Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics & Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)

Semester – II

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	200251 (46)	Communication Skills-II	4		1	5
2	Applied Science	200252 (14)	Applied Maths-II	3		1	4
3	Civil Engineering	200257 (20)	Environmental Engineering & Sustanable Development	3		1	4
4	Computer Science and Engineering	200259 (22)	Programming in 'C'	4		2	5
5	Electronics & Telecommunication Engineering	200250 (28)	Basic Electronics Engineering	3		1	4
6	Computer Science and Engineering	200266 (22)	Programming in 'C' Lab		6		3
7	Electronics & Telecommunication Engineering	200267 (28)	Basic Electronics Engineering Lab		6		3
8	Humanities	200268 (46)	Technical Presentation & Group Discussion Part-II		1		1
Total				**17**	**13**	**6**	**29**

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.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics & Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)

Semester - II

Scheme of Examination:

S.N	Board of Study	Course Code	Course Titles	Scheme of Examination					Total Marks
				Theory			Practical		
				ESE	CT	TA	ESE	TA	
1	Humanities	200251 (46)	Communication Skills-II	100	20	30			150
2	Applied Science	200252 (14)	Applied Maths-II	100	20	30			150
3	Civil Engineering	200257 (20)	Environmental Engineering & Sustainable Development	100	20	30			150
4	Computer Science and Engineering	200259 (22)	Programming in 'C'	100	20	30			150
5	Electronics & Telecommunication Engineering	200250 (28)	Basic Electronics Engineering	100	20	30			150
6	Computer Science and Engineering	200266 (22)	Programming in 'C' Lab				100	20	120
7	Electronics & Telecommunication Engineering	200267 (28)	Basic Electronics Engineering Lab				100	20	120
8	Humanities	200268 (46)	Technical Presentation & Group Discussion Part-II					10	10
Total				500	100	150	200	50	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 Attandance (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.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

A)	Course Code	:	**200251 (46)**
B)	Course Title	:	**Communication Skills-II**
C)	Pre- requisite Course Code and Title	:	
D)	Rationale	:	

In the present competitive world communication skills are vital for growth in any field. 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 The present curriculum continues to focus on the attainment of course outcomes related to speaking, reading, writing and listening as verbal, non-verbal and written communication are essential in order to deliver and receive information quickly and accurately.

This curriculum is advancement over the previous to meet the existing industrial and entrepreneurial challenges by focusing on the attainment of professional communication skills and enable the students   for effective communication in diverse situations.

E)   Course Outcomes:

CO-1   Use grammatically correct sentences in Speaking and Writing.

CO-2   Demonstrate appropriate non-verbal expression while communicating with others.

CO-3   Draft letters, notices and circulars using correct formats.

CO-4   Draft different types of report in prescribed format.

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	200251 (46)	Communication Skills-II	4	-	1	5

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	200251 (46)	Communication Skills-II	100	20	30	-	-	150

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

Note: Separate passing is must for End Semester 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   Use grammatically correct sentences in Speaking and Writing.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO1.1 Use infinitives in proper place SO1.2 Make basic sentence pattern SO1.3 Change Narration SO1.4 Use different degree in sentences SO1.5 Correct Use of Adverbial Phrases.	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 Basic Sentence Patterns 1.2 Infinitives 1.3 Modifiers 1.4 Degree 1.5 Narration 1.6 Adverbial Phrases 1.7 Conjunctions 1.9 One Word Substitution from the prescribed text.	• One Word Substitution • Rearrangement of Jumbled words

SW-1   Suggested Sessional Work (SW):

a.   Assignments:
   i. Exercises on the topic: Modifiers, Narration, Infinitives, Degree etc.
b.   Mini Project:
   i. Express your views by writing an incidence using proper grammar.
   ii. Select topic and share your views on the same with the audience. (2-3 min.)
c.   Other Activities (Specify):
   i. Practice for speaking skills in front of mirror for self feedback.

CO-2   Demonstrate appropriate non-verbal expression while communicating with others in different situations.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Explain the use of static and dynamic features of non verbal communication. SO2.2 Interpret the gesture, posture and facial expression in the given photograph and visual.	LE2.1 Use appropriate gestures, eye movements, facial expressions, postures for communication. LE2.2 Demonstrate appropriate etiquettes while working in team and group.	**Unit-2.0 Non-Verbal Communication** 2.1 Static features of Non Verbal Communication – Distance, Posture, Physical contact etc. 2.2 Dynamic features of Non-Verbal Communication – Mannerism, Head & Hand movement, Eye to Eye contact, Facial expressions, Gestures	• Collect data about good postures, expressions, visuals related to non verbal communication for Effective Communication.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

Session Outcomes	Laboratory Instruction	Class room Instruction	Self Learning (SL)
		2.3 Barriers of Communication: Physical, Semantic and Socio-psychological	

SW-2   Suggested Sessional Work (SW):

- **Assignments:**
  - i.   Collection of pictures and visuals with static and dynamic features of non verbal communication.
  - ii. Interpretation of gesture, posture and facial expression in the given photograph and visual.

- **Mini Project:**
  - i.   Seminar on topics related to "Role of non verbal communication for developing effective communication in technical education".

- **Other Activities (Specify):**
  - i.   Role play on given theme such as: When a student gets exceptionally good marks or less marks in 10th board exams, bank manager refuses to sanction the education loan at the last moment, unrest among the first year students during fresher party. Student and teacher can add the themes as per requirement.

CO-3   Draft letters, notices, circulars using correct format.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)

SO3.1 Draft business letters.
 	
SO3.2 Draft Job application and Resume
 	
SO3.2 Use technical style and mechanics for drafting business letters
	LE3.1 Write short paragraphs for social cause & newspapers.
	
	LE3.2 write letter of complaint and enquiry.
		Unit- 3.0 Paragraph &Letter Writing
		3.1 Paragraph writing.
		3.2 Letter writing
		    3.2.1 Purposes of Letters
		    3.2.2 Characteristics of a Letter
		    3.2.3 Mechanics and Style
		    3.2.4 Types of Business Letters Applications for Job & Resume Writing
		    3.2.5 Letter of Enquiry
		    3.2.6 Letter for Order Placement
		    3.2.7 Letter of Complaints/Faults (to appropriate authorities)
			• Read the sample letter, circular, notice, case and paragraph on selected theme on Internet.

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

SW-3   Suggested Sessional Work (SW) :

a. Assignments:
i.   Prepare summary of the given incident in the shop floor/office/institute.
ii. Write an application to apply for campus recruitment drive to be held in your college.
iii. Draft business letters.

b. Mini Project:
i. Prepare Resume and cover letter for job vacancy.
ii. Write a letter to appropriate authority informing about the activities to be conducted in department/Institute.

c. Other Activities (Specify):
i.   Analyze the given case and suggest views/opinion with respect to case brief.

CO-4   Draft different types of report in prescribed format.

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO4.1 Explain style and mechanics of a good report. SO4.2 Prepare project report as per given direction SO4.3 Prepare Technical reports in given format. SO4.4 Draft Notices and circulars	LE4.1 Prepare reports on given situations	**Unit 4.0 Technical Report Writing** 4.1 Characteristics of a Good Report. 4.2 Forms of Technical Report 4.3 Types of Technical Report. 4.4 Format of Project Report, Guidelines for writing Project Report, Notices and Circulars.	• Read and practice different Types of Reports.

SW-4   Suggested Sessional Work (SW) :

a. Assignments:
i. Prepare notice and circular for your class/department as per given directions.
ii. Describe qualities of a good report.

b. Mini Project:
i. Draft a report on any significant activity that had taken place in your locality.
Ii. Draft a report on culture event/ sports event conducted at your institute.

c. Other Activities (Specify):
i. Draft notices for sports activities/ lost belongings/ various competitions/celebrations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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	English Grammar	4	8	18	30
II	Non verbal communication	2	5	8	15
III	Paragraph & Letter Writing	3	7	15	25
IV	Technical Report writing	3	7	20	30
	Total	**12**	**31**	**57**	**100**

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

K)   **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

L)   **Suggested Learning Resources:**

        (a) Books :

S. No.	Title	Author	Publisher	Edition & Year
1	English Grammar in Use	Murphy Raymond	Cambridge Publications	4th 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	A Course in Technical English	TTTI Bhopal		
6	Elementary English Grammar and Composition	Agarwal N.K.	Goyal Brothers Prakashan	Latest Edition

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

(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. languagelabsystem.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	Software	English Communication Software's – Globarina, A-One Solutions, Wordsworth, Spears	All
3.	Computer tables & chairs	Depending upon the size of the Language Lab	All

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) **Semester-II**

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 grammatically correct sentences in Speaking & Writing.	2	1	1	1	-	-	-	1	2	3	1	1
CO-2 Demonstrate appropriate non-verbal expression while communicating with others.	1	1	2	2	-	-	-	2	2	3	1	1
CO-3 Draft letters, notices and circulars using correct formats.	1	1	1	2	-	-	-	1	3	2	1	1
CO-4 Draft different types of report in prescribed format.	2	1	2	2	-	1	-	2	3	2	1	1

Legend:1 – Low, 2 – Medium, 3 – High

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 grammatically 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 Demonstrate appropriate non-verbal expression while communicating with others**.**	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 Draft letters, notices and circulars using correct formats	SO3.1 SO3.2	LE3.1	Unit-3.0 Short Stories 3.1 , 3.2,3.3,3.4	
PO 1,2,3,4,6,8,9,10 PSO 1,2	CO-4 Draft different types of report in prescribed format.	SO4.1 SO4.2 SO4.3	LE4.1	Unit- 4.0 Passages for Comprehension 4.1, 4.2, 4.3, 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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

A)	**Course Code**	:	**200252 (14)**
B)	**Course Title**	:	**Applied Maths-II**
C)	**Pre- requisite Course Code and Title**	:	
D)	**Rationale**	:	

This subject is introduced to those topics of mathematics, which are applied in different branches of engineering so that it can enhance required skills in mathematics underpinning engineering subjects. Integral calculus helps to find the area; differential equation is used in finding the curves and its related applications for various engineering models. Numerical integration is used to find the area of the functions especially whose integration cannot be evaluated easily with routine methods. This course further develops the skills to enable a large range of engineering systems to be modeled.

E)   **Course Outcomes:**

CO-1   **Solve the given problems of integration using suitable methods.**

CO-2   **Use the concept of integration to find area of given curves.**

CO-3   **Model the given engineering problems using the concept of differential equation.**

CO-4   **Utilize the concepts of numerical methods to solve given equations.**

CO-5   **Measure the area using the concept of numerical integration for 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	200252 (14)	Applied Maths-II	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	200252 (14)	Applied Maths-II	100	20	30	-	-	150

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

  Note: Separate passing is must for End Semester Assessment.

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 the given problems of integration using suitable methods.

(Approx. Hrs: 12)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)

SO1.1 Solve the given simple problem(s) based on rules of integration.
 	
SO1.2 Obtain the solution of given simple integral(s) using substitution method.
 	
SO1.3 Integrate given simple functions (integration by parts).
SO1.4 Evaluate the given simple integral by using partial fractions.
	--	**Unit-1.0 Integral Calculus**
		
		1.1 Simple Integration: Rules of integration and integration of standard functions.
		
		1.2 Methods of Integration:
		    1.21 Integration by substitution.
		    1.22 Integration by parts
		    1.23 Integration by partial fractions.
			1.1 (a) Rules of integration
			
			1.2 (a) Methods of integration.

SW-1 Suggested Sessional Work (SW):

  a.   Assignments:
       i   Expound examples of integration in day-to-day life.
       ii Enumerate the value of integrals for engineering related problems.

  b.   Mini Project:
       i   Prepare charts displaying standard integration formulas.
       ii Identify problems based on application of integration.

  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 related topics.
       iii Use MATHCAD as mathematical tool to solve the problems of integral calculus.
       iv Prepare a seminar on basic applications of integrals.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-2 Use the concept of integration to find area of given curves.

(Approx. Hrs: 18)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Solve given simple problems based on properties of definite integration. SO2.2 Apply the concept of definite integration to find the area under the given curve (s). SO2.3 Utilize the concept of definite integration to find area between given two curves.		**Unit-2.0 Applications of Integral Calculus** 2.1 Definite Integration 2.11 Simple examples 2.12 Properties of definite integral (without proof) and simple examples. 2.2 Applications of integration 2.21 Area under the curve. 2.22 Area between two curves.	2.1(a) Standard formulas of simple integration 2.1(b) Properties of definite integrals. 2.2(a) Formulas for area between two curves

SW-2   **Suggested Sessional Work (SW):**

- **Assignments:**
    i. Enumerate the area of irregular shapes by using concept of integration.
    ii. Explore the use of definite integrals related to engineering applications.

- **Mini Project:**
    i. Prepare charts showing area of irregular shapes using concept of integration.

- **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 Integral calculus.
    iii. Use MATHCAD as mathematical tool to solve the problems of integral calculus.
    iv. Seminar on engineering applications of definite integrals.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-3 Model the given engineering problems using the concept of differential equation.

(Approx. Hrs: 18)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO3.1 Find the order and degree of given differential equation(s). SO3.2 Form differential equation for given simple engineering problem. SO3.3 Solve given differential equation using the variable separable method. SO3.4 Obtained the solution of given Homogeneous Differential Equation. SO3.5 Solve the given linear differential equations.	--	**Unit-3.0 Differential equations of first order and first degree** 3.1 Concept of differential equation 3.2 Order, degree and formation of differential equation. 3.3 Solution of differential equation 3.31 Variable separable form. 3.32 Homogeneous Differential Equations 3.33 Linear differential equation.	3.1(a) Terminologies of differential equations. 3.2(a) Formation, order and degree of differential equations. 3.3(a) Methods of solution of differential equation

SW-3   Suggested Sessional Work (SW):

a.   Assignments:
   i   Enumerate population growth using the concept of differential equations.
   ii Use initial conditions to solve differential equations for engineering applications.

b.   Mini Project:
   i   Prepare flow charts showing various methods for solving first order first-degree differential equations.
   ii Prepare model showing the applications of differential equation for Newton's law of cooling.
   iii Prepare models using the concept of differential equations for mixing problem.

c.   Other Activities (Specify):
   i   Identify engineering problems based on real world with the use of free tutorials available on the Internet.
   ii Use graphical software EXCEL, D-PLOT and GRAPH for applications of differential equations and related topics.
   iii Use MATHCAD as mathematical tool to solve the problems of engineering related to differential equations.
   iv Identify engineering problems related to differential equations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) **Semester-II**

CO-4 Utilize the concepts of numerical methods to solve given equations.

(Approx. Hrs: 12)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO4.1 Determine the roots of given equations using Bisection method. SO4.2 Calculate the roots of given equations using Regula Falsi method. SO4.3Compute the roots of given equations using Newton-Raphson method.		**Unit-4 Numerical Solutions of Equations** Introduction of algebraic and transcendental equations 4.1 Bisection method 4.2 Regula Falsi method 4.3 Newton Raphson method	4.1(a) Roots of equations by Bisection Method 4.2(a) Roots of equations using Regula Falsi Method 4.3(a) Solution of equations using Newton-Raphson Method

SW-4 Suggested Sessional Work (SW):

a. Assignments:
   i.   Write algorithm to find the approximate roots of algebraic equations.
   ii. Write algorithm to find the approximate roots of transcendental equations.

b. Mini Project:
   i.   Prepare graph showing the roots of algebraic equation.
   ii. Prepare graph for finding the roots of equation by Regula falsi method.
   iii. Prepare graph for finding the roots of equation by Newton-Raphson method
   iv. Prepare a seminar on any relevant topic based on numerical method.
   v.   Identify suitable numerical methods for engineering related problems.

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 related topics.
   iii. Use MATHCAD as mathematical tool to solve the given equations by numerical methods

CO-5 Measure the area using the concept of numerical integration for civil engineering. (Approx. Hrs: 20)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO5.1 Apply the concept of Numerical integration to find area from given data by Trapezoidal rule SO5.2 Utilize the concept of Numerical integration to find area from given data by Simpson's one		**UNIT 5.0 Numerical Integration** Introduction to Numerical integration 5.1 Trapezoidal rule 5.2 Simpson's one third rule 5.3 Simpson's three eighth rule	5.1(a) Integration by Trapezoidal rule. 5.2(a) Integration by Simpson's one-third rule.

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

Session Outcomes (SOs)	Laboratory	Class room Instruction (CI)	Self Learning (SL)
third rule SO5.3 Use the concept of Numerical integration to find area from given data by Simpson's three eighth rule.			5.3(a) Integration by Simpson's three eighth rule.

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:
   i.   Prepare chart showing the different formulas of numerical integration.
   ii.   Compare the results obtained by Trapezoidal and Simpson's rule for area related problems.
   iii. Explore the role of numerical integration in engineering related problems.

   b.   Mini Project:
   i   Prepare a seminar on different methods of numerical integration.
   ii   Prepare a model showing the civil engineering applications of numerical integration.

   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 related topics.
   iii Seminar on applications of numerical integration.

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

I)   Suggested Specification Table (For ESE of Classroom Instruction CI+SW+SL):

Unit Number	Unit Title	Marks Distribution			Total Marks
		R	U	A	
I	Integral Calculus	4	6	10	20
II	Applications of Integral Calculus	4	6	10	20
III	Differential equations of first order and first degree	4	6	10	20
IV	Numerical Solutions of Equations	4	6	10	20
V	Numerical Integration	4	6	10	20
Total		**20**	**30**	**50**	**100**

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 /practical ,

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

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	A text book of Engineering Mathematics	Dutta, D	New age International publications, New Delhi	2006 ISBN: 978-81-24-1689-3
6	Getting Started with MATLAB-7	Pratap, Rudra	Oxford University Press, New Delhi,	2009 ISBN: 0199731241

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

(b) O**pen 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:
   5.   Learning Packages.
   6.   Lab Manuals.
   7.   Manufacturers' Manual
   8.   Users' Guide

M) List of Major Laboratory Equipment and Tools: NA

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

N) Mapping of POs & PSOs with COs:

Course Outcomes (COs)	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	√	√	√	-	-	-	-	√	√	√		
CO-2	√	√	√	-	-	-	-	√	√	√		
CO-3	√	√	√	-	-	-	-	√	√	√		
CO-4	√	√	√	-	-	-	-	√	√	√		
CO-5	√	√	√	-	-	-	-	√	√	√		

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) **Semester-II**

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 the given problems of integration using suitable methods.	SO1.1 SO1.2 SO1.3 SO1.4		Unit-1.0 Integral Calculus 1.1, 1.2	1.1(a), 1.2(a)
PO-1, 2,3,8,9,10 PSO---	CO-2 Use the concept of integration to find area of given curves.	SO2.1 SO2.2 SO2.3 SO2.4		Unit-2.0 Applications of Integral Calculus 2.1,2.2	2.1(a), 2.1(b). 2.2(a)
PO-1, 2,3,8,9,10 PSO---	CO-3 Model the given engineering problems using the concept of differential equation.	SO3.1 SO3.2 SO3.3 SO3.4 SO3.5		Unit-3.0 Differential equations of first order and first degree 3.1,3.2,3.3	3.1(a), 3.2(a), 3.3(a)
PO-1, 2,3,8,9,10 PSO---	CO-4 Utilize the concepts of numerical methods to solve given equations.	SO4.1 SO4.2 SO4.3		Unit-4.0 Numerical Solutions of Equations 4.1, 4.2, 4.3	4.1(a), 4.2(a), 4.3(a)
PO-1, 2,3,8,9,10 PSO---	CO-5 Measure the area using the concept of numerical integration for civil engineering	SO5.1 SO5.2 SO5.3		Unit-5.0 Numerical Integration 5.1,5.2,5.3	5.1(a), 5.2(a), 5.3(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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

A)	**Course Code**	: 200257 (20)
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	200257 (20)	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

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

G)   Scheme of Assessment:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					Total Marks
				Theory			Practical		
				ESE	CT	TA	ESE	TA	
1	Civil Engineering	200257 (20)	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: 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% respectively.

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

SW-1 Suggested Sessional Work (SW) :

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

  b. **Mini Project:**
     i**.** 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:**
     i. Write short notes on sources and effects of
            a. Soil Pollution
            b. Noise Pollution
            c. Thermal Pollution
            d. Radio active Pollution

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 worming 5.10 **S**olid 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:
        i. Explain conservation of water.
        ii. Write notes on current global environment issues.

    b. Mini Project:
        i. Discuss the case study of Bhopal gas leak disaster.
        ii. 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.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

1.   **Suggested Specification Table (For ESE of Classroom Instruction CI+SW+SL):**

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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
-	-	-	-

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) Semester-II

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

A)	Course Code	:	**200259 (22)**
B)	Course Title	:	**Programming in 'C'**
C)	Pre- requisite Course Code and Title	:	**Computer Fundamentals and Applications**
D)	Rationale	:	

This Course imparts problem solving skills in the students, using a popular structured programming language `C'. The course is designed to help the students to develop logical ability to identify the best solution for a given computing problem. The programming skills thus acquired using `C' language are necessary to work with advance level of programming languages. This will be helpful in developing programs for the scientific, research, business and industrial purposes.

E)   Course Outcomes:

CO-1   Write a 'C' program using expressions.

CO-2   Develop program in 'C' using conditional statements.

CO-3   Develop program in 'C' using structural loop control statements.

CO-4   Develop program in 'C' using library functions.

CO-5   Develop program in 'C' using single dimensional array.

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	Computer Science and Engineering	200259 (22)	Programming in 'C'	4	-	2	5
2	Computer Science and Engineering	200266 (22)	Programming in 'C'	-	6	-	3

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	Computer Science and Engineering	200259 (22)	Programming in 'C'	100	20	30	-	-	150
2	Computer Science and Engineering	200266 (22)	Programming in 'C'	-	-	-	100	20	120

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

Note: Separate passing is must for Progressive and End Semester Assessment.

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 Write a 'C' program using expressions

(Approx. Hrs: CI+LI+SW+SL = 26)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO1.1 Write algorithm and flowchart for a given problem SO1.2 Differentiate keywords and identifiers. SO1.3 Explain basic structure of 'C' program with example. SO1.4 Explain different types of data types in 'C' language. SO1.5 List various types of operators used in 'C' language. SO1.6 Write a simple 'C' Program demonstrating the given data type conversion SO1.7 Write I/O Statements for the given data	LE1.1 Write an algorithm and draw a flowchart for addition of two numbers. LE1.2 Write an algorithm and draw a flowchart for calculating simple interest. LE1.3 Develop a program in 'C' to display a simple message using printf() function. LE1.4 Develop a Program in 'C' to find ASCII value of a character using input/output function. LE 1.5 Develop a program in 'C' to convert Celsius into Fahrenheit using arithmetic operators. LE 1.6 Develop a program in 'C' to find area of triangle using arithmetic operator. LE 1.7 Develop a program in 'C' to find larger number between three numbers using relational, logical and conditional operator.	**Unit-1.0 Introduction to 'C ' Programming** 1.1. Program logic development using Algorithm and Flowchart 1.2. Algorithm-Developing and writing algorithm using pseudo Codes 1.3 Flowchart- Definition and Importance of flowchart, Symbols of Flowchart, Flow lines, Terminals, Input/output, Processing, Decision, Connection off-page connectors, Limitation of flowchart 1.4 Basic structure of 'C' Program 1.5 Data Concepts- Character set, C Tokens, Keywords and Identifiers, Constants, variables and its Declaration, 1.6 Data Types- data type conversion 1.7 Operators and its types- Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional , Bitwise, Special operators 1.8 Input/Output Functions- printf(), scanf(), getch(), putch(), getchar()	• Use of algorithm for problem solving • Use of flowchart for problem solving • Evolution of programming languages • Basic data concepts & data types used in 'C'. • Types of expression

SW-1 Suggested Sessional Work (SW):

- **Assignments:**
  i. Differentiate between formatted and unformatted input/output function in 'C'.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

ii. Write advantages of algorithm and flowchart.

iii. Differentiate between pre increment and post increment with an example.

iv. Differentiate between pre decrement and post decrement with an example

- **Mini Project:**

  Write an algorithm and draw a flowchart to find given number is positive or negative.

  i.   Write a program in 'C' to swap two numbers using third variables.

  ii. Write a program in 'C' to swap two numbers without using third variables.

- **Other Activities (Specify):**

  i.   A Seminar on 'Importance of Algorithm and Flowchart in programming'.

  ii. A seminar on 'Data Types, Types of operators and Input/output Functions in 'C' language'.

CO-2   Develop program in 'C' using conditional statements.

(Approx. Hrs: CI+LI+SW+SL = 23)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO2.1 Describe the syntax of decision making statements with examples in 'C' language.(if, if else, nested if else, else if ladder, switch statements)	LE2.1 Write program for solving quadratic equation using if...else statement in 'C'. LE2.2 Write a program in 'C' to calculate the grade of a student using nested if...else statement in 'C' LE2.3 Develop the previous program using else if ladder statement in 'C'. LE2.4 Create simple calculator using switch statement in 'C'.	**Unit-2.0 Decision making and Branching statements** 2.1 Introduction of decision making statements in 'C' 2.2 Decision making with IF statement, Simple IF statement, The IF.... EISE statement, Nesting of IF.... EISE statement, The ELSE IF ladder 2.3 The Switch statement 2.4 The? : operator 2.5 GOTO statement	• Conditional branching statements in 'C' language. • Multi-way conditional branching in 'C' language. • Unconditional branching in 'C' language.

SW-2   Suggested Sessional Work (SW):

a. **Assignments:**

   i.   Differentiate between conditional and unconditional branching in 'C'.

   ii. Write merits and demerits of multi-way branching statements in 'C'.

b. **Mini Project:**

   i.   Develop a program in 'C' to convert a given number of days in terms of years, weeks and days.

   ii. Develop a program in 'C' to check whether the given alphabet is vowel or not.

c. **Other Activities (Specify):**

   i.   Seminar on 'Use of switch case statement' in 'C' language.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-3   Develop program in 'C' using structured loop control statements.

(Approx. Hrs: CI+LI+SW+SL = 23)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO3.1 List different types of looping statements in 'C' language with examples. SO3.2 Explain the use of break and continue statements in loops with examples in 'C' language.	LE3.1 Write a program in 'C' to Calculate sum of first 'N' natural numbers using while and do...while and for loop. LE3.2 Write a program in 'C' to check a given number is prime or not using loop with break statement. LE3.3 Writes a program in 'C' to find Fibonacci series using for/while/do while loop.	**Unit-3.0 Structured loop control statements** 3.1 Introduction, The WHILE Statement, The DO...WHILE Statement 3.2 The FOR statement, The BREAK and CONTINUE statement	• Nested loops in 'C' language

SW-4   Suggested Sessional Work (SW):

- **Assignments:**
    - i.   Develop a program in 'C' to print even and odd values in a given range.
    - ii. Develop a program in 'C' to find the reverse of given number.

- **Mini Project:**
    - i.   Develop a program in 'C' to check whether the given number is palindrome or not.
    - ii. Develop a program in 'C' to check whether the given number is Armstrong number or not.

- **Other Activities (Specify):**
    - i.   Seminar on 'use of loop statements in 'C''.

CO-4   Develop program in 'C' using library functions.

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

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)
SO4.1 Describe library functions with examples SO4.2 Classify different string handling function in 'C' with an example	LE4.1 Write a program in 'C' to calculate sum of two numbers using user-defined function. LE4.2 Write a program in 'C' using the given Library function.	**Unit 4.0 User-defined Function** 4.1 Concept and need of functions 4.2 Library functions: Math functions, String handling functions, other miscellaneous functions.	• Concept of Procedural oriented programming language • Advantages of library functions

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

SW-4   **Suggested Sessional Work (SW):**

- **Assignments:**
  i. Develop a program to Calculate power of a given number using user-defined function.
  ii. Develop a program to calculate a square root of a given number using user-defined function.

- **Mini Project:**
  i. Develop a program in 'C' to find Greatest Common Divisor of given numbers using function.

- **Other Activities (Specify):**
  i. A Seminar on 'use of functions in 'C''

CO- 5   **Develop program in 'C' using single dimensional array.**

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

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self-Learning (SL)

SO5.1 Describe declaring and initializing of One-Dimensional Array with example.	LE5.1 Develop a program in 'C' to display list of values in reverse order
	LE5.2 Develop a program in 'C' to perform addition of all elements of an one dimensional array
		Unit-5.0 Single Dimensional Array in 'C'
		5.1 Declaring and initializing One-Dimensional Array.
		5.2 Array Operations-
		  5.2.1 Insertion,
		  5.2.2 Searching,
		  5.2.3 deletion,
		  5.2.4 string operation,
		  5.2.5 Concatenation of two strings.
			• Advantages of array

SW-5   **Suggested Sessional Work (SW):**

- **Assignments:**
  i. Describe one dimensional array dimensional arrays in 'C' with examples.
  ii. Develop a program in 'C' to search a given number in one dimensional array.

- **Mini Project:**
  i. Develop a program in 'C' that performs inverse of square matrix.

- **Other Activities (Specify):**
  i. A seminar on 'use of one dimension of array in 'C' language'.

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

I)   Suggested Specification Table (For ESE of Classroom Instruction CI+SW+SL):

Unit Number	Unit Titles	R	U	A	Total Marks
I	Introduction to Programming in 'C'	-	1	1	02
II	Decision making and Branching statements	2	1	1	04
III	Structured loop control statements	2	2	2	06
IV	User-library functions	2	2	4	08
V	Single dimensional Array in 'C'	2	4	4	10
	Total	8	10	12	30

Legend: R: Remember, U: Understand, A: Apply and above
Note: After completion of all the chapters student will be able to perform the list of following experiments:

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

Note: The student at the end of semester examination of **100 Marks**; has to undertake any two of the listed practical's.

S. No.	Experiment Name	PRA	PDA	Viva-Voice
1	Write a menu driven program in 'C' to create calculate factorial , factors of number and palindrome of number	40	40	20
2	Write a menu driven program in 'C' to convert Binary Number into Decimal and vice-versa	40	40	20
3	Write a menu driven program in 'C' to print full pyramid and Floyds triangle	40	40	20
4	Write a Program in 'C' using function to count of prime numbers between a given intervals	40	40	20
5	Write a menu driven program in 'C' to calculate area of triangle, circle, and rectangle.	40	40	20
6	Write a menu driven program in 'C' for finding the sum of given A.P., G. P. and H. P of a series.	40	40	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 /practical's
Legend: PRA: Process Assessment, PDA: Product Assessment

K)   Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Group Discussion
4. Industrial visits

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) Semester-II

5. Industrial Training
6. ICT Based Teaching Learning (Video Demonstration, CBT, Blog, Face book, Mobile)
7. Seminar
8. Others

L) **Suggested Learning Resources:**

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1	Programming in ANSI C	E.Balaguruswami	Tata McGraw-Hills publication	Latest Edition
2	Programming with ANSI And Turbo C	Ashok N Kamthane	Pearson publication, Latest Edition	Latest Edition
3	Let us 'C'	Yashavant Kanetkar	BPB publications	Latest Edition

(b) **Open source software and website address:**

1. 'C' programming: http://www.programiz.com/c-programming
2. 'C' programming Language: http://www.w3schools.in/c-programming-language/intro/
3. 'C' Language: beginnersbook.com
4. Learn 'C' online: http://www.learnconline.com

(c) **Others:**
1. Learning Packages
2. Lab Manuals
3. Users Guide

M) **List of Major Laboratory Equipment and Tools:**

Computer System with latest configuration and memory

S. No.	Name of Equipments	Broad Specifications	Relevant Experiment Number
1	Computer System	Latest Configuration	LE1.1-LE1.4 , LE2.1-LE2.3 LE3.1-LE3.4 , LE4.1-LE4.3 LE5.1-LE5.3
2	'C' compiler	'C' Version (or latest)	LE1.1-LE1.4 , LE2.1-LE2.3 LE3.1-LE3.4 , LE4.1-LE4.3 LE5.1-LE5.3

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) Semester-II

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	Write a 'C' program using expressions	2	2	2	1	3	-	1	2	2	3	2	3
CO-2	Develop program in 'C' using conditional statements.	2	1	2	2	2	-	2	2	1	3	2	3
CO-3	Develop program in 'C' using conditional statements.	3	2	2	2	1	-	1	3	2	3	3	2
CO-4	Develop program in 'C' using library functions.	2	3	2	2	2	-	2	1	2	1	2	2
CO-5	Develop program in 'C' using single dimensional array	1	2	2	2	2	-	2	3	2	2	3	2

Legend: 1 – Low, 2 – Medium, 3 – High

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

O)   **Course Curriculum Map:**

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self-Learning (SL)
PO-1,2,3,4, 5,7, 8,9,10 PSO-1,2	CO-1 Write a 'C' program using expressions	SO1.1 - SO1.7	LE1.1 LE1.7	Unit-1.0 Introduction to 'C ' Programming	As mentioned in relevant pages
PO-1,2,3,4, 5,7, 8,9,10 PSO-1,2	CO-2 Develop program in 'C' using conditional statements.	SO.2.1	LE2.1 LE2.4	Unit-2.0 Decision making and Branching statements	
PO-1,2,3,4, 5,7, 8,9,10 PSO-1,2	CO-3 Develop program in 'C' using conditional statements.	SO.3.1 SO 3.2	LE3.1 LE3.3	Unit-3.0 Structured loop control statements.	
PO-1,2,3,4, 5,7, 8,9,10 PSO-1,2	CO-4 Develop program in 'C' using library functions.	SO.4.1 SO.4.2	LE4.1 LE4.2	Unit-4.0 User-defined Function	
PO-1,2,3,4, 5,7, 8,9,10 PSO-1,2	CO-5 Develop program in 'C' using single dimensional array	SO.5.1	LE5.1 LE5.2	Unit-5.0 Single Dimensional Array in 'C'	

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

A)	**Course Code**	: **200250 (28)**
B)	**Course Title**	: **Basic Electronics Engineering**
C)	**Pre-requisite Course Code and Title**	: **Physics**
D)	**Rationale**	:

Electronic circuits are integral part of most of the instrument, consumer gadgets, and automobile and Industrial control/automation system. This course is classified under basic technology group and is intended to enable the students to test the working of basic electronics circuits like: rectifiers, filters, amplifiers oscillators and their applications in the various electronic circuits. This course will also help the student in acquiring investigation skill when he/she will be working as technician.

E)   Course Outcomes:

CO-1   Use semiconductor diodes in various electronics circuits.

CO-2   Test the performance of different types of rectifiers and filters.

CO-3   Test function of Zener diode, clipper and clamper circuit.

CO-4   Test the working of Bipolar Junction Transistor (BJT) and FET.

CO-5   Use OP-AMP for various applications.

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	Electronics & Telecommunication Engineering	200250 (28)	Basic Electronics Engineering	3	-	1	4
2	Electronics & Telecommunication Engineering	200267 (28)	Basic Electronics Engineering (Lab)	-	6	-	3

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

G)   Scheme of Assessment:

S.No	Board of Study	Course Code	Course Title	Scheme of Examination					Total Marks
				Theory			**Practical**		
				ESE	**CT**	**TA**	**ESE**	**TA**	
1	Electronics & Telecommunication Engineering	200250 (28)	Basic Electronics Engineering	100	20	30	-	-	150
2	Electronics & Telecommunication Engineering	200267 (28)	Basic Electronics Engineering (Lab)	-	-	-	100	20	120

Legend: ESE-End semester Examination, CT-Class test, TA-Teachers' Assessment
Note: Separate passing is must for Progressive and End Semester Assessment.

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) **Semester-II**

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.

Convert unit of the given physical quantity from one unit system to other.

CO-1 Use semiconductor diodes in various electronics circuits.

(Approx. Hrs: CI+ LI+SW+SL = 15)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO1.1 Describe the construction of pn-Junction diode.	LE1.1 Test the performance of pn-Junction diode in the forward and reverse biased condition.	**Unit 1.0 Semiconductor Diode** 1.1 pn- Junction diode: working, formation of depletion layer, cconstruction, symbol and equivalent circuits of pn- Junction diode	• Sketch Symbols of Different types of diode.
SO1.2 Explain formation of depletion layer in pn-Junction.	LE1.2 Test the performance of the given LED Diode.	1.2 Barrier potential voltage, forward and reverse biasing, V-I characteristics of diode	• Compare Characteristics of Tunnel diode and pn – Junction diode.
SO1.3 Sketch V-I characteristics of pn-junction diode and LED.	LE1.3 Test the performance of the given Photo Diode.	1.3 Diode current equation, Static and Dynamic resistance, Diode.	
SO1.4 Describe Working of LED, Photo diode and Varactor diode.			

SW-1 Suggested Sessional Work (SW):

a. Assignments:
   i. Compare the construction of LED and PN-Junction diode.
   ii. Describe the working of Veractor diode.
   iii. List applications of various types of diode.

b. Mini Project:
   i. Prepare a chart showing symbol and V-I characteristic of various types of diode.
   ii. Build a circuit using LED and switch.

c. Other Activities (Specify):
   i. Arrange a seminar on applications of diode.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-2 Test the performance of different types of rectifiers and filters.

(Approx. Hrs: CI+ LI+SW+SL = 18)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO2.1 Illustrate need of rectification. SO2.2 Calculate PIV, Ripple factor, and efficiency of half wave and full wave center taped rectifier. SO2.3 Explain the need of filter circuit used with rectifier.	LE2.1 Test the input and output waveform of Half Wave Rectifier a) without filter b) with filter LE2.2 Test the input and output waveform of full Wave center tapped Rectifier a) without filter b) with filter LE2.3 Test the input and output waveform of full Wave Bridge Rectifier a) without filter b) with filter	**Unit 2.0 Rectifiers and Filters** 2.1 Need for rectification, rectifier Parameters, PIV, Ripple factor, Efficiency, Peak Inverse Voltage(PIV), Transformer utilization actor(TUF) of rectifiers 2.2 Types of rectifier: Half Wave Rectifier, Full Wave rectifier, Center taped and Bridge type full wave rectifier 2.3 Filter Circuits: L-filter, C-filter, LC-filter, CLC- filter	• Compare parameters of various types of rectifiers. • Analysis functions of different types of filters.

SW-2 Suggested Sessional Work (SW) :

   a. Assignments:
   i.   Explain the need of filter with regulator.
   ii. Compare the working of various types of filters used with rectifiers.
   b. Mini Project:
   i.   Develop a rectifier with filter to get 10v DC output.
   c. Other Activities (Specify):
   i.   Seminar on the application of various types of rectifiers.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-3 Test function of Zener diode, clipper and clamper circuit.

(Approx. Hrs: CI+ LI+SW+SL = 21)

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO3.1 Describe the working principle of Zener diode with the help of VI characteristic.	LE3.1 Test the performance of Zener diode. LE3.2 Test the output of the given Zener voltage regulator.	**Unit 3.0 Diode Circuits** 3.1 Zener diode: working, construction and eequivalent circuits of Zener diode	• Compare different types of Cliper and Clamper circuits.
SO3.2 Analyze the Positive and negative Clipper circuit.	LE3.3 Test the output waveform of a) Positive Clipper b) Negative Clipper	3.2 Zener and avalanche breakdown phenomenon, Zener diode as voltage regulator	
SO3.3 Analyze the Positive and negative Clamper circuit.	LE3.4 Test the output waveform of a) Positive Clamper b) Negative Clamper	3.3 Clipper: Function of clipper circuit, circuit diagram, types of clipper :positive and negative clipper Circuits	
		3.4 Clamper: Function of clamper, types of clamper, positive and negative clamper circuits	

SW-3 Suggested Sessional Work (SW) :

    a. Assignments:
        i.   Develop a positive Clamper circuit which clamp the given input to 5V$_{dc}$.
        ii.   Differentiate between clipper and clamper circuit.
    b. Mini Project:
        i.   Design a voltage regulator using Zener diode.
        ii.   Build and test a series diode Clipper circuit.
        iii.   Design a clamper circuit using diode

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   Semester-II

CO-4 Test the working of Bipolar Junction Transistor (BJT) and FET.

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

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO4.1 Describe construction and operation of NPN and PNP transistor. SO4.2 Compare CB,CE and CC configurations of BJT. SO4.3 Define the term: current gain, amplification factor, thermal runaway. SO4.4 Explain need of biasing for the proper operation of the given transistor. SO4.5 Describe the working of FET.	LE4.1 Determine the current gain of CE configuration with the help of input output characteristics of CE configuration. LE4.2 Determine the current gain of CB configuration with the help of input output characteristics. LE4.3 Determine the current gain of CC configuration with the help of input output characteristics. LE4.4 Build and test the operation of BJT as a switch. LE4.5 Bias the given NPN transistor in the active region by voltage divider biasing method. LE4.6 Test the performance of the given FET.	**Unit 4.0 Bipolar Junction Transistor (BJT) and Field effect transistor (FET)** 4.1 BJT: Working, types of BJT ; NPN and PNP, construction and operation of NPN and PNP transistor, base width modulation 4.2 Modes of operation : active, saturation and cutoff, current amplification factor β a d α 4.3 Transistor biasing: need for biasing, types of biasing, base resistor biasing, base collector biasing, voltage divider biasing, thermal runaway 4.4 Transistor configurations: Common Emitter(CE), Common Base(CB) and Common collector configuration circuit , working and input and output characteristics, gain, amplification factor 4.5 Field Effect Transistor(FET):	• Compare different type of biasing circuits.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
		Working, construction, input and output characteristics, drain current, pinch-off voltage	

SW-4 Suggested Sessional Work (SW) :

    a. Assignments:
        i.   Prepare a chart to describe the working principle of FET.
        ii. Enlist the technical specifications of FET.

    b. Mini Project:
        i.   Prepare a report on the comparison of technical parameters of NPN and PNP transistor.
        ii. Build and test the transistor switch circuit.

CO-5 Use OP-AMP for various applications.

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

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO5.1 Describe the working principle of differential amplifier. SO5.2 Sketch the block diagram of Op-Amp IC and describe the functions of each block. SO5.3 Define the following terms: Virtual ground, Slew rate, gain , Input and output resistance, frequency of operation.	LE5.1 Test the performance of the given Op-Amp IC in inverting mode. LE5.2 Build and test Op-Amp based summing amplifier. LE5.3 Test the output of non inverting amplifier. LE5.4 Test the performance of Op-Amp based integrator and differentiator circuit. LE5.5 Build and test the performance of Instrumentation amplifier.	**Unit 5.0 Introduction to Operational Amplifier(Op-Amp)** 5.1 Basics of differential amplifier, Working principle, input and output characteristics, amplifier, different modes of operation 5.2 Basics of Op-Amp: OP-AMPIC-741, functional block diagram, virtual ground, configurations of working :inverting and non inverting, parameters : I/O resistance, gain,	• Analyze working of Op-Amp as adder, sub tractor, multiplier and divider circuit.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

Session Outcomes (SOs)	Laboratory Instruction (LI)	Class room Instruction (CI)	Self Learning (SL)
SO5.4 Analyze working of OP-Amp as inverting non-inverting amplifier. SO5.5 Analysis the input and output waveform of Op-Amp based integrator and differentiator circuit.		slew rate, bandwidth, power, various IC packages, identification of specifications from data sheet 5.3 Applications op-amp : Summing, multiplier, and divider amplifier, integrator and differentiator, Log and Anti-Log amplifier, instrumentation, oscillators	

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:**
   i.   Describe the working of Op-Amp based Instrumentation amplifier.
   ii. List the applications of Op-Amp based circuits.
b. **Mini Project:**
   i.   Design an oscillator circuit using OP-amp.
   ii. Design a adder/subtractor circuit using OP-amp.

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	Semiconductor Diode	4	6	8	18
II	Rectifiers and Filters	4	6	10	20
III	Diode Circuits	4	8	10	22
IV	Bipolar Junction Transistor (BJT) and Field effect transistor (FET)	4	6	10	20
V	Introduction to Operational Amplifier(Op-Amp)	4	6	10	20
	Total	**20**	**32**	**48**	**100**

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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

Laboratory Instruction Number	Short Laboratory Experiment Titles	Assessment of Laboratory Work (Marks)	
		ESE	TA
LE1.1	Test the performance of pn-Junction diode in the forward and reverse biased condition.		
LE1.2	Test the performance of the given LED Diode.		
LE1.3	Test the performance of the given Photo Diode.		
LE2.1	Test the input and output waveform of Half Wave Rectifier a) without filter b) with filter		
LE2.2	Test the input and output waveform of full Wave center tapped rectifier a) without filter b) with filter		
LE2.3	Test the input and output waveform of full Wave Bridge Rectifier a) without filter b) with filter	100	20
LE3.1	Test the performance of Zener diode.		
LE3.2	Test the output of the given Zener voltage regulator.		
LE3.3	Test the output waveform of a) Positive Clipper b) Negative Clipper		
LE3.4	Test the output waveform of a) Positive Clamper b) Negative Clamper		
LE4.1	Determine the current gain of CE configuration with the help of input output characteristics of CE configuration.		
LE4.2	Determine the current gain of CB configuration with the help of input output characteristics.		
LE4.3	Determine the current gain of CC		

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

	configuration with the help of input output characteristics.			
LE4.4	Build and test the operation of BJT as a switch.			
LE4.5	Bias the given NPN transistor in the active region by voltage divider biasing method.			
LE4.6	Test the performance of the given FET.			
LE5.1	Test the performance of the given Op-Amp IC in inverting mode.			
LE5.2	Build and test Op-Amp based summing amplifier.			
LE5.3	Test the output of non inverting amplifier.			
LE5.4	Test the performance of Op-Amp based integrator and differentiator circuit.			
LE5.5	Build and test the performance of Instrumentation amplifier.			

*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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) Semester-II

L)   Suggested Learning Resources:

(a) Books :

S. No.	Titles	Author	Publisher	Edition & Year
1	Basic Electronics & Linear Circuits	Bhargava N.N.; Kulshreshtha D.C.; Gupta S. C.	Tata McGraw Hill; New Delhi	IInd edition,2013, ISBN 13:9789383286607
2	Integrated Electronics	Millman Jacob; Halkias Christo; Parikh Chetan D	Mcgraw Hill Education,India	IInd edition,2011ISBN: 9780070151420, 0070151423
3	Op-amps and linear Integrated circuits	Gayakwad Ramakant A.	PRENTICE HALL,India	4th edition,2002, **ISBN-13:** 978-8120320581
4	Linear Integrated circuits and Applications	Bakhshi U.A.; Godse A.P. and Bakshi A. V.	Technical Publications, Pune, India	SECOND edition, January 1, 2011, **ISBN-13:** 978-9350380055
5	Electronic Devices and Circuit Theory	Boylestead Robert; Neshelsky Louis	Pearson Education, New Delhi	10th edition, 2009 ISBN: 978-8131727003
6	Electronics Principles	Malvino Albert; David Paul	McGraw Hill Eduction, New Delhi,	ISBN: 978-0070634244
7	Principles of Electronics	Mehta, V.K.; Mehta, Rohit	S. Chand and Company, Ram Nagar, New Delhi-110 055, 504	2014, ISBN: 9788121924
8	Basic Electronic Engineering	Baru V.; Kaduskar R.; Gaikwad S.T.	Dream tech Press, New Delhi,	2015, ISBN: 9789350040126

(b) Open source software and website address:

   i.   http://www.learnerstv.com/video/Free-video-Lecture-5079-Engineering.htm
   ii.   https://www.allaboutcircuits.com/textbook/semiconductors/chpt-2/bipolar-junction-transistors
   iii. http://nptel.ac.in/courses/117103063/
   iv.   https://www.youtube.com/watch?v=clTA0pONnMs
   v.   Clipper and Clamper:- https://www.youtube.com/watch?v=rkP3xmDF1oA
   vi.   Clamper:- http://ee.eng.usm.my/eeacad/arjuna/Electronic%20device%20lecture4.pdf

(c) Others:

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

M) **List of Major Laboratory Equipment and Tools:**

S. No.	Name of Equipment	Broad Specifications	Relevant Experiment Number
1	Variable D.C. power supply	Variable DC power supply 0- 30V, 2A, SC protection, display for voltage and current.	All
2	Oscilloscope (CRO/DSO)	Oscilloscope (CRO/DSO) Duel Trace 20Mhz, **1MegaΩ I put I peda ce**	All
3	Function Generator	0-2 MHz with Sine , square and triangular output with variable frequency and amplitude.	All
4	Multimeter	Digital Multimeter : 3 1/2 digit display, 9999 counts digital multimeter measures: V_{ac}, V_{dc} (1000V max) , A_{dc}, A_{ac} (10 amp max), Resistance (0 - 100 M) , Capacitance and Temperature measurement	All
5	Electronic Work Bench	: Bread Board 840 -1000 contact points: Positive and Negative power rails on opposite side of the board , 0-30 V, 2 Amp Variable DC power supply, Function Generator 0-2MHz, CRO: 0-30 MHz, Digital Multimeter	All

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 Tool	PO-5 The Engineer and Society	PO-6 Environment and sustainability	PO-7 Ethics	PO-8 Individual and team work	PO-9 Communic Ation	PO-10 Life-long Learning	PSO-1 Electri Cal Equipm ent	PSO-2 Electrica l Power System
CO-1	Use semiconductor diodes in various electronics circuits.	2	2	3	3	1	1	3	3	3	3	2	2
CO-2	Test the performance of different types of rectifiers and filters.	2	3	3	3	1	1	3	3	3	3	2	2
CO-3	Test function of Zener diode, clipper and clamper circuit.	3	3	3	3	2	2	3	3	3	3	2	2
CO-4	Test the working of Bipolar Junction Transistor (BJT) and FET.	3	3	3	3	2	2	3	3	3	3	2	2
CO-5	Use OP-AMP for various applications.	3	3	3	3	2	2	3	3	3	3	2	2

Legend: 1 – Low, 2 – Medium, 3 – High

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II) Semester-II

O) Course Curriculum Map:

POs & PSOs No.	COs No. & Titles	SOs No.	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSO – 1, 2	CO-1 Use semiconductor diodes in various electronics circuits.	SO1.1 SO1.2 SO1.3 SO1.4	LE1.1 LE1.2 LE1.3	Unit-1.0 Semiconductor Diode 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 – 1, 2	CO-2 Test the performance of different types of rectifiers and filters.	SO2.1 SO2.2 SO2.3	LE2.1 LE2.2 LE2.3	Unit 2.0 Rectifiers and Filters 2.1, 2.2, 2.3	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSO – 1, 2	CO-3 Test function of Zener diode, clipper and clamper circuit.	SO3.1 SO3.2 SO3.3	LE3.1 LE3.2 LE3.3 LE3.4	Unit 3.0 Diode Circuits 3.1, 3.2, 3.3, 3.4	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSO – 1, 2	CO-4 Test the working of Bipolar Junction Transistor (BJT) and FET.	SO4.1 SO4.2 SO4.3 SO4.4 SO4.5	LE4.1 LE4.2 LE4.3 LE4.4 SO4.5 SO4.6	Unit-4.0 Electrostatics , Magnetism and Electric current 4.1, 4.2, 4.3, 4.4, 4.5	
PO - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PSO – 1, 2	CO-5 Use OP-AMP for various applications.	SO5.1 SO5.2 SO5.3 SO5.4 SO5.5	LE5.1 LE5.2 LE5.3 LE5.4 LE5.5	Unit 5.0 Introduction to Operational 5.1, 5.2, 5.3	

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.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

A)	**Course Code**	:	**200268 (46)**
B)	**Course Title**	:	**Technical Presentation & Group Discussion Part-II**
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 focus of the course is to develop a wide variety of soft skills starting from communication, to work in different environments, developing emotional sensitivity, learning creative and critical decision making, developing awareness of how to work with and negotiate with people The key areas addressed are conversation skills, group skills, persuasion skills, presentation skills, personal grooming, positive thinking and vocational skills

E)   Course Outcomes:

CO-1   Exhibit impressive personality in society.

CO-2   Explore different Leadership skills and Team work

CO-3   Develop different skills of group discussion.

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	200268 (46)	Seminar & Technical Presentation Skill Part–II	-	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					Total Marks
				Theory			Practical		
				ESE	CT	TA	ESE	TA	
1	Humanities	200268 (46)	Seminar & Technical Presentation Skill Part–II	-	-	-	-	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.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology   (Group-II)   Semester-II

CO-1   Exhibit impressive personality in society.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
SO-1 Understand and practice positive traits for an impressive personality.	Concept and meaning of personality 1.1 Characteristics/Qualities 1.2 Factors influencing personality Need for desirable personality 1.3 Posture and Health 1.4 Good Health diet Exercise, Personal Cleanliness, Sleep and Rest 1.5 Use of Cosmetics 1.6 Dress Code 1.7 Eye-Contact	• Motivational Movies, Videos, Lectures, Interviews, Yoga etc.,

CO-2   Explore different Leadership skills and Team work

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
SO-2 Understanding Leadership & Team work	2.1 Skills for a good Leader. Different Leadership Styles Autocratic, Democratic, Ethical, Transformational, Team Leadership 2.2 Necessity of Team Work Personally, Socially, professionally and Educationally	--

CO-3   Develop different skills of group discussion.

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
SO-3 Participate in **Group Discussion**	3.1 Weighing Positives & Negatives in Group Discussion 3.2 Dos and Don'ts of Group Discussion 3.3 Initiating, continuing and concluding a Group Discussion	--
SO-4 Use proper tools to manage Time in different situations.	4.1 Principles of Time Management 4.2 Criteria governing Time Management	

Session Outcomes (SOs)	Laboratory Instruction/Classroom Instruction (LI/CI)	Self Learning (SL)
	4.3 Prioritizing work	

SW- Suggested Sessional Work (SW):

a.   Assignments:

Preparing skits to show Creativity, communication, critical thinking

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, movie clips, games, examples, story/sharing questionnaire/role play/exercises/ Task, Video/Audio recording

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

Unit Number	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
I	Personal Grooming	1	-	2	3
II	Leadership & Team Work	-	1	2	3
III	Group Discussion	-	-	2	2
IV	Time Management	-	1	1	2
Total		**1**	**2**	**7**	**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	How to achieve success and happiness	Beau Norton	CreateSpace Independent Publishing Platform	Latest edition
2	Living English Structure	Allen	Cambridge Publications	Fifth edition(2009)
3	The Quick and Easy Way to Effective Speaking	Dale Carnegie	Amazing Reads	23 January 2018
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
6	Covey Sean, Seven Habit of Highly Effective Teens	Covey Sean,	Fireside Publishers, 1998.	
7	How to win Friends and Influence People	Carnegie Dale,	Simon & Schuster, New York 1998.	
8	Thomas A Harris, I am ok, You are ok	Thomas A Harris	New York-Harper and Row, 1972	
9	Emotional Intelligence, Bantam Book, 2006	Daniel Coleman	Bantam Book, 2006	
10	Chanakya's 7 Secrets of Leadership	Pillai Radhakrishnan	Jaico Publishing House	ISBN: 9788184954012, 8184954018

(b) Open source software and websiteaddress:

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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology   (Group-II)   Semester-II

9. https://www.britishcouncil.in/english/learn-online
10. http://learnenglish.britishcouncil.org/en/content
11. http://www.talkenglish.com/
12. languagelabsystem.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 software's – Globarina, A-One Solutions, Wordsworth, Spears	All
3.	Computer tables & chairs	Depending upon the size of the Language Lab	All

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 Exhibit impressive personality in society.	2	1	1	1	-	-	-	-	2	2	1	1
CO-2 Explore different Leadership skills and Team work	1	1	2	2	-	-	-	-	2	3	1	1
CO-3 Develop different skills of group discussion.	1	2	2	1					1	2	1	1

Legend:1 – Low, 2 – Medium, 3 – High

Diploma in Electronics and Telecommunication/Instrumentation/Computer Science & Engineering/Information Technology (Group-II)   **Semester-II**

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 Exhibit impressive personality in society.	SO1.1	LE.1.1 LE1.2 LE1.3 LE1.4 LE1.5 LE1.6 LE1.7		
PO 1,2,3,4,9,10 PSO 1,2	CO-2 Explore different Leadership skills and Team work	SO2.1	LE2.1 LE2.2		As mentioned in relevant pages
PO 1,2,3,4,9,10 PSO 1,2	CO-3 Develop different skills of group discussion.	SO3.1	LE3.1 LE3.2 LE3.3 LE4.1 LE4.2 LE4.3		

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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