs, which includes full-time diploma, part-time diploma and post-diploma programs. The students have to qualify for appearing in the final examinations as per details given in the MPECS rules. The examinations are conducted by the institute and the final diploma is awarded by the institute at the convocation function.

From the academic year 2016-17, our curriculum is revised and is converted to three-year diploma program. Teaching learning is done at the institute up to V semester and inplant training is offered at VI semester.

To incorporate the latest developments in technology and to have better industry institute interaction, the curriculum is revised again to be implemented from the academic year 2019-2020 which is choice and credit-based system (CCBS). This is a diploma program of three-year duration with inplant training in fifth semester.

The vision of the institute is to be a premier technical training and development institute catering to the skill and professional development in multi-domain for successful employment / self-employment by offering need-based curriculum and state of the art infrastructure. The institute shall be the centre for excellence in skill development and community development through



different training programmes, incubation centre and entrepreneurship development. For this the institute is committed to provide education for skill development, engineering diploma and continuing education programmes for enhancement of employability skills of the aspirants in the job/self-employment through continually developing quality learning systems. The institute aims at holistic and student centric education in collaboration with industry and having practice-based education. To achieve these continuous efforts are made to design the curriculum considering the latest development in the industrial sector and technology.

The focus of Civil Engineering program is to acquaint the students with wide spectrum of civil engineering such as infrastructure, residential, public health, structural engineering, repairs and redevelopment. Hence courses offered during program are relevant to this spectrum. Besides basic, core and application courses, courses such as Airports and MRTS, Building repairs, services and urban renewal, Development control rules and regulations are offered to keep the curriculum to matching needs of industry and society. Overall, the students of Civil Engineering after undergoing the programme will strengthen their knowledge and basic skill sets as needed in the field of Civil engineering.

INPLANT TRAINING:

Students receive institutional training for the first four semesters. In fifth semester, to gain practical knowledge and industrial exposure, the students have to undergo inplant training. This scheme enables the students to enhance their psychomotor skills during the industrial training. The training also helps the student to better understand the different application-oriented courses and project covered in sixth semester.

In this Curriculum-2019, the student has to acquire 180 credits for successful completion of Diploma Programme. The courses of curriculum are structured at 4 different levels i.e., Basic Courses, Core Courses, Application Courses, and Management Courses.

The minimum entry level is 10th. However, the curriculum provides “Choice and Credit system (CCBG)” for the students opting admission after passing 12th, ITI, MCVC. At higher entry level, the students will get exemptions in certain courses as per the rules.



There is a flexibility for opting the courses as per the choice of students. The curriculum provides “Sample Path” as a guide line for selection of courses in each term for entry level as 10th. The List of Courses for Award of Class after completion of Diploma Programme is prescribed separately in this curriculum.

The fulfilment of programme outcome as stated in the Curriculum-2019 will depend on its effective implementation. The teachers who are implementing the curriculum were also involved in the design process of curriculum, hence, I hope that the Curriculum-2019 will be implemented in effective way and the pass outs will acquire the requisite knowledge and skills to satisfy the industrial needs.



(Dr. M. Z. SHAIKH)

Principal

Shri Bhagubhai Mafatlal Polytechnic, Mumbai



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Shri Vile-Parle Kelavani Mandal's
Shri Bhagubhai Mafatlal Polytechnic, Mumbai



VISION

SBM Polytechnic aspires to be the lead institute in providing need based technical education

MISSION

1. To provide state of art infrastructure and latest equipment for providing a stimulating learning environment.
2. To prepare students to meet the dynamic needs of the industry by periodic reviewing and upgradation of curriculum through an interactive process with industry.
3. To inculcate a spirit of excellence in terms of academic performance, research and innovation in faculty by providing appropriate support and incentive systems.
4. To promote and support Co-Curricular, extra-curricular activities and industry interaction to make students socially sensitive and employable

CIVIL ENGINEERING DEPARTMENT

VISION

To deliver excellence in learning to diploma graduates of civil engineering for socio-economic development of the nation.

MISSION

1. Offer the teaching- learning process with practical oriented approach
2. Impart entrepreneurial qualities, soft skills and promote lifelong learning
3. Facilitate for development of group dynamics and socioeconomic behaviour



JOB PROFILE OF CIVIL ENGINEERING DIPLOMA PASSOUTS

Civil Engineering is vast field covering many aspects wherein Civil engineers conceive, design, build, supervise, operate, construct and maintain infrastructure projects and systems in the public and private sector, including roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and sewage treatment. Many civil engineers work in planning, design, construction, research, and education.

Job profile of Civil Engineers varies at per the position they acquire in any organisation. All the civil engineers will be dealing with a common goal of completing the project in time and will perform various duties at different levels in an organisation. Typical duties performed by the civil engineers are

- ✓ Perform or oversee surveying operations to establish building locations, site layouts, reference points, grades, and elevations to guide construction
- ✓ Oversee and analyse the results of material testing to determine the adequacy and strength of materials for use in particular projects
- ✓ Prepare cost estimates for materials, equipment, or labour to determine a project's economic feasibility
- ✓ Manage the repair, maintenance, and replacement of public and private infrastructure
- ✓ Analyze long range plans, survey reports, maps, and other data to plan and design projects.
- ✓ Consider construction costs, government regulations, potential environmental hazards, and other factors during the planning and risk-analysis stages of a project
- ✓ Compile and submit permit applications to local, state, and central agencies, verifying that project comply with various regulations
- ✓ Use design software to plan and design transportation systems, hydraulic systems, and structures in line with industry and government standards



DIPLOMA PROGRAMME IN CIVIL ENGINEERING

RATIONALE:

Civil Engineering is a basic branch of Engineering which caters to the basic needs of society, i.e. provide housing and take up all the required development works around the World. The aim of the institute, through Civil Engineering education is to provide trained professionals. The Civil Engineering Department is having mission of tuning students into Engineers, Technologist, Managers and Administrators. Besides teaching, it has a mission of providing services like testing & consultancy to the construction industry by motivating the faculty for taking up the challenges.

Therefore, Diploma in Civil Engineering Program envisages in developing competent technicians with a number of professional skills who can perform these jobs in the construction / contracting / consulting companies or as an entrepreneur effectively & efficiently.

The Diploma course of Civil Engineering is designed at technician level spread over 3 years i.e., VI semesters, covering the basic knowledge of core subjects like Engineering Materials, Surveying, Civil Engineering Drawing, and Applied Mechanics & Construction. This is followed by subjects like Materials & Structures, Concrete Technology and Transportation Engineering. At fourth & fifth semester subjects like water Resource Engineering, Environmental Engineering, Design Practice of RCC Structures, Geotechnical Engineering, Project Engineering Management and Contract Administration are taught after they return to final VI semester after undergoing V semester in plant Training. Subjects of futuristic areas like MRTS, Building Maintenance Repairs & Services, and Urban Renewal are also offered. Subjects are duly classified into Basic, Core, Application & Management & also as compulsory, optional, & award-winning subjects. There is structured program of briefing the students at various levels i.e., at the beginning of I semester to know about registration of subjects under MPE&CS & before proceeding for In plant Training to understand do's & don'ts to be observed during the training. On completion of Diploma, students will be able to work as

- Junior Engineer in both Public & Private Sectors
- Consulting origination for design work
- Civil Contractor
- Compete for admission to courses for higher studies



PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. Solve various civil engineering problems effectively
2. Contemplate on competency, quality and safety for sociotechnical development
3. Adopt modern and recent ideas to blend multidisciplinary work environment

PROGRAMME OUTCOMES (POs)

On Successful Completion of Diploma Programme in Civil Engineering, the pass outs will be able to,

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. **Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
3. **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. **Life-long learning:** Ability to analyse individual needs and engage in updating in the context of technological changes.



PROGRAMME SPECIFIC OUTCOMES (PSOs)

On successful completion of Diploma Programme in Civil Engineering, the student will be able to:

1. To be able to supervise different civil engineering works by interpreting different designs and drawings related to civil engineering
2. To be able to carry out survey, estimation and valuation of various projects

MAPPING OF MISSION AND PROGRAMME EDUCATIONAL OBJECTIVES

Sr. No.	Mission	Component of Mission Statement	PEO/s
1	M1	Offer the teaching- learning process with practical oriented approach	PEO1, PEO2, PEO3
2	M2	Impart entrepreneurial qualities, soft skills and promote lifelong learning	PEO3, PEO1, PEO2
3	M3	Facilitate for development of group dynamics and socioeconomic behaviour	PEO2, PEO1, PEO3

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES AND PROGRAMME OUTCOMES

Sr. No.	Programme Educational Objectives (PEOs)	Programme Outcomes (POs)
1	Solve various civil engineering problems effectively	PO1, PO2, PO3, PO4
2	Contemplate on competency, quality and safety for sociotechnical development	PO5, PO6, PO7
3	Adopt modern and recent ideas to blend multidisciplinary work environment	PO7, PO5, PO4, PO3



MAPPING OF PROGRAMME SPECIFIC OUTCOMES AND PROGRAMME OUTCOMES

Sr. No.	Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)
1	To be able to supervise different civil engineering works by interpreting different designs and drawings related to civil engineering	PO1, PO2, PO3, PO4, PO5, PO6, PO7
2	To be able to carry out survey, estimation and valuation of various projects	PO1, PO2, PO3, PO4, PO5, PO6, PO7

MAPPING OF PROGRAMME OUTCOME AND COURSES

POs No.	Program Outcome (POs)	Course Name
1	Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.	Basic Mathematics (BMT190001), Applied Chemistry (ACH190002), Engineering Drawing (EDG190101), Applied Mechanics (APM190005), Workshop Practice (CE) WSP190102), Engineering Mathematics (EMT190009), Applied Physics (APH190010), Highways, Bridges and Railways (HBR190108), Materials and Structures (MNS190109), Fluid Mechanics (FMH190117)
2	Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.	Applied Mathematics (AMT190013), Mechanics of Structures (MOS190115), #Quantity Survey and Estimation (QSE190126), Highways, Bridges and Railways (HBR190108), Materials and Structures (MNS190109), Fluid Mechanics (FMH190117)"
3	Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.	"Civil Engineering Drawing (CED190107), Airports and MRTS (AMT190111), Development Control and Promotion Regulations (DCR190112), Design Practice of Steel Structures (DPS190114),



POs No.	Program Outcome (POs)	Course Name
		#Design Practice of RCC Structure (RCC190123), #Geotechnical Engineering (GTE190127), Pre stress Concrete (PRC190128)
4	Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements	"Building Construction (BCN190103), Civil Engineering Materials (CEM190104), Surveying-I (SUR190105), Surveying-II (SUR190106), Concrete Technology (CTH190116), Advance Survey (TSS190121)
5	Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices	Environmental Studies (EVS190003), Highways, Bridges and Railways (HBR190108), #Environmental Engineering (ENV190113), Building Maintenance Repair, Services and Urban Renewal & Redevelopment (BMR190118), #Water Resource Engineering (WRE190125), Solid Waste Management (SWM190129), Disaster Management (DMT190130)
6.	Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.	Communication Skills (CMS190011), Civil Engineering Software (CES190110), #Project Engineering Management and Contract Administration (PMC190124)
7.	Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.	"Development of Life Skills (DLS190004), Stress Management (STM190012), Communication Skills (CMS190011), (CEM190104), Surveying-I (SUR190105), Surveying-II, Concrete Technology (CTH190116)





Shri Vile Parle Kelavani Mandal's
Shri Bhagubhai Mafatlal Polytechnic
Vile Parle (W), Mumbai 400 056
TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING
SEMESTER: I

With effect from Batch admitted in June, 2019 progressively
Duration:16 Weeks

Sr. No.	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr		
		L	P	D	T	Cr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total				
1.1	Basic Mathematics (BMT190001)	3	0	-	2	5	3	70	20	10	70	25	-	-	125	B*	325		
1.2	Applied Chemistry (ACH190002)	4	2	-	-	6	1	70@	20	10	70	25	50	-	175	B*	426		
1.3	Environmental Studies (EVS190003)	2	-	-	-	2	-	-	-	-	-	50	-	-	50	B*	202		
1.4	Development of Life Skills (DLS190004)	2	0		1	3	-	-	-	-	-	50	-	50	100	B*	213		
1.5	Engineering Drawing (EDG190101)	2	-	4	-	6	-	-	-	-	-	50	50	-	100	C*	246		
1.6	Applied Mechanics (APM190005)	3	2	-	1	6	3	70	20	10	70	50	-	-	150	C*	336		
1.7	Workshop Practice (CE) (WSP190102)	0	4	-	-	4	-	-	-	-	-	50	-	-	50	C*	044		
TOTAL		16	08	04	04	32	No. of Papers=03		60	30	210	300	100	50	750		16/16/32		
		TOTAL PERIODS = 32					TOTAL MARKS = 750												

Theory and practical periods of 1 Hour duration each

* Compulsory, # Award Winning, @ Online Examination

L- Lecture, P- Practical, D-Drawing Practice, T- Tutorial, Cr- Credit, ESE-End Semester Examination, SSL- Sessional, TA-Teachers assessment, TH-Theory,

TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B - Basic, C - Core, A - Application, M - Management

TA-Based on attendance, MCQ/seminar/mini project/assignment/model making etc.

PR/OR - Assessed by Internal and External Examiners Jointly, TW - Assessed by Internal Examiner Only

[Signature]

Head of Department

[Signature]

Controller of Examination

[Signature]

Secretary CDC



[Signature]

Principal



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Shri Bhagubhai Mafatlal Polytechnic
Vile Parle (W), Mumbai 400 056
TEACHING AND EXAMINATION SCHEME




**PROGRAMME: CIVIL ENGINEERING
SEMESTER - II**

**With effect from Batch admitted in June, 2019 progressively
Duration: 16 Weeks**

Sr. No.	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr
		L	P	D	T	Cr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total		
2.1	Engineering Mathematics (EMT190009)	3	-	-	2	5	3	70	20	10	70	25	-	-	125	B*	325
2.2	Applied Physics (APH190010)	4	2	-	-	6	1	70@	20	10	70	25	50	-	175	B*	426
2.3	Communication Skills (CMS190011)	3	-	-	1	4	3	70	20	10	70	25	-	-	125	B*	314
2.4	Building Construction (BCN190103)	3	2	-	-	5	3	70	20	10	70	25	-	50	175	C*	325
2.5	Civil Engineering Materials (CEM190104)	3	-	-	-	3	3	70	20	10	70	-	-	100	C*	303	
2.6	Surveying-I (SUR190105)	3	4	-	-	7	3	70	20	10	70	50	50	-	200	C*	347
2.7	Stress Management (STM190012)	-	2	-	-	2	-	-	-	-	-	-	-	-	-	M	022
TOTAL		19	10	-	03	32	No. of Papers=06		120	60	420	150	100	50	900		19/13/32
		TOTAL PERIODS = 32					TOTAL MARKS = 900										

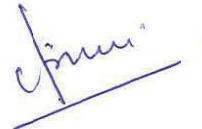
Theory and practical periods of 1 Hour duration each * Compulsory, # Award Winning, @ Online Examination
L- Lecture, P- Practical, D-Drawing Practice, T- Tutorial, Cr- Credit, ESE-End Semester Examination, SSL- Sessional, TA-Teachers assessment, TH-Theory, TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B - Basic, C - Core, A - Application, M - Management
TA-Based on attendance, MCQ/seminar/mini project/assignment/model making, etc.
PR/OR - Assessed by Internal and External Examiners Jointly, TW - Assessed by Internal Examiner Only


Head of Department


Controller of Examination


Secretary CDC




Principal



Shri Vile Parle Kelavani Mandal's
Shri Bhagubhai Mafatlal Polytechnic
Vile Parle (W), Mumbai 400 056
TEACHING AND EXAMINATION SCHEME



**PROGRAMME: CIVIL ENGINEERING
SEMESTER - III**

**With effect from Batch admitted in June, 2019 progressively
Duration: 16 Weeks**

Sr. No.	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr		
		L	P	D	T	Cr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total				
3.1	Applied Mathematics (AMT190013)	3	-	-	1	4	3	70	20	10	70	25	-	-	125	C*	314		
3.2	Surveying-II (SUR190106)	3	4	-	-	7	3	70	20	10	70	50	50	-	200	C*	347		
3.3	Civil Engineering Drawing (CED190107)	2	-	4	-	6	4	70	20	10	70	50	-	50	200	C*	246		
3.4	Highways, Bridges and Railways (HBR190108)	4	2	-	-	6	3	70	20	10	70	25	-	-	125	C*	426		
3.5	Materials and Structures (MNS190109)	3	-	-	-	3	3	70	20	10	70	-	-	-	100	C*	303		
3.6	Civil Engineering Software (CES190110)	-	4	-	-	4	-	-	-	-	-	50	50	-	100	A	044		
3.7	Airports and MRTS (AMT190111)	2	2	-	-	4	-	-	-	-	-	50	-	50	100	C	224		
3.8	Development Control And Promotion Regulations (DCR190112)	3	-	-	-	3	-	-	-	-	-	50	-	50	100	C	303		
TOTAL		20	12	04	01	37	No. of Papers=05		100	50	350	300	100	150	1050		20/17/37		
		TOTAL PERIODS = 37					TOTAL MARKS = 1050												

Theory and practical periods of 1 Hour duration each * Compulsory, # Award Winning, @ Online Examination
L- Lecture, P- Practical, D-Drawing Practice, T- Tutorial, Cr- Credit, ESE-End Semester Examination, SSL- Sessional, TA-Teachers assessment, TH-Theory, TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B - Basic, C - Core, A - Application, M - Management
TA-Based on attendance, MCQ/seminar/mini project/assignment/model making,etc.
PR/OR – Assessed by Internal and External Examiners Jointly, TW – Assessed by Internal Examiner Only

Head of Department

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Secretary CDC



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Vile Parle (W), Mumbai 400 056
TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING
SEMESTER - IV

With effect from Batch admitted in June, 2019 progressively
Duration: 16 Weeks

Sr. No.	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr		
		L	P	D	T	Gr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total				
4.1	#Environmental Engineering (ENV190113)	4	2	-	-	6	3	70	20	10	70	50	50	--	200	A*	426		
4.2	Design Practice of Steel Structures (DPS190114)	3	-	3	-	6	4	70	20	10	70	50	-	50	200	A*	336		
4.3	Mechanics of Structures (MOS190115)	4	-	-	-	4	3	70	20	10	70	-	-	100	C*	404			
4.4	Concrete Technology (CTH190116)	3	2	-	-	5	3	70	20	10	70	50	-	50	200	A*	325		
4.5	Fluid Mechanics (FMH190117)	4	2	-	-	6	3	70	20	10	70	25	-	50	175	C*	426		
4.6	# ELECTIVE-I																		
	Building Maintenance Repair, Services and Urban Renewal & Redevelopment (BMR190118)	3	2	-	-	5	3	70	20	10	70	50	-	50	200	A*	325		
	Construction Equipment & Techniques (CET190119)	3	2	-	-	5	3	70	20	10	70	50	-	50	200	C*	325		
4.7	Engineering Geology (EGL190120)	3	-	-	-	3	-	-	-	-	-	50	-	50	100	A	303		
4.8	Advance Survey (TSS190121)	-	3	-	-	3	-	-	-	-	-	50	50	-	100	A	033		
	TOTAL	24	11	03		38	No. of Papers=06		120	60	420	325	100	250	1275		24/14/38		
		TOTAL PERIODS = 38					TOTAL MARKS = 1275												

Theory and practical periods of 1 Hour duration each

* Compulsory, # Award Winning, @ Online Examination

L- Lecture, P- Practical, D- Drawing Practice, T- Tutorial, Cr- Credit, ESE- End Semester Examination, SSL- Sessional, TA- Teachers assessment, TH- Theory,

TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B- Basic, C- Core, A- Application, M- Management

TA- Based on attendance, MCQ/ seminar/ mini project/ assignment/ model making etc.

PR/OR - Assessed by Internal and External Examiners jointly, TW - Assessed by Internal Examiner Only

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Secretary CDC



Principal



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TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING
SEMESTER-V

With effect from Batch admitted in June, 2019 progressively

Inplant Training

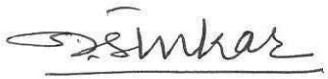
Sr No	Course Name (code)	Training Duration	Credits		Weekly Report	Quiz Test	Dissertation (Report)	Oral/Viva	Total	Group (Gr)
5.1	# Inplant Training (IPT190131)	26 Weeks **		20	Maximum Marks	50	50	50	50	200
					Minimum Marks	20	20	20	20	80
										A*

****Total Inplant Training Duration 26 weeks equal to 24 weeks actual training plus 2 weeks examination and processing**

*Compulsory, # Award Winning, Weekly Report and Quiz Test are assessed by Internal Examiner Only, Dissertation and Oral/Viva are Assessed by Internal and External Examiner Jointly

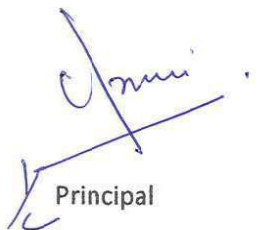
Gr- Group, B - Basic, C - Core, A - Application, M - Management


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TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING
SEMESTER - VI

With effect from Batch admitted in June, 2019 progressively
Duration: 16 Weeks

Sr. No	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr	
		L	P	D	T	Cr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total			
6.1	#Civil Engineering Project (CEP190122)	-	4	-	-	4	-	-	-	-	-	50	-	50	100	A*	044	
6.2	#Design Practice of RCC Structure (RCC190123)	3	-	3	-	6	4	70	20	10	70	50	-	50	200	A*	336	
6.3	#Project Engineering Management and Contract administration (PMC190124)	3	3	-	-	6	3	70	20	10	70	50	50	--	200	M*	336	
6.4	#Water Resource Engineering (WRE190125)	3	-	2	-	5	3	70	20	10	70	50	-	50	200	A*	325	
6.5	#Quantity Survey and Estimation (QSE190126)	3	2	-	-	5	3	70	20	10	70	50	50	--	200	A*	325	
6.6	#Geotechnical Engineering (GTE190127)	4	2	-	-	6	3	70	20	10	70	50	-	50	200	A*	426	
6.7	ELECTIVE-II																	
	Pre stress Concrete (PRC190128)	2	-	-	-	2	3	70	20	10	70	-	-	-	100	A*	202	
	Solid Waste Management (SWM190129)	2	-	-	-	2	3	70	20	10	70	-	-	-	100	M*	202	
6.8	Disaster Management (DMT190130)	2	-	-	-	2	-	-	-	-	-	50	-	50	100	M	202	
	TOTAL	20	11	05	-	36	No. of Papers = 06		120	60	420	350	100	250	1300	-	20/16/36	
TOTAL PERIODS = 36							TOTAL MARKS = 1300											

Theory and practical periods of 1 Hour duration each

* Compulsory, # Award Winning, @ Online Examination

L- Lecture, P- Practical, D-Drawing Practice, T- Tutorial, Cr- Credit, ESE-End Semester Examination, SSL- Sessional, TA-Teachers assessment, TH-Theory, TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B - Basic, C - Core, A - Application, M - Management
 TA-Based on attendance, MCQ/seminar/mini project/assignment/model making etc.
 PR/OR - Assessed by Internal and External Examiners Jointly, TW - Assessed by Internal Examiner Only

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TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING

With effect from Batch admitted in June, 2019 progressively

AWARD WINNING COURSES

Sr. No.	Course Name (code)	Scheme of Instructions and Periods per week					Theory Paper Duration and Marks (ESE)		Scheme of Examination and Maximum Marks							Gr	Scheme L/P/Cr
		L	P	D	T	Cr (L+P+D+T)	Hrs	Mks	SSL	TA	Theory Paper	TW	PR	OR	Total		
1	#Environmental Engineering (ENV190113)	4	2	-	-	6	3	70	20	10	70	50	50	--	200	A*	426
2	# ELECTIVE-I (ANY ONE) Building Maintenance Repair, Services and Urban Renewal & Redevelopment (BMR190118)	3	2	-	-	5	3	70	20	10	70	50	-	50	200	A*	325
	Construction Equipment & Techniques (CET190119)	3	2	-	-	5	3	70	20	10	70	50	-	50	200	C*	325
3	#Civil Engineering Project (CEP190122)	-	4	-	-	4	-	-	-	-	-	50	-	50	100	A*	044
4	#Design Practice of RCC Structure (RCC190123)	3	-	3	-	6	4	70	20	10	70	50	-	50	200	A*	336
5	#Project Engineering Management and Contract administration (PMC190124)	3	3	-	-	6	3	70	20	10	70	50	50	--	200	M*	336
6	#Water Resource Engineering (WRE190125)	3	-	2	-	5	3	70	20	10	70	50	-	50	200	A*	325
7	#Quantity Survey and Estimation (QSE190126)	3	2	-	-	5	3	70	20	10	70	50	50	--	200	A*	325
8	#Geotechnical Engineering (GTE190127)	4	2	-	-	6	3	70	20	10	70	50	-	50	200	A*	426
9	INPLANT TRAINING (IPT190131)	-	-	-	-	20	-	-	-	-	-	50	-	50	100	A*	0-20-20
TOTAL		23	15	05	-	63	No. of Papers = 07		140	70	490	450	150	300	1600	-	23/20/43 +20
TOTAL PERIODS = 63						TOTAL MARKS = 1600											

Theory and practical periods of 1 Hour duration each

* Compulsory, # Award Winning, @ Online Examination

L- Lecture, P- Practical, D-Drawing Practice, T- Tutorial, Cr- Credit, ESE-End Semester Examination, SSL- Sessional, TA-Teachers assessment, TH-Theory,

TW- Term Work, PR- Practical, OR- Oral, Gr- Group, B - Basic, C - Core, A - Application, M - Management

TA-Based on attendance, MCQ/seminar/mini project/assignment/model making,etc.

PR/OR - Assessed by Internal and External Examiners Jointly, TW - Assessed by Internal Examiner Only

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CREDIT SUMMARY FOR 2019 SCHEME

Gr	SEMESTER I		SEMESTER II		SEMESTER III		SEMESTER IV		SEMESTER V		SEMESTER VI		TOTAL
	C	O	C	O	C	O	C	O	C	O	C	O	
B	16	0	15	0	0	0	0	0	0	0	0	0	31
C	16	0	15	0	26	7	10+5	0	0	0	0	0	74+5
A	0	0	0	0	0	4	17+5	6	20	0	26+2	0	73+5+2
M	0	0	0	2	0	0	0	0	0	0	06+2	02	10+2
TOTAL	32	0	30	2	26	11	27+5	6	20	0	32+2	02	202

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PROGRAMME: CIVIL ENGINEERING

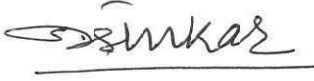
With effect from Batch admitted in June, 2019 progressively

Credit Summary

Group	Max. Credit	Compulsory Credit	Optional Credit	Remark
B = Basic	31	31	0	
C = Core	79	72	07	
A= Application	60	50	10	
M = Management	12	8	4	
Total	175+7	Maximum 154 credits are offered.	21	

Compulsory Credit : 154
Optional Credit : 21
Inplant Training Credit : 20
TOTAL CREDIT : 175+7+20


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 Vile Parle (W), Mumbai 400 056
TEACHING AND EXAMINATION SCHEME



PROGRAMME: CIVIL ENGINEERING

With effect from Batch admitted in June, 2019 progressively

RATIO OF THEORY : PRACTICAL		
Total Theory Crédits Offered	Total Practical Credits Offered	Theory : Practical
100	97	50.77 :49.23
Total Theory Credits (Award Winning)	Total Practical Credits (Award Winning)	
23	20+20	36.50 :63.50
Total TH/SSL Exam Marks for Offered Courses	Total TA/TW/PR/OR Exam Marks for Offered Courses	
2340	3035	41.23 :58.76
Total TH/SSL Exam Marks for Award Winning Courses	Total TA/TW/PR/OR Exam Marks for Award Winning Courses	
630	970	39.37 :60.63

Total Credits / Marks offered				
Semester	Theory Credits	Marks	Practical Credits	Marks
Semester I	16	270	16	480
Semester II	19	540	13	360
Semester III	20	450	17	600
Semester IV	24	540	14	735
Semester V	-	0	20	100
Semester VI	21	540	15	760
Total	100	2340	95	3035

Award winning Credits / Marks			
Theory Credits	Marks	Practical Credits	Marks
-	-	-	-
-	-	-	-
-	-	-	-
11	270	06	330
-	-	20	100
12	360	14	540
23	630	40	970

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PROGRAMME - DIPLOMA IN CIVIL ENGINEERING

SAMPLE PATH **Entry Level 10+**

Nature of Course	First Year		Second Year		Third Year		Total
	Odd Term	Even Term	Odd Term	Even Term	Odd Term	Even Term	
Compulsory	BMT190001 ACH190002 EVS190003 DLS190004 EDG190101 APM190005 WSP190102	EMT190009 APH190010 CMS190011 BCN190103 CEM190104 SUR190105	AMT190013 SUR190106 CED190107 HBR190108 MNS190109	ENV190113 DPS190114 MOS190115 CTH190116 FMH190117		CEP190122 RCC190123 PMC190124 WRE190125 QSE190126 GTE190127	29
Optional		STM190012	CES190110 AMT190111 DCR190112	EGL190120 TSS190121		DMT190130	07
Elective				BMR190118 CET190119		PRC190128 SWM190129)	04
Inplant Training					IPT190131		01
Award Winning				ENV190113	IPT190131	CEP190122 RCC190123 PMC190124 WRE190125 QSE190126 GTE190127	08
Compulsory Credits	32	30	26	27	20	32	167
Optional Credits	0	02	11	6	0	2	21
Elective Credits	0	0	0	10	0	4	14
				Total Credits Offered			202



1. COURSE DETAILS

Programme: CE/ME/EE/IE/PL/CH/DE	Semester: I
Course: Basic Mathematics	Group: B*
Course Code: BMT190001	Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
3	-	-	2	5	3	70	20	10	70	25	-	-	125

3. COURSE OBJECTIVE:

This Course is being introduced to provide mathematical background needed for any Diploma engineer. It intends to enable the students to apply basic facts, concepts and principles of algebra, trigonometry, Determinants, Matrices, functions and Limits as a tool to analyze engineering problems.

4. SKILL COMPETENCY

The aim of this course is to help the student to attain the following industry identified

Competency through various teaching learning experiences:

- Solve broad-based Engineering problems using the Basic Knowledge of mathematics

5. COURSE OUTCOMES (COs) At the end of the semester student will be able to :-

CO No.	COURSE OUTCOME	Bloom's LEVEL
1	Apply the concepts of algebra to solve engineering related problems.	R, U
2	Utilize basic concepts of trigonometry to solve elementary engineering problems.	R,U,A
3	Solve problems based on Determinants and Matrices.	U,A
4	Study the concept of function and limits and apply them into engineering	R,U,A

6. COURSE CONTENTS

Sr No.	TOPIC Sub-Topics	Hours	Marks	Cos
1	Logarithm 1.1 Concept 1.2 Basic Laws of logarithm (without proof) 1.3 Numerical on Change of Base (without proof)	03	04	CO1
2	Partial Fraction 2.1 Introduction: Proper and improper fractions 2.2 Type 1: Non-repeated linear factor 2.3 Type 2: Repeated linear factor 2.4 Type 3: Irreducible quadratic form 2.5 Examples using Substitution	04	07	CO1

3	Straight Lines 3.1 Revision: Slope of straight lines 3.2 Revision: Various form of Straight lines 3.3 General equation of line and its relation to standard form 3.4 Angle between two lines 3.5 Condition of parallel and perpendicular lines 3.6 Perpendicular distance from a point on the line 3.7 Perpendicular distance between two parallel lines.	05	09	CO1
4	Trigonometry 4.1 Revision of Trigonometry Formulas 4.2 Trigonometric ratios of Compound, allied, multiple and sub-multiple angles (without proofs) 4.3 Factorization and de-factorization formulae (without proofs) 4.4 Inverse Trigonometric function 4.5 Principle values and Relation between Trigonometric and Inverse Trigonometric function.	12	15	CO2
5	Determinants & Matrices 5.1 Revision: Determinants of 2 x 2 order 5.2 Value of Determinants of 3 x 3 order 5.3 Cramer's rule to solve three unknowns 5.4 Introduction to Matrices 5.5 Algebra of Matrices 5.6 Transpose, Adjoint and Inverse of Matrices 5.7 Solution of simultaneous equation by Matrix inversion method. (2 and 3	12	18	CO 3
6	Function 6.1 Introduction and Definition 6.2 Simple Numerical based on concept of function 6.3 Odd and Even Functions	04	07	CO 4
7	Limits 7.1 Introduction and Definition 7.2 Concepts of limits 7.3 Limits of algebraic, trigonometric, exponential and logarithmic functions	08	10	CO 4
	Total	48	70	

7. LIST OF ASSIGNMENTS/TUTORIALS

Term Work consists of Journal containing minimum no of 12 tutorials.

Sr. No.	Title of Tutorial	Approx.Hrs required	COs
1	Assignments on Logarithms based on laws and change of base.	2	1
2	Assignments on partial fraction (Non-repeated and repeated linear factor)	2	1
3	Assignments on partial fraction (Irreducible quadratic form and using Substitution)	2	1
4	Assignments on straight lines. (General equation of line and Angle between two lines)	2	1
5	Assignments on straight lines. (Condition of parallel and perpendicular lines Perpendicular distance from a point on the line Perpendicular distance between two parallel lines.)	2	
6	Assignments on trigonometric. (Trigonometric ratios of Compound, allied, multiple and sub-multiple angles. Factorization and de-factorization formulae.)	4	2
7	Assignments on trigonometric. (Inverse Trigonometric function)	2	2 13
8	Assignments on Determinates. (Basic solving and Cramer's rule)	2	3

9	Assignments on matrices. (Algebra of Matrices ,Transpose, Adjoint and Inverse of Matrices)	2	3
10	Assignments on matrices. (solving equations using matrix method)	2	3
11	Practicing matrices and on Matlab.	4	3
12	Assignments on function. (Types of functions)	2	4
13	Assignments on Limits. (Limits of algebraic, trigonometric, exponential and logarithmic functions)	4	4
	Total	32	

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan/Tutorials
2. Assignments
3. Home Work Assignment

9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Basic Mathematics	Shri. B.M. Patel, Shri J.M. Rawal	Nirali Prakashan Mumbai
2.	Calculus for Polytechnics	Shri. S.P.Deshpande	Pune Vidyarthi Graha Prakashan Pune-30
3.	Higher Engineering Mathematics	Dr. B.S. Grewal	Khanna Publishers 2/B, Delhi-6
4	Basic Mathematics	G.V.Kumbhojkar	P.Jamnadas LLP

10. WEB REFERENCES

1. www.mic-mathematics.com
2. www.math.com
3. www.lernerstv.com
4. www.onlinetutorials.com

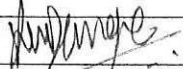

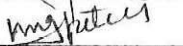
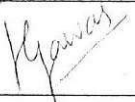
11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

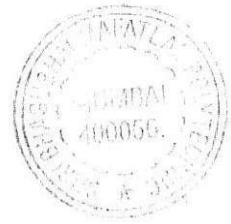
Sr. No.	TOPIC	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Logarithm	2	2		04
2	Partial Fraction	3	4		07
3	Straight Lines	2	5	2	09
4	Trigonometry	3	5	7	15
5	Determinates & Matrices	3	12	3	18
6	Function	2	3	2	07
7	Limits	3	4	3	10
	TOTAL	18	35	17	70

R Remembering, U Understanding, A Applying and Above (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of Cos. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.



Sr. No.		NAME	SIGNATURE
1	Internal	MS.Kavita.K.Dange	
2	Internal	Mr.R.R.Ambade	
3	Internal	Mr.U.J.Patel	
4	External	Ms.Meena Gawas Organisation: Mithibai College Of Arts and Science	



1. COURSE DETAILS

Programme: CE/ME/EE/IE/PE/CHE/DE

Course: Applied Chemistry

Course Code: ACH190002

Semester: I/II

Group: B*

Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
4	2	--	--	6	1	@70	20	10	70	25	50	--	175

3. COURSE OBJECTIVE

The course of applied chemistry is designed considering two aspects

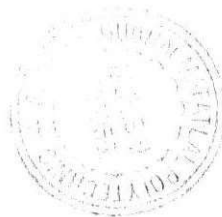
- Basic principles of Chemistry.
- Chemistry of materials

The basic principles of Chemistry as in Atomic Structure, Electrochemistry, concepts of Corrosion and Lubrication are essential to understand the various processes and their feasibility while the knowledge of chemical behavior of different chemicals and materials (metallic and non-metallic) help in appropriate selection of material for various engineering applications. The selection of materials not only depend on physical and chemical behavior but is also based on environmental and ecofriendly factors.

4. SKILL COMPETENCY

Following Skills and competency will be developed

- Identify the concepts involved in various industrial processes.
- Handle, operate equipment and reagents.
- Measure the values and interpret the observation.
- Accuracy in recording and record keeping.
- Safety and care of basic instruments, glassware.



5. COURSE OUTCOMES(COs) At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's LEVEL
CO1	Predict the chemical and physical properties of different elements and write the correct names and formulae of different compounds.	Remember
CO2	Select appropriate cells/batteries for different purposes.	Understand, Apply
CO3	Select appropriate material- metallic, non-metallic, lubricants for different engineering applications.	Understand, Apply
CO4	Identify the type of corrosion and apply suitable preventive measures.	Understand, Apply
CO5	Analyse water sample and predict its suitability for various processes.	Understand, Apply

6. COURSE CONTENTS

Sr. No.	TOPIC/ Sub-Topics	Hours	Marks	COs
1	1. Atomic Structure 1.1 Structure of atom Definition of Atom, Fundamental Particles of Atom – their Mass, Charge, Location, Definition of Atomic no, Atomic Mass no., Isotopes & Isobars 1.2 Bohr's Theory and Quantum Numbers Concept of Orbits & Orbitals. 1.3 Rules for distribution of electrons in an atom Hund's Rule, Aufbau's Principle, Pauli's exclusion principle Electronic configuration of first twenty elements 1.4 Nuclear stability and Numerical problems based on it 1.5 Chemical Bonding Valency, Octet Rule, Duplet Rule Formation of Electrovalent & Covalent Compounds e.g. NaCl, CaCl ₂ , MgO, AlCl ₃ , CO ₂ , H ₂ O, Cl ₂ , NH ₃ , C ₂ H ₄ , N ₂ , C ₂ H ₂	12	15	CO1
2	2. Electrochemistry 2.1 Concept of Ionisation & Electrolytic Dissociation Arrhenius' theory, Degree of ionization 2.2 Electrolysis. Terms Involved in Electrolysis. Mechanism of electrolysis. Faraday's Laws of Electrolysis and Numerical problems based on it. 2.3 Applications of electrolysis Electroplating & Electro refining, Electrometallurgy & Electrotyping 2.4 Cells and Batteries – Classification Primary cell (Daniel cell), Secondary cell (Lead Acid Storage cell) Lithium batteries Solar cells – advantages, disadvantages.	10	10	CO2

3	3. Metals & Alloys Metals 3.1 Characteristics of Metals 3.2 General Metallurgical processes 3.3 Physical properties and applications of some commonly used metals such as Fe, Cu, Al, Cr, Ni, Sn, Pb, Zn, Ag and Si. 3.4 Alloys Preparation, purposes of making alloy, classification (Ferrous & Non Ferrous) Composition, properties and application of Duralumin, Magnalium, Monel Metal, Gun metal, Brass, Bronze, Babbit metal and Ferrous alloys Alnico, Stainless Steel.	09	10	CO3
4	4. Water and pH: 4.1 Physical and chemical characteristics of water. 4.2 Hardness of water a) Causes and Types of Hardness b) Disadvantages of hard water – (Domestic and Industrial) Hard water in boilers and prevention: Boiler corrosion, caustic embrittlement, priming and foaming, scales and sludge. 4.3 Degree of Hardness and numerical problems based on it. 4.4 Water softening: zeolite process, ion exchange process (cation exchange and anion exchange). 4.5 Acids and bases 4.6 pH Concept of pH Applications of pH and numerical problems based on it.	09	09	CO5
5	5. Corrosion and Protective Coatings: Corrosion: 5.1 Types of Corrosion 5.2 Mechanism of Corrosion 5.3 Factors affecting corrosion 5.4 Methods of prevention of corrosion. 5.5 Methods of applying Metal coatings.	11	11	CO4
6	6. Lubricants: 6.1 Definition 6.2 Functions of Lubricants 6.3 Theories of lubrication 6.4 Classification and characteristics of Lubricants 6.5 Selection of Lubricants for different machines	07	06	CO3
7	7. Non-Metallic Engineering Materials 7.1 Polymerization, Types. 7.2 Plastics – Definition, types, compounding of plastic, properties and application 7.3 Rubber – Natural rubber & synthetic rubber properties of rubber, applications of rubber. Vulcanization of Rubber. 7.4 Thermal Insulators – Definition, characteristics, preparation, properties and applications of thermocole and glasswool.	06	09	CO3
	TOTAL	64	70	

7. LIST OF PRACTICALS

Term Work consists of Journal containing minimum no. of 10 experiments

Sr. No.	Title of Experiment	Approx.Hrs required	COs
01 to 03	Techniques of determination of concentration of solutions: <u>Volumetric Analysis</u> a) Neutralization Titration i) Titration between Strong Acid and Strong Base using Phenolphthalein as indicator – 2 sets b) Redox Titration i) Titration between KMnO_4 and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$	10	CO4 CO5
04 to 05	Determination of: a) Hardness of water using EDTA b) Chloride content in water	04	CO5
06	Determination of pH of different solutions.	02	CO5
07 to 08	<u>Qualitative Analysis of Two Solutions</u> containing One Basic and One Acidic Radical listed below: a) Basic Radicals: Pb^{+2} , Cu^{+2} , Al^{+3} , Fe^{+2} , Fe^{+3} , Ca^{+2} , Ba^{+2} , Mg^{+2} , K^+ , Na^+ . b) Acidic Radicals: Cl^- , SO_4^{-2} , CO_3^{-2} , NO_3^- .	10	CO1 CO2 CO3
09	Determination of Viscosity of a Lubricant.	02	CO3
10	Determination of Flash Point of a Lubricant using: a) Abel's Flash Point Apparatus b) Pensky Marten's Flash Point Apparatus	04	CO3
	TOTAL	32	

8.IMPLEMENTATION STRATEGY(PLANNING)

1. Teaching Plan.
2. Minimum no of practical/assignments.
3. Self Learning Online Resources
4. Worksheets for practice



9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Chemistry of Engineering Materials	Jain and Jain	Dhanpat Rai Publishing Co. New Delhi
2.	Engineering Chemistry	Narkhede & Thatte	
3.	Chemistry for Engineering students	Mahadeokar & Dr. U. P. Kodgire	Everest Publishing House, Pune
4	Applied Chemistry	B.S. Godbole	Satya Prakashan, New Delhi
5	Polytechnic Chemistry	Rao A.A.	New Age International 2007
6	Applied Chemistry	Shete S.D.	S. Chand & Company
7	A Text Book of Engineering Chemistry	Dara S.S.	S. Chand & Company, New Delhi-2008

10. WEB REFERENCES

- www.chemistryexplained.com
- <https://schools.aglasem.com>
- <https://www.thebalance.com>
- <https://water.usgs.gov/edu/hardness.html>
- <https://engineeringinsider.org>
- <http://web.mit.edu/5.33/www/lec/poly.pdf>

11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN SEM-END ONLINE EXAMINATION

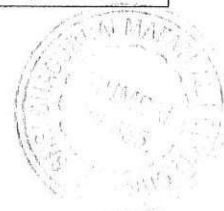
Sr. No.	TOPIC	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Atomic Structure	8	4	3	15
2	Electrochemistry	2	4	4	10
3	Metals and Alloys	4	2	4	10
4	Water and pH	2	4	3	09
5	Corrosion and protective coatings	2	7	2	11
6	Lubricants	2	2	2	06
7	Non-metallic engineering materials	4	2	3	09
TOTAL		24	25	21	70

R Remembering, U Understanding, A Applying, (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of COs. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.

12. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	S.V.Suvarna	<i>S.V.Suvarna</i>
2	Internal	K.P.Bhave	<i>K.P.Bhave</i>
3	Internal	R.D.Shimpi	<i>R.D.Shimpi</i>
4	External	<i>Dr. S. Dny</i> Organization: <i>Mucchala Polytechnic Thane</i>	<i>Sy</i>



1. COURSE DETAILS

Programme: CE/ME/EE/IE/PE/CHE/DE	Semester: I
Course: Environmental Studies	Group : B*
Course Code: EVS190003	Duration : 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
2	--	--	--	2	--	--	--	--	--	50	--	--	50

3. COURSE OBJECTIVE

Environmental Sciences is a multidisciplinary course aimed to impart knowledge about the current situation and future prospects of nature and natural resources. It is designed to create awareness of ecosystems of the world, earth's resources –renewable and non-renewable, health benefits of nature and adverse effects with depletion of environment. Such a knowledge can encourage today's generation to switch to safer and better choices.

Environmental education makes people understand the importance of renewable energy. Nonrenewable sources of energy like petrol, diesel etc. are the major sources of the world's pollution. Using renewable sources like *solar energy, wind energy etc* is encouraged by Environment Education, and is imperative in our fight against global warming.

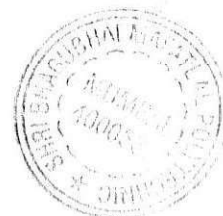
4. SKILL COMPETENCY

Following skills and competency will be developed

- Sense of social responsibility.
- Communication and analytical skills.
- Ability to apply knowledge and skills in real-world settings.
- Competence in developing arguments from scientific, ethical and philosophical perspective.

5. COURSE OUTCOMES (COs) At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's LEVEL
CO1	Identify and classify different natural resources and use them prudently.	Remember
CO2	Recognize and categorize the different ecosystems.	Remember
CO3	Estimate the importance of biodiversity and its conservation.	Remember, Understand
CO4	Judge the type of pollution, identify the pollutants and propose and design methods to reduce the same.	Remember, Understand
CO5	Use the information regarding environmental legislation to improve upon their surroundings for the betterment of the community.	Remember, Apply



6.COURSE CONTENT

Sr. No.	TOPIC/ Sub-Topics	Hours	Marks	CO
1	1. The Multidisciplinary nature of environmental studies: 1.1 Definition, scope and importance 1.2 Need for public awareness	03	--	CO5
2	2. Natural Resources: Renewable and non-renewable resources: 2.1 Natural resources and associated problems 2.2 Forest resources: Use and over-exploitation, deforestation. Timber extraction, mining, dams and their effects on forest and tribal people. 2.3 Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams' benefits and problems. 2.4 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. 2.5 Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. 2.6 Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. 2.7 Energy resources: 2.7.1 Renewable Energy Resources – Biogas, Solar energy, Wind energy, Energy from falling water, Energy from wastes and tidal energy. 2.7.2 Non-Renewable Energy Resources – Coal, Oil, Natural gas Issue of economic viability and ability to meet demands. Inequitable use of energy in urban and rural areas	10	--	CO1
3	3. Eco Systems: 3.1 Concept of ecosystem 3.2 Major ecosystems in the world	03	--	CO2
4	4. Biodiversity and Its Conservation 4.1 Concepts 4.2 Threats to biodiversity 4.3 Value and conservation of biodiversity	02	--	CO3
5	5. Environmental Pollution 5.1 Definition Causes, effects and control measures of 5.2 Air pollution 5.3 Water pollution 5.4 Soil pollution 5.5 Noise pollution	07	--	CO4



6	6. Social issues and the Environment 6.1 Types of wastes – generation, characteristics, treatment and disposal of: 6.2 Solid waste 6.3 e- waste 6.4 Biomedical waste 6.5 From Unsustainable to Sustainable development 6.6 Water conservation, rain water harvesting, watershed management 6.7 Environmental ethics: Issues and possible solutions like Carbon Credit. 6.8 Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.	05	--	CO5
7	7. Environmental Protection 7.1 Environment legislations- 7.2 Legal aspects related to environment 7.3 Brief description of various acts involving air, water and forests. 7.4 ISO-14000 7.5 Issues involved in enforcement of environmental legislation	02	--	CO5
TOTAL		32		

7. LIST OF ASSIGNMENTS

Term Work consists of Journal containing minimum no of 05 Home assignments

Sr. No.	Title of Assignment	COs
1	Write a note on different renewable sources of energy.	CO1,CO3
2	List any two man-made disasters. Analyse their causes and effects on environment.	CO5
3	Analyse the problem of water scarcity and water management in India. Suggest a suitable solution for the same.	CO1
4	Describe one endangered species and measures to protect it.	CO2,CO4,CO5
5	Collect data regarding quality of air in different parts of the city. Analyse and draw conclusion about air pollution in the city.(Group Project)	CO4

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan
2. Assignment
3. Group discussion
4. Case Study
5. Self-Learning Online Resources
6. Visit to a waste treatment plant



9. LEARNING RESOURCES

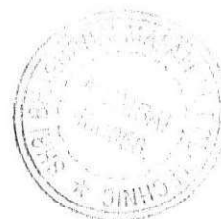
Sr. No.	Title Of Book	Author	Publication
1.	Text book of Environmental studies	Erach Bharucha	UGC Press
2.	Environmental studies	Rajagopalan	Oxford University Press
3	Environmental studies	Anandita Basak	Dring Kindersley(India)Pvt. Ltd Pearson
4	Fundamental concepts in Environmental studies	D.D. Mishra	S. Chand & Co. Ltd.
5	Role of Tech. in Environment and Health	Jain and Jain	Dhanpat Rai Publishing Co. New Delhi

10. WEB REFERENCES

- <https://study.com/academy/.../what-are-natural-resources-definition-lesson->
- www.yourarticlelibrary.com/biodiversity/biodiversity...ecological-diversity/4474
- <https://www.britannica.com/science/pollution-environment>
- <https://businessworld.in/article/Major-Environmental-Laws-Of-India/09-09-2017-125737>

11. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	S.V.Suvarna	<i>[Signature]</i>
2	Internal	K.P.Bhave	<i>[Signature]</i>
3	Internal	R.D.Shimpi	<i>[Signature]</i>
4	External	<i>Dr. S. Anni</i> Organaisation: <i>Mucchala Polytechnic Thane</i>	<i>[Signature]</i>



1. COURSE DETAILS: Development of Life skills

Program: CE / ME /EE/ IE/PE/CH/DE	Semester: I/II
Course: Development of Life skills	Group: B*
Course Code : DLS 190004	Duration:16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory	Practical	Drawing	Tutorials	Credits (L+P+D+T)	Theory Paper Duration and marks		SSL	TA	Theory	TWK	PR	OR	Total
					Hours	Marks							
02	-	-	01	03	-	-	-	-	-----	50	--	50	100

3. COURSE OBJECTIVE: Life skills include psycho-social competencies and interpersonal skills that help people make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others, by managing one's life in a healthy and productive manner. Life skills are essentially those abilities that help to promote overall wellbeing and competence in young people as they face the problems of real life. Children learn Life Skills from parents, teachers and significant others individuals to translate knowledge, attitude and values into actual abilities.

4. SKILL / COMPETENCY: This course helps the students to develop following skills/ competencies.

1. Decision making
2. Problem solving
3. Time management
4. Presentation and Grooming skills
5. Interpersonal and communication skills



5. COURSE OUTCOMES (Cos) At the end of the semester student will be able to: -

CO No.	COURSE OUTCOMES	Bloom Level
1	Find out one's Strengths, Weaknesses, opportunities and threats to contribute as youth force.	Remember
2	Make use of maximum time for more creative and constructive work.	Application
3	Demonstrate the leadership quality by making decisions while working as team member.	Understand
4	Solve the intra- personal and inter-personal conflict with highly motivated efforts.	Apply

6. COURSE CONTENTS:

Sr. No.	TOPIC/Sub-topic	Hours	COs
1	PERSONALITY DEVELOPMENT 1.1 Introduction, 1.2 Determinants of Personality- biological, Psychological and socio- cultural factors. 1.3 Areas of Personality development, 1.4 self-analysis,	03	CO 1
2	TIME MANAGEMENT 2.1 Introduction, properties of time 2.2 Time planning, how to plan time, 2.3 Time wasters, Time management 2.4 Time matrix	03	CO 2



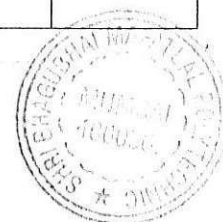
3	STRESS MANAGMENT 3.1 Definition of stress, 3.2 Types of personality and stress, 3.3 Sources of stress 3.4 Stress Busters 3.5 Psychological reaction to stress 3.6 Yoga and stress control	03	CO 1
4	PROBLEM SOLVING AND DECISION MAKING 4.1 Definition, 4.2 Steps in Problem Solving 4.3 Factors Influencing Problem Solving 4.4 Definition Process, Need Consequences, 4.5 Models of Decision Making 4.6 Goal Setting	03	CO 3
5	POWERPOINT PRESENTATION 5.1 How to prepare Power point presentation 5.2 Use of aids –OHP, LCD projector, board 5.3 Use of body language and Grooming	04	CO 2
6	MOTIVATION 6.1 Introduction to Motivation 6.2 Need for Motivation 6.4 Self- Motivation, 6.5 Theories of Motivation	03	CO 4
7	CONFLICT MANAGEMENT 7.1 Definition of Conflict 7.2 Sources of Conflict, 7.3 Types of Conflict, 7.4 Conflict Resolution, 7.5 Steps In Conflict Resolution	03	CO 4



8	SWOT ANALYSIS 8.1 Concept of SWOT 8.2 Scope of SWOT, 8.3 SWOT as decision making tool, 8.4 How to go about SWOT	04	CO 1
9	LEADERSHIP 9.1 Meaning and Definition of leadership 9.2 Importance of leadership 9.3 Types of leaderships: Autocratic, Democratic, bureaucratic, Delegative, liaise Fair	03	CO 3
10	INTERVIEW AND GROUP DISCUSSION 10.1 Meaning of Interview and G.D. 10.2 Importance of Interview and G.D. 10.3 Process of Group discussion 10.4 Types of Interview and Do's and Don'ts for Interview	03	CO 1
		32	

7(A) SUGGESTED ASSIGNMENTS: Each student has to write all ten assignment compulsorily as part of term work

Sr. No	Title of Assignments	COs
01.	Identify your areas of self-development and plan strategies to improve it.	CO 1
02.	Prepare your daily time table for any average day, enlist your time-wasters. How can you improve your time utility?	CO 2
03.	Define stress; enlist yours Stress-factors and Stress-busters.	CO 1
04.	Give a power point presentation in team on topic assigned by teacher.	CO 2
05.	Enlist the things that Motivate and Demotivate you.	CO 4
06	Enlist at least ten reasons of interpersonal conflict and solutions on it.	CO 4



07	Do your self-analysis and write down your S.W.O.T. as an individual.	CO1
08.	Describe a situation when you had to make an immediate decision on a critical issue.	CO 3
09	Write an illustration on leader that motivate you.	CO 3
10	Enlist and explain the types of interview with Do's and Don'ts for Interview.	CO 1

Note: # Teacher will do necessary changes in the assignments as per requirements.

7 (B) LIST OF TUTORIALS:

Sr.	Title of Tutorial work	Lab/ Classroom	Hrs.
1.	Role Play / Simulation	Classroom	03
2.	Video Screening	Classroom	02
3	Syndicate Task	Classroom	02
4	Extempore	Classroom	02
5	Case Studies	Classroom	02
6	Debate	Classroom	02
7	Mock interview	Classroom	03
	Total		16

8. IMPLEMENTATION STRATEGY (PLANNING)

01. Teaching Plan/Tutorials
02. Minimum TEN no. of assignments
03. Guest/Expert lectures
04. Brainstorming
05. Group discussions
06. Seminar
08. Self-Learning Online Resources
09. Role plays




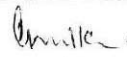
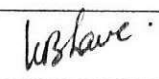
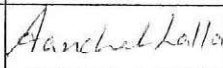
9. SUGGESTED LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Development of Generic skill-I Development of life skills -II	K. Sudesh	Nandu Publication ,Mumbai
2.	Personality Development,	Hurlock, B. Elizabeth	Tata Mc Graw Hill Publishing Company Limited, New Delhi. 2007
3.	Life Skills Training for Positive Behaviour	Nair. A. Radhakrishnan,	Rajiv Gandhi National Institute of Youth Development, Tamil Nadu.
4	Managing Time First	Dr.R.L.Bhatia	Wheeler Publishing 1994

10. WEB REFERENCES

1. http://www.cbse.nic.in/cce/life_skills
2. <https://www.britishcouncil.gr/en/life-skill>
3. <https://www.learningliftoff.com>
4. <https://www.skillsyouneed.com>
5. <https://bigthink.com>

11. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.	NAME OF EXPERTS (Internal)	SIGNATURE
1	Prof. Mr. Balaji M. Pande, Lecturer (Senior Scale)	
2	Prof. Mrs. Anita A. Kulkarni, Head of Department.	
3	Prof. Mrs. Kirti P. Bhawe, Lecturer (Selection Grade)	
	NAME OF EXPERTS (External)	
1	Prof. Aanchal Lalla, Lecturer, K.J.S. Polytechnic, Mumbai.	



1. COURSE DETAILS

Programme: Civil Engineering	Semester: I
Course: Engineering Drawing	Group: C*
Course Code: EDG 190101	Duration:16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
02	--	04	--	06	--	--	--	--	--	50	50	--	100

3. COURSE OBJECTIVE

Engineering drawing helps in understanding design of parts, assembly, structure etc. used in engineering field. It supports technology and technical subjects. By achieving visualization and drawing skills, the student will successfully discharge his role on shop floor, design department and inspection department etc.

4. SKILL COMPETENCY

The aim of this course is to help the student to attain the competency of

1. Drawing the objects, lines, projections and reading the same, through various teaching learning experiences.
2. Prepare engineering drawing manually using prevailing drawing instruments.

5. COURSE OUTCOMES (COs) at the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's LEVEL
CO1	Draw two-dimensional sectional, non-sectional views of given object using principles of orthographic projections and isometric views of given component or from orthographic projections.	Remember, Understand, Apply
CO2	Draw geometric figures and conic curves.	Remember, Understand
CO3	Draw projections of 2D and 3D standard regular entities.	Remember, Understand, Apply
CO4	Prepare free hand sketches of thread profiles and thread fasteners.	Remember, Understand



6. COURSE CONTENTS

Sr.No.	TOPIC/Sub-topic	Hours	Marks	Cos
1	Drawing Instruments and their uses 1.1. Introduction: Importance of Engineering Drawing 1.2. Study the use of Drawing instruments, types of lines and Dimensioning techniques used in Engineering Drawings. 1.3. Study the use of different Scales in Engineering Drawings: Reduce Scale, Enlarge Scale and Full Size Scale 1.4. Geometrical constructions: To draw a perpendicular bisector of a given line. To divide the line into number of equal parts To draw line parallel to one another To Divide the given circle into number of equal parts To draw regular polygon of given side	02	---	CO2
2	Engineering curves Conic Sections: 2.1 Ellipse: Introduction and Methods to draw an ellipse by oblong, arcs of circle and concentric circle methods. 2.2 Parabola: Introduction and Methods to draw parabola by Directrix-Focus and rectangular methods. 2.3 Hyperbola: Introduction and Methods to draw hyperbola by Directrix-Focus and rectangular methods	04	06	CO2
3	Orthographic projections 3.1 Introduction to orthographic and isometric projections, concept and applications. 3.2 Orthographic projection by First angle and Third angle method, and their symbols. 3.3 Conversion of Pictorial view into Orthographic Views – object containing plain surfaces, slanting surfaces, slots, ribs, cylindrical surfaces. 3.4 Introduction to Cutting plane line, Hatching Line and Sectioning Conventions. 3.5 Types of sectional views: Half, Full and Off-set sectional Views. 3.6 Conversion of pictorial views into sectional orthographic views	08	14	CO1
4	Isometric view and projection 4.1 Introduction to Isometric view and isometric projection. 4.2 Introduction to Isometric scale and Natural Scale. 4.3 Illustrative problems related to objects having plain, slanting, cylindrical Surfaces and slots on slanting surfaces. 4.4 Conversion of orthographic views into isometric View/projection. (Isometric of sphere and composite solids not to be included).	07	12	CO1



5	Projection of planes 5.1 Projection of Planes- Projections of regular polygons and circle-inclined to one reference plane and perpendicular to another. 5.2 Reverse problems with true shape given and derive the inclination of the plane.	03	06	CO3
6	Projections of solids 6.1 Types of solids- Polyhedron and solids of revolutions 6.2 Projection of regular solids like prisms, pyramids, cylinders and cones with axis – i) Perpendicular to one of the reference planes, parallel to another ii) inclined to one reference plane and perpendicular to another.	04	08	CO3
7	Free hand sketches Thread Profiles and Screw Fasteners. 7.1 Different thread profiles 7.2 Conventional representations of left hand – right hand threads, single and multistart square threads, external and internal threads. 7.3 Nuts and Bolts: Types of nuts and bolts. Locking of nuts (Castle, slotted nut, simond's nut etc.), Plane and Spring washers, Types of set screws heads and ends	04	04	CO4
TOTAL		32	50	

7. LIST OF ASSIGNMENTS / DRAWINGS

Term Work consists of Journal containing following drawing sheets and a sketchbook.

Sr. No.	Title of Assignment/Drawings	Approximate Hrs. required	COs
01	One sheet on lettering, lines, dimensioning techniques and geometrical constructions.	04	CO2
02	One sheet with four problems on ellipse, parabola and hyperbola. Home Assignments: Four problems in sketchbook	04	CO2
03	One sheet with four problems on non-sectional orthographic views for the objects with curvilinear features Home Assignments: Four problems in sketchbook	12	CO1
04	One sheet with four problems on Sectional orthographic projections with full and half section. Home Assignments: Four problems in skctchbook	14	CO1
05	One sheet with four problems on Isometric views and projections. Home Assignments: Four problems in sketchbook	10	CO1
06	One sheet with four problems on projections of planes. Home Assignment: Four problems in sketchbook.	06	CO3
07	One sheet with four problems on projections of solids. Home Assignment: Four problems in sketchbook.	08	CO3
08	One sheet on free hand sketches of Thread Profiles and Screw Fasteners Home assignments: Free hand sketches in sketchbook	06	CO4



8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan
2. Slides
3. Self-Learning online resources

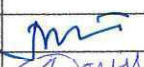
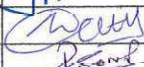

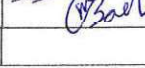
9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Engineering drawing	R.K. Dhawan	S.Chand & Co.Ltd., Ram Nagar New Delhi-110 055. ISBN-13: 9788121914314 ISBN-10: 8121914310
2.	Engineering drawing	N.H. Dubey	Nandu Prakashan
3.	Engineering Drawing Practice for Schools and Colleges IS: SP-46	Bureau of Indian Standards.	BIS, Government of India, Third Reprint, October 1998; ISBN: 81-7061-091-2
4.	Engineering Drawing	Bhatt, N.D.	Charotar Publishing House, Anand, Gujarat 2010; ISBN: 978-93-80358-17-8
5.	Machine Drawing	Bhatt, N.D.; Panchal, V. M	Charotar Publishing House, Anand, Gujarat 2010; ISBN: 978-93-80358-11-6
6	Engineering Drawing	Shah, P. J.	S. Chand and Company, New Delhi, 2008, ISBN: 81-219-2964-4

10. WEB REFERENCES

1. <http://pstulpule.com/>
2. <https://www.youtube.com/watch?v=TJ4jGyD-WCw>
3. https://www.youtube.com/watch?v=dmt6_n7Sgcg
4. https://www.youtube.com/watch?v=_MQScnLXL0M
5. <https://www.youtube.com/watch?v=3WXPanCq9LI>
6. <https://www.youtube.com/watch?v=fvjk7PlxAuo>
7. <http://www.me.umn.edu/courses/me2011/handouts/engg%20graphics.pdf>
8. <https://www.machinedesignonline.com>

11. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	Shri N.M.Pathak	
2	Internal	Shri N.M.Patil	
3	Internal	Shri P.R.Parate	
4	External	Prof. Mohan G. Bodke (MPSTME)	
		Organization :	



1. COURSE DETAILS

Program: CE/ME/PL/CH	Semester: I
Course: Applied Mechanics	Group: C*
Course Code: APM190005	Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks (ESE)	SSL	TA	TH	TW	PR	OR	Total	
					Hours	Marks							
3	2	-	1	6	03	70	20	10	70	50	-	-	150

3. COURSE OBJECTIVE

Applied Mechanics course is to study of forces and their effect on moving or stationary bodies, to understand the principles and laws of mechanics, to understand the applications of these principles and laws in various engineering applications. Also, the concept of Mechanics will be prerequisite subject to further courses like materials & structures, analysis of structures and design of structures.

4. SKILL COMPETENCY

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

- Apply concepts and behavior of forces on the structures
- Analyze the structure for the loads acting on it in terms of its resultant force, equilibrant force and stability through centre of gravity
- Apply the concept of lifting machines



5. COURSE OUTCOMES (COs)

At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's Level
1.	Resolve force and force system along with the classification for given conditions by applying the basis of mechanics	R, U
2.	Calculate the resultant and equilibrant of system of forces analytically and graphically.	R,U,A
3.	Apply principles and conditions of equilibrium and calculate the reactions at surface of contact.	R,U,A
4.	Apply and calculate force systems to friction, centroid and beam reactions	R,U,A
5.	Calculate and apply velocity ratio, Mechanical Advantage, Frictional losses and efficiency of simple lifting machines.	R,U,A

R-Remember, U-Understand, A-Apply and above (Bloom's revised taxonomy levels)

6. COURSE CONTENTS

Sr. No.	Topic / Sub-topics	Hours	Marks	CO No.
1	<p>1. Introduction and fundamentals of force system:</p> <p>1.1 Mechanics definition, classification, statics & dynamics, kinematics, kinetics</p> <p>1.2 Fundamental units of measurements (FPS, MKS, SI), derived Units, Conversion of units, Scalars & Vectors with examples</p> <p>1.3 Definition of particle, body and rigid body, mass & weight.</p> <p>1.4 Concept of force, definition, unit, graphical representation of force,</p> <p>1.5 Concept of system of forces, non-coplanar, coplanar, concurrent, Parallel, non-concurrent & non-parallel forces</p>	4	5	CO1



2	<p>2. Resolution and Composition of forces:</p> <p>2.1. Resolution of a force into two components along any direction.</p> <p>2.2 Resolution of a force into two component straight angles to each other by analytical method.</p> <p>2.3 Composition and Resultant of force</p> <p>2.4 Law of parallelogram of forces,</p> <p>2.5 Moment of force, couples lever arm,</p> <p>2.6 Varignon's theorem</p> <p>2.7. Resultant of coplanar concurrent, parallel, and non- concurrent, non-parallel forces</p>	7	10	CO2, CO3
3	<p>3. Equilibrium</p> <p>3.1 Definition of equilibrant, relation between Resultant and Equilibrant, Conditions of Equilibrium, Types of Equilibrium (Stable, Unstable and Neutral equilibrium)</p> <p>3.2 Equilibrium of coplanar concurrent forces, Lami's theorem</p> <p>3.3 Equilibrium of coplanar parallel forces & coplanar Non-concurrent Forces.</p> <p>3.4 Analytical conditions of equilibrium for coplanar concurrent & Non-concurrent Forces.</p>	7	10	CO2, CO3
4	<p>4. Beam Reactions</p> <p>4.1 Types of supports: simple, roller hinged & fixed.</p> <p>4.2 Types of Beams: simply supported, hinged & roller Supported, Cantilever, Overhang Beams</p> <p>4.3 Types of Loads: Point (Concentrated) Load, Uniformly Distributed Load (UDL)</p> <p>4.4 Problems on above combination of loads.</p>	6	10	CO4



5	<p>5. Friction:</p> <p>5.1 Definition of friction, force of friction, limiting frictional force, coefficient of friction, angle of friction, angle of repose, relation between angle of friction, angle of repose and coefficient of friction, cone of friction, types of friction, laws of friction, advantages and disadvantages of friction.</p> <p>5.2 Equilibrium of bodies on level plane –external force applied horizontal and inclined up and down.</p> <p>5.3 Equilibrium of bodies on inclined plane – external forces is applied parallel to the plane,</p> <p>5.4 Ladder Friction</p>	7	10	CO4
6	<p>6. Centroid and Centre of Gravity:</p> <p>6.1 Definition of Centre of gravity of solids and centroid of plane laminas</p> <p>6.2 Concept of parallel forces applied to find c.g. and centroid, centroid /c.g. axes of a body / lamina, c.g. / centroid of basic regular Shapes.</p> <p>(Applications like floating bodies, dams & retaining wall sections, beams, columns sections (rolled steel), simple and built up sections)</p>	7	10	CO4
7	<p>7. Graphics Statics</p> <p>7.1 Space diagram, Bows notation.</p> <p>7.2 Law of Triangle of forces, Polygon of forces, Force/ Vector diagram</p> <p>7.3 Resultant and equilibrium of concurrent forces</p> <p>7.4 Polar diagram, Funicular polygon</p> <p>7.5 Resultant and equilibrium of non-concurrent and nonparallel forces</p> <p>(Applications in finding reactions of beams)</p>	5	7	CO3



8	8. Simple Lifting Machine: 8.1 Definition: Mechanical Advantage, Velocity Ratio, Efficiency, Relation between M.A., V.R. and Efficiency, Friction in machine in terms of load & Effort. 8.2 Law of Machine, Maximum M.A., Maximum efficiency, Condition for reversibility of a machine	5	8	CO5
	TOTAL	48	70	

7. LIST OF PRACTICALS & TUTORIALS

Termwork consists of Journal containing minimum 10 nos. of experiments and 8 nos. of tutorials with approximate number of hours required and corresponding COs as mentioned below

Sr. No.	Title of Experiment	Approx.Hrs required	COs
1.	Study of Compression of spring, calculation of spring constant and verification of Hook's Law	2	CO1
2.	Study of bell crank lever and verification of condition of equilibrium.	2	CO 2
3.	Theory of Simple Lifting Machine	2	CO 5
4.	Study of Simple screw jack and to find law of machine.	2	CO 5
5.	Study of Differential axel & wheel and to find law of machine.	2	CO 5
6.	Study of Single purchase crab and to find law of machine.	2	CO 5
7.	Study of Three sheave pulley and to find law of machine.	2	CO 5
8.	Resultant of nonparallel nonconcurrent forces.	2	CO 3
9.	Calculating Coefficient of Friction	2	CO 4
10.	Calculating Angle of Repose	2	CO 4
11.	Calculating Centroid of Plane Lamina 1	2	CO 4
12.	Calculating Centroid of Plane Lamina 2	2	CO 4
13.	Calculating Centroid of Plane Lamina 3	2	CO 4
14.	Graphics statics	6	CO 3



Sr. No.	Title of Tutorial	Approx.Hrs required	COs
1.	Tutorial on Introduction and fundamentals of force system	1	CO 1
2.	Tutorial on Resolution and Composition of forces	2	CO 2
3.	Tutorial on Equilibrium	2	CO 3
4.	Tutorial on Beam Reactions	2	CO 4
5.	Tutorial on Friction	2	CO 4
6	Tutorial on Centroid and Centre of Gravity	2	CO 4
7	Tutorial on Graphics Statics	3	CO 2
8	Tutorial on Simple Lifting Machine	2	CO 5

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan/Tutorials
2. Self-Learning Online Resources
3. Slides / Presentations

9. SUGGESTED LEARNING RESOURCES

Sr.No.	Title of Book	Author	Publication
1.	Applied Mechanics	Dhade & Jamdar	Central Techno Publishers, Nagpur
2.	Applied Mechanics	R.S. Khurmi	S. Chand & Company Ram Nagar ,New Delhi-110055
3.	Engineering Mechanics Statics & Dynamics	A.K. Tayal	Umesh Publications
4	Applied Mechanics Vol.I&II	Sunil M Deo	Nirali / Pragati Publications
5	Applied Mechanics	M D Dayal	Nandu Publishers Chembur, Mumbai-71.
6	Applied Mechanics	S.S.Bhavikatti	Tata Mcgraw Hill



10. WEB REFERENCES

1. www.nptel.ac.in
2. www.discovery for engineers.com
3. www.swayam.gov.in




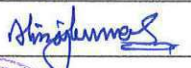
11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Sr. No.	CHAPTER	Distribution of Theory Marks			
		R Level	U Level	A LEVEL	Total Marks
1.	Introduction and fundamentals of force system	03	02	-	5
2.	Resolution and Composition of forces	02	02	06	10
3.	Equilibrium	02	02	06	10
4.	Beam Reactions	02	02	06	10
5.	Friction	02	02	06	10
6.	Centroid and Centre of Gravity	02	02	06	10
7.	Graphics Statics	01	02	04	7
8.	Simple Lifting Machine	02	02	04	8
TOTAL		16	16	38	70

R-Remembering, U-Understanding, A-Aplying and above (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of Cos. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.

12. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	Ms. Neelam N. Petkar	
2	Internal	Mr. A. K. Singh	
3	Internal	Mr. K.P. Jayateerth	
4	External	Mr. DHIRAJKUMAR S. PANDIRKAR Organization: MHADA	



1. COURSE DETAILS

Programme: Civil Engineering	Semester: I
Course: Workshop Practice (CE)	Group: C*
Course Code: WSP190102	Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Period Per week					Examination Scheme and Maximum Marks								
Theory Hrs. L	Practical Hrs. P	Drawing Hrs. D	Tutorial Hrs. T	Credits (L+P+D+T)	Theory Paper Duration and marks (ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hrs.	Mks							
-	4	-	-	4	-	-	-	-	-	50			50

3. COURSE OBJECTIVE

Workshop aims to provide comprehensive theoretical and hands on practical experience on operating various tools, tackles and testing equipment in formwork carpentry, plumbing, masonry, plastering work and building line out work by interpreting drawings to comply the quality measures.

4. SKILL COMPETENCY

The aim of this course is to help the students to attain the industry identified psychomotor and cognitive competency through various construction activities and to use tools, tackles and testing equipment by following safe practices.

5. COURSE OUTCOMES (Cos)

At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's LEVEL
CO1	Identify various construction form work and material for formwork at site.	Applying
CO2	Identify and select various plumbing fixtures and fittings.	Applying
CO3	Inspect the masonry job activities at site.	Understanding
CO4	Interpret the fabrication drawings and test the welded connections.	Understanding

6. COURSE CONTENTS

Sr. No.	Topic / Sub-topic	Hours	Marks	Cos
1.	CARPENTRY 1.1 Reading and interpretation of drawing and preparation formwork sheeting schedule. 1.2 Construction Formwork making for column, beam, slab, staircase (Any one). 1.3 Checking of plumb of column formwork	12	10	CO1
2.	PLUMBING	12	06	CO2



Sr. No.	Topic / Sub-topic	Hours	Marks	Cos
	2.1 Demonstration of different plumbing tools 2.2 Demonstration of different operations in plumbing, observing different pipe joints and pipe accessories. Different samples of PVC pipes and PVC pipe fittings. 2.3 Demonstration of Pipe threading using standard die sets. 2.4 Testing of pipe joints			
3.	BUILDING CONST. & MATERIALS 3.1 Setting out Foundation Plan on ground for load bearing and framed structure. 3.2 To construct dry brick masonry using actual bricks in stretcher. Header, English bond and Flemish bond with closer and bats for half, one and half brick thick wall. 3.3 To check the verticality and horizontal level of construction work. 3.4 Demonstration of plastering wall surface including preparation of cement mortar with all precautions.	18	15	CO1, CO3
4.	4.1 Welding: Butt & Fillet Joints 4.2 Testing of welded joints: a. Visual testing, b. Liquid penetrant testing 4.3 Radiographic Testing	4	4	CO4
5	SAFETY 5.1 Safety precautions: a. While using of carpentry tools b. While using plumbing tools c. While using welding equipment d. While using scaffolding and ladder in masonry construction and plastering work	2	-	CO1, CO 2, CO 3, CO 4
6.	SKETCHES As per list.	16	15	CO1, CO 2, CO 3, CO 4
	Total	64	50	

7. LIST OF PRACTICALS / EXERCISES/SKETCHES / DEMONSTRATION

Term Work consists of Journal containing

Sr. No.	Title of Experiment / Exercise / Sketches / Demonstration	Approx. Hrs required	COs
1	Reading and interpretation of drawing and preparation formwork sheeting schedule.	4	CO1
2	Construction Formwork making for column, beam, slab, staircase (Any one).	6	CO1
3	Checking of plumb of column formwork.	2	CO1
4	Demonstration of different plumbing tools.	2	CO2



Sr. No.	Title of Experiment / Exercise / Sketches / Demonstration	Approx. Hrs required	COs
5	Demonstration of different operations in plumbing, observing different pipe joints and pipe accessories. Different samples of PVC pipes and PVC pipe fittings.	2	CO2
6	Demonstration of Pipe threading using standard die sets.	4	CO2
7	Testing of pipe joints	4	CO2
8	Setting out Foundation Plan on ground for load bearing and framed structure.	4	CO3
9	To construct dry brick masonry using actual bricks in stretcher. Header, English bond and Flemish bond with closer and bats for half, one and half brick thick wall.	6	CO3
10	To check the verticality and horizontal level of construction work.	2	CO3
11	Demonstration of plastering wall surface including preparation of cement mortar with all precautions.	6	CO3
12	Visual testing of welded joint	2	CO4
13	Liquid penetrant testing of welded joint.	2	CO4
14	Radiographic Testing of welded joint.	2	CO4
15	Sketches containing formwork of column, beam, slab, staircase (Any one).	4	CO1
16	Sketches containing plumbing joinery details.	2	CO2
17	Sketches containing stretcher. Header, English bond and Flemish bond with closer and bats for half, one and half brick thick wall	6	CO1
18	Sketches containing symbol of various types of welding.	2	CO4
19	Plan and procedure of setting out building column centre line	2	CO2
Total		64	

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Workshop Floor level practical sessions / Demonstration
2. Industry / Site / Expo visits
3. Slides / Videos
4. Self-learning web sites / on line resources

9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Engineering Materials	S.C. Rangwala	Charotar publication
2.	D.N.Ghosh	Materials of Constructions	Tata MaGraw Hill Publish.
3.	TTTI Chandigarh	Civil Engineering	Tata MaGraw Hill







		Materials	Publish
4	Building Construction	Sushil kumar	Standard New Delhi
5	Welding Technology	O. P. Khanna	Dhanpat Rai Puplication
6	IS 822-1970 : Code of practice for inspection of welds	BIS	BIS
7	Water Supply & Sanitary Engineering	S. K. Garg	Khanna Publication
8	Formwork for Concrete Structures	Kumar Neeraj Jha	Tata MaGraw Hill Publish
9	Plumbing: Design & Practice	S. G. Deolalikar	Tata MaGraw Hill Publish

10. WEB REFERENCES

1. www.nptel.ac.in
2. www.quora.com
3. www.constructionworld.in

11. COURSE EXPERT COMMITTEE MEMBERS

S.N.	Name		Signature
1	Internal	Shri A. K. Singh	
2	Internal	Shri S. N. Ranshur	
3	Internal	Ms. Supriya Patil	
4	Internal	Ms. Neelam N. Petkar	
5	External	Name: S. H. JAIN Organisation: S. B. C. Mumbai	



1. COURSE DETAILS

Programme: CE/ME/EE/IE/PL/CH/DE	Semester: II
Course: Engineering Mathematics	Group: B*
Course Code: EMT190009	Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
3	-	-	2	5	3	70	20	10	70	25	-	-	125

3. COURSE OBJECTIVE:

This Course is being introduced to provide mathematical background needed for any Diploma engineer. It intends to enable the students to apply basic facts, concepts and principles of differential calculus, vector algebra, complex number, Indefinite integral, Numerical method and Statistics as a tool to analyze engineering problems.

4. SKILL COMPETENCY

The aim of this course is to help the student to attain the following industry identified

Competency through various teaching learning experiences:

- Solve broad-based Engineering problems using the Advanced Knowledge of mathematics.

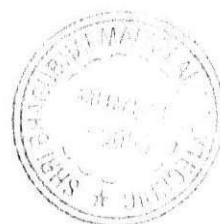
5. COURSE OUTCOMES (COs) At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's LEVEL
1	Use the concepts of differential calculus to solve engineering related problems.	R, U
2	Apply basic concepts of vector algebra and complex number in the field of elementary engineering problems.	R, U, A
3	Study the concept of Indefinite Integral.	R, U
4	Understand the concept of Probability distribution and Statistics apply to evaluate the problems.	U, A



6. COURSE CONTENTS

Sr No.	TOPIC Sub-Topics	Hours	Marks	Cos
1	Derivatives 1.1 Definition of Derivatives 1.2 Rules of Differentiation 1.3 Composite function 1.4 Inverse trigonometric function 1.5 Implicit function 1.6 Logarithmic function 1.7 Parametric function 1.8 Partial derivatives of first order(two variable)	12	17	CO1
2	Vector Algebra 2.1 Definition of vector 2.2 Algebra of vectors, equality, addition, subtraction and multiplication, 2.3 Dot product and Cross product 2.4 Scalar triple product 2.5 Work done 2.6 Moment of force about a point and line	06	09	CO2
3	Probability Distribution 3.1 Definition of probability, addition and multiplication theory of probability 3.2 Probability Distribution <ul style="list-style-type: none"> • Normal Distribution • Binomial Distribution 	06	09	CO4
4	Integration 4.1 Definition of integration as anti-derivative 4.2 Integration of standard functions 4.3 Composite Integrals 4.4 Integration of sum and difference of two or more functions 4.5 Integrals of Simple Algebraic Rational Function 4.6 Integrals of Simple Trigonometric Function 4.7 Method of integration By Partial fraction	12	15	CO3
5	Complex Number 5.1 Definition of complex number 5.2 Algebra of complex number - equality, addition, subtraction, multiplication and division 5.3 De Moivre's theorem 5.4 Euler's form of circular function	06	09	CO 2



Statistics 6.1 Range, coefficient of range of discrete and grouped data 6.2 Mean deviation and standard deviation from mean of grouped and ungrouped data, weighted means 6.3 Variance and coefficient of variance 6.4 Comparison of two sets of observation	06	11	CO 4
	48	70	

7. LIST OF ASSIGNMENTS/TUTORIALS

Term Work consists of Journal containing minimum no of 12 tutorials.

Sr. No.	Title of Tutorial	Approx.Hrs required	COs
1	Assignment on Differentiation. (Rules of Differentiation, Composite function, Inverse trigonometric function, Implicit function)	4	1
2	Assignment on Differentiation. (Logarithmic function Parametric function, Partial derivatives of first order, Second order differentiation)	4	1
3	Assignment on Vectors. (Dot product and Cross product Scalar triple product)	2	2
4	Assignment on Vectors. (Work done, Moment of force about a point and line)	2	2
5	Assignment on Probability. (Probability Distribution, Normal Distribution, Binomial Distribution, Poisson's distribution)	2	4
6	Assignment on Integration. (Integration of standard functions Composite Integrals, Integration of sum and difference of two or more functions)	4	3
7	Assignment on Integration. (Integrals of Simple Algebraic Rational Function, Integrals of Simple Trigonometric Function Method of integration)	4	3
8	Assignment on Statistics	4	4
9	Assignment on Complex Number	4	2
10	Practicing Integration and Statistics on MATLAB.	2	3
	Total	32	

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan/Tutorials
2. Assignments
3. Home Work Assignment



9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Calculus for Polytechnics	Shri. S.P.Deshpande	Pune Vidyarthi Graha Prakashan Pune-30
2.	Applied Mathematics	Shri. B.M. Patel, Shri J.M. Rawal	Nirali Prakashan Mumbai
3.	Higher Engineering Mathematics	Dr. B.S. Grewal	Khanna Publishers 2/B, Dclhi-6
4	Applied Mathematics	G.V.Kumbhojkar	P.Jamnadas L.P

10. WEB REFERENCES

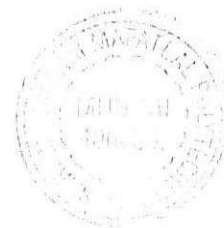
1. www.mic-mathematics.com
2. www.math.com
3. www.lernerstv.com
4. www.onlinetutorials.com
5. www.archives.math.utk.edu

11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

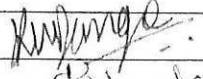
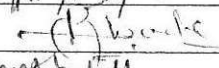
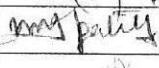

Sr. No.	TOPIC	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Derivatives	7	10		17
2	Vector Algebra	2	5	2	09
3	Probability	1	5	3	09
4	Integration	5	10		15
5	Complex Number	2	5	2	09
6	Statistics	2	4	5	11
TOTAL		19	39	12	70

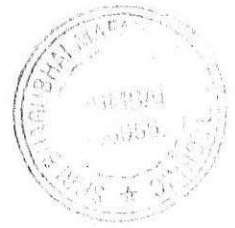
R Remembering, U Understanding, A Applying and Above (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of COs. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.



12. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	MS.Kavita.K.Dange	
2	Internal	Mr.R.R.Ambade	
3	Internal	Mr.U.J.Patel	
4	External	Ms.Meena Gawas Organisation: Mithibai College Of Arts and Science	



1. COURSE DETAILS

Programme: CE/ME/EE/IE/PL/CH/DE	Semester: I / II
Course: APPLIED PHYSICS	Group: B*
Course Code:APH190010	Duration:16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs	Tutorial Hrs	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
4	2	-	-	6	1	@70	20	10	70	25	50	-	175

3. COURSE OBJECTIVE

Diploma engineers have to deal with various materials, instruments and machines. This course is designed with some fundamental information to help the diploma engineers apply the basic concepts and principles of physics to solve broad based engineering problems. The study of basic principles of physics and the concepts related to properties of materials, heat, acoustics, electricity, magnetism, optics, semiconductors help in understanding the engineering courses where emphasis is on the applications of these in engineering.

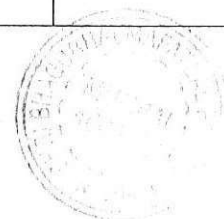
4. SKILL COMPETENCY

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

- Solve broad-based engineering problems applying basic concepts and principles of physics.

5. COURSE OUTCOMES:

CO No.	COURSE OUTCOME	BLOOM'S LEVEL
1	Estimate errors in measurement of physical quantities.	Understand, Application
2	List the use of physical properties of different materials.	Remembering
3	Use the basic principles of elasticity, surface tension, viscosity, heat and optics in related engineering applications.	Understanding
4	Apply the principles and concepts of electricity, magnetism, sound to solve engineering problems.	Application



6. COURSE CONTENT:

Sr.No	Topic/Sub-topic	Hours	Marks	COs
1.0	1. Measurement and errors 1.1 Fundamental, Derived, Supplementary SI units. 1.2 Accuracy and Precision in Measurement. 1.3 Significant figures in measured quantities. 1.4 Basic Measuring instruments-Vernier Caliper, 1.5 Micrometer screw gauge, spherometer, ammeter, Voltmeter with their least count, range, accuracy and precision.	04	04	CO1
2.0	2. Properties of matter : Elasticity , Surface Tension 2.1 Elasticity : 2.1.1 Deforming force, restoring force, elastic and plastic body. 2.1.2 Stress and strain with their types. 2.1.3 Elastic limit, Hooke's law. 2.1.4 Moduli of elasticity. 2.1.5 Stress-strain diagram, behaviour of wire under continuously increasing load. 2.1.6 Definition of yield point, ultimate stress, factor of safety. 2.1.7 Numerical on stress, strain and Young's modulus. 2.2 Surface Tension : 2.2.1 Molecular force, cohesive and adhesive force, molecular range, sphere of influence. 2.2.2 Definition of surface tension and its S.I. unit, angle of contact. 2.2.3 Capillary action with examples, shape of meniscus for water and mercury. 2.2.4 Relation between surface tension, capillary rise and radius of capillary (no derivation). 2.2.5 Effect of impurity and temperature on surface tension, 2.2.6 Numerical on relation between surface tension, capillary rise and radius. 2.3 Viscosity : 2.3.1 Fluid friction, viscous force. 2.3.2 Definition of viscosity, velocity gradient. 2.3.3 Newton's law of viscosity, Definition coefficient of viscosity and its S.I. unit. 2.3.4 Streamline and turbulent flow with examples, critical velocity. 2.3.5 Variation of viscosity with temperature. 2.3.6 Reynolds number and its significance.	11	13	CO 1 CO2 CO3



5.0	<p>5.OPTICS</p> <p>5.1 Photoelectric effect :</p> <p>5.1.1 Statement of photoelectric effect, Planck's hypotheses, Einstein's equation.</p> <p>5.1.2 Definition: Threshold wavelength, Threshold frequency, Work function.</p> <p>5.1.3 Study of experimental set up for study of photoelectric effect, Study of factors on which photoelectric effect depend on. Definition: Stopping potential.</p> <p>5.1.4 Characteristics of photoelectric effect.</p> <p>5.1.5 Photocells: Photo emissive, photoconductive, photovoltaic.</p> <p>5.1.6 Engineering applications.</p> <p>5.1.7 Numerical on energy of photon, work function, Einstein's equation.</p> <p>5.2 Interference :</p> <p>5.1Interference of light, Interference pattern. Constructive interference, Destructive interference. Steady interference of light.</p> <p>5.2.2Conditions for steady interference pattern</p> <p>5.2.3 Newton's rings, Newton's rings setup, Wavelength of source of light (No derivation)</p> <p>5.2.4Optical flatness, Engineering Applications Fiber optics Total internal reflection, optical fiber-step index and graded index, Applications.</p> <p>5.3 Diffraction :</p> <p>5.3.1 Diffraction of light, Diffraction at a slit,</p> <p>5.3.2 Diffraction Grating, Characteristics of grating spectra.</p> <p>5.4 Polarization :</p> <p>5.4.1 Polarization of light, Definition : Plane of polarization, plane of vibration</p> <p>5.4.2 Explanation of polarization of light, Nicol prism.</p> <p>5.4 X-rays :</p> <p>5.4.1 Production of X-rays, types of X-ray spectra-continuous and characteristics,</p> <p>5.4.2 X-ray wavelength (simple Problems), properties of X-rays.</p> <p>5.4.3 Applications of X-rays.</p>	11	11	CO 1 CO 2 CO 3
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6.0	6.0 ELECTRICITY AND MAGNETISM 6.1 Coulomb's law , Intensity and Potential : 6.1.1 Coulomb's inverse square law for electric charges, Electric fields, Intensity of electric field. 6.1.2 Electric line of forces, Properties of electric line of forces. 6.1.3 Electric flux, Electric flux density, Relation between flux density and Intensity of electric field. 6.1.4 Electric potential, Absolute electric potential. Numerical problems. 6.2 Capacitor : 6.2.1 Capacity of conductor, Definition: Capacitance, Farad. 6.2.2 Capacitance of Spherical conductor, Principle of capacitor (condenser). 6.2.3 Capacitors in series and parallel, Expression for the energy stored, 6.2.4 Numerical on capacitor. 6.3 Current electricity : 6.3.1 Ohm's law, Resistance, Specific resistance, Combination of resistances, e.m.f. and p.d., Temperature coefficient of resistance. Potentiometer , Applications , Numerical problems on specific resistances . 6.4 Magnetic materials : 6.4.1 Modern concepts of magnetism, Dia, Para, Ferromagnetism, 6.4.2 Testing of magnetic materials , Current carrying conductor in magnetic field, 6.4.3 Shunt, Moving coil galvanometer.	10	10	CO 1 CO 2 CO 4
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7.0	7. MODERN PHYSICS 7.1 Crystal Structure 7.1.1 Space lattice, Unit cell, Cubic Crystal Structures- Simple cubic,(S.C.), Body centered cubic(B.C.C.), Face centered cubic(F.C.C.). 7.1.2 Number of atoms per unit cell, Atomic radius, Co-ordination number, Packing density. 7.1.3 Atomic planes and spacing, Miller indices. 7.3 Lasers : 7.3.1 Elementary idea, Spontaneous and Stimulated emissions, population inversion, pumping methods, Helium-neon laser construction and working, Ruby laser. 7.3.2 Elementary idea, Spontaneous and Stimulated emissions, Ruby laser, Helium-neon laser.	10	10	CO 3 CO 4
8.0	8.0 SUPERCONDUCTIVITY AND NANOTECHNOLOGY 8.1 Super conductivity : 8.1.1 Principle of superconductivity, zero ohmic resistance, Meissner effect. 8.1.2 Properties and Applications. 8.2 Nanotechnology : 8.2.1 Nano – Technology, Nano – science, Nano – materials, Nano – machines. 8.2.2 Instruments being used in Nano – technology, Five generation of Nano – technology, Carbon allotropes, Applications.	03	04	CO 2
		64	70	

7. LIST OF PRACTICALS/ASSIGNMENTS

Term Work consists of Journal containing minimum no of 10 experiments and 03 Demonstrations.

Sr. No.	Title of experiment/Assignments/Tutorials/Drawings/Demonstrations	Appr.Hrs required	COs
1.	Use of Measuring Instruments – Vernier Callipers, Micrometer Screw Gauge , Spherometer.	2	CO1
2.	Young's Modulus by Searle's Apparatus.	2	CO2
3.	Surface tension by Capillary rise method.	2	CO2
4.	Viscosity by Poiseuille's method.	2	CO2
5.	Thermal conductivity of a good conductor by Searle's Apparatus.	2	CO2
6.	Velocity of sound by Resonance.	2	CO2
7.	Frequency of A.C. Supply by Sonometer .	2	CO4
8.	Wavelength of Light by Diffraction Grating.	2	CO3
9.	'J 'by Electrical Method.	2	CO1
10.	Wavelength of Laser Beam (He – Ne) by Diffraction Grating.	2	CO4
11.	Wavelength of Light by Diffraction Grating.	2	CO4
12.	Study of Crystal Structure.	2	CO2
13.	Use of Potentiometer (Principle, Comparison of e.m.f.s of Cell, Calibration of Voltmeter).	2	CO1,CO4
14.	Use of Wheatstone's bridge (Resistance, Specific resistance).	2	CO1,CO4
15.	Study of Spectrometer (Minimum Deviation and Refractive Index.	2	CO3



Demonstrations			
(i)	Use of Precision Measuring Instruments (Dial Vernier , Dial Micrometer , Travelling Microscope etc.)	1	CO1
(ii)	Temperature of Flame (Optical Pyrometer)	1	CO2
(iii)	Spectra of Ionized Gases.	1	CO2
(iv)	Study of Photocell.	1	CO3
(v)	Study of Newton's Rings.	1	CO3
(vi)	Study of Para and Diamagnetism by Electromagnet.	1	CO3

8.0 IMPLEMENTATION STRATEGY:

- (i) Teaching Plan
- (ii) Minimum number of Practical.
- (iii) Demonstrations
- (iv) Guest lecture

9.0 LEARNING RESOURCES:

Sr. No.	Title Of Book	Author	Publication
1.	Engineering Physics	R.K. Gaur and S.L. Gupta	Dhanpat Rai Publishing Co. New Delhi
2.	Physics for Engineers	M.R. Shrinivasan	New Age International , New Delhi
3.	A Text Book of Engineering Physics	P.G. Kshirsagar and M.N. Avandhunulu	S. CNHAND & CO. LTD.
4	Introductory Physics – Volume 1,2 & 3	Gambhir, Durgapal and Banerji	Wiley Eastern

10. WEB REFERENCES

1. [http://www.books.google.co.in/books/physics Dummies by Steven Holzner](http://www.books.google.co.in/books/physics%20Dummies%20by%20Steven%20Holzner), <http://www.hypertextbook.com/physics>, <http://www.google.co.in/search?=&physics>, <http://www.physics.ucsc.edu/~josh/6A/mechanics-e-books>

2. 2.1 Elasticity :

<http://www.hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>, <http://www.youtube.com/watch?v=Ejn6Fytn15Y>

2.2 Surface Tension :

<http://www.hyperphysics.phy-astr.gsu.edu/hbase/surten.html>, <http://www.youtube.com/watch?v=wOOY1szbcX4>

2.3 Viscosity :

[http://www.books.google.co.in/books/physics Dummies by Steven Holzner](http://www.books.google.co.in/books/physics%20Dummies%20by%20Steven%20Holzner), <http://www.hypertextbook.com/physics>

<http://www.wiley.com/college/cutnell>, <http://www.google.co.in/search?=&physics>

3. . Heat and Temperature :

<http://www.google.co.in/search?=&physics>, <http://www.hypertextbook.com/physics>

4. SOUND , ULTRASONIC AND ACOUSTICS :

<http://www.google.co.in/search?=&physics>,

<http://www.hypertextbook.com/physics>, <http://en.wikipedia.org/wiki/Simpleharmonic>

<http://www.youtube.com/watch?v=SBC0C8pa2VU>, <http://www.hyperphysics.phy-astr.gsu.edu/hbase/sound/>



wavplt.html , www.tutorvista.com/content/physics/physics-iii/waves/stationary-waves.php,
http://www.youtube.com/watch?v=y_Ne17Y1h7I

5. OPTICS:

<http://www.hypertextbook.com/physics> , <http://www.google.co.in/search?=physics>, <http://www.hyperphysics.phy-astr.gsu.edu/hbase/relative/photel.htm>, www.newton.dep.anl.gov/askasci/phy05/phy05070.htm, <http://www.hyperphysics.phy-astr.gsu.edu/hbase/quantum/hydfin.html>, <http://www.youtube.com/watch?v=0CdXidwO8LM>

6. ELECTRICITY AND MAGNETISM:

<http://www.hypertextbook.com/physics> , , <http://www.wiley.com/college/cutnell>, <http://www.google.co.in/search?=physics>,
<http://www.biomed.exactatign.com/topic/environment/energy/electricity/electromagnetics>,
[http://www.books.google.co.in/books/physics Dummies by Steven Holzner](http://www.books.google.co.in/books/physics_Dummies_by_Steven_Holzner), <http://www.physics.ucsc.edu/~josh/6A/mechanics-e-books>

7.0 MODERN PHYSICS :

<http://www.hypertextbook.com/physics> , <http://www.google.co.in/search?=physics>, <http://www.hyperphysics.phy-astr.gsu.edu/hbase/relative/photel.htm>, www.newton.dep.anl.gov/askasci/phy05/phy05070.htm, <http://www.hyperphysics.phy-astr.gsu.edu/hbase/quantum/hydfin.html>, <http://www.youtube.com/watch?v=0CdXidwO8LM>,
<http://www.hyperphysics.phy-astr.gsu.edu/hbase/soilds/fermi.html>, http://www.electronics-tutorials.ws/diode/diode_1.html,

8. SUPERCONDUCTIVITY AND NANOTECHNOLOGY:

<http://www.hypertextbook.com/physics> , <http://www.google.co.in/search?=physics>,

11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN:

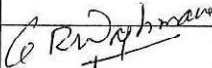
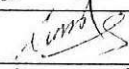
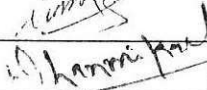
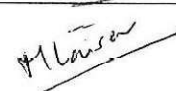
Sr.No.	TOPIC	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1.	MEASUREMENT AND ERRORS	2	1	1	04
2.	PROPERTIES OF MATTER : ELASTICITY , SURFACE TENSION	6	4	3	13
3.	HEAT AND TEMPERATURE.	2	2	2	06
4.	SOUND , ULTRASONIC AND ACOUSTICS	4	4	4	12
5.	OPTICS	4	4	3	11
6.	ELECTRICITY AND MAGNETISM	3	4	3	10
7.	MODERN PHYSICS	4	3	3	10
8.	SUPERCONDUCTIVITY AND NANOTECHNOLOGY	1	2	1	04
TOTAL		21	27	22	70

R Remembering, U Understanding, A Applying, (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of COs. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.



12. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	MR. G.R. WAGHMARE	
2	Internal	MR.S.S.SALVE	
3	Internal	MR. L.D.DESHPANDE	
4	External	Mr. M. B. JAISWAR Organization: Shri T.P. Bhatia Jr. College, Kandivali (W)	



1. COURSE DETAILS: Communication Skills

Program: CE/ME/ EE/IE/PE/CH/DE	Semester: I /II
Course: Communication Skills	Group: B*
Course Code: CMS190011	Duration:16Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory Hrs	Practical Hrs	Drawing Hrs	Tutorial Hrs	Credits (L+P+D+T)	Theory Paper Duration and Marks		SSL	TA	TH	TWK	PR	OR	Total
					Hours	Marks							
03	--	--	01	04	03	70	20	10	70	25	-	-	125

3. COURSE OBJECTIVE: The communicative competence in English is the pre-requisite for the employment market at national and international level today. However, the ability to communicate effectively does not come easily to many people. No matter how brilliant and invaluable your idea is, it is worthless until shared either orally or in written manner. Here arises the need to learn communication skills which will enable the students to enhance their comprehension, writing and oral skills in English.

4. SKILL COMPETENCY: Students will be able to develop the following skills / competencies.

1. Interpersonal skills
2. Listening and Reading skills
3. Formal Writing skills
4. Pronunciation and Speaking
5. Usage of Grammar and Vocabulary



5. COURSE OUTCOMES (COs) at the end of the semester student will be able to: -

CO No.	COURSE OUTCOMES	Bloom's Level
CO1	Define communication with its types and understand the Process of communication.	Remember
CO 2	Apply the various grammatical structures which will enhance oral and written communication.	Application
CO 3	Demonstrate the proficiency in language skills (L.S.R.W.) by using language lab.	Understand
CO 4	Draft various types of written communication eg. Letter, circular, notices for personal and professional use.	Application

6. COURSE CONTENTS:

Sr. No.	TOPIC/Sub-topic	Hours	Marks	COs
1	COMMUNICATION 1.1 Communication: Meaning and Definition 1.2 Features of communication 1.3 Oral & written Communication 1.4 verbal and Nonverbal communication	04	06	CO 1
2	Application of Grammar 2.1 Tense & its sub types 2.2 Degree and Its types 2.3 Change the voice	04	06	CO 2
3	Vocabulary Building 3.1 Word Formation Processes Affixation, Echoism, clipping, conversion Back formation, Shortforms, Acronyms 3.2 Idioms and use of idioms in sentence 3.3 Antonyms and synonyms	04	03	CO 2
4	Language lab and Spoken English 4.1 English sound system (RP) 4.2 Vowels & Diphthongs(RP), Consonants(RP) 4.3 Word Accent, stress a Rhythm and Intonation	04	03	CO 3



5	Nonverbal Communication 5.1 Meaning of Nonverbal Communication 5.2 Use of body language in communication 5.3 Nonverbal codes: Haptics, vocalics, Artifacts, chronemics, proxemics	04	08	CO 1
6	Barriers to communication 6.1 Definition of Barrier 6.2 Types of barriers of communication 6.3 Mechanical, Psychological, Linguistic, Social-cultural & Environmental	05	08	CO 1
7	Paragraph writing 7.1 Types of paragraph writing Inductive and Deductive method 7.2 Development of Paragraph	05	06	CO 4
8	Notice and circular 8.1 Difference between notice and circular 8.2 Drafting notice and circular for Library, gym, office, Students stores facility and sports	06	06	CO 4
9	Letter writing 9.1 Importance of letters writing in business 9.2 7 Cs of letter writing 9.3 Layouts: Block, semi-block, full block 9.4 Job application letter 9.5 Resume writing	08	16	CO 4
10	Reading comprehension 10.1 Unseen passages with wh- type and MCQ types of questions	04	08	CO 3
TOTAL		48	70	



7 (A) LIST OF ASSIGNMENTS: Each student has to write all ten assignments compulsorily as term work.

Sr. No.	Title of Assignments	COs
1.	Explain the process of communication with the help of diagram.	CO 1
2.	Give five examples of each sub type of tense.	CO 2
3.	Find out twenty difficult words from the English newspaper and understand their meaning by using dictionary and use it in your own sentences.	CO 2
4.	Write the phonetic transcription of given words by using dictionary.	CO 3
5.	Explain various types of barriers to communication.	CO 3
6	Explain different nonverbal codes with help of pictures.	CO 1
7	Attempt to answers for given unseen passage for reading comprehension.	CO 3
8.	Explain the Various formats of letter writing with diagram.	CO 4
9	Draft the notice / circular on given topic.	CO 4
10	Develop the paragraph on the given topic	CO 4

Note: # Teacher will do necessary changes in the assignments as per requirements.

7 (B) LIST OF TUTORIALS:

Sr.	Title of Tutorial	Lab /Classroom	Hrs.
1.	Practice of R.P. English sounds to overcome mother tongue impact.	Lang.lab	03
2.	Listen and repeat words with phonemic transcription.	Lang.lab	03
3	Public speaking (Listening Famous speakers)	Lang.lab	02
4	Extempore	Classroom	02
5	Loud reading / Recitation	Classroom	02
6	Debate / Role play	Classroom	02
7	Mock interview	Classroom	02
	Total		16



8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan/ Tutorials
2. Minimum TEN no assignments
3. Guest/Expert lectures
5. Slides
7. Group discussions
8. Seminar
9. Self-Learning Online Resources

9 Learning Resources:

Sr. No.	Title Of Book	Author	Publication
1.	Communication Skills for Engineers	C. Murali Krishna	Pearson Education
2.	Technical Communication Principles and Practice	Meenakshi Raman, Sangeeta Sharma	Oxford university press , Chennai
3.	A Communicative Grammar of English	Geoffrey Leech, Jan Swartvik	ELBS – with Longman
4	Body Language	Allan Pease	Sheldon Press, London
5	Basics of Management and Communication Skills	Dr. P.C. Shejwalkar	Everest Publishing House
6	Business Communication Strategies	Matthau M. Monippally	Tata – McGraw – Hill

10. WEBSITE REFERENCES

1. <http://www.free-english-study.com>
2. <https://communicationkills.bandcamp.com>
3. <http://www.english-online.org.uk>
4. <http://www.talkenglish.com>
5. <http://www.learnenglish.de>



11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Sr. No	CHAPTER	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Communication	3	3	0	06
2	Application of Grammar	-	3	3	06
3	Vocabulary Building	-	-	3	03
4	Language lab and Spoken English	-	-	3	03
5	Nonverbal Communication	4	4	-	08
6	Barriers to communication	4	4	-	08
7	Paragraph writing	--	-	6	06
8	Notice & circulars	--	--	6	06
9	Letter writing	-	8	8	16
10	Reading comprehension	-	-	8	08
TOTAL		11	22	37	70

R - Remembering, U- Understanding, A- Application, AN - Analyzing, E- Evaluation and C- Creating (Bloom's revised taxonomy levels)

Note: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess the students with respect to the attainment of COs. The actual distribution of marks at different taxonomy levels (R, U, A, An etc.) in the question paper may vary from above table.

12 COURSE EXPERT COMMITTEE MEMBERS

Sr. No.	NAME OF EXPERT (Internal)	SIGNATURE
1	Prof. Mr. Balaji M. Pande, Lecturer (Senior Scale)	<i>B. Pande</i>
2	Prof. Mrs. Anita A. Kulkarni, Head of Department.	<i>Anita A. Kulkarni</i>
3	Prof. Mrs. Kirti P. Bhawe, Lecturer (Selection Grade)	<i>K. P. Bhawe</i>
	NAME OF EXPERT (External)	
4	Prof. Mrs Aanchal Lalla, Lecturer , K.J.S Polytechnic , Mumbai	<i>Aanchal Lalla</i>



1. COURSE DETAILS

Program: Civil Engineering	Semester: II
Course: Building Construction	Group: C*
Course Code: BCN190103	Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory Hrs/Week L	Practical Hrs/Week P	Drawing Hrs/Week D	Tutorial Hrs/Week T	Credits (L+P+D+T)	Theory Paper Duration and marks		SSL	TA	Theory paper	TWK	PR	OR	Total
					Hours	Marks							
3	2	-	-	5	03	70	20	10	70	25	-	50	175

3. COURSE OBJECTIVE

Building construction is a core subject in civil engineering, which deals with construction processes such as substructure, superstructure & building finishes. In construction, different processes play key role as far as safety, stability, economy, aesthetic sense are concerned. Working knowledge of this will enable the student to plan effectively, execute building construction work with quality in construction. Working knowledge of this will enable the student to supervise and maintain better in the field of civil Engineering activities.

4. SKILL COMPETENCY

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

1. Prepare a foundation plan to mark lay out on the ground of the framed structure and load bearing structure, from the given building plan independently on the field.
2. Select suitable types of finishes, masonry and means of vertical circulation.
3. Execute different construction processes & activities on field.



5. COURSE OUTCOMES (COs)

At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Blooms Level
1	Identify and explain different components of building	R,U,A
2	Understand suitability of various types of foundation, floors, roofs etc	U
3	Identify and select various construction activities like type of masonry, flooring, doors and windows etc for intended use, Understand safety at construction place.	R,U,A
4	Explain various types of finishes and means of vertical circulation	R
5	Analyse the cost of accidents and the safety measures to be followed in construction processes.	R,U,A

6. COURSE CONTENT

Sr No.	Topic / Sub topics	Hours	Marks	COs
1	INTRODUCTION 1.1 Definition of Building as per IS 1256-1958 1.2 Components of structure: Substructure (Foundation, Plinth & DPC) and Superstructure (Wall, Peir, Floor, Lintel, Sill, Chajjas, Beams, Roof, Staircase, Wall finishes), their functions and requirement. 1.3 Load Bearing structure and framed structure. Comparison between load bearing and framed structures.	2	3	CO1
2	FOUNDATION 2.1 Definition, Function and essential requirement of good foundation, 2.2 Types of foundation. Shallow and Deep Foundation. Depth and size of foundation. sketches of Spread footing (Wall footing and isolated footing), Combined footing, Strap footing, Grillage foundation, Mat or Raft footing, Pile foundation, suitability of each type of foundations 2.3 Job layout, site clearance, preparing job layout for framed structure & load bearing structure by center line method & face line method. 2.4 DPC: Definition, Causes, effects, DPC 2.5 Treatment to wall and basement.	8	12	CO2
3	MASONRY 3.1 Technical terms used in stone masonry: facing,	8	12	CO2,



Sr No.	Topic / Sub topics	Hours	Marks	COs
	hearting, backing, through stone, corner stone, cornice 3.2 Precautions to be taken in construction of stone masonry 3.5 Brick masonry: Technical terms used in brick masonry: bed joint, perpends, lap, closer- Queen closer, King closer, Bevelled, Mitred closer, Bat 3.6 Rules for bonds in brick work, Different types of bonds, Stretcher, Header, English and Flemish bond. Procedure of laying of bricks. 3.7 Precautions to be taken in brick masonry construction, tools & plants used. 3.8 Comparison of Stone and brick masonry. 3.9 Scaffolding: necessity & purposes of scaffolding, types of scaffolding, 3.10 Purposes of shoring & underpinning			CO3
4	DOORS & WINDOWS 4.1 Definition of technical terms, location of doors and windows, size and type of doors panelled doors, battened doors, flush doors, collapsible doors, rolling shutters, revolving doors, Glazed doors. 4.2 Types of windows fully panelled, partly panelled & glazed, glazed wooden, steel, Aluminium windows, sliding windows, louvered window, ventilators, cement grills, sizes of doors & windows. 4.3 Fixtures and fastenings for doors and windows.	4	5	CO1
5	LINTELS & ARCHES 5.1 Necessity of lintels, types of lintels 5.2 Technical terms used in arches, advantages & disadvantages of arches 5.3 Types of arches, according to shape & purposes	4	6	CO1
6	FLOORS AND ROOF 6.1 Floor tiles : Procedure of laying Ceramic, vitreous, Wooden, Kotah, marble, granite 6.2 Roof : Definition, Different technical terms Requirement of ideal roof, Classification of roofs, Pitched roof (Lean to roof, King post truss, Queen post truss), Types of Flat roof (RCC roof), steel trusses (advantages & disadvantages)	8	11	CO3, CO4



Sr No.	Topic / Sub topics	Hours	Marks	COs
7	WALL FINISHES 7.1 Plastering: Definition, Object & requirement of good plaster. 7.2 Different terminologies used in plastering work. 7.3 Tools for plastering, number of coats of plaster. 7.4 Detailed procedure of cement plastering. Types of plaster finishes, Defects in plastering. 7.5 Pointing: Definition, mortar used in pointing, preparation of surface, methods of pointing & types of pointing.	8	11	CO3, CO4
8	CIRCULATION 8.1 Term used: Baluster, handrail, newel post, soffit, tread, rise, scotia, headroom, flight, landing, pitch, stringer 8.2 Classification of stairs, specifications and suitability 8.3 Ramps, Escalator, Elevators 8.4 Planning of doglegged staircase for one storey	4	6	CO4
9	CONSTRUCTION SAFETY 9.1 Introduction 9.2 Objective and Scope of Statutory safety regulations 9.3 Safety-specific Statutory acts and rules, relevant sections of rules, 9.4 Recommendations of BIS, 9.5 Accidents and safety measures at construction sites 9.6 Activity and reasons for accidents 9.7 Insurance cover for the cost of the accidents 9.8 Safety Training and its objective 9.9 Fire safety, Electrical safety, Environmental safety	2	4	CO5
TOTAL		48	70	

7. PRACTICALS / ASSIGNMENTS / DRAWINGS

Term Work consists of Journal containing minimum 8 experiments including sketch book

Sr. No.	Title of Experiments / Assignments / Drawings	Approximate Nos. of Hrs. required	COs
1	Prepare a foundation plan to mark lay out on the ground of the load bearing structure from the given building plan.	6	CO2
2	Prepare a foundation plan to mark lay out on the	4	CO2



Sr. No.	Title of Experiments / Assignments / Drawings	Approximate Nos. of Hrs. required	COs
	ground of the framed structure from the given building plan.		
3	Assemble 1½ thick brick wall in English bond (minimum 3 course).	2	CO3
4	Assemble 1½ thick brick wall in Flemish bond (minimum 3 course).	2	CO3
5	Prepare simple stone masonry construction work.	2	CO3
6	Prepare a report on visit to construction site with respect to scaffolding,	4	CO1, CO3
7	Formwork / centring work, plastering and pointing work.	2	CO4
8	Identify various components of staircase, doors & windows in the lab in the given model & prepare a report.	2	CO1
9	Drawing of sketches on quarter imperial sheet / A4 size drawing sheet book.	8	
	i. Shallow foundation		CO2
	ii. Rectangle Combined footing and Trapezoidal footing		CO2
	iii. Spread footing for column		CO2
	iv. Strap footing		CO2
	v. Grillage rectangular footing.		CO2
	vi. Deep foundation		CO2
	vii. DPC treatment to wall and basement		CO1
	viii. Brick Work:		
	ix. Elevation of Brick wall a) Plan showing alternate courses of brick walls in different thickness as 1 thick brick, 1½ thick brick in English bond b) Plan showing alternate courses of brick walls in different thickness as 1 thick brick, 1½ thick brick in Single and Double Flemish bond.		CO3
	x. Plan, elevation and sectional elevation of any four types of Doors and Windows		CO1
	xi. Dog legged stair case with quarter space landing and mid landing		CO4, CO5
	xii. Prepare the report on construction safety.		
	Total	32	



8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan
2. Industry / Site visits
3. Guest / expert lecture on construction safety (desirable)
4. Slides
5. Self-Learning Online Resources
6. Presentation by students

9. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Building Construction	S.P. Arrora & Bindra	Dhanpat Rai Publication, Delhi Edition
2.	Building Construction	S.C. Rangwala	Charotar Publication, Dist.-Anand
3.	Building Construction	B.C. Punmia & A.K. Jain	Firewall Media
4	Building Construction	Sushil kumar sharma	S. Chand & Co. Pvt ltd. New Delhi
5	Building Construction	S. S. Bhavikatti	Vikas Publication House Pvt.Ltd, New Delhi
6	A to Z Building Construction	Sandip Mantri	Satya Prakashan; New Delhi

10. WEB REFERENCES

1. www.nptel.ac.in
2. <http://www.learningconstruction.com/>
3. www.constructionworld.in
- 4 <http://www.constructionknwoledge.net/>




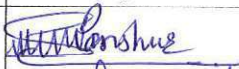

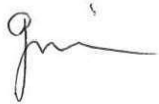
11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

SR NO	TOPICS	Teaching Hours	Distribution of theory marks			
			R Level	U Level	A Level	Total Marks
1	Introduction	2	3	-	-	3
2	Foundation	8	4	4	4	12
3	Types of masonry	8	4	4	4	12
4	Door and windows	4	5	-	-	5
5	Lintel and arches	4	-	3	3	6
6	Floors and roof	8	6	5	-	11
7	Wall finishes	8	6	5	-	11
8	Circulation	4	3	3	-	6
9	Construction safety	2	-	-	4	4
	TOTAL	48	31	24	15	70

R Remembering, U Understanding, A Applying, (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of Cos. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.

12. COURSE EXPERT COMMITTEE MEMBERS

S.N.	Name		Signature
1	Internal	Shri A. K. Singh	
2	Internal	Shri S. N. Ranshur	
3	Internal	Smt. Supriya Patil	
4	External	Name: S.H. JAIN Organisation: S.B.CMUMBAI.....	



1. COURSE DETAILS

Program: Civil Engineering
 Course: Civil Engineering Materials
 Course Code: CEM190104

Semester: II
 Group: C*
 Duration: 16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per week					Examination Scheme and Maximum Marks								
Theory Hrs/Week L	Practical Hrs/Week P	Drawing Hrs/Week D	Tutorial Hrs/Week T	Credits (L+P+D+T)	Theory Paper Duration and marks		SSL	TA	Theory paper	TWK	PR	OR	Total
					Hours	Marks							
3	-	-	-	3	03	70	20	10	70	-	-	-	100

3. COURSE OBJECTIVE

Construction material is a key element in construction project. A diploma civil engineer has to constantly deal with selection of materials for various engineering materials for various engineering materials for various engineering project, such as residential /commercial buildings, roads, metro, dams, flyover, etc.

The development of advance technology generates the necessity of new engineering materials, which is durable, economical & ecofriendly.

Modern technologies are developed to handle & use the materials for economic & safer design of engineering studies.

4. SKILL COMPETENCY

The aim of this course is to help the student to attain the identified competency through various teaching learning process

1. Select the suitable material for required applications.
2. Compare natural and artificial material.

5. COURSE OUTCOMES (COs)

At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom Level
CO1	List materials to be used for specific civil engineering applications.	U
CO2	Classify different construction materials.	R, U, A
CO3	Identify relevant natural & artificial construction materials for intended use.	U
CO4	Know the properties of materials with respect to uses in civil engineering.	R



6. COURSE CONTENTS

Sr No.	Topic / Sub Topics	Hours	Marks	COs
1	Cement: 1.1 Chemical composition of Cement 1.2 Varieties: (1) Portland Cement, (2). Portland Pozzolana Cement, (3) Portland Slag Cement (4). Sulphate resistant cement, (6) White cement, and their uses. 1.3 Testing of Cement: Setting and hardening of cement and relative strength. Grades of cement, List of tests and necessity of these tests.	7	12	CO1
2	Sand and coarse aggregate 2.1 Sources, properties and uses.	6	8	CO3
3	Masonry Materials: 3.1 Bricks: Quality of good bricks, Strength of bricks, Tests on bricks, Classification of bricks, Uses of bricks clay brick, Special brick, hollow brick, Flyash bricks. 3.2 Stones, suitability of stones for masonry work, quality of stones, dressing of stones, Uses of stones 3.3 Concrete blocks. 3.4 Light weight Autoclaved aerated concrete (AAC) block	7	10	CO2
4	Tiles 4.1 Characteristics of good tiles 4.2 Types of tiles: (i). Floor tiles: Mosaic, Terracotta, Ceramic, vitreous, Wooden, Kotah, marble, granite (ii). Wall Cladding: Dado, dry-cladding, (iii). Roof Tiles: Mangalore, Allahabad	6	8	CO1
5	Lime, Gypsum and Plaster of Paris 5.1 Classification of limes, Uses of limes, 5.2 Gypsum, Gypsum Plaster, Gypsum sheet, POP and their uses.	6	10	CO2
6	Timber and Timber Products 6.1 Timber as a material of construction, Relative advantages of its use as compared to other materials. 6.3 Types of Boards: Ply, Veneer, MDF, Batten Board, Block Board, Laminates, their properties and uses. 6.4 Bamboo and Ballis, properties, uses of bamboos and ballis.	8	12	CO1
7	Glass and Plastics 7.1 Glass, Toughened glass, Structural grade glass, 7.2 Plastics: PVC, CPVC, PPRC, Korean, Vinyl, PPF 7.3 Cladding materials – properties, names of different cladding materials and uses.	4	4	CO4



Sr No.	Topic / Sub Topics	Hours	Marks	COs
8	Paint, Varnish and Polishing: 8.1 Characteristics of good paint 8.2 White wash, Cement Paint, distemper, Plastic Emulsion Paint, Acrylic Paint, oil painting, Special Surface coating (like anticarbonation, antirust, nano, etc.) 8.4 Varnish: water varnish, oil varnish, spirit varnish and turpentine varnish. 8.5: Wood polishing, melamine	4	6	CO4
TOTAL		48	70	

7. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan
2. Industry / Site / Expo visits
3. Slides
4. Self-learning web sites / on line resources
5. Presentation by students

8. LEARNING RESOURCES

Sr. No.	Title Of Book	Author	Publication
1.	Engineering Materials	S.C. Rangwala	Charotar publication
2.	D.N.Ghosh	Materials of Constructions	Tata MaGraw Hill Publish.
3.	TTTI Chandigarh	Civil Engineering Materials	Tata MaGraw Hill Publish
4	Building Construction	Sushil kumar	Standard New Delhi

9. WEB REFERENCES

1. www.nptel.ac.in
2. www.quora.com
3. www.constructionworld.in




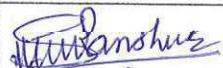


10. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

SR NO	TOPICS	Teaching Hours	Distribution of theory marks			
			(*Mentioned marks are subjects to variation according to examiner)			
			R Level	U Level	A Level	Total Marks
1	Cement:	7	8	4	-	12
2	Sand and coarse aggregate	6	4	4	-	8
3	Masonry Materials:	7	-	6	4	10
4	Tiles	6	3	3	2	8
5	Lime, Gypsum and Plaster of Paris	6	4	4	2	10
6	Timber and Timber Products	8	4	4	4	12
7	Glass and Plastics	4	-	4	-	4
8	Paint, Varnish and Polishing:	4	-	4	2	6
	TOTAL	48	23	33	14	70

R-Remember, U-Understand, A-Apply and above (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of Cos. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.

11. COURSE EXPERT COMMITTEE MEMBERS

S.N.	Name		Signature
1	Internal	Shri A. K. Singh	
2	Internal	Shri S. N. Ranshur	
3	Internal	Smt. Supriya Patil	
4	External	Name: S. H. JAIN Organisation: S. B. C Mumbai.	



1. COURSE DETAILS

Programme: Civil Engineering	Semester:II
Course: Surveying - I	Group:C*
Course Code: SUR190105	Duration:16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum Marks								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
3	4	-	-	7	03	70	20	10	70	50	50	-	200

3. COURSE OBJECTIVE

This is core technology subject which is intended to teach the students core facts, concepts, principles and procedures in surveying and leveling. With this knowledge and skill, he will be able to choose appropriate surveying and levelling methods depending upon requirement, to carry out survey work in Building Construction system, Transportation Engineering system, Environmental Engineering system and Irrigation Engineering system for investigation of projects before and during execution of work, while serving as investigator for design department, supervisor on the site of work, draftsman in the drawing office.

4. SKILL COMPETENCY

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

- Apply principles and methods of different types of survey.
- Carry out leveling independently on the field.
- Apply surveying knowledge to various problems on site related to survey.
- Undertake civil engineering surveys



5. COURSE OUTCOMES(COs)

At the end of the semester student will be able to: -

CO No.	COURSE OUTCOME	Bloom's Level
1.	Apply principles of survey instruments i.e cross staff, prismatic compass, Planimeter, dumpy level.	R,U,A
2.	Compute area of open field using chain, tape and cross staff.	R,U,A
3.	Conduct traversing in the field using chain and compass.	R,U,A
4.	Use levelling instruments to determine reduced level of ground points.	R,U,A
5.	Draw/interpret contour maps of an area collecting field data and use digital planimeter to calculate the areas	R,U,A

6. COURSE CONTENTS

Sr. No.	Topic / Sub-topics	Hours	Marks	CO No.
1	1.0 Introduction and types of survey: 1.1 Scope of surveying and their purpose. 1.2 General principles of surveying 1.3 Types of surveying: Primary –Plain, Geodetic. Secondary – Based On Instruments, Method, Object, Nature Of Field 1.4 Conventional symbols in survey plans/maps such as cutting, embankment, marshy land, road, railway, stream, river, bridge, tunnel, fencing, orchard, Cultivated land, transmission line, places of worship etc. (To be taught in practical / drawing hours)	4	06	CO1
2	2.0 Chain and Cross Staff Survey: 2.1 Equipment used in Chain survey like ranging rods, pegs, chain, arrow, wooden mallet, tapes etc. 2.2. Ranging, direct and Indirect Ranging, line ranger. 2.3 Opening and closing of chain and testing of chain, different parts of a 30 m chain. 2.4 Offsets, perpendicular and oblique offset, different methods of setting out offsets, cross staff, cross staff survey use and application, different types of cross staff, French and open cross staff 2.5 Errors in chaining, location sketch, recording in field book, plotting the cross staff survey, Obstacles in chaining. 2.6 Problems based on incorrect length of chain and cross staff survey.	10	14	CO1, CO2
3	3.0 Chain and Compass Surveying: 3.1 Meridians Magnetic, arbitrary and true, bearing,	10	15	CO1, CO3,



	<p>WCB, RB, fore Bearing, Back Bearing, Conversion of bearing from one form into the another form</p> <p>3.2 Prismatic Compass, its use, different parts and functions of each part, Temporary adjustments of prismatic compass, centering, leveling etc. , surveyor's compass and trough compass</p> <p>3.3 Included angles, traverse, open and close traverse, checks on close traverse, Magnetic declination, local attraction, sources and effects, dip of magnetic needle.</p> <p>3.3 Traversing with compass, plotting of traverse, adjustments of closed traverse.</p> <p>3.4 Problems based on calculation of included angles, Correction of Local Attraction, declination and dip of magnetic needle.</p> <p>3.5 Measurement of linear distances with digital distance meter.</p>			
4	<p>4.0 leveling:</p> <p>4.1 Terminologies: Level surfaces, Horizontal and vertical surfaces, Datum, Bench Marks- GTS, Permanent, Arbitrary and Temporary, Reduced Level, Rise, Fall, Line of collimation, Station, Back sight, Fore sight, intermediate sight, Change point, Height of instruments etc</p> <p>4.2 Parts of Dumpy level and its telescope, line of collimation, plane of collimation, bubble tube and focusing, parallax, bench marks, use of dumpy level, temporary adjustments, permanent adjustments (only introduction). Leveling Staffs, Reduction of level by Line of collimation method and Rise/ Fall Method</p> <p>4.3 Leveling Types: Simple, Differential, Fly, Profile and Reciprocal Leveling</p> <p>4.4 Computation of missing readings, Errors in Leveling</p> <p>4.5 Recording in level books, rise and fall method, Height of Instruments method.</p> <p>4.6 Methods of leveling for longitudinal and cross sections, precautions in leveling, sources of errors in leveling, permissible errors, etc.</p>	15	23	CO1, CO4
5	<p>5.0 Contouring survey:</p> <p>5.1 Contour, contour interval, horizontal equivalent.</p> <p>5.2 Contour maps: Characteristics and uses</p> <p>5.3 Methods of Contouring: Direct and indirect</p> <p>5.4 Methods of interpolation of contours: approximate, arithmetic and graphical</p>	05	6	CO1, CO5



	5.5 Characteristics of contour, interpolation of contours 5.6 Topo sheets and their reading.			
6	6.0 Planimeter: 6.1 Parts, their functions, and use in measurements of areas, zero circle, problems based on area calculation, etc. 6.2 Digital planimeter, its use, various parts, setting of scale, recording measurements, calculation of area etc	4	6	CO1, CO5
	TOTAL	48	70	

7. LIST OF PRACTICALS AND DRAWINGS

Term Work consists of Journal containing minimum 12 no of experiments and 4 drawing sheets (marked with *) with approximate no of hours required and corresponding CO attained are specified here.

Sr. No.	Title of Experiments and Drawings	Approximate No. of Hrs required	COs
1.	*Study, opening and closing, Testing of Chain and Measurement of distances with chain and tape.	2	CO1
2.	*Direct ranging and Reciprocal ranging	2	CO1
3.	*Study of Cross Staff Survey and Offsetting and taking out area of the given plot by cross staff survey	2	CO2
4.	Cross Staff Survey Project	2	CO2
5.	*Study of Prismatic Compass and Taking Out different types of bearing and calculating included angles from the observed bearings	2	CO3
6.	*Calculating included angles from the observed bearings of Closed Traverse	2	CO3
7.	*Correcting the observed bearings of a closed traverse and calculating included angles	2	CO3
8.	Compass Traverse Survey Project by adjusting error of closure	2	CO3
9.	*Study of Dumpy Level, Levelling Staff, temporary adjustments of level and reading the levelling staff	2	CO4
10.	*Height of Instruments Method of levelling	2	CO4
11.	*Rise and Fall Method of leveling	2	CO4
12.	Negative staff reading	2	CO4
13.	Fly Levelling	2	CO4
14.	Setting of survey points at required level	2	CO4
15.	*Profile levelling Project Running a longitudinal section for a length of about 750 m with cross sections at 10m or 20 m centre to centre. The length of cross section may be 9 m or 15 m on either side with staff readings at 10 m interval. Spot levels should be	16 (2 days)	CO4



Sr. No.	Title of Experiments and Drawings	Approximate No. of Hrs required	COs
	taken at every 10 m along the base line, plotting the L section and cross section on a full size imperial sheet.		
16.	*Contour Survey Project Running a level survey for plot of 25x25 meters minimum, with blocks of 5m x 5m. the contour shall be drawn with the contour interval of 0.5 m	8 (1 day)	CO5
17.	*Drawing sheet of symbols	6	CO1
18.	*Drawing sheet of Cross Staff Survey Project	6	CO2
19.	*Drawing sheet of Compass Survey Project	6	CO3
20.	*Drawing Sheet of Profile Levelling project	12	CO4
21.	*Drawing Sheet of Contour Survey project	6	CO5
Total		64 + 24	

8. IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan/Practical
2. Minimum no. of practical/drawings etc.
3. Survey Project for 3-4 days on site
4. Slides / Presentation
5. Group discussions for practical assignments
6. Self-Learning Online Resources

9. LEARNING RESOURCES

Sr. No.	Title of Book	Author	Publication
1	Surveying I and II	Punmia B.C.	Laxmi publication New Delhi
2	Surveying Vol. I	Kanetkar and Kulkarni	Pune VidyarthiGruha
3	Surveying	Gajare V.S	NiraliPrakashan Mumbai
4	Surveying	J.R. Muley	Vrinda Publication Jalgaon
5	Textbook of Surveying	Venkatramaiah, C	Universities Press.New Delhi
6	Surveying and. Levelling Volume- I	Bhavikatti, S. S	I. K. International, New Delhi
7	Surveying & Levelling	Basak N.N.	Tata McgrawHill , New Delhi

10. WEB REFERENCES

1. <https://nptel.ac.in/courses/105107122/>
2. <https://swayam.gov.in/>
3. www.oupinheonline.com
4. www.mtu.edu/technology/



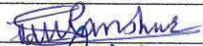

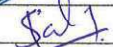

11. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Sr. No.	TOPIC	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction and types of survey:	04	02	04	00	06
2	Chain and Cross Staff Survey	10	02	04	08	14
3	Chain and Compass Surveying	10	03	04	08	15
4	Levelling	15	04	04	15	23
5	Contouring survey	05	--	02	04	06
6	Planimeter	04	--	02	04	06
	Total	48	11	20	39	70

R Remember, U Understand, A Apply and above (Bloom's revised taxonomy levels)

NOTE: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of COs. The actual distribution of marks at different taxonomy levels (R, U, A) in the question paper may vary from above table.

12. COURSE EXPERT COMMITTEE MEMBERS

Sr. No.		NAME	SIGNATURE
1	Internal	Shri. Sandeep Narayan Ranshur	
2	Internal	Miss. Neelam Nagraj Petkar	
3	Internal	Mrs. Supriya Prasad Patil	
4	External	Mr. DHIRAJKUMAR S. PANDIKAR Organisation: MHADA	



1. COURSE DETAILS

Programme: CE/ME/EE/PE/CH	Semester:II/III/IV/III/II
Course: Stress Management	Group:M
Course Code: STM190012	Duration:16 Weeks

2. TEACHING AND EXAMINATION SCHEME

Scheme of Instructions and Periods per Week					Examination Scheme and Maximum								
Theory Hrs L	Practical Hrs P	Drawing Hrs D	Tutorial Hrs T	Credits (L+P+D+T)	Theory Paper Duration and marks(ESE)		SSL	TA	TH	TW	PR	OR	TOTAL
					Hours	Marks							
----	02	----	----	02	----	----	----	----	----	----	----	----	022

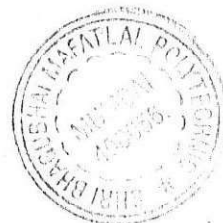
3. COURSE OBJECTIVE

Students will be able to

1. Gain knowledge about the basic technique and practice of yoga, including instruction in Breath control, meditation, and physical postures.
2. Develop physical competency and mental concentration.
3. Gain an intellectual and theoretical understanding of the principles embodied in the Yoga Sutras,
4. Increase efficiency, concentration, inner power and enhance the spiritual power for improving Learning Skill

4. SKILL COMPETENCY :

The aim of the course is to develop the various basic skills required for individuals to identify and manage various stresses in their academic and personal life.



5. **COURSE OUTCOMES(COs) At the end of the semester student will be able to: -**

CO No.	COURSE OUTCOME	Bloom's LEVEL
CO1	Understand the basic methods to manage the stress.	Understanding
CO2	Understand the social ethics	Understanding
CO3	Develop the positive attitude towards society	Applying
CO4	Reduce psychological, mental and emotional stress	Applying

6. **COURSE CONTENTS**

Sr. No.	TOPIC/Sub-topic	Hours	Marks	COs
1	HISTORICAL BACKGROUND AND YOGA LEARNING i) Yoga in Vedas ii) Yoga and its Principles iii) Consciousness iv) Yoga approach and Scientific view v) Pranayama: Breath Control, Breath and Postures, Rhythmic Breathing vi) Controlling the Body, Mechanism of Body: Kriyas and its high Therapeutic value. vii) Body as understood in its frame work systems and structure:.Asanas Cultural and Relaxation Asanas - viii) Muscles strength, Muscular coordination strength of Immune system ix) Relation and Reflection techniques Shavasana Shakshi Bhavanam. x)Bandhas and Mudras. xi) Depth of perception and expansion of awareness xii) Gross level Muscular stretches xiii) Subtle level Respiration changes and normalizing breath.	10	---	CO1 CO2
2	MEDITATION AND ITS TECHNIQUES: Meditative postures and kinds of Meditation Bodily Benefits Lower Blood Pressure ,lowers the levels of blood lactate, improves the immune system, increases body vitality, controls insomnia and increases overall health of the body Violence Free Society Meditation develops happiness, contentment and calmness. When increasing number of people practice meditation, it has a calming effect on the environment. This is a potent way to achieve a violence free society. Mental Benefits Emotional stability, anxiety decreases, anger reduces, happiness increases, and intuition develops clarity and peace of mind, induces ability to focus, and reduces tension and fear. Value Based Society	10	----	CO3

3	ART OF LIVING 1. Sudarshan Kriya 2. Life Skills 3. Ancient Wisdom 4. Practical knowledge to deal with the daily challenges of life 5. Interactive exercises 6. Dealing with your emotions 7. Improving Communication skills and Relationship	08	----	CO3
4	STRESS MANAGEMENT FOR STUDENTS Stress management techniques: 1. Time management techniques 2. Organization techniques 3. Create a study environment 4. Memorization techniques 5. Be an Optimist 6. Sleep Well 7. Study Techniq	04	----	CO4
TOTAL		32	----	----

7. LIST OF PRACTICALS/ASSIGNMENTS/EXERCISES/TUTORIALS/DRAWINGS

This is purely practice based subject where students will be doing exercises of asana and pranayama and dhyana under the guidance of external and internal experts

Sr. No.	Title of Experiment/Assignment/Exercise/Tutorial/Drawings	Approx.Hrs required	COs
1	HISTORICAL BACKGROUND AND YOGA LEARNING	04	CO1
2	MEDITATION AND ITS TECHNIQUES	08	CO3
3	ART OF LIVING	04	CO3
4	STRESS MANAGEMENT FOR STUDENTS	08	CO4

8. IMPLEMENTATION STRATEGY (PLANNING)

1. The students will be performing practice sessions covering above topics.
2. Live demonstration along with content delivery sessions will be conducted.
3. The lecture room/ Hall separately will be assigned batchwise as per Time Table for Male (Boys) and Female(Girls) as where an applicable depending upon relevant topics.
4. The materials/ Items required example Yoga Matt/ Chatai/corresponding matt / towels / chadar are to be brought by students only for particular topics.

