

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Civil/Electrical/EEE/Mining & Mine Surveying (Group-IA)

Semester - I

Scheme of Studies:

S. No	Board of Study	Course Code	Course Titles	Scheme of Studies (Hours/Week)			
				L	P	T	Credit $L+(P+T)/2$
1	Humanities	2000151 (046)	Communication Skills-I	3		1	4
2	Applied Science	2000152 (014)	Applied Maths-I	3		1	4
3	Mechanical Engineering	2000153 (037)	Applied Mechanics	3		1	4
4	Civil Engineering	2000154 (020)	Environmental Engineering & Sustainable Development	3		1	4
5	Computer Science and Engineering	2000155 (022)	Computer Fundamentals & Applications	1		2	2
6	Mechanical Engineering	2000156 (037)	WorkShop Practice (Theory)	1			1
7	Mechanical Engineering	2000161 (037)	Applied Mechanics Lab		3		2
8	Computer Science and Engineering	2000162 (022)	Computer Fundamentals & Applications Lab		6		3
9	Mechanical Engineering	2000163 (037)	WorkShop Practice (Practical)		6		3
10	Humanities	2000164 (046)	Seminar & Technical Presentation Skill Part -I		1		1
Total				14	16	6	28

L - Lecture, T - Tutorial, P - Practical,

Legend:- Lecture (L) --> CI : Classroom Instruction (Includes different instructional strategies i.e. Lecture and others).

Practical (P) --> LI : Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies.

Tutorial (T) --> SL : Self Learning.

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Scheme of Examination:

S. No	Board of Study	Course Code	Course Titles	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Humanities	2000151 (046)	Communication Skills-I	100	20	30			150
2	Applied Science	2000152 (014)	Applied Maths-I	100	20	30			150
3	Mechanical Engineering	2000153 (037)	Applied Mechanics	100	20	30			150
4	Civil Engineering	2000154 (020)	Environmental Engineering & Sustainable Development	100	20	30			150
5	Computer Science and Engineering	2000155 (022)	Computer Fundamentals & Applications	50	20	30			100
6	Mechanical Engineering	2000156 (037)	WorkShop Practice (Theory)			30			30
7	Mechanical Engineering	2000161 (037)	Applied Mechanics Lab				50	20	70
8	Computer Science and Engineering	2000162 (022)	Computer Fundamentals & Applications Lab				100	20	120
9	Mechanical Engineering	2000163 (037)	WorkShop Practice (Practical)				50	20	70
10	Humanities	2000164 (046)	Seminar & Technical Presentation Skill Part -I					10	10
Total				450	100	180	200	70	1000

ESE : End of Semester Exam, CT: Class Test, TA: Teachers Assessment

Legend :- PRA :Process Assessment, PDA : Product Assessment.

Note: i) TA in Theory includes Sessional work (SW) and Attendance (ATT) with weightage of 70% and 30% of total respectively.

ii) TA in Practical includes performance of PRA, PDA and Viva-Voce with weightage of 50%, 40% and 10% of total respectively.

iii) 85% attendance is essential in theory & Practical classes appear in examination.

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- A) Course Code : 2000151 (046)
B) Course Title : Communication Skills - I
C) Pre-requisite Course Code and Title :
D) Rationale :

Communication Skills in English is one of the core skills to be developed in diploma holders as students exchange information and convey their ideas and opinions with different stakeholders. In recent years English has emerged as language of communication to exchange ideas, information and views amongst top and middle level management in organization/institution. It is the need of the day to be proficient in communication skills to perform effectively. Students in technical institutes need to be trained for this. The present curriculum focuses on the attainment of course outcomes related to speaking, reading, writing and listening, so that the students are confident, self-reliant and capable of communicating in varied situations.

Many industrial surveys have indicated that most of the pass outs from educational institutions are found to be lacking in soft skills especially in communication skills, thus adversely affecting their efficiency and effectiveness at work.

E) **Course Outcomes:**

CO-1 Use elementary grammar to form correct sentences while Speaking & Writing.

CO-2 (a) Demonstrate ability to read and interpret documents/news paper/reports with correct pronunciation, audibility & accent.

(b) Demonstrate effective speaking skills with clarity in an organized and professional manner.

(c) Listen and reproduce the same in the oral and written form.

CO-3 Provide response in written form related to prescribed short stories and passages.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credit L+(P+T)/2
1	Humanities	2000151 (046)	Communication Skills-I	3	-	1	4

Legend: L-Lecture, P-Practical, T-Tutorial

G) **Scheme of Assessment:**

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Humanities	2000151 (046)	Communication Skills-I	100	20	30	-	-	150

Legend: ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment

Note: Separate passing is must for End Semester Assessment.

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H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Use elementary grammar to form correct sentences while Speaking & Writing.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO1.1 Use proper determiners SO1.2 Use singular and plural verb forms. SO1.3 Use correct voice in sentences. SO1.4 Use appropriate auxiliaries SO1.5 Supply correct prepositions	LE1.1 Prepare grammatically correct sentences as per given instruction LE1.2 Speak on a given topic using grammatically correct sentences.	Unit-1.0 English Grammar 1.1 Determiners 1.2 Auxiliaries 1.3 Tenses 1.4 Active and Passive Voice 1.5 Prepositions 1.6 Subject-Verb Agreement 1.7 Rearrangement of Jumbled words	<ul style="list-style-type: none">One Word SubstitutionRearrangement of Jumbled words

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- Fill in the blanks, match the following, multiple choice question on the topic: Determiners, Auxiliaries, Tenses, Active and Passive Voice, Prepositions, Subject-verb Agreement, etc.

b. Mini Project:

- Express your views by writing an incidence using proper grammar.
- Select topic and share your views on the same with the audience. (2-3 min.)

c. Other Activities (Specify):

- Practice for speaking skills in front of mirror for self feedback.

- CO-2 (a) Demonstrate ability to read and interpret documents/news paper/reports with correct pronunciation, audibility & accent.
- (b) Demonstrate effective speaking skills with clarity in an organized and professional manner.
- (c) Listen and reproduce the same in the oral and written form.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Summarize the given contents of news papers/letters/reports/articles in oral and	LE2.1 Deliver extempore speech of short duration (2 minutes)	Unit-2.0 Effective Communication 2.1 Factors Affecting communication	Practice paralinguistic features

SO2.2 Communicate effectively using correct pronunciation, accent, modulation, intonation, pace, pitch, tone etc. during conversation, presentations, debates, mock interviews and viva -voce.	using appropriate verbal & non-verbal communication. LE2.2 Interpret & Communicate Aural instructions to others in Oral and Written Form.	Classroom Environment, Teaching Aids, Interruption, Miscommunication, Communication Gap 2.2 Seven Cs of Communication 2.3 Different Communication Skills: Listening, Speaking, Reading 2.4 Presentation skills - Clarity of objectives & logical sequencing of contents, Ethics in Presentation, Copyright, Oral Presentation 2.5 Listening skills- Learning to Listen, Qualities of a Good Listener, Purpose of Effective Listening, How to improve Listening	
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SW-2 Suggested Sessional Work (SW):

a. Assignments:

- Prepare a report on different factors affecting communication.
- Discuss various factors affecting Listening.
- List down the dos & don'ts to be taken care for attending a counseling

b. Mini Project

- Recorded Lecture, Presentation, Discourse from different channels like Peace of Mind/Astha, may be recorded and played in the class. Students are asked to listen and answer the questions

c. Other Activities (Specify):

- Group discussion on different topics can be arranged by the teacher like Skills Development & youth, PM Skill Development Mission, Importance of Soft Skills, Professional Ethics & Values, Being Human, Environmental Protection, Gender Bias, Improving Presentation Skills etc.

CO-3 Provide response in written form related to prescribed short stories and passages.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
<p>SO3.1 Express views in written and oral form after reading the stories</p> <p>SO3.2 Comprehend the passages.</p> <p>SO 3.3 Use appropriate verb forms in sentences.</p> <p>SO3.4 Exhibit the Procedure of summarizing</p>	<p>LE3.1 Interpret & Communicate aural instructions to others in oral and written form.</p> <p>LE3.2 Use dictionary, thesaurus and reference books as per requirement.</p>	<p>*SOs Reading and Writing skills will be developed through following content for CO2 as well</p> <p>Unit-3.0 Short Stories</p> <p>3.1 Selfish Giant-Oscar Wilde</p> <p>3.2 A Letter to God-Gregario Lapex Y-Fuentes</p> <p>3.3 An astrologer's Day –R.K. Narayan</p> <p>3.4 The last Leaf-O Henry</p> <p>Unit 4.0 Suggestive passages for Comprehension</p> <p>4.1 Language of Science</p> <p>4.2 Robotic Revolution</p> <p>4.3 Designing a Car</p> <p>4.4 New Wonders of Camera</p> <p>4.5 Non-conventional sources of Energy</p> <p>4.6 Our Environment</p> <p>4.7 Safety practices</p> <p>4.8 Entrepreneurship</p>	<ul style="list-style-type: none"> Summarize Short Stories and passages as mentioned in Class room Instruction

SW-3 Suggested Sessional Work (SW):

a. Assignments:

- Loud reading of given stories by each student in the class. Students will listen the story carefully and summarize with moral of the story.
- Answer briefly questions of the prescribed stories and chapters.

b. Mini Project:

- A group of students will select some short stories from Panchtantra or good source. Each student will read the different story loudly. It is reproduced/narrated by another student turn wise which is audio recorded through mobile etc. Teacher acts as facilitator.
- Read and interpret documents/news paper/internet for understanding the prescribed content

c. Other Activities (Specify):

- Paragraph writings on general topics such as Time Management, Developing Positive Attitude, Team Building, environment, entrepreneurship, Developing Learning to Learn skills etc.
Group discussion, debate and extempore on current topics.

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I) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	English Grammar	4	11	10	25
II	Effective communication	2	8	10	20
III	Short Stories	-	10	10	20
IV	Passages for Comprehension	5	10	20	35
Total		11	39	50	100

Legend: R: Remember, U: Understand, A: Apply and above

Note: There will be no end semester examination (ESE) for laboratory instructions and the practical activity will be assessed for term work.

J) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Role Play
6. Demonstration
7. ICT Based Teaching Learning (Video Demonstration/Tutorials CBT, Blog, Facebook, Twitter, Whatsapp, Mobile, Online sources)
8. Brainstorming

K) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1	English Grammar in Use	Murphy Raymond	Cambridge Publications	4 th Edition
2	Living English Structure	Allen	Cambridge Publications	Fifth edition(2009)
3	Effective English with CD	Kumar, E. Suresh; Sreehari,P.; Savithri, J.	Pearson Education, Noida, New Delhi	2009 ISBN: 978-81-317-3100-0
4	English Grammar at Glance	Gnanamurali, M.	S. Chand and Co. New Delhi,	2011 ISBN:9788121929042
5	Communication Skill for Technical Students		Somaiya Publication	
6	Elementary English Grammar and Composition	Agarwal N.K.	Goyal Brothers Prakashan	Latest Edition

(b) Open source software and website address:

1. <https://www.englishgrammar.org/>
2. <http://www.englishgrammarsecrets.com/>
3. <https://www.usingenglish.com/handouts/>
4. <http://learnenglish.britishcouncil.org/en/english-grammar>
5. <https://www.englishclub.com/grammar/>
6. <http://www.perfect-english-grammar.com/>
7. <http://www.englishteachermelanie.com/category/grammar/>
8. <https://www.grammarly.com/blog/category/handbook>
9. <https://www.britishcouncil.in/english/learn-online>
10. <http://learnenglish.britishcouncil.org/en/content>
11. <http://www.talkenglish.com/>
12. [language-labs.com](http://www.language-labs.com/)
13. www.wordsworthelt.com

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Language software Manual
4. Users' Guide

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computers	A complete computer system with headphones & Speakers	All
2	Soft ware	English communication softwares – Globalina, A-One Solutions, Wordsworth, Spears	All
3	Computer tables & chairs	Depending upon the size of the Language Lab	All

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO-1 Use elementary grammar to form correct sentences while Speaking & Writing..	2	1	1	1	-	-	-	1	2	3	1	1
CO-2 (a) Demonstrate ability to read and interpret documents/news papers/reports with correct pronunciation, audibility & accent. (b) Demonstrate effective speaking skills with clarity in an organized and professional manner. (c) Listen and reproduce the same in the oral and written form.	1	1	2	2	-	-	-	2	2	3	1	1
CO-3 Provide response in written form related to prescribed short stories and passages	2	1	2	2	-	1	-	2	3	2	1	1

Legend: 1 – Low, 2 – Medium, 3 – High

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O) Course Curriculum Map:

POs & PSOs No.	COs No.& Titles	SOs No.	Laboratory Instruction(LI)	Classroom Instruction (CI)	Self Learning (SL)
PO1,2,3,4,8,9,10 PSO 1,2	CO-1 Use elementary grammar to form correct sentences during Speaking & Writing.	SO1.1 SO1.2 SO1.3 SO1.4 SO1.5	LE1.1 LE1.2	Unit-1.0 English Grammar 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7	As mentioned in relevant pages
PO 1,2,3,4,8,9,10 PSO 1,2	CO-2 (a) Demonstrate ability to read & interpret documents/news papers/reports with correct pronunciation, audibility & accent. (b) Demonstrate effective speaking skills with clarity in an organized and professional manner. (c) Listen and reproduce the same in the oral and written form.	SO2.1 SO2.2	LE2.1 LE2.2	Unit-2.0 Effective Communication 2.1, 2.2, 2.3, 2.4, 2.5	
PO 1,2,3,4,8,9,10 PSO 1,2	CO-3 Provide response in written form related to prescribed short stories and passages	SO3.1 SO3.2 SO3.3 SO3.4	LE3.1 LE3.2	Unit-3.0 Short Stories 3.1, 3.2, 3.3, 3.4 Unit-4.0 Passages for comprehension 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

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- A) Course Code : 2000152 (014)
 B) Course Title : Applied Maths-I
 C) Pre-requisite Course Code and Title :
 D) Rationale :

Mathematics has the potential to understand the core technological studies. This course of Applied Mathematics-I is being introduced as a foundation, which will help in developing the requisite course outcomes to most of the Diploma programs, and hence caters to the needs of the industry enhancing the employability. It will help the students to apply the principles of the fundamental engineering mathematics to solve related technology problems. The course will give the students an insight to apply and analyze the Engineering problems scientifically based on Determinants, Matrices, Differential Calculus, Co-ordinate Geometry and Fundamentals of the Statistics.

E) **Course Outcomes:**

- CO-1 Solve engineering related problems based on concepts of Algebra.
 CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.
 CO-3 Compute maxima, minima, tangent and normal for engineering related problems.
 CO-4 Solve engineering problems under given conditions of straight lines and conic sections.
 CO-5 Use basic concepts of Statistics to solve engineering related problems.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Total Credit $L+(P+T)/2$
1.	Applied Science	2000152 (014)	Applied Maths-I	3	-	1	4

Legend: L-Lecture, P-Practical, T-Tutorial

G) **Scheme of Assessment:**

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Applied Science	2000152 (014)	Applied Maths-I	100	20	30	-	-	150

Legend: ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment

Note: Separate passing is must for End Semester Assessment.

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H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Solve engineering related problems based on concepts of Algebra.

(Approx. Hrs: 13)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO1.1 Calculate the area of the given triangle by determinant method. SO1.2 Solve given system of linear equations using Cramer's rule. Solve given system of linear equations using matrix inversion method.		Unit-1.0 Algebra 1.1 Determinants 1.11 Concept and properties of determinants 1.12 Solution of simultaneous equations in three unknowns by Cramer's rule 1.2 Matrices 1.21 Algebra of Matrices 1.22 Inverse of Matrices 1.23 Solution of Simultaneous equations by matrix inversion method of order 3x3	1.1 (a) Solution of simultaneous equations by determinants 1.2 (a) Solution of simultaneous equations by matrix

SW-1 Suggested Sessional Work (SW):

a. Assignments:

- Expound examples of determinant in day today life.
- Explore the use of simultaneous equations by matrix method in daily life.
- Expound examples of inverse of matrix for real world problems.

b. Mini Project:

- Prepare charts using determinants to find the area of triangle.
- Prepare flow charts for solutions of system of equations by matrix method.
- Prepare models using matrices to solve simple problems based on Cryptography.

c. Other Activities (Specify):

- Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
- Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
- Use MATH-CAD as mathematical tool to solve the problems of differential calculus.
- Seminar on basic applications of matrices
- Seminar on application of algebra to engineering related problems.

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CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.

(Approx. Hrs.: 13)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Utilize basic concepts of trigonometry to solve given elementary engineering problems. SO2.2 Calculate limit of given functions. SO2.3 Obtain derivatives of given function of functions.	--	Unit-2.0 Differential Calculus 2.1 Basic Trigonometry 2.11 Multiple and sub multiple angles 2.2 Functions and Limits 2.21 Independent and dependent variables 2.22 Different types of functions 2.23 Concept of Limit and its evaluation 2.3 Differentiation of elementary functions 2.31 Differentiation of Algebraic, Trigonometric, Exponential and Logarithmic functions 2.32 Differentiation of sum, product, quotient of two functions 2.33 Differentiation of function of a function	2.1 (a) Limit for given function of one variable 2.1 (b) Derivatives of given Algebraic, Trigonometric, Exponential and Logarithmic functions

SW-2 Suggested Sessional Work (SW):

a. Assignments:

- I. Enumerate the value of the limit for given function of one variable.
- II. Explore the applications of derivative of given Algebraic, Trigonometric, Exponential and Logarithmic functions in engineering.

b. Mini Project:

- i. Prepare charts showing formulas of multiple and sub multiple trigonometric functions.
- ii. Prepare graphical representation for the existence of limits of given functions.

c. Other Activities (Specify):

- I. Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
- II. Use graphical software EXCEL, D-PLOT and GRAPH for topics related to calculus.
- III. Use MATH-CAD as mathematical tool to solve the problems of differential calculus.
- IV. Seminar on engineering applications of derivatives of functions.

CO-3 Compute maxima, minima, tangent and normal for engineering related problems.

(Approx. Hrs: 19)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO3.1 Calculate second order derivatives of given functions. SO3.2 Apply the concepts of differentiation to find	--	Unit-3.0 Applications of Differential Calculus 3.1 Second order derivatives Second order derivatives (without examples)	3.1(a) Applications of derivatives 3.1(b) Maximum and minimum value

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Session Outcomes (SOs)	Laboratory	Class room Instruction (CI)	Self Learning (SL)
the equation of tangent and normal for given problem. SO3.3 Utilize the concepts of differentiation to calculate maxima and minima for given function under certain conditions.		3.2 Equation of Tangent and Normal Equation of Tangent and Normal for functions of one variable only 3.3 Maxima and minima 3.31 Maxima and minima for functions of one variable only	of given functions

SW-3 Suggested Sessional Work (SW):

a. Assignments:

- Explore the role of differentiation to second order derivatives.
- Analyze the equation of tangent and normal for given function and expound what it reflects.
- Calculate the maximum and minimum value of given function for engineering related problems.

b. Mini Project:

- Prepare flow charts showing method of getting maximum and minimum value of given function.
- Prepare graph for tangent and normal for given function.
- Prepare model showing the application of tangent and normal to bending of roads in case of sliding of vehicle.

c. Other Activities (Specify):

- Identify engineering problems based on real world with the use of free tutorials available on the Internet.
- Use graphical software EXCEL, D-PLOT and GRAPH for applications of calculus and related topics.
- Use MATH-CAD as mathematical tool to solve the problems of applications of differential calculus.
- Seminar on the engineering applications of maxima and minima.
- Seminar on applications of tangent and normal for engineering related problems.

CO-4 Solve engineering problems under given conditions of straight lines and conic sections.

(Approx. Hrs.: 16)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO4.1 Calculate angle between given two straight lines. SO4.2 Obtain parallel distance between the given two parallel lines. SO4.3 Form the equation of circle under given conditions. SO4.4 Calculate the		Unit-4.0. Co-ordinate Geometry Various forms of straight lines 4.11 Co-ordinate systems, slope point form, two point form 4.12 Distance between two points, division of a line segment 4.13 Two points intercepts form, general form 4.14 Perpendicular distance from a point on the line, perpendicular distance between two parallel lines	4.1 (a)Co-ordinate geometry of straight lines and given conic sections 4.2 (b)Parameters of focus, axis, directrix, vertex and

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parameters of given parabola and ellipse.		Conic sections 4.15 Definition, standard forms 4.16 General equation 4.17 Center and radius of a circle 4.18 Focus, axis, directrix, latus rectum and vertex of parabola and ellipse	latus rectum of ellipse and parabola
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SW-4 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Enumerate the angle and distance between two lines.
 - ii. Prepare a model showing various forms of equation of circle under given conditions.
 - iii. Write the specific features of the parameters like focus, axis, directrix, vertex and latus rectum of ellipse and parabola.
- **Mini Project:**
 - i. Prepare flow charts showing different forms of straight lines.
 - ii. Prepare graph for plotting ellipse and parabola.
- **Other Activities (Specify):**
 - i. Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
 - ii. Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
 - iii. Use MATH-CAD as mathematical tool to solve the problems of differential calculus.
 - iv. Seminar on the conversion of different forms of straight lines.
 - v. Seminar on charts showing method of getting maximum and minimum value of given functions.

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CO- 5 Use basic concepts of Statistics to solve engineering related problems. (Approx. Hrs: 19)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO5.1 Draw the graph for given frequency distribution (distributions). SO5.2 Calculate mean, median and mode for the given set of observations. SO5.3 Calculate standard deviation for given set of engineering problems. SO5.4 Determine the variance and coefficient of variance of grouped and ungrouped data.	--	UNIT 5. Fundamentals of Statistics 5.1 Frequency distribution and central tendency 5.11 Introduction, graphical representation of frequency distribution 5.12 Central tendency, mean, median, frequency distribution and mode 5.2 Dispersion and deviation 5.21 Measure of dispersion. 5.22 Range, quartile deviation. 5.23 Standard deviation, root mean square deviation 5.3 Variance and coefficient of variance 5.31 Variance and coefficient of variance	5.1 (a) Frequency distribution and central tendency 5.2(a) Standard deviation for the given frequency distribution

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others) , LI : Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-5 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Prepare detail report on frequency distribution for the given data.
 - ii. Represent the given frequency distribution in graphical form.
 - iii. Enumerate the mean, median and mode of the given data.
 - iv. Write the importance of calculating standard deviation for the given frequency distribution to engineering applications.
 - v. Analyze variance and coefficient of variance of the given data to industry specific problems.
- **Mini Project:**
 - i. Prepare charts for grouped and ungrouped data.
 - ii. Prepare chart showing mean, median and mode values of given data.
 - iii. Prepare frequency curves like histogram, frequency polygon and ogive by graphical method.
- **Other Activities (Specify):**
 - i. Identify engineering problems based on real world problems with the use of free tutorials available on the Internet.
 - ii. Use graphical software EXCEL, D-PLOT and GRAPH for related topics.
 - iii. Use MATH-CAD as mathematical tool to solve the problems of differential calculus.
 - iv. Seminar on different types of dispersion and deviations.
 - v. Seminar on applications of central tendencies likes mean, median and mode for engineering related problems.

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Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Algebra	4	6	10	20
II	Differential Calculus	4	6	10	20
III	Applications of Differential Calculus	4	6	10	20
IV	Co-ordinate Geometry	4	6	10	20
V	Fundamentals to Statistics	4	6	10	20
Total		20	30	50	100

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*): NA

Laboratory Instruction Number	Short Laboratory Experiment Title	Assessment of Laboratory Work (Marks)			
		Performance		Viva-Voce	
		PRA	PDA		
-	-	-	-	-	-

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals.

Legend: PRA: Process Assessment, PDA: Product Assessment

Note: Only one experiment has to performed at the end semester examination of Marks as per assessment scheme.

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips
8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
12. Brainstorming
13. Others

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L) Suggested Learning Resources:

(a) Books:

Sl. No.	Title	Author	Publisher	Edition & Year
1	Advanced Engineering Mathematics	Krezig, Ervin	Wiley Publ., New Delhi	2014, ISBN: 978-0-470-45836-5
2	Advanced Engineering Mathematics	H. K. Das	S. Chand & Co, New Delhi	ISBN: 9788121903455
3	Higher Engineering Mathematics	B. S. Grewal	Khanna Publ., New Delhi	2015, ISBN: 8174091955
4	Engineering Mathematics, Volume 1	S. S. Sastry	PHI Learning, New Delhi	2009, ISBN: 978-81-203-3616-2
5	Fundamentals of Mathematical Statistics	S. C. Gupta	S. Chand & Sons	2014

(b) Open source software and website address:

- 1 www.scilab.org/ -SCI Lab
- 2-www.dplot.com/ -DPlot
- 3 www.allmathcad.com/ -MathCAD
- 4 www.wolfram.com/mathematica/ - MATHEMATICA
5. www.easycalculation.com

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide

M) List of Major Laboratory Equipment and Tools: NA

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
-	-	-	-

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O) Course Curriculum Map:

POs & PSOs No.	COs No. & Title.	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO-1, 2,3,8,9,10 PSO---	CO-1 Solve engineering related problems based on concepts of Algebra.	SO1.1 SO1.2 SO1.3		Unit-1.0 Algebra 1.1, 1.2	1.1(a), 1.2(a)
PO-1, 2,3,8,9,10 PO-10 PSO-----	CO-2 Use basic concepts of Differential Calculus to solve engineering related problems.	SO.2.1 SO.2.2 SO2.3		Unit-2.0 Differential Calculus 2.1,2.2,2.3	2.1(a), 2.1(b)
PO-1, 2,3,8,9,10 PSO-----	CO-3 Compute maxima, minima, tangent and normal for engineering related problems.	SO.3.1 SO3.2 SO3.3		Unit-3.0 Applications of Differential Calculus 3.1,3.2,3.3	3.1(a), 3.1(b)
PO-1, 2,3,8,9,10 PO-10 PSO-----	CO-4 Solve engineering problems under given conditions of straight lines and conic sections.	SO4.1 SO4.2 SO4.3		Unit-4.0 Co-ordinate Geometry 4.1, 4.2	4.1(a), 4.1(b)
PO-1,2,3,8,9,10 PSO-----	CO-5 Use basic concepts of Statistics to solve engineering related problems.	SO5.1 SO5.2 SO5.3		Unit-5.0 Fundamentals of Statistics 5.1,5.2,5.3	5.1(a),5.2(a)

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies)
SL: Self Learning

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- A) Course Code : 2000153 (037)
 B) Course Title : Applied Mechanics
 C) Pre- requisite Course Code and Title :
 D) Rationale :

Applied mechanics (Engineering mechanics) is a branch of the physical sciences that deals with the response of bodies (solids and fluids) or systems of bodies to external forces. To impart basic knowledge of Engineering Mechanics this course will help the student to develop basic know-how and awareness of the various laws of physics and it's real life applications in the various fields of engineering. After going through this course the student will be able to identify, convert and resolve real loads and couples into their theoretical counterparts. This course is a prerequisite to 'strength of materials' and 'Theory of machines' courses in latter semesters.

E) **Course Outcomes:**

- CO-1 Identify the force systems for different conditions using concepts of mechanics.
 CO-2 Find the Centroid and Centre of gravity of various engineering components.
 CO-3 Estimate force of friction in various conditions.
 CO-4 Estimate velocities and accelerations in various linear and curvilinear motions.
 CO-5 Calculate power, torque and energy associated with various engineering applications.
 CO-6 Select suitable power transmission mode, simple lifting machine and estimate related parameters for various situations.

F) **Scheme of Studies:**

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Credits $L+(P+T)/2$
1	Mechanical Engineering	2000153 (037)	Applied Mechanics	3	-	1	4
2	Mechanical Engineering	2000161 (037)	Applied Mechanics (Lab)	-	3	-	2

Legend: L: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others), P: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies), T- Tutorial includes Sessional Work(SW) (assignment, seminar, mini project etc.) and Self Learning(SL), C:Credits

Note: SW and SL has to be planned and performed under the continuous guidance and feedback of teacher to ensure outcome of Learning

G) **Scheme of Assessment:**

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1.	Mechanical Engineering	2000153 (037)	Applied Mechanics	100	20	30	-	-	150
2.	Mechanical Engineering	2000161 (037)	Applied Mechanics (Lab)	-	-	-	50	20	70

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- **PROGRESSIVE ASSESSMENT: (70 MARKS)**
 1. CLASSROOM ASSESSMENT (CA): (a) CLASS TEST (CT) – 20,
(b) TEACHER'S ASSESSMENT (TA) – 30 (Sessional work (SW) -20, Attendance (ATT) - 10)
 2. LABORATORY ASSESSMENT (LA): TEACHER'S ASSESSMENT (TA) – 20 (PRA – 10, PDA-5, VIVA VOICE-5)
- **END SEMESTER ASSESSMENT (ESE): (150 MARKS)**
 1. END SEMESTER EXAM (ESE-THEORY)- 100
 2. END SEMESTER EXAM (ESE-PRACTICAL) - 50

Legend: PRA: Process Assessment, PDA: Product Assessment

Note: Separate passing is must for End Semester Exam (Theory) and End Semester Exam (Practical).

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (L), Laboratory Instruction (P), T- Tutorial Includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Identify the force systems for different conditions using concepts of mechanics.

(Approx. Hrs: L+P+T=12)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO1.1 Explain basic terms related to mechanics.	LE1.1 Measure resultant force using law of Triangle of forces setup.	Unit-1.0 Fundamentals and Resolution of Forces 1.1 Definition of Mechanics, Statics, Dynamics- Kinetics, Kinematics. Concept of space, mass, particle, body, rigid body, scalar, vector, fundamental units, derived units. 1.2 Force- concept, definition, unit, graphical representation. 1.3 Concept of system of forces- non-coplanar, coplanar, concurrent, non-concurrent and parallel forces. 1.4 Composition and Resolution of forces. 1.5 Free body diagrams, law of parallelogram, Varignon's theorem. 1.6 Equilibrium of Coplanar concurrent forces, parallel forces and non-concurrent	<ul style="list-style-type: none"> • Unit system. • Graphical method of Composition and resolution of forces.
SO1.2 Identify the system of forces in the given situation with justification.	LE1.2 Measure resultant force using law of Parallelogram of forces setup.		
SO1.3 Resolve and compose various forces acting on the given component.	LE1.3 Measure resultant force using law of Polygon of forces setup.		
SO1.4 Identify the moment or couple acting in the given system with justification.	LE1.4 Measure resultant force using Lami's Theorem using Jib crane setup.		
SO1.5 Estimate forces and Couples acting on the given component.	LE1.5 Use Funicular diagram to demonstrate Non-concurrent, Non-Parallel forces.		
	LE1.6 Measure resultant		

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Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
	moment using Law of Moments setup.	forces, Lami's Theorem. 1.7 Moment of a force and Couple, properties of couple, conditions of equilibrium, applications.	

SW-1 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Solve two problems related to law of triangle and law of polygon of forces (each).
- **Mini Project:**
 - i. Select two stationary components from day to day life and try to identify all the forces acting on them in magnitude and direction.
- **Other Activities (Specify):**
 - i. Draw free body diagram of 'hanging rod' of a ceiling fan in running condition.
 - ii. Draw free body diagram of brake lever of a bike.
 - iii. Estimate force exerted by your body on each leg of the chair/bench on which you are sitting.

CO-2 Find the Centroid and Centre of gravity of various engineering components.

(Approx. Hrs: P+L+T = 16)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO2.1 Locate centroid of given regular plane and compound areas. SO2.2 Compute MI of a given plane areas. SO2.3 Use Perpendicular and Parallel Axis theorems to calculate MI about given axis of a given plane area.	LE2.1 Determine centroid of a given lamina of any shape using any computer aided drafting software. LE2.2 Determine M.I of a given lamina any shape using any computer aided drafting software.	Unit-2.0 Centroid and Moment of Inertia 2.1 Location of Centroid and Center of Gravity. 2.2 Centroid of regular plane and compound areas. 2.3 Center of Gravity of simple solids. 2.4 Moment of Inertia of plane areas. 2.5 Perpendicular and Parallel Axis theorems.	<ul style="list-style-type: none"> • Calculation of CG of solid body. • Calculation of M.I of solid body.

SW-2 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Find out Area Moment of Inertia of a solid circular wheel at the point of contact with road.
 - ii. Find out Area Moment of Inertia of any rectangular shaped calendar at the point of hinge/suspension on the wall.

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- iii. Locate CG and find out Area Moment of Inertia '30°-60° and 45°-45° solid Set Squares' used as drawing instruments about any side and hypotenuse.
- iv. Verify all above using MI calculation facility of any computer aided drafting software.

- **Micro Project:**

- i. Prepare a chart to show CGs locations of cross sections of different standard Mild steel pipe and rod sections available in the market.
- ii. Determine the location of CG of 'circle master' used as a drawing instrument.

- **Other Activities (Specify):**

- i. Prepare a list of at least five formulas related to Mechanical and Civil engineering in which use of area Moment of Inertia is required.

CO-3 Estimate force of friction in various conditions.

(Approx. Hrs: L+P+T= 20)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO3.1 Explain friction and related terms. SO3.2 Select coefficient of friction from data book for a given situation. SO3.3 Estimate coefficient of friction, angle of friction and angle of repose for given situation. SO3.4 Suggest ways to reduce friction.	LE3.1 Determine coefficient of friction for surfaces of different materials on a Horizontal Plane with given setup. LE3.2 Determine coefficient of friction for surfaces of different materials with Inclined Plane apparatus.	Unit-3.0 Friction 3.1 Rough and Smooth surfaces, concept of friction. Types of friction, Coulomb's laws of friction 3.2 Co-efficient of friction, angle of friction, angle of repose. 3.3 Friction on horizontal and inclined plane, Method of reducing friction. 3.4 Screw and Nut friction, friction in journal bearing	<ul style="list-style-type: none">• Method of reducing friction.• Advantage and disadvantage of friction

SW-3 Suggested Sessional Work (SW) :

- **Assignments:**

- i. Solve numerical problems related to co-efficient of friction, angle of friction, angle of repose and force of friction in different situations.

- **Micro Project:**

- i. Prepare a list of engineering components where friction is desirable and undesirable also suggest ways to improve and reduce it respectively.

- **Other Activities (Specify):**

- i. Visit a nearby automobile workshop and collect details of the components and locations where oil and grease are applied to reduce the friction.

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CO-4 Estimate velocities and accelerations in various linear and curvilinear motions.

(Approx. Hrs: L+P+T=22)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO4.1 Compute velocity under the given uniform and non-uniform acceleration situation. SO4.2 Describe Newton's Laws of Motion with examples. SO4.3 Calculate force and momentum in the given situation.	LE4.1 Plot Velocity -Time diagrams for different combinations of Uniform and non uniform velocities.	Unit 4.0 Kinematics and Kinetics 4.1 Kinematics in Cartesian and polar coordinates. Concept of speed, velocity, acceleration, radial and transverse velocity, 4.2 Particle under uniform and non-uniform acceleration, tangential and normal acceleration. 4.3 Angular displacement, Angular Velocity, Angular Acceleration. 4.4 Motion under gravity. 4.5 Kinetics of particle, motion under constant force, Newton's Laws of Motion. 4.6 Momentum and energy principles, Impulses and angular momentum.	<ul style="list-style-type: none"> Velocity profile

SW-4 Suggested Sessional Work (SW):

- Assignments:**
 - Solve numerical problems related to velocity and acceleration
 - Solve numerical problems related to force and impulse.
- Micro Project:**
 - Collect information on engineering components/members subjected to tangential and normal acceleration and prepare a report.
- Other Activities (Specify):**
 - Calculate how much force is required to push a stationary Bicycle, Bike and Car and compare it. If we reduce the width of the car tires will the force reduces? Please comment.
 - Check how much gradually applied weight is required to press a nail in a wooden board and then compare the same with the weight of the hammer normally used to do the same thing. Please comment on why less weight hammer is capable of doing the same thing.

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CO- 5 Calculate power, torque and energy associated with various engineering applications.

(Approx. Hrs: L+P+T=18)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO5.1 Define work, power, energy and their units of measurement SO5.2 Calculate IHP and BHP in the given condition. SO5.3 Calculate Kinetic and Potential energy of an object from the given data. SO5.4 Establish relation between Work, Power and Energy.	LE5.1 Use dynamometer to calculate power in any rotating shaft/drum/pulley/wheel. LE5.2 Use tachometer to calculate speed of any rotating shaft/drum/pulley/wheel.	Unit-5.0 Work, Power and Energy 5.1 Work- Definition and unit of work done, force displacement diagram, torque, work done by torque. 5.2 Power-Definition and unit of Power, I.H.P and B.H.P of engine, Equation of H.P in terms of Torque and R.P.M. 5.3 Energy- Definition and units of Energy, Kinetic and Potential energy. 5.4 Relation between Heat and Mechanical work, relation between Electrical and Mechanical energy	<ul style="list-style-type: none">Torque

SW-5 Suggested Sessional Work (SW) :

- Assignments:**
 - Solve problems related to work, power and energy in different domestic and industrial situations.
 - Solve numerical problem based on work done by force and torque.
 - Solve numerical problem based on computation of IHP and BHP of engines.
 - Solve numerical problem based on computation of Kinetic and Potential energy
 - Convert motor or engine horse power into watts/kilo watts
 - In 'Electricity Bill' one UNIT consumption represents what?
- Micro Project:**
 - Visit different labs of your institute and collect data related to power, torque and RPM of various actuators like electric motors and engines.
 - In case of Electric motors and Batteries calculate electric power it can supply.
 - Collect data of IHP and BHP related to two Bikes, Cars, Jeeps and Buses (each) of your locality.
- Other Activities (Specify):**
 - Collect information on electric cars related to its battery power and correlate it theoretically to the torque and rpm available at wheel if the car is running at 30km/hr.

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CO-6 Select suitable power transmission mode, simple lifting machine and estimate related parameters for various situations.

(Approx. Hrs: L+P+T= 24)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
<p>SO6.1 Describe Load, Effort, Mechanical advantage, Velocity ratio, Efficiency</p> <p>SO6.2 Compute Mechanical advantage, Velocity ratio, Efficiency of the given simple machine.</p> <p>SO6.3 Select suitable power transmission mode for the given situation.</p>	<p>LE6.1 Estimate Mechanical advantage, Velocity Ratio and Efficiency for Simple Screw Jack setup.</p> <p>LE6.2 Estimate Mechanical advantage, Velocity Ratio and Efficiency for Differential Wheel and Axle setup.</p> <p>LE6.3 Demonstration of use of inclined plane as a lifting machine.</p> <p>LE6.4 Estimate Velocity Ratio for a belt-pulley system, simple gear train, worm and worm wheel.</p>	<p>Unit-6.0 Simple Lifting Machines and Transmission of power</p> <p>6.1 Load, Effort, Mechanical advantage, Velocity ratio, Efficiency and relation between them.</p> <p>6.2 Law of Machine, Reversibility of Lifting machine.</p> <p>6.3 Study of Machines- Differential wheel and axel, Simple Screw Jack, Pulley block, System of pulleys, Simple and compound levers.</p> <p>6.4 Transmission of power through Belt (flat belt, V-belt, Timer belt), Rope, Gears (Spur, Helical, worm and worm wheel, rack and pinion) and Gear trains (simple, compound, epycyclic): terminology, classification, salient features, area of application, velocity ratio and efficiency.</p>	<ul style="list-style-type: none"> Study of single and double purchase winch crab machine.

SW-6 Suggested Sessional Work (SW):

- Assignments:**
 - Solve numerical problem based on computation of Mechanical advantage, Velocity ratio, Efficiency of simple machines.
 - Solve numerical problem based on law of machine.
- Mini Project:**
 - Visit different labs of your institute or nearby workshop and collect information about various transmission modes used and related data. Estimate velocity ratio in each case and justify its use in that particular situation.
 - Visit a nearby automobile repair shop and list the types of gears used in a bike/moped/scooter.

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• **Other Activities (Specify):**

- Prepare a report on application of timer belt and pulley through internet.
- List the devices in which epicyclic gear trains are used.
- Collect the photographs and details of different types of lifting jacks are available in market for lifting and car.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

I) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Fundamentals and Resolution of Forces	3	3	4	10
II	Centroid and Moment of Inertia	4	6	7	17
III	Friction	3	6	8	17
IV	Kinematics and Kinetics	4	6	7	17
V	Work, Power and Energy	4	6	7	17
VI	Simple Lifting Machines and Transmission of power	6	7	9	22
Total		24	34	42	100

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*):

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
LE1.1	Measure resultant force using law of Triangle of forces setup.	25	20	5
LE1.2	Measure resultant force using law of Parallelogram of forces setup.	25	20	5
LE1.3	Measure resultant force using law of Polygon of forces setup.	25	20	5
LE1.4	Measure resultant force using Lami's Theorem using Jib crane setup.	25	20	5
LE1.5	Use Funicular diagram to demonstrate Non-concurrent, Non-Parallel forces.	25	20	5
LE1.6	Measure resultant moment using Law of Moments setup.	25	20	5
LE2.1	Determine C.G. of a given lamina of any shape using any computer aided drafting software.	25	20	5
LE2.2	Determine M.I of a given lamina any shape using any computer aided drafting software.	25	20	5
LE 3.1	Determine coefficient of friction for surfaces of different materials on a Horizontal Plane with given setup.	25	20	5
LE 3.2	Determine coefficient of friction for surfaces of different materials with Inclined Plane apparatus.	25	20	5

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Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
LE4.1	Plot Velocity -Time diagrams for different combinations of Uniform and non uniform velocities.	25	20	5
LE5.1	Use dynamometer to calculate power in any rotating shaft/drum/pulley/wheel.	25	20	5
LE5.2	Use tachometer to calculate speed of any rotating shaft/drum/pulley/wheel.	25	20	5
LE6.1	Estimate Mechanical advantage, Velocity Ratio and Efficiency for Simple Screw Jack setup.	25	20	5
LE6.2	Estimate Mechanical advantage, Velocity Ratio and Efficiency for Differential Wheel and Axle setup.	25	20	5
LE6.3	Demonstration of use of inclined plane as a lifting machine.	25	20	5
LE6.4	Estimate Velocity Ratio for a belt-pulley system, simple gear train, worm and worm wheel.	25	20	5

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals ,

Legend: PRA: Process Assessment, PDA: Product Assessment

Note: Only one experiment has to be performed at the End Semester Examination of 50 marks as per assessment scheme.

K) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips
8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
12. Brainstorming
13. Others

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L) Suggested Learning Resources:

(a) Books :

S.No.	Titles	Author	Publisher and Edition*
1	Applied Mechanics	Khurmi, R.S.	S.Chand & Co. New Delhi 2014 ISBN: 9788121916431
2	Applied Mechanics	S.S.L Patel	Dhanpat Rai & Company
3	Foundations and Applications of Applied Mechanics	Ram, H. D.; Chauhan, A. K.	Cambridge University Press, Thomson Press India Ltd., New Delhi, 2015, ISBN: 9781107499836
4	Engineering Mechanics- Statics, Vol. I	Meriam, J. L.; Kraige, L.G.	Wiley Publication, New Delhi, ISBN: 978-81-265-4396
5	Engineering Mechanics	Ramamrutham, S.	S Chand & Co. New Delhi 2008 ISBN:9788187433514

*Latest edition of all above books should be referred

(b) Open source software and website address:

1. <http://www.asnu.com.au>
2. www.youtube.com for videos regarding machines and applications, friction
3. www.nptel.ac.in
4. www.discoveryforengineers.com

(c) Others:

5. Learning Packages
6. Users' Guide
7. Manufacturers' Manual
8. Lab Manuals

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1.	Differential axle and wheel	Differential axle and wheel (wall mounted unit with the wheel of 40 cm diameter and axles are in steps of 20 cm and 10 cm reducing diameter).	LE6.2
2.	Universal Force Table	Universal Force Table (Consists of a circular 40 cm dia. Aluminum disc, graduated into 360 degrees.) with all accessories.	LE1.1, LE1.2, LE1.3,
3.	Jib crane setup.	Jib crane setup.	LE1.4
4.	Law of moments apparatus	Law of moments apparatus consisting of a stainless steel graduated beam 12.5 mm square in section, 1m long, pivoted at centre.	LE1.6
5.	Beam Reaction apparatus	Beam Reaction apparatus (The apparatus is with two circular dial type 10 kg.	LE1.1
6.	Models of geometrical figures.	Acrylic models of standard geometrical figures.	LE2.1, LE2.2

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S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
7.	Latest educational version of AutoCAD software	Latest educational version of AutoCAD software	LE2.1,LE2.2
8.	Friction apparatus	Friction apparatus for motion along horizontal and inclined plane (base to which a sector with graduated arc and vertical scale is provided. The plane may be clamped at any angle up to 45 degrees. pan. Two weight boxes (each of 5 gm,10 gm, 2-20 gm, 2-50 gm, 2-100 gm weight),	LE 3.1, LE 3.2, LE6.3
9.	Dynamometer and Tachometer	Dynamometer and Tachometer	LE5.1, LE5.2
10.	Simple screw Jack	Simple screw Jack (Table mounted metallic body , screw with a pitch of 5 mm carrying a double flanged turn table of 20 cm diameter.	LE6.1
11.	Worm and worm wheel	Worm and worm wheel (wall mounted unit with threaded spindle, load drum, effort wheel; with necessary slotted weights, hanger and thread)	LE6.4
12.	Single Purchase Crab winch	Single Purchase Crab winch (Table mounted heavy cast iron body. The effort wheel is of C.I. material of 25 cm diameter mounted on a shaft of about 40mm dia. On the same shaft a geared wheel of 15 cm dia.	LE6.1 to LE6.4
13.	Double Purchase Crab winch	Double Purchase Crab winch (Having assembly same as above but with double set of gearing arrangement.)	LE6.2
14.	Weston's Differential pulley block	Weston's Differential pulley block (consisting of two pulleys; one bigger and other smaller.	LE6.2
15.	Weston's Differential worm geared pulley block	Weston's Differential worm geared pulley block (Consists of a metallic (preferably steel) cogged wheel of about 20 cm along with a protruded load drum of 10 cm dia to suspend the weights of 10 kg, 20 kg-2 weights and a 50 kg weights)	LE6.2

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N) Mapping of POs and PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)		
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2	PSO-3
CO-1 Identify the force systems for different conditions using concepts of mechanics.	2	3	3	2	1	1	1	2	2	2	-	2	-
CO-2 Find the Centroid and Centre of gravity of various engineering components.	3	2	1	2	1	1	1	2	2	2	2	1	1
CO-3 Estimate force of friction in various conditions.	3	2	2	1	1	1	1	2	2	2	-	2	1
CO-4 Estimate velocities and accelerations in various linear and curvilinear motions.	2	2	2	1	1	1	1	2	2	2	1	2	1
CO-5 Calculate power, torque and energy associated with various engineering applications.	2	3	2	2	1	1	1	2	2	3	-	2	1
CO-6 Select suitable power transmission mode, simple lifting machine and estimate related parameters for various situations.	2	3	3	2	1	1	1	2	2	3	-	2	1

Legend: 1 – Low, 2 – Medium, 3 – High

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O) Course Curriculum Map:

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs - 2	CO-1 Identify the force systems for different conditions using concepts of mechanics.	SO1.1 SO1.2 SO1.3 SO1.4 SO1.5	LE1.1 LE1.2 LE1.3 LE1.4 LE1.5 LE1.6	Unit-1.0 Fundamentals and Resolution of Forces 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7	As mentioned in relevant pages
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs – 1, 2, 3	CO-2 Find the Centroid and Centre of gravity of various engineering components.	SO2.1 SO2.2 SO2.3	LE2.1 LE2.2	Unit-2.0 Centroid and Moment of Inertia 2.1, 2.2, 2.3, 2.4, 2.5	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs – 2, 3	CO-3 Estimate force of friction in various conditions.	SO3.1 SO3.2 SO3.3 SO3.3	LE3.1 LE3.2 LE3.3	Unit-3.0 Friction 3.1, 3.2, 3.3, 3.4	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs - 1, 2, 3	CO-4 Estimate velocities and accelerations in various linear and curvilinear motions.	SO4.1 SO4.2	LE4.1	Unit-4.0 Kinematics and Kinetics 4.1, 4.2, 4.3, 4.2, 4.4, 4.5, 4.6	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs – 2, 3	CO-5 Calculate power, torque and energy associated with various engineering applications.	SO5.1 SO5.2 SO5.3 SO5.4	LE5.1 LE5.2	Unit-5.0 Work, Power and Energy 5.1, 5.2, 5.3, 5.4	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSOs – 2, 3	CO-6 Select suitable power transmission mode, simple lifting machine and estimate related parameters for various situations.	SO6.1 SO6.2 SO6.3	LE6.1 LE6.2 LE6.3 LE6.4	Unit-6.0 Simple Lifting Machines and Transmission of power 6.1, 6.2, 6.3, 6.4	

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- A) **Course Code** : 2000154 (020)
- B) **Course Title** : Environmental Engineering and Sustainable Development
- C) **Pre-requisite Course Code and Title** :
- D) **Rationale** : The world has changed drastically during the last half century, both technologically, economically and socially. In present time, solid waste, e-waste, air pollution, water and land pollution and conservation of natural resources wants more attention. The growth of multinational businesses, the depletion of national and natural resources, and the tremendous advances in technology in many countries raised concerns over issues of Environment climate Change and Sustainable Development. We are also witnessing the emergence of Green and Clean Technology for Sustainable Development. In this context, the understanding about environment issues and challenges is very essential for engineers as it guide for sustainable development.

The knowledge and application of such aspects is essential in developing a good technician who should be conversant with the core concepts, principles and practices of environment pollution problems and sustainable development (SD).

This course is designed to serve as foundation knowledge for diploma studies in Engineering. It will introduce the concept of environmental issues, problems due to pollution and social & economical dimensions including disaster management for SD. The future engineers must use 3R concept by focusing on changing patterns of Engineering Design, Production, Consumption, and use of natural and non conventional energy resources optimally and judiciously by enforcing laws and legislatives during any engineering projects.

- E) **Course Outcomes** :
- CO-1 Describe causes, prevention and remedial measures of water and air pollution.
- CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.
- CO-3 Create awareness about sustainable development and clean technology.
- CO-4 Perform Environmental Impact Assessment (EIA) for new design and project
- CO-5 Create awareness for social issues and the environment.

F) Scheme of Studies:

S.No L -	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Credits L+(P+T)/2
1 L e c	Civil Engineering	2000154 (020)	Environmental Engineering and Sustainable Development	3	-	1	4

L- Lecture, T- Tutorial, P- Practical

Legend: Lecture (L)→CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others).

Practical (P)→LI: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies)

Tutorial (T)→SL: Self Learning

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G) Scheme of Assessment:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Civil Engineering	2000154 (020)	Environmental Engineering and Sustainable Development	100	20	30	-	-	150

ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment

Legend - PRA: Process Assessment, PDA: Product Assessment

- Note:**
- TA in Theory includes Sessional work (SW) and attendance (ATT) with weightage of 70% and 30% of total respectively.
 - TA in practical includes performance of PRA, PDA and Viva-Voce with weightage of 50%, 40% and 10% respectively.
 - 85% attendance is essential in theory and practical classes to appear in Examination.

CO-1 Describe causes, prevention and remedial measures of water and air pollution.

(Approx. Hrs: L+P+T = 13Hr)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
<p>SO1.1 Develop awareness for Global Environmental problems.</p> <p>SO1.2 Explain causes of water pollution and describe its prevention and remedial measures.</p> <p>SO 1.3 Explain causes of air pollution and describe its prevention and remedial measures.</p>	--	<p>UNIT-1 Water pollution and Air pollution</p> <p>1.0 Introduction to environment and environment pollution</p> <p>1.1 Water pollution</p> <p>1.1.1 Introduction</p> <p>1.1.2 sources of water pollution</p> <p>1.1.3 classification of water pollutants</p> <p>1.1.4 adverse effect of water pollution</p> <p>1.1.5 control of water pollution</p> <p>1.1.6 Physical and chemical standard of domestic water as per Indian standard.</p> <p>1.2 Air pollution</p> <p>1.2.1 Introduction</p> <p>1.2.2 Sources of air Pollutants</p> <p>1.2.3 classification of air Pollutants</p> <p>1.2.4 Effect of air pollution on human plant, animal.</p> <p>1.2.5 Air monitoring system</p> <p>1.2.6 Air pollution control</p>	<p>SL 1.1 Study of health hazards of water pollution.</p> <p>SL 1.2 Explain with help of diagram the working of pollution control devices</p> <p>a. Cyclone separators</p> <p>b. Electrostatic precipitators.</p>

SW-1 Suggested Sessional Work (SW) :

a. Assignments:

- Describe in a tabular format the various causes of air and water pollution.
- Make a chart for physical and chemical standard of domestic water as per Indian standard.

b. Mini Project:

- Collect information about water and air quality in the vicinity from local bodies and discuss the findings.

CO- 2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.

(Approx. Hrs: L+P+T = 13Hr)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Recognise causes of Soil pollution. SO 2.2 Explain causes of Noise pollution. SO 2.3 Recognise the Thermal as pollutant. SO 2.4 Describe radiation and its pollution effects.		UNIT-2 Soil, Noise , Thermal and Nuclear pollution 2.1 Soil pollution 2.1.1 introduction 2.1.2 sources of soil pollution 2.1.3 adverse effect of soil pollution 2.1.4 control measures of soil pollution 2.2 Noise pollution 2.2.1 Introduction 2.2.2 measurement of noise and acceptable noise level 2.2.3 sources of noise pollution 2.2.4 effect of noise pollution 2.2.5 control of noise pollution 2.3 thermal pollution 2.3.1 introduction 2.3.2 effects of thermal pollution 2.3.3 causes 2.3.4 control 2.4 Radioactive pollution 2.4.1 introduction 2.4.2 sources of radioactive pollution 2.4.3 Adverse effects of radioactive pollution 2.4.4 control of radioactive pollution	SL 2.1. Identify the modern equipments and methods for measurement of Soil, Noise and Thermal pollution.

SW-2 Suggested Sessional Work (SW) :

a. Assignments:

- Write short notes on sources and effects of
 - Soil Pollution
 - Noise Pollution
 - Thermal Pollution
 - Radio active Pollution

b. Mini Project:

- i. Collect informations from local bodies for their efforts and findings regarding soil pollution in vicinity.

CO-3 Create awareness about sustainable development and clean technology.

(Approx. Hrs: L+P+T = = 13 hrs)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
<p>SO3.1 Recognize the concept of sustainable development.</p> <p>SO3.2 Appreciate the importance of management, consumption & conservation of natural resources.</p> <p>SO3.3 Explain clean technology.</p> <p>SO 3.4 Recognize the importance of waste minimization.</p> <p>SO3.5 Appreciate importances of solar power, hydel, wind power and biomass energy.</p>		<p>Unit 3. Sustainable Development and Clean technologies</p> <p>3.1 Sustainable Development</p> <p>3.1.1 Concept of sustainable development</p> <p>3.1.2 Natural resources, a-biotic and biotic resources</p> <p>3.1.3 Principles of conservation of energy and management</p> <p>3.1.4 Need of Renewable energy</p> <p>3.1.5 Growth of renewable energy in India and the world</p> <p>3.1.6 Concept of waste management and recycling</p> <p>3.2 Clean Technologies</p> <p>3.2.1 Introduction: Clean technology</p> <p>3.2.2 Types of Energy</p> <p>3.2.3 Conventional Energy Sources</p> <p>3.2.4 Non-conventional Sources of Energy</p> <p>3.2.5 Recycling pollution control</p> <p>3.3 Solar Power</p> <p>3.3.1 Features of solar thermal and PV systems</p> <p>3.3.2 Types of solar cookers and solar water heaters</p> <p>3.4 Hydel Energy and its advantages</p> <p>3.5 Wind energy –advantages and limitations</p> <p>3.6 Biomass energy</p> <p>3.6.1 Types of Biomass Energy Sources</p> <p>3.6.2 Energy content in biomass of different types</p> <p>3.6.3 Types of Biomass conversion processes</p> <p>3.6.4 Biogas production</p>	<p>SL3.1 Utilisation of biofuels and electricity in transportation sector.</p>

SW-3 Suggested Sessional Work (SW):

- **Assignments:**
 1. Explain concept of sustainable development.
 2. Describe conventional and non conventional energy sources with suitable example.
- **Mini Project:**
 1. Prepare a report on energy scenario in India context.

CO- 4 Perform Environmental Impact Assessment (EIA) for new design and project

(Approx. L+P+T = 13 Hrs:)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO4.1 Carry out EIA for A new engineering product /projects. SO4.2 Develop Post EIA report. SO4.3 Implement EIA findings ensuring Sustainable development		Unit 4.0 Envi. Impact Assessment (EIA) 4.1 Public Participation in EIA 4.1.1 EIA documentation 4.1.2 Case studies on EIA 4.1.3 EIA scope & steps 4.2 EIA process 4.2.1 EIA report 4.2.2 EIA Gazette notification 4.2.3 EIA action plan 4.3 EIA implementation 4.3.1 EIA directives 4.3.2 follow-ups	SL 4.1 Study the reports of EIA of a construction project

SW-4 Suggested Sessional Work (SW):

- a. **Assignments:**
 - i. Prepare EIA for Roads construction
 - ii. Prepare sugar industry EIA advertisement for a daily news papers
- b. **Other Activities (Specify):**
 - i. Mock drill for EIA session

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CO- 5 Create awareness for social issues and the environment.

(Approx. Hrs: L+P+T = 12)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO5.1 Appreciate conservation of water. SO5.2 Explain acid rain , green house effect, depletion of ozon layer, global warning. SO5.3 Understand solid waste management.		Unit 5.0 Social Issues And The Environment 5.1 Water conservation 5.2 Rain water harvesting 5.3 Watershed management 5.4 Acid rain and its effect 5.5 Climate change 5.6 Green house effect 5.7 Depletion of Ozon layer and effect of Ozon layer depletion 5.8 Global warming and Measures against global warming 5.10 Solid waste management: causes, effects and control measures of urban and industrial waste, importance of 3R's in waste management. 5.11 Environment protection Act 1986: importance and objective	SL 5.1 Study rain water harvesting system in a building.

SW-5 Suggested Sessional Work (SW) :

a. Assignments:

- Explain conservation of water.
- Write notes on current global environment issues.

b. Mini Project:

- Discuss the case study of Bhopal gas leak disaster.
- Discuss the method of solid waste management adopted by local authority in the vicinity.

Note: Performance under Laboratory and Sessional work may appear in more than one Cos/Sos.

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J) Suggested Specification Table (For ESE of Classroom Instruction):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Water pollution and Air pollution	6	8	6	20
II	Soil, Noise , Thermal and Nuclear pollution	6	8	6	20
III	SUSTAINABLE DEVELOPMENT and Clean technologies	6	8	6	20
IV	Environmental Impact Assessment (EIA)	6	8	6	20
V	SOCIAL ISSUES AND THE ENVIRONMENT	6	8	6	20
Total		30	40	30	100

Legend: R: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*): NA

Laboratory Instruction Number	Short Laboratory Experiment Title	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
-	-	-	-	-

* Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals

Legend: PRA: Process Assessment, PDA : Product Assessment

Note: Only one experiment has to performed at the end semester examination of -- Marks as per assessment scheme

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K) Suggested Instructional/Implementation Strategies:

- 1) Improved Lecture
- 2) Case Method
- 3) Group Discussion
- 4) Industrial visits
- 5) Field Trips
- 6) Demonstration
- 7) ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)

L) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1	Environmental studies	Dr. Suresh K. Dhameja	S K kataria and sons	2012
2	Energy, Environment Ecology & Society	Dr. Surinder Deswal	Dhanpat Rai & sons	2014
3	Environment & Ecology	Dr. Plyush Kant Pandey	Sun India Publication	2009
4	Energy and sustainable development	P S Ramakrishnan	National Book Trust	2014
5	Our Environment (Hindi Textbook)	M k Goyal	Agrawal publications Agra	2013

(b) Open source software and website address :

1. www.nptel.ac.in
2. <https://swayam.gov.in>

M) List of Major Laboratory Equipment and Tools: NA

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
-	-	-	-

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs) Titles	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	Basic knowledge PO-1	Discipline knowledge PO-2	Experiments & Practice PO-3	Engineering Tools PO-4	The Engineer & Society PO-5	Environment & Sustainability PO-6	Ethics PO-7	Individual & Team work PO-8	Communication PO-9	Life Long learning PO-10	PSO-1	PSO-2
CO-1 Describe causes, prevention and remedial measures of water and air pollution.	1	1	1	1	3	3	3	3	1	3	1	1
CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.	1	1	1	1	3	3	3	3	1	3	1	1
CO-3 Create awareness about sustainable development and clean technology	1	1	1	1	3	3	3	3	1	3	1	1
CO-4 Perform Environmental Impact Assessment (EIA) for new design and project	1	1	1	1	3	3	3	3	1	3	1	1
CO-5 Create awareness for social issues and the environment.	1	1	1	1	3	3	3	3	1	3	1	1

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O) Course Curriculum Map:

POs & PSOs No.	COs No. & Title	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO- 1 to 10 PSO-1,2	CO-1 Describe causes, prevention and remedial measures of water and air pollution.	SO1.1 SO1.2 SO1.3	--	UNIT-1 Water pollution and Air pollution 1.0 1.1 : 1.1.1 – 1.1.6 1.2 : 1.2.1 – 1.2.6	SL 1.1 SL 1.2
PO- 1 to 10 PSO-1,2	CO-2 Explain causes, prevention and remedial measures of Soil, Noise, Thermal and Nuclear pollution.	SO 2.1 SO 2.2 SO 2.3 SO 2.4	--	Unit 2.0 Soil, Noise , Thermal and Nuclear pollution 2.1: 2.1.1- 2.1.4 2.2 : 2.2.1 -2.2.5 2.3 : 2.3.1 -2.3.4 2.4 : 2.4.1 - 2.4.4	SL 2.1
PO- 1 to 10 PSO-1,2	CO-3 Create awareness about sustainable development and clean technology	SO.3.1 SO3.2 SO3.3 SO3.4 SO3.5	--	Unit 3.0 Sustainable Development and Clean technologies 3.1:3.1.1 - 3.1.6 3.2 : 3.2.1 -3.2.5 3.3 : 3.3.1,3.3.2 3.4 3.5 3.6 : 3.6.1 – 3.6.4	SL 3.1
PO- 1 to 10 PSO-1,2	CO4- Perform Environmental Impact Assessment (EIA) for new design and project	SO4.1 SO4.2 SO4.3	--	Unit 4.0 Envi. Impact Assessment (EIA) 4.1 : 4.1.1 - 4.1.3 4.2 : 4.2.1 - 4.2.3 4.3 : 4.3.1,4.3.2	SL 4.1
PO- 1 to 10 PSO-1,2	CO-5 Create awareness for social issues and the environment.	SO5.1 SO5.2 SO5.3	--	Unit 5.0 Social Issues And The Environment 5.1 – 5.11	SL 5.1

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Semester - I

- A) Course Code : 2000155 (022)
 B) Course Title : Computer Fundamentals and Applications
 C) Pre- requisite Course Code and Title :
 D) Rationale :

This course will enable diploma engineers to use computers and different applications for various computing purposes. It will enable technicians to perform for day-to-day computing activities, in particular- preparing professional documents, analyzing details graphical representations, and multimedia presentation for time to time decision making by the management of academia, business and industry. They would also be able to use Internet, cloud services and its security features for effective computing.

- E) **Course Outcomes:** The course content should be taught and implemented with the aim to develop the following outcomes in the students.

- CO-1 Use effectively computer system and its peripherals.
 CO-2 Prepare a professional document using various features of word-processing for academic/business/ industry.
 CO-3 Create a spread sheet, analyze the data using different formula/ functions and represent it in different form of chart for solving academic/business/industrial problem.
 CO-4 Create a professional multimedia presentation using its various features for an academic/business/ industrial application.
 CO-5 Use Internet, Cloud services, and its security features for computing.

F) Scheme of Studies

S.No	Board of Study	Course Code	Course	Scheme Of Studies (Hours/Week)			
				L	P	T	Total Credit L+(P+T)/2
1	Computer Science and Engineering	2000155 (022)	Computer Fundamentals and Applications	1	-	2	2
2	Computer Science and Engineering	2000162 (022)	Computer Fundamentals and Applications (Lab)	-	6	-	3

Legend: L-Lecture, P-Practical, T-Tutorial

G) Scheme of Assessment

S.No	Board of Study	Course Code	Course	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Computer Science and Engineering	2000155 (022)	Computer Fundamentals and Applications	50	20	30	-	-	100
2	Computer Science and Engineering	2000162 (022)	Computer Fundamentals and Applications (Lab)	-	-	-	100	20	120

Legend: ESE-End semester Examination, CT-Class test, TA-Teachers' Assessment

Note: Separate passing is must for Theory and Practical assessment.

H) Course-Curriculum Detailing

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessionals Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Use effectively computer system and its peripherals.

(Approx. Hrs: CI+LI+SW+SL = 20)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO1.1 Use functions of CPU, ALU, Memory Unit and I/O Units using block diagram of Computer SO1.2 Explain purpose and function of OS in computer SO1.3 Use various file handling operations in Windows operating system. SO1.4 Describe any five important features of Windows control panel. SO1.5 Describe Green IT concept for environment ally sound computing.	LE1.1 Perform various file handling operations of Windows OS (Create, copy, rename, delete, move files and folder) LE1.2 Use accessories utilities of windows OS (Notepad, Paint etc.)	Unit-1.0 Basics of Computer System 1.1 Computer block diagram 1.1.1 Central Processing Unit (CPU), Control Unit, Arithmetic logic Unit (ALU), Memory Unit 1.1.2 Input Output Units- Monitor, Printers: Dot matrix, Laser, Inkjet, Plotters, Scanner 1.2 Data Representation 1.2.1 Bit, Byte, Nibble, Word, ASCII, BCD, EBCDIC, UNICODE 1.3 Concept of Hardware and Software 1.3.1 System software & Application Software 1.4 Operating system 1.4.1 Concepts, Purpose and its Functions 1.4.2 Operations of Windows OS 1.5 Operations of Windows OS 1.5.1 Create and name file and folders 1.5.2 Copy file, Rename and Delete of files and folders, Search files and folders 1.5.3 Install Application, Create shortcut of	<ul style="list-style-type: none"> Block Diagram of Computer System Features of Windows OS Advance Features of Windows OS Utilities Concept of Green IT

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		application on the desktop 1.6 Windows OS Utilities 1.6.1 Windows accessories Utilities 1.6.2 Control Panel, Taskbar 1.7 Green IT Concepts: Ergonomics, Power Plans to maximize computer's performance and conserve energy, Concept of minimizing Carbon Footprint, computing ewaste its toxic constituent and Health effects, ewaste management & recycling	

SW-1 Suggested Sessional Work (SW):

a) Assignments

- Describe functions of CPU, ALU and Memory Unit using block diagram of Computer
- List different features of operating system.

b) Mini Project

- Prepare a report on different type of computer system and printers with its specifications in your computer lab.

c) Other Activities (Specify)

- A Seminar on 'Various features of Windows O.S. of computer'
- A Seminar on 'The Green IT concept for environmentally sound computing'.

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Semester - I

CO-2 Prepare a professional document using various features of word-processing for an academic/business/industry.

(Approx. Hrs: CI+LI+SW+SL =24)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO2.1 Use the various features of a word processing software for preparing a professional document.	<p>LE2.1 Prepare a sample academic/ business/ industrial/ letter document applying formatting features on text like bold, italics, underline, font type, color and size.</p> <p>LE2.2 Apply bullet, and numbering feature in the above sample document</p> <p>LE2.3 Insert images and manipulate tables in the above sample document.</p> <p>LE2.4 Use mail merge feature of word processing to write and send a personalized letter or e-mail to different people at the same time such as appointment or invitation letters.</p> <p>LE2.5 Develop typing speed for documentation at a proficiency level.</p>	<p>Unit-2.0 Word Processing</p> <p>2.1 Overview of Word processor</p> <p>2.1.1 Basics of Font- Type, Size, Color, Effects like Bold, Italic, Underline, Subscript and superscript, Case changing options</p> <p>2.2 Working with Text</p> <p>2.2.1 Inserting & Deleting, Undo and Redo</p> <p>2.2.3 Copy and Moving (cutting) text within a document</p> <p>2.3 Formatting Paragraphs</p> <p>2.3.1 Lists Setting, Line spacing</p> <p>2.4 Page settings</p> <p>2.4.1 Margins Setting, Header and Footer</p> <p>2.5 Spelling and Grammatical checks</p> <p>2.6 Table and its options</p> <p>2.6.1 Inserting rows or columns, Merging and Splitting cells, Arithmetic Calculations in a Table</p> <p>2.7 Working with pictures</p> <p>2.7.1 Inserting Pictures from Files</p> <p>2.8 Using Drawings & Objects</p> <p>2.8.1 WordArt, Lines and Shapes, Modifying Drawn Objects, Formatting Drawn objects</p>	<ul style="list-style-type: none"> • Features of word-processing software • Advance features of word processing • Features for working with pictures and drawing objects

SW-2 Suggested Sessional Work (SW):

a. Assignments

- Make a report file on short cut key for different word processing commands.
- Describe mail merge feature of word processing software for sending mass letter.

b. Mini Project

- Prepare a learning material in form of a document on the sessions taken on word processing.

c. Other Activities (Specify)

- A Seminar on 'Features of Word processing Software'

CO-3 Create a spread sheet, analyze the data using different formula/ functions and represent it in different form of chart for solving academic/business / industrial problem.

(Approx. Hrs: CI+LI+SW+SL= 24)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO3.1 Use Spread Sheet software to create, analyze and represent it different form of charts.	LE3.1 Create a sample worksheet for any academic/ business/ industrial problem. (pay bill/ pay slip/ electricity bill/ examination results/ admission list). LE3.2 Apply different formula and functions in the above sample sheet for analyzing data. LE3.3 Use graphics and auto shapes in above sample sheet. LE3.4 Create and manipulate charts on the analyzed data for above sample sheet.	Unit-3.0 Spread sheet/ Data Analysis & Chart Presentation 3.1 Introduction to spread sheet/ Data Analysis & Graphical Presentation 3.1.1 Introduction to data, cell address 3.1.2 Excel Data Types 3.2 Concept of hyperlink 3.3 Introduction to Formatting 3.3.1 Formatting Number, Text, Formatting Date & Time, Formatting Concept of Worksheet, Formatting Concept of Workbook 3.4 Understanding Formulas 3.4.1 Operators in spread sheet 3.4.2 Operators Precedence 3.5 Understanding Functions 3.5.1 Common Excel Functions <ul style="list-style-type: none">Math & Trig Functions such as Sum, Round, Sqrt, Power etc.Statistical Function such as Average, Min, Max, etc.Date & TimeLookup & Reference such as transpose etc.Logical Functions such as IN, AND, OR etc.Text Function such as Upper, Lower 3.6 Types of Graphics	<ul style="list-style-type: none">Features of spread-sheet softwareAdvance features of Data AnalysisType of data representation/ Charts

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		3.6.1 Word Art, Auto Shapes, Images 3.7 Introduction to charts 3.7.1 Overview of different types of Charts, 3.7.2 Using different Types of Charts such as Bar Chart, Pi-Chart etc 3.8 Printing in spreadsheet 3.8.1 Print Area, set Margins, Header & Footer 3.8.2 Page Setup options	

SW-3 Suggested Sessional Work (SW):

a) Assignments

- Describe the use of Spread Sheet software to create, analyze and represent it different form of charts.

b) Mini Project

- Create a student result sheet using Spreadsheet software, analyses the data and represent it in form of chart with respect to scores of previous exams/test/ Assignment.

c) Other Activities (Specify)

- A Seminar on 'Features of Spread sheet/ Data Analysis & Chart Presentation software'

CO-4 Create a professional multimedia presentation using its various features for any academic/business/industrial application.

(Approx. Hrs: CI+LI+SW+SL = 22)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Use various features of multimedia presentation software.	LE4.1 Create a sample multimedia presentation for any academic/ business/ industrial application. LE4.2 Perform various operation on above sample presentation. LE4.3 Apply formatting features like font setting, text fill, space formatting on above sample presentation. LE4.4 Apply word arts, styles, bullets and numbers on above sample	Unit-4.0 Multimedia/ Graphic Presentation 4.1 Introduction to Multimedia/Graphic Presentation package 4.1.1 Outline of an effective presentations, Starting a New Presentation Files, Saving work, Creating new Slides 4.2 Work with textboxes 4.2.1 Adjusting character spacing, Adjusting line spacing, Formatting text	<ul style="list-style-type: none"> Features of Multimedia Presentation software Advance features of Multimedia Presentation Features of drawing tools, clip art's, multimedia elements

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
	<p>presentation.</p> <p>LE4.5 Apply drawing tools, shapes object borders, object fill and effects on above sample presentation.</p> <p>LE4.6 Insert video, animation and sound files on above sample presentation.</p> <p>LE4.7 Create hyperlink and use action buttons on above sample presentation.</p> <p>LE4.8 Print the above multimedia presentation as per given format.</p>	<p>boxes,</p> <p>4.2.2 Create new Slides</p> <p>4.3 Introduction to Formatting</p> <p>4.3.1 Change a slides Layout, Applying a theme, Changing Colors, Using various types of effects, Creating and managing custom Color, Changing the background, Formatting bulleted and numbered list, Styles</p> <p>4.4 Work with Fonts</p> <p>4.4.1 Change the font, font size, font color, Creating and managing custom font theme & Color, Using text fill</p> <p>4.5 Work with Slides</p> <p>4.5.1 Change slides Layout, Slides Master, Slide Sorter</p> <p>4.5.2 Apply & Manage theme</p> <p>4.6 Use Drawings & Objects</p> <p>4.6.1 Word Arts, Selecting, deleting, moving, copying, resizing and arranging objects, working with drawing tools, Apply shape or picture styles, Applying object borders, Apply object fill, Apply object effects, Apply object borders</p> <p>4.7 Work with Clip Art & Picture</p> <p>4.7.1 Insert Clip Art, Modify Clip Art, Insert & Editing Pictures</p> <p>4.8 Find and replace text, Correcting your spelling</p>	

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
		4.9 Use Tables 4.9.1 Creating a new Table, Editing a table's structure 4.10 Work with Video 4.10.1 Embed a video, Link to a video, Size a video, Video playback options 4.11 Use Animation, Sound & Effects 4.11.1 Using Custom Animation for Text & Picture 4.11.2 Configure a sound playback, Add a digital music sound track, provide Transition effects and timings, Creating hyperlinks, using action buttons	

SW-4 Suggested Sessional Work (SW):

a. Assignments:

- Describe the potential use multimedia presentation.

b) Mini Project:

- Create a short slide show of any event organized in college.

c. Other Activities (Specify)

- A Seminar on 'Features of multimedia presentation Software

CO-5 Use Internet, Cloud services, and its security features for computing.

(Approx. Hrs: CI+LI+SW+SL = 22)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.1 Identify different type of computer Networks. SO5.2 Explain briefly wired and wireless internet connectivity.	LE5.1 Identify various types of network, its devices LE5.2 Configure Internet connection and browser setting. LE5.3 Search web content based on different criteria using search engine. LE5.4 Use email services to send	Unit-5.0 Basics of Internet & Cloud Computing 5.1 Types of Networks 5.1.1 LAN, MAN, WAN 5.2 Intranet, Internet, VPN, Wi-Fi, Bluetooth, switches 5.3 Brief of Internet Connectivity 5.4 Devices and Services	<ul style="list-style-type: none"> Internet and its services Browsers and search engines Network security and features of cloud

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO5.3 Use different types of internet services SO5.4 Identify various types of Viruses and its protection. SO5.5 Explain briefly cloud computing.	and receive emails. LE5.5 Use voice mail, newsgroup, chat and video conferencing, ftp services LE5.6 Install and configure Anti-virus/firewall on computer system	5.4.1 Dial up, Leased line, DSL Broadband, Access Point, Modem, Wi-Fi Router 5.4.2 Email, voice mail, Newsgroup, Chat, Video conferencing, File Transfer Protocol 5.5 Web Browsers URL, Web Site, http 5.6 Internet Services 5.6.1 Queries, Search Engines 5.7 Introduction to Virus & Antivirus 5.7.1 Virus & its type, Antivirus 5.7.3 Firewall 5.8 Overview of Cloud Computing	computing

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

SW-5 Suggested Sessional Work (SW)

a. Assignments:

- Explain Different type of networks
- List the basic features of cloud network

b. Mini Project:

Prepare report on computer network, devices, antivirus and firewall software installed in the laboratory.

c. Other Activities (Specify)

- A seminar on 'Computer Antivirus'
- A seminar on 'Computer Firewall'
- A seminar on 'Overview of Cloud Computing'

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

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I) Suggested Specification Table (For ESE of Classroom Instruction)

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Basics of Computer System	4	6	2	12
II	Word Processing	-	2	-	2
III	Spread sheet/ Data Analysis & Chart Presentation	-	2	-	2
IV	Multimedia/Graphic Presentation	-	2	-	2
V	Basics of Internet, Cloud Services and its Security for Computing	2	4	1	7
Total		8	18	4	25

Legend: Remember, U: Understand, A: Apply and above

J) Suggested Specification Table (For ESE of Laboratory Instruction*)

S.No/ Units	List of Practicals	Assessment of Laboratory Work (Marks)			100 Marks are allocated for performance under ESE
		Performance		Viva- Voce	
		PRA	PDA		
1	i. Perform various file handling operations of Windows OS (Create, copy, rename, delete, move files and folder) ii. Use accessories utilities of windows OS (Notepad, Paint etc.)	4	4	4	
2	Prepare a sample academic/ business/ industrial/ letter document applying formatting features on text like bold, italics, underline, font type, color and size.	12	8	4	
3	Create a sample worksheet for any academic/ business/ industrial problem.(pay bill/ pay slip/ electricity bill/ examination results/ admission list).	12	8	4	
4	Create a sample multimedia presentation for any academic/ business/ industrial application.	12	8	4	
5	i. Use voice mail, newsgroup, chat and video conferencing, ftp services ii. Install and configure Anti-virus/firewall on computer system	8	4	4	
		48	32	20	

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practicals

Legend: PRA: Process Assessment, PDA: Product Assessment

Note: Each student at the end of semester examination of **100 Marks**; has to undertake five experiments (one from each Unit)

K) Suggested Instructional/Implementation Strategies

1. Improved Lecture
2. Tutorial

3. Case Method
4. Group Discussion
5. Industrial visits
6. Industrial Training
7. Field Trips
8. Portfolio Based Learning
9. Role Play
10. Demonstration
11. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
12. Brainstorming
13. Others

L) Suggested Learning Resources

(b) Books

S. No.	Titles	Author	Publisher	Edition & Year
1.	Computer Fundamentals	Goel, Anita	Pearson Education, New Delhi,	2014, ISBN-13: 978-8131733097
2.	Computer Course	Ravi Kant Taxali	Tata McGraw Hills. New Delhi.	Year 2014 or latest
3.	Fundamentals of computers	V. Rajaraman, NeehariKaAdabala	PHI	6 th Edition 2014 or latest
4.	Computer Basics Absolute Beginner's Guide, Windows 10	Miller, Michael	QUE Publishing;	8th edition August 2015, ISBN: 978-0789754516 or latest
5.	The Internet Book	Douglas Comer	Prentice Hall	Year 2007 or latest
6.	Microsoft Office 2010: On Demand	Johnson, Steve	Pearson Education, New Delhi India,	-2010. ISBN :9788131770641 or latest
7.	OpenOffice.org for Dummies	Leete, Gurdy, Finkelstein Ellen, Mary Leete	Wiley Publishing, New Delhi,	2003 ISBN : 978-0764542220 or latest
8.	Computer Fundamentals	Pradeep K Sinha	BPB Publication	Year 2004 or latest

(c) Open source software and website address

1. Fundamentals of computers- V. Rajaraman, NeeharikaAdabalahttps://books.google.co.in/books?id=rGjkbQAAQBAJ&dq=Fundamentals+of++computers&source=gbs_navlinks_s
2. Computer course, Ravi Kant Taxali- https://books.google.co.in/books/about/COMPUTER_COURSE.html?id=PfHftdSmNBkC&redir_esc=y
3. Computer Fundamentals Tutorials- https://www.arstecb.com/book_argument/com_fun.pdf
4. Computer fundamentals, P.K. Sinha <http://www.edutechlearners.com/computer-fundamentals-p-k-sinha-free-pdf/>
5. Microsoft office set by step Joan Lambert and Curtis Frye <https://ptgmedia.pearsoncmg.com/images/9780735699236/samplepages/9780735699236.pdf>
6. Open Office Suit- <http://www.openoffice.us.com/download-openoffice-free.php>
7. MS Office: <https://www.microsoft.com/en-in/learning/office-training.aspx>

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8. Open Office Training: <http://www.tutorialsforopenoffice.org/>
9. Star Office- https://s3-ap-southeast-1.amazonaws.com/r4ltue295xy0d/Special_Edition_Using_StarOffice_6_0.pdf
10. Typing Master 10 in English for Windows: <http://www.typingmaster.com/typing-tutor/free-download.html>
11. Hindi Typing Tutor and Master <http://www.hinditypingtutor.com/>

(c) Others

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' Manual
4. Users' Guide

M) List of Major Laboratory Equipment, Tools & Software

S. No.	Name of Equipment/Tools/Software	Broad Specifications	Relevant Practical Number
1.	Computer Network	LAN Cable, Router, Switch 30*2/Hub	LE1.1 & LE1.2
2.	Printer, Scanner, Plotter, Modem	Laser Printer, Scanner, Plotter, Modem	LE1.1 & LE1.2
3.	MS Back Office 2016 or latest	Office suit	LE2.1 to LE4.8
4.	Typing Master in English for Windows(Free download) Hindi Typing Tutor and Master (Free download)	http://www.typingmaster.com/typing-tutor/free-download.html http://www.hinditypingtutor.com/	LE2.5
5.	Open Office Suit Latest	Office suit	LE2.1 to LE4.8
6.	Internet Connectivity	Broad band/Leased Line	LE5.1 to LE5.6
7.	Anti-Virus Software & Firewall	Antivirus software And Firewall	LE5.5

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N) Mapping of POs & PSOs with Cos

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO-1 Use computer system and its peripherals effectively for solving various engineering problems.	3	3	3	3	3	2	2	1	2	2	3	3
CO-2 Prepare a professional document using various features of word-processing for academic/business/ industry purpose.	3	3	3	3	3	1	2	2	3	2	3	3
CO-3 Create a spread sheet, analyze the data using different formula/ functions and represent it in different form of chart for solving academic/business/ industrial problem.	3	3	3	3	3	1	2	2	3	2	3	3
CO-4 Create a professional multimedia presentation using its various features for any academic/business/ industrial application.	3	3	3	3	3	1	2	2	3	2	3	3
CO-5 Use Internet, Cloud services, and its security features for computing.	3	3	3	3	3	1	2	2	3	2	3	3

Legend: 1 – Low, 2 – Medium, 3 – High

O) Course Curriculum Map

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POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
PO 1,2,3,4, 5,6,7, 8,9,10 PSO 1,2	CO-1 Use computer system and its peripherals effectively for solving various engineering problems.	SO1.1-SO1.5	LE1.1 LE1.2	Unit-1.0 Basics of Computer System	As mentioned in relevant pages
PO 1,2,3,4, 5,6,7, 8,9,10 PSO 1,2	CO-2 Prepare a professional document using various features of word-processing for academic/business/ industry purpose.	SO.2.1	LE2.1-LE2.5	Unit-2.0 Word Processing	
PO 1,2,3,4, 5,6,7, 8,9,10 PSO 1,2	CO-3 Create a spread sheet, analyze the data using different formula/ functions and represent it in different form of chart for solving academic/business/ industrial problem.	SO.3.1	LE3.1-LE 3.4	Unit-3.0 Spread sheet/ Data Analysis & Chart Presentation	
PO 1,2,3,4, 5,6,7, 8,9,10 PSO 1,2	CO-4 Create a professional multimedia presentation using its various features for any academic/business/ industrial application.	SO4.1	LE4.1-LE4.8	Unit-4.0 Multimedia/Graphic Presentation	
PO 1,2,3,4, 5,6,7, 8,9,10 PSO 1,2	CO-5 Use Internet, Cloud services, and its security features for computing.	SO5.1-SO5.5	LE5.1-LE5.6	Unit-5.0 Basics of Internet & Cloud Services, its security for Computing	

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

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- A) Course Code : 2000156 (037)
 B) Course Title : Workshop Practice
 C) Pre-requisite Course Code and Title :
 D) Rationale :

Mechanical Workshop practice is an essential requirement to understand the working and execution of jobs in industrial environment. This course intends to impart basic know-how of various tools, methods and their use at different stages of manufacturing. This course will develop skills in handling tools, instruments, equipments used in the workshop and perform operations in various shops and enhance relevant technical skills required to work in an industry along with the understanding of the complexity of the industrial job.

E) Course Outcomes:

- CO-1 Use measuring devices and hand tools effectively.
 CO-2 Undertake wood working operations economically and safely.
 CO-3 Perform various joining operations using welding, brazing and soldering methods.
 CO-4 Perform different types of fitting and sheet metal operations.
 CO-5 Prepare simple jobs using lathe.

F) Scheme of Studies:

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Credits L+(P+T)/2
1	Mechanical Engineering	2000156 (037)	Workshop Practice	1	-	-	1
2	Mechanical Engineering	2000163 (037)	Workshop Practice (Lab)	-	6	-	3

Legend: L: Classroom Instruction (Includes different instructional strategies i.e. Lecture and others), P: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies), T- Tutorial includes Sessional Work (SW) (assignment, seminar, mini project etc.) and Self Learning(SL), C:Credits

Note: SW & SL has to be planned and performed under the continuous guidance and feedback of teacher to ensure outcome of Learning

F) Scheme of Assessments:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1.	Mechanical Engineering	2000156 (037)	Workshop Practice	-	-	30	-	-	30
2.	Mechanical Engineering	2000163 (037)	Workshop Practice (Lab)	-	-	-	50	20	70

• PROGRESSIVE ASSESSMENT: (50 MARKS)

1. CLASSROOM ASSESSMENT (CA): (a) CLASSTEST (CT) – Nil,
(b) TEACHER'S ASSESSMENT (TA) – 30 (Sessional work (SW) -20, Attendance (ATT) -10)
2. LABORATORY ASSESSMENT (LA): TEACHER'S ASSESSMENT (TA) – 20 (PRA – 10, PDA -5,
VIVA VOICE -5)

• END SEMESTER ASSESSMENT (ESE):

3. END SEMESTER EXAM (ESE-THEORY)- Nil
4. END SEMESTER EXAM (ESE-PRACTICAL) ESE - 50

Legend:PRA: Process Assessment, PDA: Product Assessment

Note: Separate passing is must for End Semester Exam (Theory) and End Semester Exam (Practical).

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (L), Laboratory Instruction (P), T- Tutorial Includes Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO- 1 Use measuring devices and hand tools effectively.

(Approx. Hrs: L+P+T = 16)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO1.1 List various measuring tools and instrument. SO1.2 Describe measuring unit and its conversion. SO1.3 Select suitable measuring devices in a given situation. SO1.4 List workshop hand tools. SO1.5 Describe Safety procedure in different workshops.	LE1.1 Identify different type of measuring tools available in workshop. LE1.2 Use suitable Marking and hand tools in a given situation. LE1.3 Measure the given job using suitable measuring Devices. LE1.4 Perform mock drill session in group of minimum 15 students for extinguishing fire.	Unit- 1.0 Measurement, Hand tools and workshop safety. 1.1 Engineering Measurement: definition, importance and Types of measurements. 1.2 Measuring instruments: linear measurement and angular measurement instruments. 1.3 Measuring devices: Linear measurement and angular measurement devices. 1.4 Workshop hand tools: List the various hand tools used in workshops. 1.5 Workshop Safety –Safety Practices, Causes of accidents, General safety rules, Safety signs and symbols. Firefighting equipment, fire extinguishers, and their types and First Aid	<ul style="list-style-type: none"> Collect the information related to various hand tools listed.

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SW-1 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Select any engineering object / part / drawing and perform the measurement using suitable measuring device.
- **Mini Project:**
 - i. Visit nearby mechanical workshop and collect information about operation performed by identified workshop and prepare the list of tools and equipment along with specification.

CO-2 Undertake wood working operations economically and safely.

(Approx. Hrs: L+P+T = 20)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO2.1 List various wood working tools with major specifications. SO2.2 Select wood working tools as per given job. SO2.3 Demonstrate various wood working operations. SO2.4 Explain procedure to prepare given type of joint.	LE2.1 Prepare one simple job of wood working comprises of marking, cutting, planing and finishing as per given drawing/sketch. LE2.2 Prepare any two wooden joints safely as per given drawing.	Unit- 2.0 Wood Working Shop 2.1 Types of woods and artificial woods and their applications. 2.2 wood working tools –bench vice, hammers, chisel, files, hacksaw, wood saw, surface planer, punch, v block, try square, steel rule, twist drill, marking block, reamers, tap set, mallet and their specification. 2.3 Wood working operations – Marking, Cutting, reaming, filing, drilling, joining, 2.4 Types of wood working joint – Butt joint, lap joint, Bridle joint, Dowel joint, Mitre joint, finger joint, dovetail joint, Dado joint, Groove joint, Cross lap, splice joint. 2.5 Applications of various joints.	<ul style="list-style-type: none"> • Collect the information on various types and appearance of wood being used in packaging of industrial products using internet facility.

SW-2 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Select any (Minimum 3 finished jobs) different wood working / carpentry jobs and prepare list of different types of woods and joints used in selected objects.
- **Mini Project:**
 - i. Make a wooden job as per given drawing and specifications of material.

CO-3 Perform various joining operations using welding, brazing and soldering methods.

(Approx. Hrs: L+P+T = 20)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
<p>SO3.1 Perform various types of joining methods.</p> <p>SO3.2 Select suitable welding method as per job requirement.</p> <p>SO3.3 Explain arc welding and gas welding procedure.</p>	<p>LE3.1 Operate gas welding apparatus to generate different types of flames.</p> <p>LE3.2 Prepare lap joint using gas welding as per given drawing safely.</p> <p>LE3.3 Prepare butt joint using arc welding as per given drawing safely.</p> <p>LE3.4 Mount the given electronic component on Printed circuit board (PCB) in a given situation.</p> <p>LE3.5 Join the given aluminum sheet by using brazing.</p>	<p>Unit- 3.0 Joining Methods :</p> <p>3.1 Joining methods- Various types of Joining Methods and their field application and types of welding joint.</p> <p>3.2 Arc welding</p> <p>3.2.1 Arc welding process, equipment with necessary accessories, Welding electrode, tools and consumables</p> <p>3.3 Personal protective equipment like safety glasses, welding gloves etc and safe practices in welding shop.</p> <p>3.4 Gas welding</p> <p>3.4.1 Gas welding process, Equipment with necessary accessories, Types like Carburizing, oxidizing and neutral flame.</p> <p>3.5 Soldering and brazing: specification, filler material, flux, heating methods, temperature range, advantages, and comparison.</p>	<ul style="list-style-type: none"> Collect the information on various types of welding electrodes and their industrial applications.

SW-3 Suggested Sessional Work (SW):

- Assignments:**
 - Select any two joining method and prepare their engineering field of application.
- Mini Project:**
 - Prepare any utility job like lab stool structure by using suitable welding process with list of tools and equipment along with specification.

CO-4 Perform different type of fitting and sheet metal operation.

(Approx. Hrs: L+P+T = 20)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO4.1 Identify various tools used in fitting shop. SO4.2 Select relevant tools as per given job in fitting shop. SO4.3 Perform various fitting operations. SO4.4 Perform various sheet metal operations.	LE4.1 Prepare one simple Job of fitting shop as per given drawing and instruction. LE4.2 Prepare one male – female type Fitting Jobs as per given Drawing. LE4.3 Prepare one sheet metal job using cutting, bending, edging and joining operations as per given drawing.	Unit- 4.0 Fitting and Sheet metal Shop. 4.1 Fitting tools – Hand tools used in fitting shop, holding tools, Marking and measuring tools, cutting tools. 4.2 Fitting Operation –Sawing, Chipping, Filling, Taping, Reaming and Drilling. 4.3 Sheet metal tools-list of sheet metal tools used. 4.4 Sheet metal operation- Shearing, Bending, Drawing, Squeezing, Snipping, riveting, Grooving.	<ul style="list-style-type: none">Using internet facility and collect the information related to field applications of sheet metal.

SW-4 Suggested Sessional Work (SW):

- **Assignments:**
 - i. Prepare simple jobs as per drawing and instructions given.
- **Mini Project:**
 - i. Prepare file stand by using by suitable material and sheet metal operations.

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CO-5 Prepare simple jobs using lathe

(Approx. Hrs: L+P+T = 16)

Session Outcomes (SOs)	Laboratory Instruction (P)	Class room Instruction (L)	Self Learning (SL)
SO5.1 Explain working principle of lathe machine. SO5.2 Explain various components of lathe machine. SO5.3 Describe job and tool holding devices. SO5.4 Calculate speed, feed, depth of cut f lathe machine SO5.5 Perform simple lathe operations.	LE5.1 Prepare one simple turning job as per given drawing. LE5.2 Perform drilling/ knurling/threading operation to prepare job as per given drawing.	Unit- 5.0 Lathe Machine 5.1 Concept, Working principle, constructional details and major components of lathe machine with their functions. 5.2 Job and tool holding devices and lathe attachments – head stock , tail stock, tool post, Lathe tools, chucks (3 and 4 Jaw), name and advantages of lathe attachment. 5.3 Lathe operations – Plain turning, Facing, taper turning , Knurling, Threading etc.	<ul style="list-style-type: none"> Collect data on various applications of lathe machine for engineering applications.

SW-5 Suggested Sessional Work (SW):

- Assignments:**
 - Visit the institute workshop and prepare a report comprises of names of different machine tools / tools their specifications and manufacturer's name.
- Mini Project:**
 - Visit the nearby workshop /machine shop and prepare the field report comprises of the following
 - Product(s) name
 - List of machine tools with associated accessories,
 - List of lathe tools with relevant accessories
 - List major clients.

Note: Performance under Laboratory and Sessional work may appear in more than one COs/SOs.

J) Suggested Specification Table (For ESE of Laboratory Instruction*):

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)		
		Performance		Viva-Voce
		PRA	PDA	
LE1.1	Measuring tools available in workshop.	30	15	5
LE1.2	Marking and hand tools in a given situation.	30	15	5
LE1.3	Mock drill session for extinguishing fire	35	10	5
LE2.1	Preparation of simple wooden job.	25	20	5
LE2.2	Preparation of two wooden joints	25	20	5
LE3.1	Operate gas welding apparatus	30	15	5
LE3.2	Preparation of lap joint using gas welding	25	20	5
LE3.3	Preparation of butt joint using arc welding	25	20	5
LE3.4	Mounting of electronic components on PCB	30	15	5
LE3.5	Joining of aluminum sheet by using brazing.	25	20	5
LE4.1	Preparation of simple fitting job.	25	20	5
LE4.2	Preparation of simple male –female type fitting job.	25	20	5
LE4.3	Preparation of sheet metal job .	25	20	5
LE5.1	Preparation of simple turning job.	25	20	5
LE5.2	Preparation of simple drilling/ knurling /threading using lathe	25	20	5

*Assessment rubric, process and product check list with rating scale need to be prepared by the course wise teachers for each experiment for conduction and assessment of laboratory experiments /practical's

Legend:PRA: Process Assessment, PDA: Product Assessment

Note: Only one experiment has to performed at the end semester examination of 50 Marks as per assessment scheme

K) Suggested Instructional/Implementation Strategies:

- Improved Lecture Method
- Industrial visits
- Expert Lecture
- Field Trips
- Self Learning
- Portfolio Based Learning
- Observation, Practice and Feedback
- Classroom, Laboratory, Workshop, Field, Video, Live Demonstrations
- Real Model
- Charts
- Demonstration
- ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile) can be integrated with many method

L) Suggested Learning Resources:

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1	Workshop Practice	Bawa, H.S.	McGraw Hill Education, Noida; ISBN: 978-0070671195	Latest
2	A Textbook of Manufacturing Process (Workshop Tech.)	Gupta, J.K.; Khurmi, R.S.	S.Chand and Co. New Delhi ISBN:81-219-3092-8	Latest
3	Introduction to Basic Manufacturing Process & Workshop Technology	Singh, Rajender	New Age International, New Delhi; 2014, ISBN: 978-81-224-3070-7	Latest
4	Elements of Workshop Technology	Hajra; Choudhary;	Media Promoters and Publishers Mumbai, 2009, ISBN: 10-8185099146	Latest

(b) List of open source software/learning website :

1. Measuring device : <https://www.youtube.com/watch?v=3M4rsWBYaIA>
2. Precision measuring device : <https://www.youtube.com/watch?v=JX8gHdNpamk>
3. Angular measuring device : <https://www.youtube.com/watch?v=dgkLbX4cqr4>
4. Workshop hand tools: <https://www.youtube.com/watch?v=4o0tqF0jDdo>
5. Wood working joint : https://www.youtube.com/watch?v=UDQ_aS8qvaU
6. Wood working tools : <https://www.youtube.com/watch?v=aCe9dNzCVQU>
7. Joining method : https://www.youtube.com/watch?v=rFKtP_6w4B0
8. Arc welding: <https://www.youtube.com/watch?v=ZQ7vdwjmX80>
9. Gas welding process: https://www.youtube.com/results?search_query=gas+welding+process+animation
10. Types of flame: <https://www.youtube.com/watch?v=1OLppHw6GRE>
11. Types of welding process: <https://www.youtube.com/watch?v=CCzhT81GrBo>
12. Soldering and brazing : <https://www.youtube.com/watch?v=BplzRtQAMw0>
13. Welding safety equipment : https://www.youtube.com/watch?v=S1H_mv3Webo
14. Fitting shop : <https://www.youtube.com/watch?v=dVxjT5kKhFc>
15. Sheet metal operation : <https://www.youtube.com/watch?v=95rgHM58dgw>
16. Drilling operation : <https://www.youtube.com/watch?v=zf9rgvzjkyY>
17. Shearing operation : https://www.youtube.com/watch?v=VMu7_W0QE3Y
18. Drawing operation : <https://www.youtube.com/watch?v=MQwHMebFuZM>
19. Lathe component: <https://www.youtube.com/watch?v=YQznRi3heQ>
20. Lathe Machine operation : <https://www.youtube.com/watch?v=OggsjZJwce8>
21. Work holding devices : <https://www.youtube.com/watch?v=jP1-lzLtxRw>
22. Working principle of lathe : <https://www.youtube.com/watch?v=NgbbB1tdmo4>

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Manufacturers' operating Manual

M) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1.	Measuring Instruments	Vernier calliper, Micrometer outside & inside, Bevel protractor, Pair of Inside spring calliper 150 mm, Pair of outside spring calliper- 250 mm	LE1.1 & 1.2
2.	Vernier height Gauge	Vernier height Gauge 450 mm	LE1.1 & 1.2
3.	Surface Plate	Surface Plate 600 x 900 mm Grade I	LE1.1 & 1.2
4.	Angle Plate	Angle Plate 450 x 450 mm	LE1.1 & 1.2
5.	Fire Safety Equipment	Fire buckets of standard size.	LE1.3
6.	Fire Safety Equipment	Fire extinguisher A,B and C types	LE1.3
7.	Wood Turning Lathe	Wood Turning Lathe Machine, Height of Centre: 200mm, Distance between Centers: 1200mm, Spindle Bore: 20mm with Taper, Range of Speeds: 425 to 2800 with suitable Motor Drive. with all accessories	LE2.1 & 2.2
8.	Circular Saw Machine	Circular Saw Machine, Diameter of saw blade 200 mm, Maximum Depth of Cut 50 mm, Table Size - 350 x 450 mm, Table Tilting - 450	LE2.1 & 2.2
9.	Wood working tools	Wood working tools- marking and measuring tools, saws, claw hammer, mallet, chisels, plans, squares,	LE2.1 & 2.2
10.	Carpentry Vice	Carpentry Vice 200 mm	LE2.1 & 2.2
11.	Work Benches	Work Benches- size:1800 x 900 x 750 mm	LE4.1 & 4.2
12.	Drilling machine	Bench Drilling machine (up to 13 mm drill cap.) with ½ H.P. Motor 1000 mm. Height.	LE4.1 & 4.2
13.	Power Saw machine	Power Saw machine 350 mm mechanical with 1 HP Motor & all Accessories.	LE4.1 & 4.2
14.	Bench Grinder	Bench Grinder 200 mm Grinding Disc diameter 200 mm. with 25 mm. bore 32 mm. with ½ HP/1HP Motor.	LE4.1 & 4.2

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S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
15.	Arc Welding machine	Welding machine 20 KVA 400A welding current 300A at 50, 100, 200, 250, 300 with std. Accessories and Welding Cable 400 amp. ISI with holder	LE3.3
16.		Arc welding hand tools- electrode holder, cable connector, cable lugs, chipping hammer, earthling clamp, wire brush.	LE3.3
17.	PPE	Personal Protective Equipment like safety gloves, face shield /screen, safety goggle, apron safety shoes and helmet etc.	LE3.3
18.	Gas welding apparatus	Oxygen and acetylene gas welding and cutting kit with cylinders and regulators.	LE3.2
19.		Gas welding hand tools- welding torch, welding tip, pressure regulator, oxygen and acetylene cylinders, spark lighter	LE3.1 & 3.2
20.	Pipe Bending Machine	Pipe Bending Machine	For Mini Projects
21.	Pipe Vice	Pipe Vice – 100 mm	
22.	Pipe Cutter	Pipe Cutter- 50 mm	
23.	Bench Vice	Bench Vice 100 mm	
24.	Portable drill Machine	Portable Hammer Drill Machine 0-13 mm A.C. 230 V, 2.5Amp, Pistol type, having different types of bits	
25.	Sheet Bending Machine	Sheet Bending Machine	LE4.3
26.	Sheet Cutting Machine	Sheet Cutting Machine	LE4.3
27.	Brazing Equipment	Brazing Equipment	LE3.5
28.	Soldering Iron	Soldering iron, Flux for soldering and Solder filler material.	LE3.4
29.	PCB	Various types of electronic components and Printed Circuit Boards (PCB)	LE3.4
30.	Fitting tools	Fitting tools - hammers, chisels, files (smooth & rough file, round, flat, safe edge, square, knife edge, triangular, half round file) hacksaw, surface plate, punch, v block, angle plate, try square, marking block, steel rule, twist drills, reamers, tap set, die set.	LE4.1 & 4.2
31.	Plumbing tools	Plumbing tools- pipe vice, pipe bending	For Mini Projects

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S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
		equipment, pipe wrenches, dies.	
32.	Sheet metal hand tools	Sheet metal hand tools- snip, shears sheet gauge, straight edge, L square, scriber, divider, trammel, punches, pliers, stakes, grooves, limit set	LE4.3

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)		
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2	PSO-3
CO-1 Use measuring devices and hand tools effectively.	2	2	3	3	1	1	1	2	1	1	-	2	2
CO-2 Undertake wood working operations economically and safely.	2	2	3	3	1	1	1	2	1	1	-	2	2
CO-3 Perform various joining operations using welding, brazing and soldering methods	2	2	3	3	1	1	1	2	1	1	-	2	2
CO-4 Perform different types of fitting and sheet metal operations	2	2	3	3	1	1	1	2	1	1	-	2	2
CO-5 Prepare simple jobs using lathe	2	2	3	3	1	1	1	2	1	1	-	2	2

Legend: 1 – Low, 2 – Medium, 3 – High

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O) Course Curriculum Implementation Map:

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (P)	Classroom Instruction (L)	Self Learning (SL)
PO 1,2,3,4,5,6, 7,8,9,10 PSO 2,3	CO-1 Use measuring devices and hand tools effectively.	SO-1.1, 1.2, 1.3, 1.4	LE1.1, 1.2, 1.3	Unit-1.0 Measurement, Hand tools and Workshop Safety. 1.1, 1.2, 1.3, 1.4	As mentioned in relevant pages
PO 1,2,3,4,5,6, 7,8,9,10 PSO 2,3	CO-2 Undertake wood working operations economically and safely.	SO-2.1, 2.2, 2.3, 2.4	LE2.1, 2.2	Unit-2.0 Wood Working Shop. 2.1, 2.2, 2.3	
PO 1,2,3,4,5,6, 7,8,9,10 PSO 2,3	CO-3 Perform various joining operations using welding, brazing and soldering methods	SO-3.1, 3.2, 3.3	LE3.1, 3.2, 3.3, 3.4	Unit-3.0 Joining Methods 3.1, 3.2, 3.3, 3.4	
PO 1,2,3,4,5,6, 7,8,9,10 PSO 2,3	CO-4 Perform different types of fitting and sheet metal operations	SO-4.1, 4.2, 4.3, 4.4	LE4.1, 4.2, 4.3	Unit-4.0 Fitting and Sheet Metal Shop 4.1, 4.2, 4.3, 4.4	
PO 1,2,3,4,5,6, 7,8,9,10 PSO 2,3	CO-5 Prepare simple jobs using lathe	SO-5.1, 5.2, 5.3, 5.4	LE5.1, 5.2	Unit-5.0 Lathe Machine 5.1, 5.2, 5.3	

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Semester - I

- A) Course Code : 2000164 (046)
B) Course Title : Seminar & Technical Presentation Skill Part –I
C) Pre- requisite Course Code and Title :
D) Rationale :

Technical Writing and Presentation Skills are core skills to be developed in diploma graduates as students exchange information and convey their ideas and opinions with different stakeholders. Students in technical institutes need to be trained for this. The present curriculum focuses on the attainment of course outcomes related to soft skills, so that the students are confident, self-reliant and capable of presenting themselves appropriately.

E) Course Outcomes :

CO-1 Demonstrate effective listening and reading skills with clarity.

CO-2 Demonstrate appropriate presentation skills using different aids and techniques.

F) Scheme of Studies:

S.No	Board of Study	Course Code	Course Title	Scheme of Studies (Hours/Week)			
				L	P	T	Credit L+(P+T)/2
1	Humanities	2000164 (046)	Seminar & Technical Presentation Skill Part –I	-	1	-	1

Legend: L-Lecture, P-Practical, T-Tutorial

G) Scheme of Assessment:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					
				Theory			Practical		Total Marks
				ESE	CT	TA	ESE	TA	
1	Humanities	2000164 (046)	Seminar & Technical Presentation Skill Part –I	-	-	-	-	10	10

Legend: ESE: End Semester Exam, CT: Class Test, TA: Teacher Assessment

H) Course-Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW) and Self Learning (SL). Students are expected to demonstrate the attainment of Session Outcomes (SOs) and finally Course Outcomes (COs) upon the completion of course.

CO-1 Demonstrate effective listening and reading skills with clarity

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
SO1- Communicate effectively using correct pronunciation, modulation, pitch etc.,	1.1 Need of Learning to learn skills (Listening, Reading and Speaking) 1.2 Methods of good study habits 1.3 Practice Loud reading 1.4 Practice Active Listening 1.5 Practice Speaking in Class(Group Discussion, Extempore, Debate, Role Play etc.,	<ul style="list-style-type: none">• One Word Substitution• Rearrangement of Jumbled words• Use Synonyms and Antonyms appropriately.• Reading Current articles from newspaper magazines

CO-2 Demonstrate appropriate Presentation Skills using different aids and techniques.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
SO-2 Display Different Presentation Skills by using different techniques	2.1 Characteristics of good oral presentation 2.2 Ways of oral presentation 2.3 Gestures Mannerism during oral presentation 2.4 Preparing Successful Presentations 2.5 Making Effective Use of Visual Aids	<ul style="list-style-type: none">• Short Stories• Magazines• Articles etc.

SW- Suggested Sessional Work (SW):

a. Assignments:

Loud reading of given stories by each student in the class.
Similar activity can be done with the help of News papers/Magazines.

b. Mini Project:

Recorded Lectures may be played in the class and students are asked to listen and answer.

c. Other Activities (Specify):

Self-Introduction, Speech and Spell Test.

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I) Suggested Specification Table (For ESE of Classroom Instruction)

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Learning to Learn Skills	01	01	03	05
II	Presentation Skills	01	01	03	05
Total		02	02	06	10

Legend: R: Remember, U: Understand, A: Apply and above

Note: There will be no end semester examination for laboratory instructions and the practical activity will be assessed for term work.

J) Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Role Play
6. Demonstration
7. ICT Based Teaching Learning (Video Demonstration/Tutorials CBT, Blog, Facebook, Twitter, WhatsApp, Mobile, Online sources)
8. Brainstorming

K) Suggested Learning Resources:

(a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1	English Grammar in Use	Murphy Raymond	Cambridge Publications	4 th Edition
2	Living English Structure	Allen	Cambridge Publications	Fifth edition(2009)
3	Effective English with CD	Kumar, E. Suresh; Sreehari,P.; Savithri, J.	Pearson Education, Noida, New Delhi	2009 ISBN: 978-81-317-3100-0
4	English Grammar at Glance	Gnanamurali, M.	S. Chand and Co. New Delhi,	2011 ISBN:9788121929042
5	Elementary English Grammar and Composition	Agarwal N.K.	Goyal Brothers Prakashan	Latest Edition

(b) Open source software and website address:

1. <https://www.englishgrammar.org/>
2. <http://www.englishgrammarsecrets.com/>
3. <https://www.usingenglish.com/handouts/>
4. <http://learnenglish.britishcouncil.org/en/english-grammar>
5. <https://www.englishclub.com/grammar/>

6. <http://www.perfect-english-grammar.com/>
7. <http://www.englishteachermelanie.com/category/grammar/>
8. <https://www.grammarly.com/blog/category/handbook>
9. <https://www.britishcouncil.in/english/learn-online>
10. <http://learnenglish.britishcouncil.org/en/content>
11. <http://www.talkenglish.com/>
12. [language-labs.com](http://www.language-labs.com/)
13. www.wordsworthelt.com

(c) Others:

1. Learning Packages.
2. Lab Manuals.
3. Language software Manual
4. Users' Guide

L) List of Major Laboratory Equipment and Tools:

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Computers	A complete computer system with headphones & Speakers	All
2	Soft ware	English communication softwares – Globalina, A-One Solutions, Wordsworth, Spears	All
3.	Computer tables & chairs	Depending upon the size of the Language Lab	All

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N) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)	
	PO-1 Basic knowledge	PO-2 Discipline knowledge	PO-3 Experiments and practice	PO-4 Engineering Tools	PO-5 The engineer and society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communication	PO-10 Life-long learning	PSO-1	PSO-2
CO-1 Demonstrate effective listening and reading skills with clarity	2	1	1	1	-	-	-	-	2	2	1	1
CO-2 Demonstrate appropriate Presentation Skills using different aids and techniques.	1	1	2	2	-	-	-	-	2	3	1	1

Legend: 1 – Low, 2 – Medium, 3 – High

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Semester - I

O) Course Curriculum Map:

POs & PSOs No.	COs No.& Titles	SOs No.	Laboratory Instruction(LI)	Classroom Instruction (CI)	Self Learning (SL)
PO1,2,3,4,9,10 PSO 1,2	CO-1 Demonstrate effective listening and reading skills with clarity	SO1	LE1.1 LE1.2 LE 1.3 LE1.4 LE 1.5		As mentioned in relevant pages
PO 1,2,3,4,9,10 PSO 1,2	CO-2 Demonstrate appropriate Presentation Skills using different aids and techniques.	SO2	LE2.1 LE2.2 LE2.3 LE2.4 LE2.5		

Legend: CI: Classroom Instruction (Includes different instructional strategies i.e. Lecture (L) and Tutorial (T) and others), LI: Laboratory Instruction (Includes Practical performances in Laboratory, Workshop, field or other locations using different instructional strategies) SL: Self Learning

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