Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology
Branch: Plastics Engineering
Subject: Mould Engineering
Credit : 04
Maximum Marks: 100

Semester: IV
Code: B095411(095)
Assignment: 02 (Minimum)
ESE Duration: 03 Hours
Minimum Marks: 35

Course Objectives

To introduce the students Mould, Mould parts, mechanisms, various machining operations. To introduce the students to understand materials required, design, polishing technology, metrology and inspection.

UNIT-I

Mould Making: Introduction of Mould parts, Mechanism of metal cutting, types of tools, influence of tool angles, Cutting fluids, Tool materials used including coated tools. Studies of various machining operations: Turning, Shaping, Planning, Drilling, Grinding (Surface, Cylindrical, Tool & Cutter, Rotary Grinding), Milling (Horizontal / Copy Milling / Vertical / Ram / Tool Milling).

UNIT-II

Electrical discharge machining - Characteristics, physical processes, special technological features, types of EDM, design consideration & functions and technological planning. Applications of wire cut EDM in mould making.

UNIT-III

Mould materials: Introduction, properties of mould material, ferrous and non ferrous materials used in moulds. Criteria for mould materials selection. Effect of various alloying elements on steel used in mould. Factors governing the choice of mould material. Composition and applications of tool steels, carbon and alloy steels, stainless steels, Copper alloy, aluminium alloy, Zinc alloy and bismuth-tin alloys.
Heat treatment: Introduction, purpose, different types of heat treatment process used in mould making (such as annealing, normalizing, tempering, Hardening, case hardening, quenching, carburizing, nitriding, etc.).

UNIT-IV

Polishing technology in Mould making: Definition of surface roughness, basis of polishing technology- Types of polishing tools, methods of polishing -surface texturing - Process description-patterns and Mould shapes, - Mould preparation- limitations of chemical texturing.

UNIT-V

Metrology and inspection: Scope of inspection, Procedures, Choices of basic measuring instruments, Vernier, Micrometer, Surface Plates, Angle plates, Squares, Vernier height gauges, Depth gauges, Slip gauges, Dial gauges, Surface roughness measurement, Hardness testing, Comparators, Optical profiles projectors, Tool makers microscope, Optical flats - types and uses. Coordinate Measuring Machine.

Course outcomes:
Upon completion of this course, the students will be able to

1. After studying this course, the students will be able to understand various machining operations, processes, applications.
2. The students will be able know polishing technology in Mould making and inspection methods.

Text Books:

1. R.G.W.Pye, Injection Mold Design, East West Press Pvt. Ltd., New Delhi
2. KlusStokhert (Edt.),Mold making handbook for Plastic Engineers, Hanser Publication NY,1983.
3. Material Science and Matalurgy, by O.P. Khanna, Ghanpath Rai Publication.

Reference:

1. HMT Production Technology, TMH (India), 1992
2. Bhattacharya, A New Technology, IB Publishers, 1984
3. Stoeckhert & Menning, Mold making handbook, 2nd edition, Hanser Publishers, Munich.
4. W.A.J Chapman, Workshop Technology, Vol I & II, ELBS.
5. Herbert Rees, Mold Engineering, Hanser Publishers, NY. George Menges& Paul Mohren
6. How To Make Injection Molds, Hanser Publishers.
7. DuBois; J. Harry and Pribble; W. I. (Eds.), Plastics Mold Engineering, SPE Polymer Technology Series, Revised Edition, Van Nostrand Reinhold Co., New York (1965)
8. Fundamental of Plastics Mould Design by Sanjay K. Nayak, Pratab Chandra Padhi, Y. Hidayathullah, Mc Graw Hill Higher Education.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology
Branch: Plastics Engineering
Subject: Advance Mould Design
Credit : 04
Maximum Marks: 100

Semester: IV
Code: B095412(095)
Assignment: 02 (Minimum)
ESE Duration: 03 Hours
Minimum Marks: 35

Course Objectives

The course objectives include establishing an understanding of current state-of-the art design practices, including injection moulding simulation, and then build a higher-level scientific understanding of the rheological and process-induced properties of polymer materials and how to apply this knowledge in the design and troubleshooting of injection moulds. Understanding of processing and tooling design influences the morphology of the plastic material and how this relates to achieving product objectives including the influence on the size, shape, weight and mechanical properties of moulded plastic parts.

UNIT-I

Split moulds: External undercuts - Splits – Guiding and retention of splits – Finger cam and Dog leg cam actions – Cam track – Spring – Hydraulic actuation – Side cores and side cavities – Calculation of split movement – Split safety arrangements –Angled lift split – Form pin and Angled pin action – Split cores– Collapsible core.
Ejection from Fixed half-Double ejection in the moulds-Delayed ejection required in split mould

UNIT-II

Moulds for threaded components: Automatic unscrewing – Unscrewing methods – Inline layout – Pitch circle layout – Mould movements – Hydraulic and pneumatic core systems for mould movement –Double Daylight Underfeed Mould.
Insulated and hot runner moulds – Types of manifold block, primary nozzle & secondary nozzle design – Flow way system – Types of shut off valve system – Hot runner mould advantages and limitation.
Water Assisted & Gas Assisted Injection Mould – Multi-colour moulding – Insert moulding – Outsert moulding – Stack mould – Two and three level.

UNIT-III

Compression Mould Design: Types of compression moulds, Open flash, Semi-positive, Positive, Displacement mouldsin detail long with examples, Types of loading chambers, Bulk factor, Flash thickness, Projected area, Compression pressure, Clamping force, No. of impression by technological method, Heating system, Types of heaters, Heat loss, Heat requirement & heater capacity.

Transfer Mould Design: Types of transfer moulds- Pot and Plunger type mould, Integral pot transfer mould, Auxiliary ram,Transfer pot design, Feed system.Projected area, Transfer pressure, Clamping force, Pressure pad design, Design of sprue runner and gate, Advantages and disadvantages of transfer mould - Design related calculations.

UNIT-IV

Blow Mould design: Types of blow moulds - Extrusion - Injection stretch blow moulds - Blow ratio - Parison design - Pinch off design - Parting line - Clamping force - Mould venting, Mould cooling, Mould alignment. Design for industrial applications.

Rotational Mould design: Introduction – Mould material – Mould design: Mould frame, Mould inserts, Moulded handles, Movable cores. – Mould venting – Mould cooling.

UNIT-V

Extrusion die design: Construction features of an extruder, Process, Characteristics of Polymer melt, Die geometry, Die head Pressure, Characteristics of land length to Profile thickness, Extrudate die swell, Die materials- Design formulae for design of approach section, land, etc. Rheological considerations, Classification of dies- Dies for Solid Section, Dies for Hollow Profiles, Blown film dies, Flat film dies, Parison dies, Wire and cable Coating dies, Spiral mandrel die, Fish tail die, Adjustable Core die

Course outcomes:

Upon completion of this course, the students will be able to

1. Interpret & prepare the drawing of Advanced mould design.
2. Describe construction of Moulds of different procedure and material
3. Prepare drawing and release upgraded version of design based on different design of mould.
4. Inspect mould parts as required for the outcomes of the mould.
5. Create report for mould and mould part production.

Text Books:

1. Design data for plastics engineers – By Rao NS
2. Design formula for plastics engineers- By Rao NS
3. Dies for plastics extrusion – By M.V.Joshi
4. Product design with plastics -By Dym
5. Plastics product design – By Beck
6. Plastics Product Design Engineering Hand Book - By Dubois, H
7. Plastics Mould Design Vol.1 Compression and Transfer Moulds- By Bebb,R.H.,
8. Injection Mould Design for Thermoplastic - By Pye, R.G.W
9. Injection Mould &Molding - By Dym
10. Blow moulding design guide -By Lee NC
11. Fundamental of Plastics Mould Design by Sanjay K. Nayak, Pratab Chandra Padhi, Y. Hidayathullah, Mc Graw Hill Higher Education.

Reference:

1. Plastic Design & Processing - By Sharma, S.C
2. Plastics Moulds& Dies - By Sors, & Others
3. Injection Mould Design Fundamentals (Vol. I& II) - By Glanvill&Dento
4. Polymer product design materials and processing-By David H Morton Jons John wellis
5. Plastics Product Design & Process Engineering - By Belofsky, Harold

6. Plastics product design part A& B -By Millar ,Edward
7. Plastics part design for injection moulding- By Malloy ,Robert,A
8. Design of Plastics Moulds and Dies- Laszlo Sors and ImreBalazs,, Elsevier, Amsterdam - Oxford – Tokyo - NY, 1989.
9. Injection Moulds – 130 Proven Design - By Gastrow, H

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology | **Semester: IV**
Branch: Plastics Engineering | **Code: B095413(095)**
Subject: Physical Polymer Chemistry | **Assignment: 02 (Minimum)**
Credit : 04 | **ESE Duration: 03 Hours**
Maximum Marks: 100 | **Minimum Marks: 35**

Course Objectives:
To learn about different conformational and configurational states of polymers and sizes of the polymer chains using different models. To study about various morphological aspects and thermal transitions of polymers. To know about the orientation in polymers and various processes to induce orientation.To understand the dissolution of polymers based on thermodynamics.

UNIT-I
Potential energy and conformational energy of molecules - Staggered and eclipsed states- conformations and configurations, Isomerism in polymers – structural and stereoisomerism., Tacticity, - Unperturbed and Gaussian chains Random coils and average end to end distance Freely jointed and freely rotating chain models - Random flight analysis.

UNIT-II
Morphological aspects of polymers – polymer single crystals, lamellae, spherulites, fringed micelle model – crystallinity, degree of crystallinity, factors affecting crystallinity, Polymer crystal structure by Small and Wide angle X-ray diffraction

UNIT-III
Thermal transition in polymer- from glassy to rubber like and viscofluid states- thermal transition in crystalline and amorphous polymers, Glass transition temperature(T_g) – melting temperature (T_m)- 1st order and second order transitions, free volume, kinetic and thermodynamic views of glass transition - Factors influencing glass transition temperature, Measurement of T_g and T_m

UNIT-IV
Chain orientation - Concept of chain orientation - orientation in amorphous and crystalline polymers - Uniaxial and biaxial orientation practical significance – Orientation processes - fibre spinning, blown film extrusion, solid state extrusion, profile extrusion -Properties of oriented polymers - Birefringence.

UNIT-V Polymer solutions - Ideal Solutions; Nonideal Solutions; Enthalpy, entropy, free energy of mixing; lattice theory, Flory-Huggins theory, Thermodynamic view of miscibility, phase diagrams-upper critical solution temperature (UCST), lower critical solution temperature (LCST) - Concentration regimes in polymer solutions - theta conditions.

Course Outcomes

Upon successful completion of this course, the students will be able to-

1. Understand the conformation and configuration of polymers.
2. Understand basic concepts of micro structure of polymers and the fundamental concepts of crystallization of polymers.
3. Able to understand the polymer thermal transition
4. Understand the orientation of polymer chains
5. Basic knowledge on thermodynamics of polymer solution.

Text Books:

1. S. Glasstone and D. Lewis, Elements of Physical Chemistry, Macmillan India Press, Madras, 1995.
2. Paul C. Painter and Michael M. Coleman, Fundamentals of Polymer Science, Technomic Publishing Co. Inc., Lancaster, USA, 1994.
3. J. M Smith and H.C. Van Ness Introduction to Chemical Engineering Thermodynamics" McGraw-Hill
4. Principles of Polymer Chemistry, Paul J Flory

Reference Book:

1. Ulf W. Gedde, Polymer Physics, Chapman & Hall, 1995
2. Cowie; JMG Polymers: Chemistry & Physics of Modern Materials, Nelson Thornes ltd. Chelterham, 2001

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology
Branch: Plastics Engineering
Subject: Material Science
Credit : 03
Maximum Marks: 100

Semester: IV
Code: B095414(095)
Assignment: 02 (Minimum)
ESE Duration: 03 Hours
Minimum Marks: 35

Course Objectives

To understand various mechanical properties of materials. To understand how and why the properties of materials are controlled by its molecular structure and its crystal imperfection. To understand how and why the structure and composition of a material may be controlled by different processing techniques. To understand the inter-relationship between composition, structure and properties of engineering materials. Get knowledge about different materials, their properties and application in plastic industries.

UNIT-I

Introduction to materials, Mechanical Properties and behavior of materials, Atomic arrangements in material and crystal imperfections and Deformation of Metals: Elastic deformation, Plastic deformation, Theories of corrosion and methods of corrosion control.

UNIT-II

Phase Diagrams: Phase and phase equilibrium: solidification of pure metals and alloys, Allotropy of iron and Fe-C diagram, Theory of alloying and their construction, Applications of alloys in industries, Cast iron as material of construction with reference to its application.

UNIT-III

Ferrous Metals -Materials of construction with reference to application in industries, Mild steel, high carbon steel, Stainless steel, High silicon steel, Molybdenum and tungsten steel, Heat Treatment of carbon and alloy steels, T-T-T curve and various heat treatment processes

UNIT-IV

Nonferrous metals – Copper and its alloy: Brass, Bronze and Monel metal, bearing metals-Babbit, Copper-lead alloys, Aluminum & its alloy : Aluminium Silicon Alloys. Sintered Carbide . Lead, Chromium, Tin.

UNIT-V

Non-metals – Glass, Enamels, Chemical stone wares, Graphite, Wood, Plastics, Rubber, Polymers and Ceramics. Composite Materials: Agglomerated Materials: Cermets .Reinforced Materials: Reinforced Concrete. Fibre reinforced plastics, Properties of composites, Metal matrix composites, manufacturing procedure for fiber reinforced composite.

Course outcomes:

Upon completion of this course, the students will be able to

1. Acquire knowledge and applying the concepts of material science in the design and development in industries.
2. Demonstrate create & design of new systems components and processes in the field of engineering.
3. Identify, analysis and apply material engineering problems.

Text Books:

1. Material Science & Engg. – A first course – V. Raghavan – PHI(P) Ltd., Delhi, 2003
2. A Text Book of Material Science & Science & Metallurgy,O.P. Khanna ,Dhanpat Rai & Sons, New Delhi.

Reference:

1. Elements of Material Science & Engg. – Van Vlack. – Addison – Wesley Longman, 6th Edn., New York. 2. Physical Metallurgy – Clark & Varney, East West Edn., New Delhi
2. Engineering Physical Metallurgy – Lakhtin – CBS Publishers & Distributors
3. Materials Science – Narang – CBS Publishers & Distributors
4. Engineering Materials – Woulf Series.
5. Physical Metallurgy Principles – Robert E Re3ed Hill – Affiliated East-West Press Pvt. Ltd., New Delhi, 2004

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology
Branch: Plastics Engineering
Subject: Instrumentation & Measurement
Credit : 02
Maximum Marks: 100

Semester: IV
Code: B095415(095)
Assignment: 02 (Minimum)
ESE Duration: 03 Hours
Minimum Marks: 35

Course Objectives

This course is designed to familiarize the students with various instrumental methods and Measurement techniques of chemical analysis that engineers come across during their course work. Introduction to the principles of chemical analysis, matrix effects, detailed instrumentation, operation and interpretation of data, error analysis and statistical methods of data handling. Standard Operation Techniques of Pressure measurement instruments, Flow measurement instruments, Liquid level measurement instruments and analytical measurement instruments.

UNIT-I

Principles of measurement: Error analysis, Static & dynamic characteristics of measurements, Dynamic response of I & II order instruments. Temperature measurement: Expansion thermometers, Thermocouples, Resistance temperature detectors, Thermistors & pyrometers and their calibrations.

UNIT-II

Pressure measurement: Manometers, Bourdon tubes, Bellows, Measurement of gauge pressure and vacuum. Measurement of absolute pressure, McLeod gauge, Pirani gauge, Ionization gauge, Vacuum sensor, Thermal vacuum sensor, Response of mechanical pressure gauges, Strain Gauges & LVDT, Transmitter definition types, I/P and P/I Converters.

UNIT-III

Building blocks of an instrument: Classification, Principles and applications of transducer & amplifier. Signal conditioner, its isolation and signal transmitter. Display data acquisition modules, I/O devices, Interfaces. Flow measurement: Head flow meters, Area flow meters, Open channel meters, Positive displacement meters, Control valves and their characteristics.

UNIT-IV

Liquid level measurement: Direct level measurement, Interface measurement, Hydrostatic head level measurement in pressure vessels, Ultrasonic level devices, Point &continuous

level measurement using radioactive devices, Capacitance type devices, Resistance sensors, Nuclear radiation type level gauges & level switches.

UNIT-V

Analytical instrumentation: Gas Chromatography, Operating principles, Type, Components & applications, High performance liquid chromatography, Refractive index, pH, viscosity, density & conductivity measurement, Gas analyzers.

Course outcomes:

Upon completion of this course, the students will be able to

1. At the end of the course the students would be able to handle the analysis at mg, ppm and ppb levels by appropriate instrumental methods.
2. Students will understand the procedure to operate and handle Pressure measurement instruments, Flow measurementinstruments, Liquid level measurement instruments and analytical measurement

Text Books:

1. Johnson C., Process Control Instrumentation Technology, 8th Edition, Prentice-Hall. (2005)
2. Eckman D.P., Industrial Instrumentation, McGraw Hill Publications (1975)

Reference:

1. Nakra B.C. and Chaudhary K.K., Instrumentation, Measurement and Analysis, 2nd Edition, Tata McGraw Hill (2004)
2. Andrew W. G. Applied Instrumentation in the Process Industries,Volume I, II &III,Gulf Publication. (1993)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology **Semester: IV**
Branch: Plastics Engineering **Code: B095421(095)**
Subject: Mould Engineering Lab **Credit : 01**
Maximum Marks: 40 **Minimum Marks: 20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Making a dowel / leader pin/spue bush using lather machine.
2. Making a mounting plate/ back plate using milling machine.
3. Making a mounting plate/ back plate holes by using drilling machine.
4. Surface grinding of mounting plate / back plate using surface grinding machine.
5. Cylindrical grinding of dowel / back plate /leader pin using cylindrical grinding machine.
6. Hardening and quenching of mould insert.
7. Linear measurement using Veriniers Callipers'.
8. Linear measurement using Micrometer.
9. Measurement of hardness of mould plate by using Rockwell Hardness tester.
10. Measurement of slot thickness using slip gauge.
11. Usage dial gauge in mould making.

Study:

1. Study of different types of Cutting tools.
2. Study of shaper and planer machines and its operation.
3. Study of EDM machine and its operation.
4. Study of wire cut EDM machine and its operation.
5. Study of injection, Blow, Compression and transfer.moulds, assembly & its material.
6. Study of different heat treatment process for mould parts.
7. Study of various polishing tools used for mould polishing.
8. Study of optical profile projector and tool maker microscope.
9. Study and usage of dial gauge.

Equipment/Machines/Instruments/Tools/Software Required:

1. **Machine**: Lathe, Milling, Drilling Machine, Surface grinder, Cylindrical grinder, CNC EDM, Wirecut EDM, Shaper, Cutting Tools.
2. **Measuring Instruments:** Vernier, Micrometer, Hardness Tester, Rockwell, Slip gauge, Dial gauge, Profile projector & dial gauge.
3. Oven.
4. Mould policing tools.

5. **Mould:** Simple Injection & Blow Mould - 02 nos. Each.

Recommended Books:

1. HMT Production Technology, TMH (India), 1992
2. Bhattacharya, A New Technology, IB Publishers, 1984
3. Stoeckhert&Menning, Mold making handbook, 2nd edition, Hanser Publishers, Munich.
4. W.A.J Chapman, Workshop Technology, Vol I & II, ELBS.
5. Herbert Rees, Mold Engineering, Hanser Publishers, NY. George Menges& Paul Mohren
6. How To Make Injection Molds, Hanser Publishers.
7. DuBois; J. Harry and Pribble; W. I. (Eds.), Plastics Mold Engineering, SPE Polymer Technology Series, Revised Edition, Van Nostrand Reinhold Co., New York (1965)
8. Fundamental of Plastics Mould Design by Sanjay K. Nayak, Pratab Chandra Padhi, Y. Hidayathullah, Mc Graw Hill Higher Education.
9. Elements of Workshop Technology, Vol-I & II by Hajra Chaudhary, Media Promoters & Publishers Pvt. Ltd.
10. Material Science and Matalurgy, by O.P. Khanna, Ghanpath Rai Publication.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology **Semester: IV**
Branch: Plastics Engineering **Code: B095422(095)**
Subject: Instrumentation & Measurement Lab **Credit : 01**
Maximum Marks: 40 **Minimum Marks: 20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Determination of the percentage composition of unknown liquid using abbe refractometer
2. Determination of the TDS value of the given sample using TDS meter.
3. Determination of the specific conductance of given liquid using digital direct reading conductivity meter.
4. Determination of TDS, temperature, conductivity, ORP and DO of water sample by portable water analyzer kit.
5. Determination of acid - base characteristics of given sample using digital pH meter.
6. Determination of the percentage composition of given solution by photoelectric colorimeter.
7. Determination of the percentage composition of given solution by UV-VIS spectrophotometer.
8. To detect the presence of alkali metals in the given solution using flame photometer.
9. Determination of turbidity of given sample using nephelo-turbidity meter.
10. Measurement of temperature of hot surface using thermocouple.
11. Determination of wavelength at which given liquid shows maximum absorbance using UV-VIS spectrophotometer.

Equipment/Machines/Instruments/Tools/Software Required:

1. Abbe Refractometer
2. Digital TDS Meter
3. Digital pH Meter
4. Digital Colorimeter
5. UV-VIS Spectrophotometer

Recommended Books:

1. Johnson C.,Process Control Instrumentation Technology, 8th Edition, Prentice-Hall. (2005)
2. Eckman D.P., Industrial Instrumentation, McGraw Hill Publications (1975)
3. Nakra B.C. and Chaudhary K.K., Instrumentation Measurement and Analysis, 2nd Edition, Tata McGraw
4. Hill(2004)
5. Andrew W. G. Applied Instrumentation in the Process Industries, Volume I, II &III ,
6. Gulf Publication (1993)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology **Semester: IV**

Branch: Plastics Engineering **Code: B095423(095)**

Subject: Advance Mould Design practice using CAD/CAM/CAE Lab **Credit : 01**

Maximum Marks: 40 **Minimum Marks: 20**

List of Experiments:

1. Design the sectional elevation, plan and inverted plan of Split Mould with Finger Cam/Dog Leg Cam/Cam Track actuationMechanism with delayed ejectionusing AUTOCAD.
2. Design of Automatic Internally Threaded Design for Injection Mould with gear system (Archimedean Screw)using any software
3. Design of Automatic Internally Heated Hot Runner Systems using any software
4. Design of collapsible core-mechanism mould using any software
5. Design of positive, semi positive, displacement typecompression mould(main Loading chamber Part) using AutoCAD
6. Design of Pot Type Transfer mould design using AutoCAD
7. Design of Plunger Type Transfer mould design using AutoCAD
8. Design of automatic blow mould for 1 litre bottle using AutoCAD
9. Analysis of injection moulding of simple products using mould analysis software
   a. Product mould design considerations
   b. Mould filling and cooling analysis
   c. Control of product tolerances
   d. Increasing product strength and stiffness

Study mould

1. Study of split cavities compression mould
2. Study of Insulated Hot Runner Moulding System
3. Study of Gas assisted and Water assisted Injection mould and Hot runner mould
4. Study of Rotational & Thermoforming Mould
5. Study of Dies for solid rod & Hollow Tube
6. Study of Design of Dies for Coat hanger die& Fishtail die
7. Study of Design of Blown Film Die

Equipment/Machines/Instruments/Tools/Software Required:

1. AutoCAD software & workstation.
2. Mouldflow Plastics Adviser Software

Recommended Books:

1. Fundamental of Plastics Mould Design by Sanjay K. Nayak, Pratab Chandra Padhi, Y. Hidayathullah, Mc Graw Hill Higher Education.
2. Moldflow design Guide by Jay Shoemuker Ed., Hanser Publication
3. AutoCAD LT 2020 for designers by Sham Tickoo, CADCIM Series.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the Program: Bachelor of Technology **Semester: IV**
Branch: Plastics Engineering **Code: B095424(095)**
Subject: Virtual Lab **Credit : 01**
Maximum Marks: 40 **Minimum Marks: 20**

List of Experiments:

1. Manufacturing Simulation of Contour profiles using CAD/CAM software.
2. Product design validation for its processibility using CEA software for injection moulding purposed.
3. Estimation of cost per component of an injection moulded part using virtual manufacturing or CAM.
4. Study of computer aided process planning for mould manufacturing.

Software Required:

1. Unigraphics (NX)
2. Mould flow part Adviser

Recommended Books:

1. Mouldflow Design Guide – A Resource for Plastics Engineeing, MouldfLow Corporation, USA.
2. Moldflow design Guide by, Jay Shoemuker Ed., Hanser Publication
3. AutoCAD LT 2020 for designers by Sham Tickoo, CADCIM Series.
4. Process Planning and Cost Estimation by M. Adithan, New Age International Publishers.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Technology**

Branch: **Common to All Branches** Semester: **IV**

Subject: **Indian Culture and Constitution of India** Code: **B000406(046)**

Total Theory Periods: **2/Week** Total Tutorial Periods: **NIL**

Assignments: **Two (Minimum)** Total Marks in ESE: **NIL** 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 Objectives

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 central and state relation, financial and administrative.

UNIT-I

Meaning and concepts of Culture: Traditional and Modern concepts of Culture-Notions of Culture in textual tradition, anthropological, archaeological and sociological understanding of the term 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

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

UNIT–III

History of Indian Constitution Constitutional History, Preamble salient features, citizenship, Method of Amendment and Recent Amendments. **Rights and Duties** Fundamental Rights 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) Parliament- Loksabha, Rajyasabha- composition powers and functions.

c) Judiciary (Supreme Court) composition powers and functions Judicial Activism

UNIT–IV

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

UNIT–V

Recent Trends in Indian Constitutional a) Basic structure of Indian Constitution. 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,NewDelhi,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 ,NewDelhi,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 inIndia, New Delhi, S. Chand and Co., latest edition.