Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: B. Tech -2nd	**Branch: Common to all Branches**			
Subject: Engineering Mathematics II	**Code: 3000B02AT014**			
ESE Maximum: 100	**Periods/Week:**			
ESE Minimum: **35**	**L**	**T**	**P**	**Ass. Hours**
Total Teaching Hrs: 60	**3**	**1**	**0**	**1/week**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**			
Duration (ESE): 3 hours	**Total Credits: 4**			

Course Objectives

The objective of the course is aimed to develop the basic mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. Also, the topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology. This course includes: Complex numbers, Sequence and Series, Multivariable Calculus, Vector Calculus and Statistics.

Course Outcomes

On successful completion of the course, the students will be able to:

CO1. Implement the De Moivre's theorem for finding roots of Complex numbers and use the Method of separation into real and imaginary parts in the study of complex numbers and Summation of series C+iS method.

CO2. Use the concept of convergence and tool of power series in various problems of advanced Mathematics.

CO3. Use the Multivariable Integral Calculus for finding Area and Volume and to employ the Beta and Gamma functions for evaluating improper finite integrals.

CO4. Differentiate and Integrate Vector functions and apply Stoke's, Gauss and Divergence theorem for easier evaluation.

CO5. Fit Linear and Second order Parabolic curves to given set of data. And use Correlation and Regression for Interpolation or Extrapolation.

UNIT–I: Complex Numbers:

De Moivre's theorem; Roots of complex numbers; Separation into real and imaginary parts of circular, hyperbolic, logarithmic and exponential functions; Summation of series C+iS method. **[12 Hrs]**

UNIT–II: Sequence and Series:

Sequences and their limits; Convergence of series; Test for convergence (Comparison tests, D'Almbert's ratio test, Raabe's test, Cauchy's root test); Power Series (exponential, logarithmic and binomial series). **[12 Hrs]**

UNIT–III: Multi variable Calculus (Integration):

Double and Triple integrals; Change of order of integration; Beta and Gamma functions; Application to area and volume. **[12Hrs]**

UNIT–IV: Vector Calculus:

Scalar and vector fields, vector operator; Directional derivative; Gradient, divergence and curl; Line, surface, and volume integration; Green's, Gauss's and Stoke's theorem (without proof) and its applications. **[12Hrs]**

UNIT–V: Statistics:

Curve fitting by method of least squares (fitting of straight lines and second-degree parabolas), Correlation: Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient; Line of regression. **[12Hrs]**

TextBooks:

S.No.	Title	Authors	Edition	Publisher
1)	Higher Engineering Mathematics	B. S. Grewal	44th Edition,2017	Khanna Publishers
2)	Advanced Engineering Mathematics	H.K. Dass	28thEdition, 2012	S. Chand Publication
3)	Advanced Engineering Mathematics	Erwin Kreyszig	9th Edition, 2006	John Wiley &Sons
4)	Applied Engineering Mathematics	Madan Mohan Singh	2ndEdition,2016	B S Publications
5)	Engineering Mathematics (Hindi)	S. C. Goyal	6thEdition, 2022	Khanna Publishers
6)	Engineering Ganit(Vol 1 aur 2)	R. K. Jain	10thEdition, 2023	Vikas Publishing House

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Calculus and Analytic geometry	G.B. Thomas and R.L. Finney	9th Edition 2002	Pearson, Reprint
2)	Engineering Mathematics for first year	T. Veera Rajan	2008	Tata McGraw Hill, New Delhi
3)	Higher Engineering Mathematics	B.V. Raman	Reprint2010	Tata McGraw Hill New Delhi
4)	A text book of Engineering Mathematics	N.P. Baliand Manish Goyal	Reprint,2010.	Laxmi Publications
5)	Ganitaur Uske Anuprayog	V. K. Singh	5thEdition,2021	Arihant Publication

E- resources/ Web Sources: NPTEL You Tube Channel

- SWAYAM Portal: Online Lectures on Engineering Mathematics.(https://onlinecourses swayam2.ac.in/cec20_ma02/preview)

CHHATTISGARHSWAMIVIVEKANANDTECHNICALUNIVERSITY,BHILAI(C.G.)

Semester- Second	**Branch: Common for All**			
Subject: Environmental Chemistry	**Code: 3000B03AT011**			
ESE Maximum: 100 **ESE Minimum**: **35** **Total Teaching Hrs: 45**	**Periods/week:**			
	L	**T**	**P**	**Ass. Hours**
	3	**-**	**-**	**1/week**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**			
Duration (ESE): 3 hours	**Total Credits: 3**			

Course Objectives

1. Demonstrate a foundation of atmospheric structure and pollution.
2. Provide a comprehensive understanding of water and soil pollution,
3. Learn about different types of pollutant emitted from various types of industries and to explore about environmental consequences.
4. Familiarize the methods and instrument used to measure environmental pollutants accurately.

5. Visualize the local and global environmental issues.

Unit – 1

Atmospheric Pollution

Composition and Structure of Atmosphere, Air Pollutants: Classification, Sources, effect and fate in environment of sulphur dioxide, Carbon monoxide, hydro carbons, Particulate 2.5 & 10 micro meter , Volatile organic compounds, oxidant and ozone, Air quality and pollutant concentration calculation. Photochemical Smog, Greenhouse Gases and Global warming, , Depletion of Stratospheric Ozone , Acid Rain, Dispersion , carbon footprint, Kyoto Protocol, Montreal Protocol. Air pollution Standards.

9 **hours**

Unit – 2

Water and soil Pollution

Hydrosphere, hydrological cycle, Classification of Water Pollutants, water quality parameters : Alkalinity, Hardness, Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen demand, Thermal Pollution, Heavy Metals pollution and their biochemical effects: Lead, Arsenic, Mercury, Cadmium, Chromium, Soaps and Detergents. DO sag Curve, Characteristic of Ground Water, Sources, types and environmental effect, mitigation, Ground water in Indian Perspective, Eutrophication, Water quality standards. Numerical related to dissolved oxygen, Chemical Oxygen Demand & Biological Oxygen Demand.

Soil Pollution: Soil Profile, Sources and effects of soil pollution **10 hours**

Unit -3

Industrial Pollutants

Polymer and plastic: Characteristics, Classification and Environmental Implications, Asbestos: Structure, Characteristics and Application, Sources and Effect of Asbestos Pollution, Polychlorinated Biphenyls, dioxins, and pesticides: Fate and Environmental Implications. Carcinogens, Food Additives: Classification, Risk Analysis, Radioactive waste,
Waste water from industries and mines: Sources, Characteristics effect and treatment effluent of Textile Industry, Paper and Pulp Industry, Electroplating Industry, Leather industry, oil refineries, Fertilizer industry

9 hours

Unit -4

Environmental Sampling and Analysis

Air Pollutants:Sampling (active and passive sampling), High Volume sampler, Principle & Analysis of SO_2, NO_2, detection of atmospheric Oxidants and Hydrocarbons, particulate matter, Numerical.
Water Pollutants: Sampling (grab sampling, composite sampling), Principle & Spectrophotometric Analysis of Chromium, Uranium, Arsenic, nitrate, fluoride, Numerical.
Environmental Impact Assessment Studies **9 hours**

Unit -5

Case Studies and Waste Management Challenges

Case Studies: Bhopal gas leak Disaster, Santa Barbara Oil Slick, Chernobyl Nuclear Disaster, MinamitaTragedy, Love canal episode, Nuclear Pollution, Delhi's air pollution crisis
Waste Management Challenges: Municipal solid waste, e-waste, biomedical waste, hazardous waste, waste minimization, recycling.

8 hours

Course Outcome

1. Awareness how the human activity affects air quality and the ability to assess the impact.
2.Ability to classify and evaluate water and soil pollutants and apply numerical techniques for analyzing water quality parameters.
3. Critically analyze the complexities of industrial pollutants and evaluate solution for mitigation.
4. Proficiency in using various methods and instruments to measure environmental parameter.
5. Integrate knowledge from diversified case studies and understanding various environmental challenges.

Text Books

1.Energy Environment Ethics and Society, S. S. Dara, Rashmi Shrivastav, S. Chand.
2.Energy Ecology Environment and Society, Surinder Deswal, Anupam Deswal. Danpat Rai & Co.
3.Environmental & Ecology, Piyush Kant Pandey, Deepti Gupta, Sun India Publications.

Reference Books

1.Fundamental Concepts of Environmental Chemistry, G. S. Sodhi, Narosa.
2.Environmental Pollution Control Engineering, C S Rao, New Age International P Limited.
3.Pollution Control in Process Industries, S P Mahajan, Tata McGraw-Hill Publishing company Ltd.
4. Basic Environmental Technology, Jerry A. Nathanson, Prentice-Hall of India Private limited.
5. Industrial Waste Management" by R. K. Trivedy (CRC Press)
6https://books.google.co.in/books?id=ndJto18rHM8C&printsec=copyright&redir_esc=y#v=onepage&q&f=false
7.https://tech.chemistrydocs.com/Books/Environmental/An-introduction-to-Environmental-Chemistry-By-M.Fazal-ur-Reh

man.pdf
8. https://nptel.ac.in/courses/104103020
9. Environmental Science , Subrat Roy [Hindi Edition], Khanna Book Publishing Co. (P) Ltd.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester- B. Tech -2nd	Branch: Common for All			
Subject: Concept of Programming Language	Code: 3000B04AT022			
ESE Maximum: 100 ESE Minimum: 35 Total Teaching Hrs: 45	Periods/week:			
	L	T	P	Ass. Hours
	03	-	-	1/week
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)			
Duration (ESE): 3 hours	Total Credits: 03			

Course Objectives:

1. To develop logic building skills for problem solving
2. To translate the solution logic to computer programs using C language constructs
3. To decompose a problem into modules and synthesize a complete program
4. To develop the student's ability to understand the salient features of programming languages.
5. To provide the students to gain experience with these paradigms by using example programming languages.

UNIT I: Introduction to Problem Solving The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Introduction to 'C' Language Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic input/output statement, Simple 'C' programs. **(8Hrs)**

UNITII: Decision, Control and Looping Statements Conditional Statements and Loops: Decision making within a program, Conditions, Relational Operators, Logical Connectives, if statement, if-else statement, Loops: while loop, do while, for loop, Nested loops, Infinite loops, Switch statement, structured programming **(8Hrs)**

NIT III: Arrays, Pointers and Strings Arrays: One dimensional arrays: Array manipulation Searching, Insertion, Deletion, Finding the largest/smallest element in an array Two dimensional arrays, Addition/Multiplication of two matrices, Transpose of a square matrix Null terminated strings as array of characters, Standard library string functions Pointers: Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, Arrays and Pointers, pointer arrays, pointers and structures, dynamic memory allocation **(10Hrs)**

UNIT IV: Functions Functions: Top-down approach of problem solving, Modular programming and functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments. Storage Classes: Scope and extent, Storage Classes in a single source file: auto, extern and static, register, Storage Classes in multiple source files: extern and static **(10 Hrs)**

UNITV: Structures and Unions: Structure basics, structures and functions, array of structures, pointers to structures, self-referential structures, table lookup, typed, unions, files, creating a data file, enumerators, bit wise operation **(9Hrs)**

CourseOutcomes:

1. Explain the process of problem solving using computer
2. Design an algorithmic solution for a given problem
3. Write a maintainable C program for a given algorithm.
4. Trace the given C program manually.
5. Able to write C program for simple applications of real life using structures and files.

TextBooks:

1. Lets C, Y. Kanitkar, BPB
2. Programming with C, Gottafried, Schaum Series
3. C The Complete Reference, Scholdt, TMH
4. Programming with C, S. Kaicher, Macmillan

ReferenceBooks:

1. Programming in ANSI C, 8th Edition, E. Balagurusamy
2. Programming in C, 3rd Edition, ReemaThareja
3. C For Yourself, Asian Inst. of Tech AIT
4. Structured Programming Approach Using C, B. Forouzen, Thomas Learning

हिंदीपुस्तक**:**

1. प्रोग्रामिंगइनC – डॉ. अजयतिवारी(अमेज़नपरउपलब्ध)
2. C भाषामेंप्रोग्रामिंगANSIविशेषताओकेसाथ -डॉएस. एस. श्रीवास्तव, फ़ायरवॉलमीडियापब्लिकेशन

MOOCS

1. **Programming Languages, Part A-** Offered by the University of Washington**https://www.coursera.org/**

2. Concepts of Programming Languages **https://www.openlearning.com/unsw/courses/comp3161/?cl=1**

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Name of program: Bachelor of Technology	**Semester: 2nd Sem**
Branch: Common to all Branches	**Code : 3000B05ET046**
Subject: Indian Culture and Constitution	**Credit:2**
Total Assessment Hrs: 1/Week	**Total Teaching Hrs:30**
Assignment : Min 02	**Marks in CT: 10**
Total Marks ESE: 50/17	**Marks in TA:10**

Objective: The Constitution is the supreme law and it helps to maintain **Integrity** in the society and to promote unity among the citizens to build a great nation. The main objective of the Indian Constitution is to promote harmony throughout the nation.

Course Objective:
Upon completion of this course, the student shall be able

- To understand Meaning and concepts of Traditional and Modern of Culture
- To understand Sources of the Study of Indian Culture
- To Enable the student to understand the history and importance of constitution
- To understand philosophy of fundamental rights and duties
- To understand the powers and functions of executive, legislature and judiciary
- To understand the powers and functions of state government
- To understand the recent trends in Indian Constitutional and election commission of India
  To understand the centrall and sate relation, financial and administrative

UNIT-I **(6 hours)**

Meaning and concepts of Culture: Traditional and Modern concepts of Culture Notion of Culture in textual tradition. anthropological, archaeological and sociological understanding of the terms culture. ELements of Culture, concept of Indianness and value system. Relation between culture and civilization. Historiography and approaches to the study of Indian Culture Stereotypes, Objectivity and Bias, Imperialist, Nationalist, Marxist and Subaltern Heritage of India and world's debt to Indian Culture.

UNIT-II **(6 hours)**

Sources of the Study of Indian Culture: Archaeological: cultural remains, Monuments, Numismatics, Epigraphy: Literary sources and Oral traditions, Foreign Accounts, Archival sources.

UNIT-III **(6 hours)**

History of Indian Constitution Constitutional History, Preamble salient features, citizenship, Method of Amendment and Recent Amendments **Rights and Duties** Fundamental Righis and Directive Principles of State Policy, Fundamental Duties, Difference between Fundamental Rights and Directive Principles of State Policy.

Union Government a) President-powers and functions, Vice President powers and functions, Prime Minister and council of ministers powers and functions. b) Parliment - Loksabha, Rajyasabhs-composition powers and functions.

UNIT IV **(6 hours)**

State Government a) Governor powers and functions b) Chief minister, powers and functions c) Sate Legislative Assembly and Legislative Council-composition powers and functions. d) High Court: composition powers and functions.

UNIT-V **(6 hours)**

Recent Trends in Indian Constitutional a) Basic structure of Indian Constitation. b) Electoral Reforms c) Panchayati Raj system in India.

Books of Reference

1. Dr. P. K. Agrawal Indian Culture, Art and Heritage,
2. P. Raghunadha Rao Indian Heritage and Culture
3. M.V.Pylee, An Introduction to the Constitution of India, New Delhi, Vikas 2005,
4. Subhash C.Kashyap, Our Constitution: An Introduction to India's Constitution and constitutional Law, New Delhi, National Book Trust, 2000.
5. Durga Das Basu, Introduction to the Constitution of India, New Delhi, Prentice Hall of India, 2001,
6. D.C.Gupta, Indian Government and Politics, VIII Edition, New Delhi, Vikas, 1994.
7. V.D.Mahajan, Constitutional Development and National Movement in India, New Delhi, S. Chand and Co., latest edition.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester- II	**Branch: B.Tech. (Common to all Branches)**			
Subject: Cyber Laws and Ethics	**Code: 3000B06FT076**			
Maximum/Minimum-Passing marks: 50/17	**Periods/week:**			
TA:10	**L**	**T**	**P**	**Ass. Hours**
CT:10	**01**	**-**	**00**	**1/Week**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**			
Duration (ESE): 3 hours	**Total Credits: 1**			

Course Objectives:

1. To understand the fundamentals of Information Technology and Cyber Crimes.
2. To examine various forms of cybercrimes and their criminological dimensions.
3. To analyze the legal framework governing cyber space in India and globally.
4. To explore emerging trends in cyber security and digital forensics.
5. To evaluate cybercrimes from human rights and ethical perspectives.

UNIT I: Information Technology & Cyber Crimes: Introduction, Glimpses, Definition and Scope, Nature and Extent, Know no Boundaries, Rapid Transmission and Accuracy, Diversity and Span of Victimization, Cyber World, Inadequacy of Law, Influence of Teenagers. Regulatory Perspective on Technology: Impact of Information and Technology, Regulation of Cyber Space, Legal Aspects of Regulation. **(3 Hrs)**

UNIT II: Technology & Forms of Cyber Crimes: Influence of Technology on Criminality, Forms of Cyber Crimes. Computer Crimes & Cyber Crimes: A Criminological Analysis Computer Crimes and Cyber Crimes: Terminological Aspects, Opportunities to Cyber Criminals, Motives of Offenders, Problems Affecting Prosecution, Cyber Crimes: Challenges of Prevention and Control, Need and Prospects. Role of Guardians, Mobile Pornography: No Nearer Solution in Sight, Self-regulation in Cyber Space **(3 Hrs)**

Case Study On Cyber Crimes: Harassment Via E-Mails, Email Spoofing (Online A Method Of Sending E-Mail Using A False Name Or E-Mail Address To Make It Appear That The E-Mail Comes From Somebody Other Than The True Sender, Cyber Pornography (Exm.MMS),Cyber-Stalking.

NIT III: Information Technology Act Overview of IT Act, 2000, Amendments and Limitations of IT Act, , Cyber Regulations Appellate Tribunal, Penalties and Adjudication. Cyber Crimes 'and Global Response: Global Perspective, Country wise Legal Response, Country wise Analysis. Cyber Crimes and Indian Response: Introduction, The Indian Information Technology Act 2000, Preamble & Coverage, Nature of Offences and Penalties, Miscellaneous and Subsidiary Provisions Certain Shortcomings, Future Prospects and Needs. **(3 Hrs)**

UNIT IV: Emerging Trends and Challenges: Emerging technologies and their implications for cyber security in India, Ethical and privacy issues in cyber security practices: data sovereignty, surveillance concern. **(3 Hrs)**

Digital Forensics: Digital evidence -collection, preservation, and admissibility in Indian courts, Forensic tools and techniques: chain of custody, data recovery, and analysis, Role of cyber forensics in cybercrime investigations in India.

UNIT V: Human Rights Perspectives Cyber Crimes: Introduction, Ideological Aspects, Fundamental Rights and Civil Liberties, Various Issues and Challenges. **(3 Hrs)**

Cyber Ethics: The Importance of Cyber Law, Significance of cyber Ethics, Need for Cyber regulations and Ethics. Ethics in Information society, Introduction to Artificial Intelligence Ethics: Ethical Issues in AI and core Principles, Introduction to Block chain Ethics.

Course Outcomes:

1. Understand and explain the concept, nature, and scope of cybercrimes, including the challenges posed by rapid technological advancements and the limitations of existing legal frameworks.
2. Identify and analyze various forms of cybercrimes and criminal behavior in cyberspace
3. Evaluate the provisions of the Information Technology Act, 2000 and related legal mechanisms in India and abroad
4. Apply knowledge of digital forensics and cyber security tools to collect, preserve, and analyze digital evidence
5. Critically assess cybercrimes through human rights and ethical lenses, understanding the importance of cyber ethics

Text Books:

- Dr Pramod Kr.Singh, “Laws on Cyber Crimes [Along with IT Act and Relevant Rules]” Book Enclave Jaipur India..

Reference Books:

1. Pawan Duggal, “Cyber Laws” Universal Law Publishing.
2. K.Kumar,” Cyber Laws: Intellectual property & E Commerce, Security”, First Edition, Dominant Publisher, 2011.
3. Rodney D. Ryder, “Guide to Cyber Laws”, Second Edition, Wadhwa And Company, New Delhi, 2007.
4. Vakul Sharma, "Handbook of Cyber Laws" Macmillan India Ltd, Second Edition, PHI, 2003.
5. Justice Yatindra Singh, "Cyber Laws", Universal Law Publishing, First Edition, New Delhi, 2003.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: 2nd	**Branch: Common for All**			
Subject: Concept of Programming Language Lab	**Code: 3000B02AL022**			
ESE Maximum: 40	**Periods/week: 02**			
ESE Minimum: 20	**L**	**T**	**P**	**Ass. Hours**
Total Teaching Hrs: 30	**-**	**-**	**02**	**1/Week**
Teacher Assessment: 20	**Credit :01**			

Course Objective:

1. To develop logic building skills for problem solving
2. To translate the solution logic to computer programs using C language constructs
3. To decompose a problem into modules and synthesize a complete program
4. To develop the student's ability to understand the salient features of programming languages.
5. To provide the students to gain experience with these paradigms by using example programming languages.

List of Experiments: (Each student is required to perform a minimum of 15 experiments.)

1. Write a C program to find sum and average of three numbers.
2. Write a C program to find the sum of individual digits of a given positive integer.
3. Write a C program to generate the first n terms of the Fibonacci sequence.
4. Write a C program to generate prime numbers between 1 to n.
5. Write a C program to Check whether given number is Armstrong Number or Not.
6. Write a C program to evaluate algebraic expression (ax+b)/(ax-b).
7. Write a C program to check whether given number is perfect number or Not.
8. Write a C program to check whether given number is strong number or not.
9. Write a C program perform arithmetic operations using switch statement.
10. Write a C program to find factorial of a given integer using non-recursive function.
11. Write a C program to find factorial of a given integer using recursive function.
12. Write C program to find GCD of two integers by using recursive function.
13. Write C program to find GCD of two integers using non-recursive function.
14. Write a C program to find both the largest and smallest number in a list of integers.
15. Write a C Program to Sort the Array in an Ascending Order.
16. Write a C Program to find whether given matrix is symmetric or not.
17. Write a C program to perform addition of two matrices.
18. Write a C program that uses functions to perform Multiplication of Two Matrices.
19. Write a C program to use function to insert a sub-string in to given main string from a given position. Write a C program that uses functions to delete n Characters from a given position in a given string.
20. Write a C program using user defined functions to determine whether the given string is palindrome or not.
21. Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.
22. Write C program to count the number of lines, words and characters in a given text.
23. Write a C program to find the length of the string using Pointer
24. Write a C program that uses functions and structures to perform the following operations: i) Reading a complex number ii) Writing a complex number iii) Addition of two complex numbers iv) Multiplication of two complex numbers
25. Write a C program to display the contents of a file.
26. Write a C program to copy the contents of one file to another.
27. Write a C program to merge two files into a third file.

28. Write a C program to reverse the first n characters in a file.

Course Outcome:

1. Explain the process of problem solving using computer
2. Design an algorithmic solution for a given problem
3. Write a maintainable C program for a given algorithm.
4. Trace the given C program manually.
5. Able to write C program for simple applications of real life using structures and files.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester- B.Tech. 2nd Semester	Branch: Common to all branches
Subject: Engineering Graphics Lab	Code: 3000B03AL037
Maximum /Minimum Passing Marks: 40/20	Period/Week:01
Total Credit: 2 Teacher Assessment: 20	L: -, T: -, P: 4, Ass. Hours: -

Course Objectives:

An engineer need to have three skills, he must be able to imagine, draw clearly and rapidly and to read the drawings drawn by others. Engineering Graphics aims in teaching the principles of accuracy and clarity while presenting the information necessary for a product. It also develops visualization capabilities that are essential for creation of a successful design. Manual drafting is now being replaced by highly accurate and efficient computer aided drafting The objective of this course is to teach the basic commands and tools necessary to create and manipulate geometric models using CAD software system with an aim to inculcate employability skills and prepare the candidates for the new highly competitive working era.

Course Outcomes:

On successful completion of the course, the student will be able to:

CO1: Describe the basic concepts of drafting software and able to crate drawing using software tools.

CO2: Modify the geometry, dimension the views and create drawing using layer command.

CO3: Draw scale, and engineering curves using CAD software.

CO4: Draw orthographic projection and develop solids using drafting software.

CO5: Convert orthographic view into isometric view and vice-versa using drafting software.

List of Exercises

1. Getting stated with drafting software: GUI, limits and units, grid, various modes of input of point, erase and zoom commands.
2. Introduction to drawing tools: line, circle, arcs, rectangle, polygon, ellipse etc. Editing tools: trim, move, copy, rotate, etc.
3. Introduction to geometry modifying tools: offset, mirror, scale, basic commands of array, block and insert, fillet, chamfer.
4. Introduction to text, layer commands and dimensioning in drafting software
5. Scale: Plain scale and diagonal scale.
6. Conic Sections: Ellipse, Parabola & Hyperbola.
7. Cycloidal Curve: Cycloid, Hypocycloid, Epicycloid and Involute
8. Projection of points.
9. Projection of lines.
10. Projection of planes
11. Projection of solids.
12. Section of solids.

13. Development of lateral surfaces of solids.
14. Conversion of pictorial view of solid to its orthographic views.
15. Conversion of orthographic views into isometric view.

Text / Reference Books:

S. No.	Title	Author(s)	Publisher
1.	A Text book of Engineering Drawing	N.D. Bhatt, V.M. Panchal	Charotar Publishing House
2.	Engineering Graphics & Design	Pradeep Jain	Khanna Publication
3.	Engineering Graphics (In Hindi)	Sharad K. Pradhan	Khanna Publication
4.	Engineering Graphics	K. C. John	PHI Learning
5.	Mastering AutoCAD and AutoCAD LT	George Omura, Brian C. Benton	Wiley India
6.	AutoCAD: A problem solving approach	Sham Tickoo	CADCIM Technologies
7.	Engineering Graphics Using Auto CAD	Jeyapovan T.	Vikas Publishing House
8.	Engineering Drawing	BasantAgrawal, C. M. Agrawal	Tata McGraw Hill

E-resources / Web Sources:

S. No.	Title	Link
1.	Engineering Drawing	https://nptel.ac.in/courses/112103019
2.	Engineering Graphics and Design	https://archive.nptel.ac.in/courses/112/102/112102304/
3	Engineering Drawing e-book pdf	https://www.ncvtonline.com/2021/01/engineering-drawing-1st-year-book.html
4	Engineering Drawing II Book pdf in Hindi	https://civilguru.net/engineering-drawing-ii-book-pdf-in-hindi/
5	Engineering Drawing (Hindi) Author: S.K.Arya	https://computechpublications.in/product/engineering-drawing-with-sol-asst-mech-elect-sem-123-4/
6	Engineering Drawing & Design (Handwritten) Study Notes	https://newtondesk.com/engineering-drawing-design-handwritten-study-notes/
7	Engineering Drawing pdf notes inHindi	https://sarkariexamc.com/engineering-drawing-pdf-in-hindi/
8	Engineering Graphics Video lectures in Hindi	https://www.youtube.com/watch?v=gp3oKSEnEFM&list=PLDN15nk5uLiD3MEUiqsYPnZOHcVu7um6_
9	Engineering Graphics for all branches (video lectures)	https://www.youtube.com/live/wgYLfs6DenI?si=aTBZP_cX2Zp9On6a

CHHATTISGARHSWAMIVIVEKANANDTECHNICALUNIVERSITY,BHILAI(C.G.)

Semester- 2nd	**Branch: Common for All**			
Subject: Environmental Chemistry (lab)	**Code: 3000B04AL011**			
Maximum/Minimum-Passing marks:40/20	**Periods/week:**			
Teacher Assessment: 20	**L**	**T**	**P**	**Ass. Hours**
	-	**-**	**2**	**-**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**			
Duration (ESE): 3 hours	**Total Credits : 1**			

List of Practical

Course Objective

1. Introduce analytical techniques for water quality testing.
2. Develop proficiency in conducting common water quality tests.
3. Foster understanding of instrumentation used in environmental testing.
4. Enable assessment of water quality and air pollutants.
5. Prepare students for real-world environmental monitoring.

Choice of 8 – 9 experiments from the following:

1.Determination of alkalinity in water sample.
2.Determination of hardness in water sample.
3.Determination of chloride in water sample
4.Determination of dissolved oxygen by DO meter.
5. Determination of pH using pH meter.
6.Determination Na, & K using Flame Photometer.
7.Spectrophotometric determination of organic/inorganic compounds.
8. Determination of conductivity and TDS by water testing kit.
9. Collection of particulate by High Volume Sampler.
10. Determination of COD in water samples.
11. Determination of BOD in water samples.
12. Microbiological test.

Course Outcome

1. Demonstrate the ability to analyze key water quality parameters.
2. Utilize laboratory instruments to measure water quality indicators.
3. Conduct advanced water testing and interprets results.
4. Collect and analyze particulate matter and pollutants in water samples for environmental management.
5. Apply analytical data for environmental impact assessment and pollution control**.**

Text Books

1. Laboratory Manual on Engineering Chemistry, S. K. Bhasin, Sudha Rani, Dhanpat Rai., Dhanpat Rai Pub Company
2. A Textbook on Experiments and Calculations in Engineering Chemistry, S. S. Dara, S. Chand& Company Limited

Reference

https://www.wctmgurgaon.com/pdf/Env.%20Lab%20Manual.pdf

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: II **Branch: Common to all Branches**
Subject: Value Education **Code: 3000B07FT046**
L: 1 T: 0 P: 0 **Credit: Nil**

Course Description:

This course aims to cultivate ethical awareness, moral reasoning, and responsible citizenship in students. It explores fundamental human values, their significance in personal and social life, and their application in diverse contexts. Through interactive discussions, case studies, and reflective exercises, students will develop a deeper understanding of their own value system and its impact on their choices and actions.

Course Objectives:

1. To understand the meaning and imperative of values, learning values and inculcating them in personal attitude.
2. Cultivate self-awareness and consciousness regarding values.
3. To interpret and analyze the importance of values in personal, social and professional spheres.
4. Develop critical thinking skills to evaluate ethical dilemmas.
5. Promote values to built a harmonious society.

Unit I
Introduction to Value **(3 Hours)**
Defining Values: Meaning, Nature, and Types- Human Values, Aesthetic Values, Ethical Values, Spiritual Values Family Values
Importance of Values in Life: Personal, Social, and Professional.
The Importance of Value Education in Character Development.
Introduction to Indian Knowledge Tradition on Values: Bhagwad Gita, Ramayana, Mahabharata, Panchatantra, Jatka tales, Arthashastra.Right Understanding (Knowing)- Knower, Known & the Process.

Unit: II
Core Human Values in Human Character **(3 Hours)**
Character Building qualities: Self-Discipline, Self-Confidence, Forgiveness, Honesty, and Courage.
Spiritual Values: Truthfulness (Satya): Honesty, Integrity, Authenticity. Righteousness (Dharma): Justice, Fairness, Responsibility.Peace (Shanti): Inner Peace, Harmony, Tolerance.Love (Prema): Compassion, Empathy, Kindness.Non-violence (Ahimsa): Respect for Life, Conflict Resolution.

Unit: III
Values in Personal and Social Life **(3 Hours)**
Values in Family Life: Respect, Care, Cooperation.
Values in Educational Institutions: Discipline, Learning, Collaboration.
Values in Professional Life: Ethics, Accountability, Teamwork.
Values in Social Interactions: Respect for Diversity, Social Responsibility.
Environmental Ethics: Values concerning the environment.
Digital ethics: Values concerning technology and online interaction.

Unit: IV

Ethical Decision Making and Responsible Citizenship **(3 Hours)**

Ethical Dilemmas: Identifying and Analyzing.
Steps in Ethical Decision Making.
Promoting Responsible Citizenship: Civic Duties, Social Service.
Values and National Integration.
Developing a personal code of ethics.

Unit: V

Harmony in Mind, Body and Emotion **(3 Hours)**

Harmony: Definition, need and role. Levels of a Living Human Being
Controlling Mind and Body – Physical Exercise and Meditation
Concept of Harmony in ancient Indian Text
Three basic requirements to ensure happiness and prosperity for human beings: Right Understanding, Relationship and Physical facilities

References:

1. R R Gaur, R Asthana, G P Bagaria, 2019 (2nd Revised Edition), A Foundation Course in Human Values and Professional Ethics. ISBN 978-93-87034-47-1, Excel Books, New Delhi.
2. Premvir Kapoor, Professional Ethics and Human Values, Khanna Book Publishing, New Delhi, 2022.
3. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003
4. Jash, P. Glimpses of Hindu Cults and Culture Education in Values, New Delhi, 1992.
5. R. C. Pradhan, "Language and Mind in the Upanishads", Indian Perspective, ed. K. S. Prasad, Hyderabad Studies in Philosophy Decent Books, New Delhi, 2008.
6. Vincent Peale, Norman. Six Attitudes for Winners
7. Vivekananda, Swami. "Personality Development", Advaita Ashrama, Kolkata, 2008.
8. M Govindrajran, S Natrajan& V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
9. ManavVyavaharDarshan, A. Nagraj, Divya Path Sansthan, Amarkantak, India.
10. Hind Swaraj or, Indian home rule Mohandas K. Gandhi, 1909.
11. Integral Humanism, Deendayal Upadhyaya, 1965.

E- resources/ Web Sources:

- Valuation and Creating Sustainable value - https://onlinecourses.swayam2.ac.in/imb25_mg15/preview

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

<table>
<tr><td>Semester- 2nd</td><td colspan="4">Branch: Common for All</td></tr>
<tr><td>Subject: Civil Eng- Societal and Global impacts</td><td colspan="4">Code: 3000B08FT020</td></tr>
<tr><td rowspan="4">Maximum/Minimum-Passing marks: -
Class Test Marks: -
Teacher Assessment: 30</td><td colspan="4">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours/week</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>1</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Class Tests: 2 (Mandatory)</td><td colspan="4">Assignments: 2 (Minimum)</td></tr>
<tr><td>Duration (ESE): 3 hours</td><td colspan="4">Total Credits: -</td></tr>
</table>

Course Objectives

This course aims to provide civil engineering students with a comprehensive understanding of the **societal and global impacts** of their profession. It explores how civil engineering activities influence infrastructure development, energy use, environmental sustainability, aesthetics, employment, and the overall quality of life. Students will learn to assess these impacts critically and contribute positively through responsible engineering practices.

Unit I: Civil Engineering and Society – Past, Present, and Future (3 Hours)

Civil engineering in historical context: Agricultural and Industrial Revolutions; Evolution of infrastructure and engineering practices; Recent civil engineering innovations and breakthroughs; Future projections and global challenges; Human Development Index and Ecological Footprint (India vs world); GIS and its role in monitoring and planning.

Unit II: Civil Engineering Marvels and Vision (3 Hours)

Ancient and modern marvels of civil engineering; Wonders of the world through engineering lens; Role of civil engineering in shaping society and civilization; Future vision: Smart materials; AI applications, and resilient systems.

Unit III: Infrastructure Systems and Urban Development (3 Hours)

Urban habitats: Megacities, Smart Cities, sustainable planning; Transportation systems: Roads, Rails, Metros, Airports, Tunnels, Hyperloop; Energy infrastructure: Hydro, Solar (PV & Chimney), Wind, Tidal, Geothermal; Water supply and telecommunication systems; Integration of futuristic and sustainable technologies.

Unit IV: Environment and Sustainability (3 Hours)

Solid and hazardous waste management; Water purification and wastewater treatment; Flood control: Dams, Canals, River interlinking; Pollution control measures (air, water, land); Role of civil engineers in climate change mitigation; Environmental Impact Assessment procedures.

Unit V: Built Environment and Economic Contributions (3 Hours)

Sustainable buildings and materials; Repairs, retrofitting, and conservation of heritage structures; Techniques to reduce greenhouse gas emissions in construction; Efficiency in use of materials, manpower, and equipment; Employment

generation and civil engineering's contribution to GDP; Quality of life and built environment interaction.

Course Outcomes-

After completing the course, students will be able to:

1. Understand the societal and global significance of civil engineering projects.
2. Evaluate the energy demands and sustainability of infrastructure.
3. Analyze environmental impacts and apply sustainable solutions.
4. Appreciate civil engineering's role in national economic development and job creation.
5. Connect built environment planning to quality of life improvement.

Recommended Textbooks & References-

- Ziga Turk (2014), *Global Challenges and the Role of Civil Engineering*, Springer
- Brito et al. (2013), *Engineering Impacting Social, Economic and Working Environment*, ASEE
- Allen M. (2008), *Cleansing the City*, Ohio University Press
- Ashley R. et al. (2010), *London Tideway Tunnels Programme*
- Ashley R.M. et al. (2011), *Surface Water Management and Urban Green Infrastructure*
- Barry M. (2003), *Corporate Social Responsibility*, ICE Engineering Sustainability
- Bogle D. (2010), *UK's Engineering Council Guidance on Sustainability*, ICE
- Butler D. & Davies J. (2011), *Urban Drainage*, Spon
- Brugnach M. et al. (2008), *Uncertainty in Ecology and Society*
- Centre for Water Sensitive Cities (2012), *Blueprint for a Water Sensitive City*, Monash University
- Charles J.A. (2009), *UK Public Health Revolution*, ICE.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester- II	Branch: Electronics & Telecommunication Engineering/ Electronics and Communication Engg(VLSI Design and Technology)			
Subject: Industrial Instrumentation	Code: 3028B01CT028			
Maximum/Minimum-Passing marks:100/35 CT: 20 TA: 20	Periods/week:			
	L	T	P	Ass. Hour
	3	-	-	1/Week
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)			
Duration (ESE): 3 hours	Total Credits: 3			

Course Objectives:

1. To recognize various types of Transducers and their performance characteristics.
2. To interpret working principles of various Temperature, Displacement, and Weight Measurement Transducers.
3. To recognize operation and application of Measuring Instruments.
4. To illustrate elements of Basic Instrumentation and Data Acquisition System.
5. To develop a basic understanding of Automation Systems.

UNIT-I: **(9 Hrs)**

Measurement and Performance Characteristics:

Sensors and Transducers: Definition of Sensor and Transducer, Classification of Transducers: Analog and Digital, Primary and Secondary, Active and Passive, Mechanical and Electrical Transducers, Classification based on Transaction Principles and Functions.

Performance Characteristics: Accuracy, Precision, Sensitivity, Resolution, Stability, Repeatability, Response time and Least count. **[No Numericals]**

UNIT-II: **(9 Hrs)**

Measurement of Displacement and Temperature:

Displacement Measurement: Capacitive and Inductive Transducers, Linear Variable Differential Transducer (LVDT) Strain Gauges (Principle, Applications, Types). **Temperature Sensors:** Thermistors, Thermocouples, LDR, RTD, Non-Contact Type Thermal Sensor. **Weight Measurement:** Load Cells (Hydraulic, Pneumatic), Piezo-Electric Sensors, **Dynamic Measurement:** Motion Sensors, Vibration Sensors**. [No Numericals]**

UNIT-III: **(9 Hrs)**

Measuring Instruments

Potentiometer: Introduction, Basic Slide wire Potentiometer Circuit and Laboratory Type Potentiometer, AC Potentiometers: Drysdale Polar Potentiometer and Gall-Tinsley Potentiometer, **AC Bridges:** General Equation for Bridge Balance. **[No Numericals]**

UNIT-IV: **(9 Hrs)**

Instrumentation and Signal Conditioning: Block Diagram and Elements of Basic Instrumentation, Need of Amplification, ADC/DAC (Concept Only), AC and DC Signal Conditioning (Block Diagram), Introduction and Objective of DAS, Block Diagram of Single and Multi-Channel DAS, TDM in DAS, Digital DAS, Filters used in DAS. **[No Numericals]**

UNIT-V: **(9 Hrs)**

Programmable Logic Controller: Introduction to PLC, Input and Output System of PLC, Processor Unit of PLC, Types of Memory used in PLC, Understanding of PLC Using Ladder Diagram, Ladder Program of Relay and Elevator only. **Supervisory Control and Data Acquisition:** Introduction of SCADA with Block Diagram only. **[No Numericals]**

Text Books:

S.N.	**Title**	**Author(s)**	**Publisher**
1.	A Course in Electrical and Electronic Measurements and Instrumentation	A.K. Sawhney	Dhanpat Rai & Co
2.	Electrical and Electronics Measurement and Instrumentations	R.K. Rajput	S. Chand
3.	Instrumentation, Measurement and Analysis	B.C. Nakra and K.K. Chaudhry	McGraw Hill
4.	Process Control Instrumentation Technology	Curtis D. Johnson	Pearson Education

Reference Books:

S.N.	**Title**	**Author(s)**	**Publisher**
1.	Mechanical Measurement and Control	D.S. Kumar	Metropolitan book Co. Pvt. Ltd.
2.	Electronic Instrumentation	H.S. Kalsi	McGraw Hill Education
3.	Programmable Logic Controllers: Principles and Applications	John W. Webb and Ronald A. Reis	Pearson Education

Course outcomes:

On completion of the course, students will be able to:

1. Explain the components of measurement systems, including sensors and transducers, and their performance parameters
2. Analyze the working principles and applications of displacement and temperature transducers.
3. Illustrate the utility of measuring instruments such as potentiometers & working of AC Bridges.
4. Interpret the elements of basic instrumentation and Data Acquisition System.
5. Design basic automation solutions using programmable logic controllers and explain the role of SCADA systems.

NPTEL Link:

1. https://nptel.ac.in/courses/108106193
2. https://nptel.ac.in/courses/108105153

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)

<table>
<tr><td>Semester- II</td><td colspan="4">Branch: Electronics & Telecommunication Engineering/ Electronics and Communication Engg(VLSI Design and Technology)</td></tr>
<tr><td>Subject: Industrial Instrumentation Laboratory</td><td colspan="4">Code: 3028B01CL028</td></tr>
<tr><td rowspan="3">Maximum/Minimum-Passing marks: 40/20
Teacher Assessment: 20</td><td colspan="4">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hour</td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>-</td></tr>
<tr><td></td><td colspan="4">Total Credits: 1</td></tr>
</table>

Course Objectives:

1. To introduce the fundamental principles of sensor elements.
2. To illustrate the fundamental concepts of different transducers.
3. To describe the basic principles of electrical quantity measurement.
4. To explain the fundamentals of measuring non-electrical parameters.
5. To evaluate the performance and limitations of different optical transducers.

List of Experiments: (Minimum Ten Experiments are to be performed by each student)

1. To study method of displacement measurement using Linear Potentiometer.
2. To study Strain gauge working as displacement sensor.
3. Measurement of linear displacement using Linear Variable Differential Transformer (LVDT).
4. To study LVDT as displacement transducer and observe displacement versus output voltage characteristics.
5. To calibrate variation in capacitance to measure displacement using Capacitive Displacement Transducer.
6. To study measurement of humidity using Humidity Transmitter set up.
7. To study the characteristics of IC temperature sensor (LM 335).
8. To study the characteristics of NTC Thermistor.
9. To study the characteristics of Temperature Sensor Setup (Thermocouple, RTD, Thermistor Setup).
10. To study working of Pressure sensor (Piezo resistive/strain) and to observe characteristics of air pressure versus output voltage.
11. To study Dead Weight Pressure Gauge Tester.
12. To study the characteristics of Filament Lamp.
13. To study the characteristics of Photovoltaic Cell.
14. To study the characteristics of Photoconductive Cell.
15. To study the characteristics of Photo-Transistor.
16. To study the characteristics of Optically Controlled Switching System.
17. Measurement of displacement using Light Dependent Resistor (LDR).
18. Study of Transducer and Measurement system based upon a particular Application.

Course Outcomes:

On the completion of this course, students will be able to:-

1. Measure different characteristics of Sensors and working of Resistive, Inductive and Capacitive Transducers.
2. Analyze constructional and operational features of different types of Pressure Transducers.
3. Explain the concept of different types of Transducers relating with Non-Electrical Parameters.
4. Categorize different Temperature measurement parameters using thermal devices.
5. Analyze the phenomena of various optical transducer devices and techniques.

NPTEL Link:

1. https://nptel.ac.in/courses/108106193
2. https://nptel.ac.in/courses/108105153