



## Veermata Jijabai Technological Institute (V.J.T.I.)

(Central Technological Institute, Maharashtra State, INDIA)

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Website: [www.viti.ac.in](http://www.viti.ac.in)

### Programme Name: Diploma in Civil Engineering

Programme Code		: DCE		With Effect From Academic Year		: 2023-24																		
Duration of Programme		: 6 Semester		Duration		: 16 WEEKS																		
Semester		: First		Scheme		: R-2023																		
Sr No	Course Title	Abbreviation	Course Type	Course Code	Total IKS Hrs. for Sem	Learning Scheme			Paper Duration (Hrs.)	Theory			Based on LL & TL			Based on Self Learning		Total Marks						
						Actual Contact Hrs./Week	Self-Learning (Term Work + Assignment)	Notional Learning Hours/Week		Credits	FA-TH (MST)	SA-TH (ESE)	Practical			F-A-PR (CA)	S-A-PR (PR/OR)		SLA	Min	Max			
													CL	TL	LL							Max	Min	Max
1	MATHEMATICS I	MS-I	AEC	231MA11A	6	4	2	-	2	8	4	3	30	70	28	100	40	25	10	-	25	10	150	
2	PHYSICS	PHY	DSC	231PH12	4	3	-	2	1	6	3	3	30	70	28	100	40	25	10	25@	10	25	10	175
3	COMMUNICATION SKILLS (ENGLISH)	ENG	AEC	231HM13	0	3	-	2	1	6	3	3	30	70	28	100	40	25	10	-	25	10	150	
4	CONSTRUCTION MATERIALS	CMT	DSC	231CE14	6	3	-	2	1	6	3	3	30	70	28	100	40	25	10	-	25	10	150	
5	ENGINEERING DRAWING	ED	DSC	231CE15	2	2	-	4	-	6	3							75	30	50#	20	-	125	
6	COMPUTER APPLICATIONS	CA	SEC	231CE16	-	-	-	4	2	6	3							25	10	25@	10	25	10	75
7	YOGA AND STRESS MANAGEMENT	YSM	VEC	234CE17	1	-	-	1	1	2	1							25	10	-	-	25	10	50
<b>Total</b>					19	15	2	15	8	40	20		120	280	280	400		225		100		150		875

Abbreviations : CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, IKS - Summative Assessment, SA - Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

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

Course Category : Discipline Specific Course Core (DSC) : 2, Discipline Specific Elective (DSE) : 0, Value Education Course (VEC) : 1, Intern./Apprentice./Project./Community (INP) : 0, Ability Enhancement Course (AEC) : 2, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

*[Signature]*

Curriculum Coordinator

*[Signature]*

Head

Diploma in Civil Engineering



*[Signature]*

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: MATHEMATICS – I
COURSE CODE	:231MA11A

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME													
C L	T L	L L	Self- learni ng	CR	PAP ER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL		Based on LL & TL Practical				Based on Self- learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA			
											Max	Min	Max	Min	Max	Min	Max	
4	2	-	2	4	3	30	70	28	100	40	25	10	-	-	25	10	150	

### II. Rationale:

- To teach students basic facts, concepts and principles of mathematics as a tool to analyze engineering problems.
- To make students well versed in prerequisite for further studies in mathematics and engineering.

### III. Course Outcomes:

Student should be able to

CO1	Use Determinant and Matrices to solve simultaneous linear equations.
CO2	Apply basic concepts in trigonometry to solve engineering problems.
CO3	Define function and find limit of function. Use derivatives to solve the engineering problems.
CO4	Find equation of straight line, under given conditions.



IV. Course Contents with Specification Table

SECTION - I							
Unit & Sub - Unit	Topics/Sub-topics	Hours	Marks	C OS	R Level	U Level	A Level
1	<b>Determinants</b>	05	07	1	40%	40%	20%
	Determinants of order two and three. Properties of determinants Cramer's rule.						
2	<b>Matrices</b>	07	10	1	40%	40%	20%
2.1	Transpose of a matrix, identity matrix						
2.2	Addition and subtraction of matrices, multiplication of matrices						
2.3	Adjoint of a matrix, inverse of a matrix using adjoint.						
2.4	Solution of simultaneous linear equations by adjoint method (containing two unknowns)						
3	<b>Straight Lines</b>	03	06	4	40%	40%	20%
3.1	Equations of straight lines in different forms: Two points form, slope y-intercept form, angle point form.						
3.2	Angle between two straight lines.						
4	<b>Function</b>	06	06	3	40%	40%	20%
4.1	Definition of function.						
4.2	Logarithms and properties, composite functions.						
4.3	Simple problems based on function						
5	<b>Limits</b>	04	06	3	40%	40%	20%
5.1	Concept of limit of a function. Theorems on limits (Without proof)						
5.2	Limits of algebraic functions.						



5.3	Standard limits: $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ , simple problems						
6	<b>Indian Knowledge System</b>						
	Information about Ancient Indian Mathematicians	06					
<b>SECTION – II</b>							
Unit & Sub Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
7	<b>Trigonometry</b>	15	20	2	40%	40%	20%
7.1	Circular measure, Conversion from degrees to radians and radians to degrees.						
7.2	Trigonometric ratios of angles in 4 quadrants. Trigonometric identities, Trigonometric ratios of negative angles						
7.3	Compound angle formulae.						
7.4	Allied angle formulae.						
7.5	Factorization and de-factorization formulae.						
7.6	Multiple, submultiples angle formulae.						
7.7	Inverse trigonometric functions, definition, simple problems						
8	<b>Derivatives</b>	9	15	3	40%	40%	20%
8.1	First principle, geometrical interpretation						
8.2	Derivatives of standard functions						
8.3	Theorems of derivatives. Simple problems						
8.4	Derivative of composite function. (Chain rule).						
8.5	Derivative of implicit function, parametric function.						
<b>Legends:</b> R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).							



V. List of Assignments/Tutorials:

Sr. No.	Tutorials	Approx. Hours	CO
1	Determinants	2	1
2	Matrices	2	1
3	Circular Measures, Trigonometric ratios and identities	2	2
4	Compound, allied angles formulae, factorization, de-factorization formulae	2	2
5	Multiple, submultiple formulae	2	2
6	Inverse trigonometric functions	2	2
7	Functions	2	3
8	Limit	2	3
9	Derivatives	2	3
10	Straight lines	2	4

VI. Assessments Methodologies /Tools

Formative assessment (Assessment for Learning)

- Tutorials
- Mid Semester Test
- Self-learning
- Term Work

Summative Assessment (Assessment of Learning)

- End Term Exam

VII. Suggested Self Learning Assignments/Micro project/Activities

- Activities to help students remember formulae. Two tests based directly only on formulae.
- Find applications in engineering where one or more above concepts are used.



VIII. Reference Books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	B. M. Patel, J. M. Rawal	Applied Mathematics	Nirali Prakashan
2	S. P. Deshpande	Mathematics for Polytechnic	Pune Vidyarthi Griha Prakashan.
3	Deepak Singh	Mathematics-I	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-42-4
4	Garima Singh	Mathematics-II	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-52-3

IX. Suggested Cos-Po Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	2	1	1	1	-	-	1	1	1	-	-
CO2	2	1	1	1	-	-	1	1	1	-	-
CO3	2	1	1	1	-	-	1	1	1	-	-
CO4	2	1	1	1	-	-	1	1	1	-	-

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



1 DCE R23, VJTI  
BOS approved dated 01/08/2023

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: PHYSICS
COURSE CODE	: 231PH12

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME												
C	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
							Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	1	3	3	30	70	28	100	40	25	10	25@	10	25	10	150

@ Internal Assessment

### II. Rationale

Physics is a foundation of any engineering discipline. Its principles, laws, rules, results and conclusions drawn from observations and predictions of various phenomena occurring in nature; play important role in solving field problems in engineering and technology.

Though the span of physics is from quark to galaxy or particle physics to astrophysics; here certain topics are carefully selected for particular discipline. These topics will provide sufficient fundamental as well as background knowledge for the particular branch. Proper attention is given to the selection of sub-topics and their depth so that student will be able to cope up with innovations and new technologies in his field.

Various phenomena, principles, laws, rules discovered and invented by physics are used for industrial, engineering and technological applications. The overall growth of various engineering disciplines, namely, mechanical, electrical, electronics, civil, environmental and so on depends upon the development of physics and its detail understanding.



### III. Course Outcomes (Cos)

Students will be able to achieve the following COS on completion of course based learning

CO1	Use various system for measurements and apply the knowledge to handle measuring instruments.
CO2	Understand properties of matter like elasticity, surface tension along with relevant formulae, applications and problem solving based on it.
CO3	Understand concepts used in various phenomenon of optics, such as wave theory of light and diffraction along with their applications and problem based on it.
CO4	Understand principles of heat, thermodynamics and apply it to solve the problems based on it.
CO5	Understand concepts, laws and rules used in static and current electricity and apply it to solve the problems based on it.
CO6	Understand concepts of modern physics used in x-rays and photoelectric effect with their applications and problem based on it.

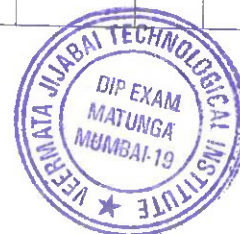
### IV. Course Contents with Specification Table

SECTION - I							
Unit & Sub Unit	Topics/Sub-topics	Hours	Marks	C OS	R Level	U Level	A Level
1	Measurements	07	10	1	40%	40%	20%
1.1	Need of measurements, requirements of standard unit, CGS, MKS, FPS and SI systems, fundamental and derived quantities/units, dimensions and dimensional analysis, problems						
1.2	Vernier caliper, screw gauge, spherometer. Least counts and range of voltmeter, ammeter and thermometer.						
1.3	Physics in Indian Knowledge System (IKS) - Bhaskaracharya (Theory of gravity, Surya siddhanta & Sidhanta shriomani), Lilavati (Gurutvakashan Shakti).						
2	Properties of matter	10	15	2	40%	40%	20%

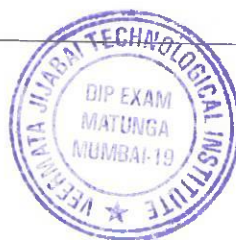




2.1	Elasticity- elasticity, plasticity, Hooke's law, Young's, Bulk and rigidity modulus, problems, relation between them, Searle's method of determination of Y, ultimate and breaking stress, factor of safety, wire under continuously increasing load.						
2.2	Surface tension - cohesive and adhesive forces, sphere of influence, molecular theory of surface tension, angle of contact, capillarity (formula with derivation), problems						
3	<b>Optics</b>	07	10	3	40%	40%	20%
3.1	Wave theory - wave front, wave normal, laws of reflection and refraction, problems, Huygens's principle, total internal reflection, Snell's law.						
3.2	Diffraction – definition, types of diffraction, single slit diffraction pattern, diffraction grating, Grating element, grating formula, Problems, determination of wavelength of light.						
<b>SECTION - II</b>							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
4	<b>Heat and thermodynamics</b>	10	15	4	40%	40%	20%
4.1	Gas laws - Boyle's law, Charle's law, Gay- Lussac's law, absolute zero, Kelvin scale, work done at constant pressure, Cp, Cv and Mayer's relation (only formula), problems, isothermal, adiabatic, isobaric and isochoric processes.						
4.2	Expansion and transmission of heat-coefficients of linear, areal and						



	cubical expansion, modes of transmission of heat, laws of thermal conductivity, coefficient of thermal conductivity, Lee's and Searle's methods, First law of thermodynamics, problems.						
<b>5</b>	<b>Static and Current electricity</b>	<b>7</b>	<b>10</b>	<b>5</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
<b>5.1</b>	Static Electricity – Coulomb's law, One coulomb, Electric field, Electric Potential, Capacitor and problems						
<b>5.2</b>	Electrochemical corrosion, mechanism of electrochemical corrosion, types of electrochemical corrosion: galvanic corrosion and concentration cell corrosion,						
<b>5.3</b>	Current Electricity- Ohm's law, one ohm, resistivity, conductivity, series and parallel combination of resistors, problems, Wheatstone bridge, Joules law						
<b>6</b>	<b>Modern Physics</b>	<b>7</b>	<b>10</b>	<b>6</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
<b>6.1</b>	X-rays - Coolidge X-ray tube, continuous characteristic and X-rays, problems, properties and applications, Moseley's law.						
<b>6.2</b>	Photoelectric effect - Planck's theory of radiation, Einstein's photoelectric equation, problems, photocells - photo-emissive, photovoltaic and photoconductive (construction, working and applications)						
<b>Legends:</b> R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).							



**V. List of Practical/Assignments/Tutorials:**

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COS
1	Use of Vernier caliper and observations with Travelling microscope	2	1
2	Use of micrometer screw gauge	2	1
3	Determination of surface tension of a liquid using capillary action	2	2
4	To find wavelength of laser light using diffraction grating	2	3
5	To find the refractive index of given glass using Snell's law	2	3
6	Determination of grating element	2	3
7	To find coefficient of Thermal conductivity of a good conductor by Searl's method	2	4
8	To find coefficient of Thermal conductivity of a bad conductor by Lee's method	2	4
9	To verify Ohm's law	2	5
10	Use of Meter Bridge	2	5

**VI. Suggested Self Learning Assignments / Micro project / Activities**

**Assignments (if any)**

- Convert the units of a given physical quantity from one system of units to another.
- Measure room temperature of hot baths / bodies by using mercury thermometer and convert it into different unit systems.
- Enlist information like band gap, material used, and dimension about different semiconductor device.
- Give details about the explanation of concept like electrostatics, magnetic domain, and current.
- Applications of optical fibers in civil, mechanical, electrical engineering etc.

**Micro Project (if any)**

- Conductivity: Collect different materials such as metal, plastics, glass etc. and prepare chart of their conductivity.



- Vernier Calipers: Prepare prototype Vernier caliper of desired least count using card sheet.
- LDR: Use Light dependent resistor for measuring the intensity of light.

#### VII. Assessments Methodologies /Tools

Formative Assessment (Assessment of Learning)

- Mid semester test
- Timely practical journal completion
- Performance in Practicals

Summative Assessment (Assessment of Learning)

- End Term Exam
- Practical exam

#### VIII. Suggested Learning Materials Textbooks/Reference Books/Websites

Sr. No	Author	Title	Publisher
1	--	XI <sup>th</sup> standard physics book	HSC Board, M.S. / NCERT
2	--	XII <sup>th</sup> standard physics book	HSC Board, M.S. I NCERT
3	Halliday D., Resnik R. and Walker	Fundament ls of physics extended	Wiley India, New Delhi, 8 <sup>th</sup> edition
4	Serway RA and Jewett JW	Physics for scientists and Engineers	Cengage learning, New Delhi, 6 <sup>th</sup> edition
5	Verma H C	Concepts of Physics - Part I and II	Bharti Bhavan, New Delhi



IX. Suggested Cos-Po Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	3	2	1	1	-	-	2	2	-	-	-
CO2	3	2	1	1	-	-	1	2	-	-	-
CO3	3	2	1	1	-	-	1	1	-	-	-
CO4	3	2	1	1	-	-	1	2	-	-	-
CO5	3	2	1	1	-	-	1	1	-	-	-
CO6	3	2	1	1	-	-	1	1	-	-	-

Legends: - High:03, Medium:02, Low:01, No Mapping:

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: COMMUNICATION SKILLS
COURSE CODE	: 231HM13

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
											Max	Min	Max	Min	Max	Min	
3	-	2	1	3	3	30	70	28	100	40	25	10	-	-	25	10	150

### II. Rationale

Cultivating Reading, Writing, Listening, and Speaking skills in students by giving exposure to good language, enhancing the power of expression through vocabulary exercises, improving skills of composition, promoting coherence in thinking, assimilating and reproducing ideas, and enabling the students to formulate grammatically correct sentences there by developing their ability to communicate effectively in industry, professional fields, in academic and social circles. Developing life skills by enhancing communication skills. Students will get exposure to leadership qualities (problem-solving attitude) by participating in different curriculum activities. All these will enhance their confidence and build good language. Making students proficient in oral skills through various activities that will enable them to perform efficiently during interviews, meetings, seminars, conferences, group discussions, and negotiations. Thus, developing a problem-solving attitude among students by synergizing their Emotional quotients with their Intellectual quotient through various activities will also provide exposure to learn and groom their soft skills. Giving exposure to self-learning by providing enough materials through the language laboratory's ETNL software and Open-source software.



- a) In order to develop the writing abilities of students, some textbooks that give exposure to language have been introduced.
- b) The tutorials have been incorporated to provide practice to the student develop writing skills.
- c) Vocabulary exercises are given to enhance word power while writing.
- d) Grammar topics are taught by giving sufficient practice material to help them formulate grammatically correct sentences.
- e) Idioms, phrases, and proverbs, Quotations are introduced in order to acquire fluency and richness to their language while expressing ideas through writing.

### III. Course Outcomes (Cos)

Students will be able to achieve the following COS on completion of course based learning

CO1	Acquiring the ability to formulate grammatically correct sentences
CO2	Improving the power of expression in written communication
CO3	Developing coherence in thinking, comprehending, and expressing one's ideas in one's own language

### IV. Course Contents with Specification Table

SECTION - I							
Unit & Sub - Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
1	Emnating Voices- textbook1	06	10	3	30%	50%	20%
1.1	The Mother of a Traitor- Maxim Gorky						
1.2	Speeches at the World's Parliament of Religions- Swami Vivekananda						
1.3	Appro JRD -Sudha Murthy						
2	Igniting Minds- textbook II	04	08	3	40%	40%	20%
2.1	What Teenagers Need to Know about Cyber security? - Sanjay Goyal						
2.2	India What can it teach us? -Max Muller						



3	Written and spoken communication in English	14	17	1	40%	40%	20%
3.1	<ul style="list-style-type: none"> <li>English in use</li> <li>English for routine communicative function</li> <li>English in common interactive situations</li> <li>Speech in practice</li> <li>Paragraph writing</li> <li>Essay writing</li> <li>Application letters as per the Industrial situation</li> <li>Critical Analysis</li> <li>PowerPoint presentation based on texts as well as drawing parallels from industry</li> </ul>						
3.2	<p>Grammar and sentence formation</p> <ul style="list-style-type: none"> <li>Use of technical vocabulary</li> <li>Verbs kinds and Uses</li> <li>Tenses kinds and uses</li> <li>Subject-verb agreement</li> <li>Active passive voice</li> <li>Prepositions</li> <li>Types of sentences</li> </ul>						
<b>SECTION - II</b>							
4	Short Composition	18	25	1,2	30%	50%	20%
4.1	<ul style="list-style-type: none"> <li>Paragraph writing</li> <li>Coherence</li> <li>Correct grammar</li> <li>Good vocabulary</li> <li>Creative Writing</li> <li>Proper structure</li> </ul>						





	<ul style="list-style-type: none"> <li>• Description of an object or a product or a situation-use of technical words</li> <li>• Development of ideas</li> <li>• developing a story/ poetry/ paragraph</li> </ul>						
4.2	<b>Comprehension passage</b> a) Summarization of passages in own words. (Newspaper articles, general articles etc.) b) Identifying the theme of the passage precisely and enumerating the sub points						
4.3	<b>Vocabulary Building</b> a) Synonyms b) Antonyms c) Homophones d) One-word substitute e) Homonyms						
5	<b>Application of Grammar</b>	3	5	1	40%	40%	20%
	a) Correction of common errors in English b) Tenses c) Verbs d) Sentence structure e) Email Etiquette –drafting technique f) Leave applications g) grievance letter (campus situations) h) Use of the famous quotations						
6	<b>Use of refined language</b>	3	5	2	40%	40%	20%
	a) Idioms b) Proverbs c) Phrases d) Quotations						
<b>Legends:</b> R- Remember, U – Understand, A – Apply and above levels (Blooms’ Revised Taxonomy).							



**V. List of Practical/Assignments/Tutorials:**

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COS
1	Synonyms & Antonyms	2	2
2	Homophones & Homonyms	2	2
3	Subject Verb Agreement	2	2
4	One Word Substitutes	2	2
5	Official letters/Application as per Industry situations	2	2
6	Phrasal verbs	2	2
7	Phonetics- a) Voice Modulation b) Intonation- rise and fall of pitch	2	2
8	Idioms	2	3
9	Email Etiquette	2	3
10	Proverbs	2	2
11	Sentence structure	2	3
12	Correction of Errors (grammatical)	2	1

**VI. Assessments Methodologies /Tools**

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

**Assignments (if any)**

- Journal Writing/ Maintain a fortnight dairy entry and write the same on the assignment sheets
- Write a blog/post an article and write the same on an assignment sheet

**Micro Project (if any)**

Summative Assessment (Assessment of Learning)



- End Term Exam
- Tutorial Performance

#### VII. Suggested Learning Materials Textbooks/Reference Books/Websites

Sr. No	Author	Title	Publisher
1	Board of Editors – Ajiet Ravikant Jachak, Neehal Shikh & Sawan Dharmapuriwar	Emanating Voices (Book I)	Orient Black Swan, First edition, 2019
2	Board of Editors – Indrajeet K Orke, Dr. Madhukar Rao Wasnik. P.W.S, Maroti Wagh, Veena Ilame, Manushree Sardeshpande, Narayan Mehare, Subhashree Mukherjee	Igniting Minds (Book II)	Orient Black Swan, First edition, 2021

#### VIII. Learning Websites & Portals

Sr. No.	Link	Description
1	<a href="https://www.britishcouncil.in/english/learn-online">https://www.britishcouncil.in/english/learn-online</a>	The website link is given to refer to Unit 1
2	Vocabulary.com	Refer to this website for interactive vocabulary quizzes, word lists
3	International Phonetic Association (IPA) Website	It offers audio examples and charts to help understand and transcribe sounds
4	<a href="http://grammarly.com/blog">grammarly.com/blog</a>	For constructing effective paragraphs and improving clarity
5	<a href="http://www.newagegolden.com">www.newagegolden.com</a>	Refer to this website for speech writing, diary entry, and paragraph writing



## IX. Suggested Cos-Po Matrix Form

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

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: CONSTRUCTION MATERIALS
COURSE CODE	: 231CE14

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME													
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA			
											Max	Min	Max	Min	Max	Min	Max	
3	-	2	1	3	3	30	70	28	100	40	25	10	-	-	25	10	150	

### II. Rationale

This course is intended to teach the students various construction materials, properties, testing, manufacturing methods and their suitability.

### III. Course Outcomes (Cos)

Student should be able to

CO1	State the sources, composition & properties of vast variety of construction materials.
CO2	Compare different construction materials.
CO3	Identify selection, testing, storing & use of various materials in civil engineering project.
CO4	Know the manufacturing methods of different construction materials.
CO5	Know field tests for assessing required quality of construction materials.



IV. Course Contents with Specification Table

SECTION - I							
Unit & Sub - Unit	Topics/Sub-topics	Hours	Marks	C OS	R Level	U Level	A Level
1	<b>Introduction</b>	06	08	1,3	40%	40%	20%
1.1	Building Materials: Physical and mechanical properties.						
1.2	Building Stones: Origin, Uses of stones, Characteristics of good Building stone, Properties and Testing of stone, Quarrying & Dressing of stones, Selection of stones, Common building stones, Application of stones						
2	<b>Aggregate &amp; Lime</b>	04	10	1,3	30%	50%	20%
2.1	Aggregate: Classification of Aggregates, Properties and Uses						
2.2	Lime: Sources, Properties, Classification, Slacking of Lime, Storage of Lime.						
3	<b>Brick and Cement</b>	10	12	2,4,5	30%	50%	20%
3.1	Brick: Manufacturing, Classification, Characteristics of good brick, Conventional size in practice & standard IS size, Field Tests on Bricks, Bricks used on site – Fly Ash bricks & Concrete Blocks- Lightweight autoclaved aerated concrete blocks.						
3.2	Cement: Manufacturing – Dry Process & its flow chart, Chemical constituent of cement, Properties, Field Testing of cement, Storage of cement						



4	<b>Paints and Varnishes</b>	04	05	1,3	40%	40%	20%
4.1	Paint: Definition, Characteristics of an ideal paint, Various types of Paints- Aluminum Paint, Cement Paint, Enamel Paint, Anti-Corrosive Paint, Oil Paint, Emulsion Paint and Plastic Paint.						
4.2	Distemper: Types and uses.						
4.3	Varnishes: Types and uses.						

SECTION – II							
5	<b>Ferrous &amp; Non-Ferrous Metals</b>	04	08	2,3	40%	40%	20%
5.1	<b>Ferrous Metals:</b> Introduction to Iron, Pig iron, Wrought Iron, Cast Iron. Rusting and Corrosion.						
5.2	<b>Non-Ferrous Metals:</b> Properties, uses of Aluminum, Copper, zinc, Lead, Nickel, Tin.						
6	<b>Wood and Wood based products</b>	08	10	3,5	40%	40%	20%
6.1	<b>Timber:</b> Use of timber in different parts of the building, Characteristics of good timber, Seasoning of timber, Defects in Timber.						
6.2	<b>Wood based products:</b> Veneers, Plywood, Fibre Board, Particle board, and Block board, Batten Board and Lamin Board, Application of wood-based products.						
6.3	<b>Bamboo and Ballis:</b> Properties and uses of Bamboos and Ballis.						
7	<b>Glass and Plastics</b>	04	06	2,3	40%	40%	20%
7.1	<b>Glass:</b> Classification, commercial forms and uses.						
7.2	<b>Plastic:</b> Types of plastics, Application of plastics						



8	Pozzolanas	05	08	1,3	30%	50%	20%
8.1	<b>Introduction:</b> Definition, Introduction, Classification, Activity of Pozzolanas.						
8.2	<b>Various Pozzolanas:</b> Fly ash, Ground blast furnace slag, Silica Fume, Rice Husk ash.						
9	<b>Smart and Composite Materials</b>	03	03	1,3	40%	40%	20%
	Definition of smart and composite materials, properties, examples and uses.						

**Legends:** R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).

#### V. List of Practical/Assignments/Tutorials

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	RelevantCOS
1	Introduction of various construction materials e.g. stones, bricks, cement, aggregates, bitumen etc.	4	1,3
2	Shape and size test of brick	2	2,4,5
3	Field tests on bricks	4	3,5
4	Determination of water absorption of brick	4	2,4,5
5	Field tests on cement	2	5
6	Study of composite materials and ecofriendly construction materials a) Different types of reinforcing bars b) Bamboo and Ballies	2	1,3
7	Study of wood-based products a) Veneers b) Plywood c) Fiber Board d) Particle board e) Block board	4	1,3,4
8	a) Study of various types of doors and windows based on materials available in market. b) Study of MDF and HDF doors.	4	1,3
9	Assignment on Paint and Varnishes	4	1,3
10	Assignment on Glass and Plastics	2	2,3

\* Minimum 8 and maximum 10 practical's /assignments / tutorials sessions to be included in a course term work in a semester for continuous assessment (CA)



## VI. Suggested Self Learning Assignments/Micro project/Activities

Sr. No.	Unit	Micro-Projects	Approx. Hours	CO
1	II, III, V, VII, VIII, IX	Visit to Construction Material shops for availability of different construction materials in the market. Prepare list of the materials, their rates and other details	4	1,3
2	VI	Visit to different plywood dealers' shop for availability of different types of wood-based products in the market. Prepare list of the materials, their rates and other details	2	1,3
3	IV	Collect the information of variety of paints available in the market. Prepare its list and rates.	2	1,3
4	II	Visit to a factory manufacturing M sand	2	1,3,5
5	II, III, IV, V, VI, VII, VIII, IX	Visit to any residential building site to study/observe quality control of construction materials	4	1,2,3,4,5
6		Develop power point presentation OR animation based on above list of 5	2	1,2,3,4,5

## VII. Assessments Methodologies /Tools

Formative assessment (Assessment for Learning)

- Tutorials
- Mid Semester Test
- Self-learning
- Term Work

Summative Assessment (Assessment of Learning)

- End Term Exam

## VIII. Suggested Learning Materials Textbooks/Reference Books/Websites

Sr. No	Author	Title	Publisher
1	R.K. Rajput.	Engineering Materials	S Chand & Company Ltd, New delhi-110055
2	S.C. Rangwala	Engineering Materials	Charotar publishing house private Ltd, Anand 38801, Gujarat India.
3	S.K. Duggal	Building Materials	New Age International (P) Ltd, New Delhi 110002.
4	IS Codes		Bureau of Indian Standards for various construction materials



### IX. Suggested Cos-Po Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	3	2	2	2	1	1	1	2	1	3	2
CO2	3	2	3	2	1	0	1	2	1	3	1
CO3	3	2	3	2	1	1	1	3	1	3	2
CO4	3	2	2	2	1	0	1	2	1	2	1
CO5	2	2	3	2	2	2	1	3	2	3	2

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: ENGINEERING DRAWING
COURSE CODE	: 231CE15

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME													
CL	TL	LL	Self learning	CR	PAPER HRS	FA-TH (MST)	SA-TH(ESE)			TOTAL		Based on LL & TL Practical				Based on Self learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA			
						Max					Min	Max	Min	Max	Min	Max	Min	
2	-	4	-	3	-	-	-	-	-	-	-	75	30	50#	20	-	125	

#: assessment by External Examiner

### II. Rational

Civil Engineering Diploma holder has to supervise various construction processes and execute civil engineering structures such as buildings, roads, railways, dams, bridges; etc. He has to convert design parameters, process details into pictorial views. Therefore, he is required to understand and prepare the drawings, interpreted it so that he can execute the works smoothly. Drawing helps in detailing the structures processes with quality parameter and is essential for drafting specifications and tender documents. The knowledge of this subject is useful for building construction, estimation and costing, design of structure, surveying, projects etc.

### III. Course Outcomes (Cos)

Student should be able to

CO1	Understand geometry of shapes, drawing conventions, definitions and drawing procedures.
CO2	Use of drawing conventions, shapes of solid objects in three dimensions and draws their different views.
CO3	Read, interpret and draw the drawings with internal details of solid objects from given views.



IV. Course Contents with Specification Table (Theory to be covered for practical purpose) :

SECTION - I							
Unit & Sub - Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
1	<b>Introduction</b>	04	16	1,3	30%	50%	20%
1.1	Importance of Engineering Drawing, Drawing instruments and materials						
1.2	Scales, Recommended, reduced and enlarged scale.						
1.3	B.I.S. and ISO Conventions, First angle and third angle projection method.						
1.4	Requirement of good drawing. Different types of drawing. Selection of Pencils.						
1.5	Drawing sheets, different sheet sizes and standard layouts. Title block as per I.S. specification.						
1.6	Care and maintenance of drawing material.						
2	<b>Lettering, Numbering and Dimensioning</b>	6	10	1,2	30%	30%	40%
2.1	Importance of lettering. Different types of lettering as per I. S. code. Capital and small letters of vertical and slanting type as per I. S. code.						
2.2	Drawing of plain and diagonal scales and dimensioning practice.						
3	<b>Convention of Lines &amp; Engineering Curves</b>	6	14	1	20%	30%	50%
3.1	Lines, Types of lines, Selection of line thickness.						
3.2	Making of Centre Line, Section Line, Dimensioning Lines, etc. Draw different						



	types of line work used in submission drawing.						
3.3	Checklist for different component of structure						
3.4	Classification of engineering curves, construction of conics, cycloidal curves, Involutives and spirals its applications						

SECTION - II							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
4	<b>Orthographic Projections</b>	06	12	3	40%	30%	30%
4.1	<b>Projections of Points &amp; Straight Lines</b> Reference Planes of projections – HP, VP & PP, Orthographic Projections of Points, Projections of Straight Lines with lines inclined to both the reference planes. (Lines to be considered in first quadrant only. Simple problems excluding HT & VT of a line)						
5	<b>Isometric Projections</b>	06	16	3	20%	40%	40%
5.1	Terminology and isometric scale						
5.2	Plan, Elevation, section and isometric view of structure						
6	<b>Introduction to Civil Engineering Drawing</b>	04	12	1 & 3	30%	30%	40%
	Symbols, Letters & Numbers - Symbols of different materials used in construction, building components.						

**Legends:** R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).



## V. List Of Practicals/Assignments/Tutorials

Sr. No.	Name of the Topic	Hrs.	CO
1	Drawing Book Work- Scales, Different types of drawing, Title block as per I.S. specification, Terminology and isometric scale, Symbols of different materials used in construction	16	1&3
2	Three sheets on problems from geometrical constructions, lettering & types of lines	12	1
3	Two Sheets on the topic of Engineering Curves.	12	1
4	Two Sheets on Orthographic Projections of Points	12	2
5	Two Sheets on isometric views of construction members.	8	2
6	Reading of working drawings of residential buildings	4	3

Note - The students should workout the problems on the following topics preferably on quarter imperial drawing sheets during the practical.

## VI. Assessments Methodologies /Tools

Formative Assessment (Assessment of Learning)

- Timely practical drawing sheet completion

Summative Assessment (Assessment of Learning)

- Practical exam

## VII. Suggested Learning Materials Textbooks/Reference Books/Websites

Sr. No.	Author	Title	Publisher and Edition
1	R.K. Dhawan	Engineering Drawing	S. Chand & Co.Ltd.
2	N.D. Bhatt	Engineering Drawing	Charotar Publishers
3	S.T. Ghan, M.V. Rawalani	Engineering Drawing	Nirali Publications, Edition -2014/1
4	D.A.Jolhe	Engineering Drawing	TATA McGraw Hill- 2008
5	K.R.Mohan	Engineering Graphics	Dhanpatrai Publishing Co.
6	National Building Code of India, BIS		Edition 2002, publisher- BIS.



### VIII. Suggested Cos-Po Matrix Form

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

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: COMPUTER APPLICATIONS
COURSE CODE	: 231CE16

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME															
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL				Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA				
												Max	Min	Max	Min	Max	Min			
-	-	4	2	3	-	-	-	-	-	-	-	25	10	25@	10	25	10	75		

@ Assessment by Internal Examiner

### II. Rationale

The student will able to

- Understand the components of computer system.
- Use of Microsoft office.
- Format data & sheet structure using formula & functions.
- Data manipulations.
- Present any topic by using power point.

### III. Course Outcomes (Cos)

Students will be able to achieve the following COS on completion of course

CO1	Able to identify and define the components of computer system.
CO2	Able to use word software to prepare report.
CO3	Able to prepare power point presentation effectively.
CO4	Able to prepare excel worksheets for basic data interpretation by using formulae and functions.





**IV. List of Practical/Assignments/Tutorials:**

Sr. No.	Tutorial Exercise	Hours	CO
1	Practice session for Word software	4	CO2
2	Basic knowledge of computer hardware & operating systems.	3	CO1
3	Study of different Office tool bars.	3	CO2
4	Entering / Editing in Excel: Solve any problem based on formatting the cell content, setting the alignment & setting the number of decimal places. Preparation of mark sheet & result analysis.	6	CO4
5	Formatting Data & sheet Structure: Solve any problem based on conditional formatting.	2	CO4
6	Data manipulations: Problem based on data sorting using filter option	4	CO4
7	Problem based on what if analysis using scenario option	2	CO4
8	Create chart for population, rainfall, marks obtained, profit & loss etc. by using Line chart, Bar chart, Pie chart, XY Scatter chart	4	CO2, CO4
9	Preparation of presentation using power point (5-8 slides) based on any topic. Students shall also learn to insert videos, jumping slides to improve presentation.	4	CO3
<b>TOTAL</b>		<b>32</b>	

**V. Assessments Methodologies /Tools**

Formative assessment (Assessment for Learning)

- Term Work

Summative Assessment (Assessment of Learning)

- Practical Exam by Internal Examiner

**VI. Reference Books and Websites:**

Sr. No	Author	Title	Publisher
1	Arun Soni	Simple dose of computers MS Excel 2000 Beginners	Navdeep
2	Arun Soni	Simple dose of computers MS Excel 2000 Advance Level	Navdeep.
3	Patt and Patel	Introduction to computing systems	Tata McGraw- Hill Publishing Company.



## VII. Suggested Cos-Po Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design / Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	1	2	1	-	-	-	2	1	-	-	1
CO2	1	2	1	-	-	-	2	1	-	-	1
CO3	1	2	1	-	-	-	2	1	-	-	1
CO4	1	2	1	-	-	-	2	1	-	-	1

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

BOS approved dated 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIRST
COURSE TITLE	: YOGA AND STRESS MANAGEMENT
COURSE CODE	: 231CE17

### I. Teaching, Learning and Examination Scheme:

TEACHING SCHEME					EXAMINATION SCHEME											TOTAL MARKS	
CL	TL	LL	Self learning	CR	PAPER HRS	FA-TH (MST)	SA-TH(ESE)		TOTAL		Based on LL & TL Practical				Based on Self learning		
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA		
											Max	Min	Max	Min	Max		Min
-	-	1	1	1	-	-	-	-	-	-	25	10	-	-	25	10	50

### II. Rationale

- Diploma Graduate needs a sound body and mind to face the challenging situations in career as employee or as an entrepreneur.
- Yoga and Meditation brings about the holistic development of an individual and equips with necessary balance to handle the challenges.
- Yoga inculcates discipline in all walks of the life of student. Pranayama practice regulates breathing practices of the student to improve stamina, resilience. Meditation empowers a student to focus and keep calm to get peace of mind.
- This course for Diploma students is designed for the overall wellbeing of the student and aims to empower students to adopt and practice "Yoga" in daily life.

### III. Course Outcomes (Cos)

Students will be able to achieve the following COS on completion of course

CO1	Practice basic Yoga and Pranayama in daily life to maintain physical and mental fitness.
CO2	Practice meditation regularly for improving concentration and better handling of stress and anxiety.
CO3	Follow healthy diet and hygienic practices for maintaining good health.



IV. Course Contents with Specification Table:

SECTION - I							
Unit & Sub - Unit	Topics/Sub-topics	Hours	Marks	C O	R Level	U Level	A Level
1	<b>Introduction to Yoga</b>	04	-	1,2,3	40%	40%	20%
	Perform warming up exercises to prepare the body from head to toe for Yoga. Practice Surya Namaskar: Perform all the postures of Surya Namaskar one by one in a very slow pace, after warm up.						
2	<b>Practice basic Asanas</b>	04	-	1,2,3	30%	30%	40%
	Perform: Sarvangasna, Halasana, Kandharasana (setubandhasana), Perform Bhujangasana, Naukasana, Mandukasana. Other asanas guided by expert						
SECTION - II							
3	<b>Practice basic pranayama</b>	04	-	1,2,3	30%	30%	40%
	Perform Bhastrika, Anuloma Villoma Pranayama Kriya, Practice Kapalbhati Pranayama Kriya						
4	<b>Practice meditation</b>	04	-	1,2,3	30%	30%	40%
	Perform sitting in Dhyam Mudra and meditating. Start with five minute and slowly increasing to higher durations. (Trainer will explain the benefits of Meditation before practice)						
<b>Legends:</b> R- Remember, U – Understand, A – Apply and above levels (Bloom’s Revised Taxonomy).							




V. Reference Books and Websites:

Sr. No	Author	Title	Publisher
1	Swami Vivekananda	Patanjali's Yoga Sutras	Fingerprint Publishing (2023) Prakash Books India Pvt Ltd, New Delhi
2	Luisa Ray, Angus Sutherland	Yoga for Every Body: A beginner's guide to the practice of yoga postures, breathing exercises and me	Vital Life Books (2022)

VI. Suggested Cos-Po Matrix Form

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

Legends: - High:03, Medium:02, Low:01, No Mapping: -

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma

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