

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

## SCHEME OF TEACHING AND EXAMINATION

### B.E. VI SEMESTER MECHATRONICS ENGINEERING

S. No.	Board Of Study	Sub. Code	Subject	Periods Per Week			Scheme Of Exam Theory/Practical			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1.	Electronics and Telecom	367611 (28)	Microcontroller Based System Design	4	1	-	80	20	20	120	5
2.	Electronics and Telecom	367612 (28)	Digital Signal Processing	4	1	-	80	20	20	120	5
3.	Mech. Engg.	337611 (37)	Machine Design - II	4	1	-	80	20	20	120	5
4.	Mech. Engg.	367613 (37)	Industrial & Power Electronics	4	1	-	80	20	20	120	5
5.	Mech. Engg.	337615(37)	Industrial Engineering	3	1	-	80	20	20	120	5
6.	Refer Table 1		Professional Elective 1	4	1	-	80	20	20	120	4
7.	Electronics and Telecom	367621 (28)	Microcontroller Based System Design Lab	-	-	2	40	-	20	60	1
8.	Mech. Engg.	337621 (37)	Machine Design II Lab	-	-	2	40	-	20	60	1
9.	Electronics and Telecom	367622 (28)	Digital Signal Processing Lab	-	-	2	40	-	20	60	1
10.	Mech. Engg.	337623(37)	Industrial Engineering Lab	-	-	2	40	-	20	60	1
11.	Management	300625(36)	Managerial Skills	-	-	2	-	-	40	40	1
12.			Library	-	-	1	-	-	-	-	-
			Total	23	6	11	640	120	240	1000	34

**L – Lecture, T – Tutorial, CT- Class Test,**

**P – Practical, ESE- End Semester Exam, TA – Teacher’s Assessment**

**Note :** Industrial Training of eight weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV sem. The second part to be completed during summer after VI sem. after which students have to submit a training report which will be evaluated by College teachers during B.E. VII sem.

**Table – 1  
Professional Elective-I**

S.No.	Board of Studies	Subject Code	Subject
1	Mechanical	337633(37)	Engineering Economics
2	Mechanical	337634(37)	Composite Materials
3	Mechanical	337631(37)	Fluidics & Hydraulic Control
4	Mechanical	337614 (37)	Machine Tool Technology
5	Electronics and Telecom	328632(28)	Computer Network
6	Electronics and Telecom	328633(28)	Medical Electronics

**Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.**

**Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.**

## *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: VI**

**Subject: Machine Design – II**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg., Mechatronics Engg.**

**Code: 337611 (37)**

**Total Tutorial Periods: 12**

*Note: 1) Design data book by PSG and ISI data sheets are allowed in the examination. 2) The duration of the paper is 4 (four) hours.*

### **UNIT – I**

#### **Spring**

Spring materials and their mechanical properties, equation for stress and deflection, helical coil springs of circular section for tension, compression and torsion, dynamic loading, fatigue loading, Wahl line, leaf spring and laminated spring.

### **UNIT – II**

#### **GEARS**

##### **Spur Gears**

Gear Drives, Classification of Gears, Selection of Type of Gears, Law of Gearing, Force Analysis, Gear Tooth Failures, Selection of Material, Number of Teeth, Face Width, Beam Strength of Gear Tooth, Effective Load on Gear Tooth, Estimation of Module Based on Wear Strength, Lewis equation, Gear Design for Maximum Power Transmitting Capacity, Gear Lubrication.

### **UNIT-III**

#### **Helical Gears**

Helical Gears, Terminology of Helical Gears, Virtual Number of Teeth, Tooth Proportions, Force Analysis, Beam Strength of Helical Gears, Effective Load on Gear Tooth, Wear Strength of Helical Gears.

##### **Bevel Gears:**

Bevel Gears, Terminology of Bevel Gears, Force Analysis, Beam strength of Bevel Gears, Wear Strength of Bevel Gears, Effective Load on Gear Tooth.

### **UNIT – IV**

#### **BEARINGS**

##### **Rolling Contact Bearings**

Types of ball and roller bearings, selection of bearing for radial and axial load, bearing life, Mounting and lubrication, shaft scales – contact type and clearance type.

##### **Journal Bearings**

Types of lubrication, viscosity, Hydrodynamic theory of lubrication, Sommerfield number, heat balance, self-contained bearings, bearing materials.

### **UNIT – V**

#### **Clutches**

Friction clutches, Friction materials, Torque transmitting capacity, Single & Multiple plate clutch, centrifugal clutches.

##### **Belt and Rope Drive:**

Flat and V-belts, belt constructions, geometrical relationships for length of the belt, analysis of belt tensions, condition for maximum power, selection of flat & V-belts, adjustment of belt tensions, Wire ropes, stresses in wire ropes.

### **TEXT BOOKS**

1. Design of Machine Elements from V.B. Bhandari, TMH Publications.
2. Machine Design by Shigley – McGraw Hill Pub.

### **REFERENCE BOOKS**

1. Machine Design by Movnin – MIR Publishers
2. Machine Design by Sharma & Agrawal - Katson publications
3. Principles of Mechanical Design by R. Phelan – McGraw Hill Pub.
4. Machine Design by Suderraj Murthy – Khanna Publishers
5. Machine Design, theory & Practice by Michels Walter, J, Wilson Charles E. & Add, MacMilan Publishers, New York.

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Industrial Engineering**

**Total Theory Periods: 40**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 337615 (37)**

**Total Tutorial Periods: 12**

## **UNIT – I**

### **Introduction**

History & development, system approach, relationship with other departments. Objective of Industrial Engineering, Place of Industrial engineering in an organization, related discipline, management, OR, statistics, ergonomics, manufacturing engineering.

### **Plant Location**

Need for a suitable location, urban, suburban, systems approach, factors affecting location, quantitative method for evaluation of plant location.

### **Plant Layout**

Objective & Principles, factors affecting layout, types of layout.

## **UNIT – II**

### **Work Study**

Purpose, objectives and applications of work study, Productivity and work study.

### **Method Study**

Introduction, procedure, charts, man-machine, flow process charts, motion economy principles, micro motion study - Therbligs, cyclegraph.

### **Work Measurement**

Definition, types, selection & timing the job, rating, allowances, Normal and standard time determination, work sampling

## **UNIT -III**

### **Job Evaluation & Merit Rating**

Definition, objectives, methods, job rotation, job enlargement, job enrichment.

### **Wages & Incentives**

Terminology, characteristics, factors, types of incentives, wage incentive plan, Rowan plan, Taylor's differential piece rate system, Emerson's efficiency plan, Halsey's 50-50 plan, Bedaux plan, Group task & Bonus system.

## **UNIT – IV**

### **Information systems in organizations**

Role of IS in Industry, increasing value of Information Technology, Internet worked enterprise, Internet, Intranet and Extranet, Globalization and IT, competitive advantage with IT.

### **Business Process Re-Engineering**

Definition, need & characteristics, Industrial Engineering & Re-engineering, advantages of re-engineering.

## **UNIT V**

### **Maintenance Management**

Objectives and need for maintenance, types of maintenance, breakdown, predictive and preventive maintenance

### **Equipment replacement policy**

Reasons for replacement, deterioration, obsolescence, depreciation, method for depreciation calculation

### **Value Engineering & Value Analysis**

Objectives & scope, application & techniques.

## **TEXT BOOKS**

1. Industrial Engineering & Management –A new perspective, Philip E Hicks, McGraw Hill
2. Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons
3. Introduction of work study, ILO, Geneva. Universal Publishing Corporation, Bombay

## **REFERENCE BOOKS**

1. Industrial Engineering and Production Management – Martand Telsan – S. Chand & Company
2. Motion & Time Study – Mundel - PHI
4. Motion and Time Study – Ralph M. Bannes – John Wiley & Sons
5. Techniques of Value Engineering – L.D. Miles – Mc GrawHill
6. Work Study and Ergonomics – H.S. Shan – Dhanpat Rai & Sons
7. Industrial Engineering & Management – S. Dalele & Mansoor Ali – Standard Publishers & Distributors
8. Handbook of Industrial Engineering – Grant & Grant – PHI

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Engineering Economics**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 337633(37)**

**Total Tutorial Periods: 12**

## **UNIT-I**

### **Introduction & Scope**

Engineers and Economics, Utility of its study, Managerial Economics, Nature and scope, basic terms and concept of economics like goods, kinds of goods, utility, value and wealth.

Theory of Demand and supply, Elasticity of demand.

Meaning, Characteristics, Objectives of Firm, Managerial and behavioral theories of a firm.

## **UNIT – II**

### **Pricing and Market Competition**

Industrial Establishments, various types of industrial establishments, Sole traders, partnership, joint stock company, types of shares, financial goals of organization.

Pricing Perspective approach: Pricing policy and price influencing factors, Basic data for price fixation.

Market forms & Competition – Pure and perfect competition, monopoly, monopolistic competition, price determination under perfect and monopolistic competition.

## **UNIT – III**

### **Economy, Monetary & Fiscal Policy**

Balance of payments – money and monetary policy, fiscal policy, Inflation, measuring employment and unemployment. Credit policies

Concept and measurement of national income.

Working Capital, Factors deciding Working capital, Return on investment, Financial Planning.

## **UNIT – IV**

### **Cost and Costing Factors**

Cost Analysis – Types and Elements of cost, cost planning and control.

Relationship between Average cost & Marginal cost, Short run and long run average cost curves.

## **UNIT – V**

### **Depreciation & Capital Budgeting**

Depreciation and its methods of calculation, marginal costing, break – even analysis, profit planning and forecasting, Capital budgeting, cost of capital, Appraising projects profitability.

## **TEXT BOOKS**

1. Managerial Economics – P.L. Mehta – S. Chand and sons
2. Economics Michael Parkin, Addison Wesley Longman Publication, International Edition.
3. Elementary Economics Theory – K.K. Dewett – S. Chand & Company

## **REFERENCES**

1. Economics – Samuelson, Pauls & W.D. Nordhan – McGraw Hill
2. Advanced Cost Accounting – Nigam, Sharma – Himalaya Publishing House
3. Managerial Economics – Mote and Paul - TMH
4. Macro Economics for management Students – A. Nag - Macmillan India Ltd
5. Cost Accounting – Jain & Narang – Kalyan Publishers
6. Managerial Economics - G.S. Gupta – TMH
7. Engineering Economics – J.L. Riggs, D.D. Bedforth, Randhawa – TMH
8. Essentials of Managerial Economics – Reddy & Ganesh – Himalaya Publishing Hosue
9. Managerial Economics – Joel Dean - PHI

# *Chhattisgarh Swami Vivekanand Technical University, Bilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Composite Materials**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 337634 (37)**

**Total Tutorial Periods: 12**

## **UNIT - I**

### **Introduction**

Definition of composite and their characteristics, polymeric materials, fibrous materials, polymeric composites, Review of force tensors, stress tensors, strain tensors

## **UNIT - II**

### **Material Properties:**

Anisotropic materials, properties relating stress to strain, properties relating temperature to strain, properties relating moisture to strain, properties relating stress (or strain) to failure

## **UNIT - III**

### **Elastic Response of Anisotropic Material:**

Hooke's Law, stress and environmental effects, unidirectional composite laminates; Hooke's law - referenced to principal material coordinate system; Hooke's law - referenced to arbitrary coordinate system, effective engineering properties

## **UNIT - IV**

### **Multi-angle Composite Laminates:**

Thin-plate theory, classical lamination theory, effective elastic engineering properties

## **UNIT - V**

**Manufacturing and testing:** Moulding, pultrusion, filament winding, quality inspection methods, uniaxial tension test, uniaxial compression test-in plane shear test, fracture toughness testing of composites

## **TEXT BOOKS**

1. Analysis and Performance of Fiber Composites - B.D. Agarwal and L.J. Broutmen - John Wiley and Sons, New York
2. Fiber Re-inforced Composite materials: Manufacturing and design – P.K. Mallick - Marcel Dekker Inc

## **REFERENCE BOOKS**

1. Primer on composite Materials analysis – J.C. Halpin - Techomic Publishing Co
2. Composite Materials Technology; Processes and Properties – P.K. Mallick and Newman - Hansen Publisher, Munich

## *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Fluidics & Hydraulic Control**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 337631 (37)**

**Total Tutorial Periods: 12**

### **UNIT-I**

#### **Fluidics**

Technology, Terminology, types of fluid logic elements, amplifiers, logic states, methods of obtaining input signals and power outputs, application of fluidics, third generation fluidics.

### **UNIT – II**

#### **Fluid Power System**

Components, advantages, applications in the field of Machine Tools, material handling, presses, mobile and stationary machines, clamping & indexing devices etc., transmission of power at static and dynamic states.

#### **Hydraulic Fluid**

Types of hydraulic fluids, properties of fluid, selection of fluids, JIC/ISO symbols for hydraulic circuits.

### **UNIT – III**

#### **Pumps**

Types, classification, principle and working of vane, gear, radial and axial plunger pumps, power and efficiency calculations, selection of pumps for hydraulic transmission.

#### **Actuators**

Linear and rotary actuators, hydraulic motor types & construction methods of control of acceleration, types of cylinder and mountings, calculation of piston velocity, thrust under static and dynamic application.

### **UNIT – IV**

#### **Control of Fluid Power**

Principle, working types of the following valves, pressure control, direction control, flow control, relief valves, sequence valves etc.

### **UNIT – V**

#### **Hydraulic Circuits**

- Meter in, meter out circuits
- Pressure control for cylinders
- Flow divider circuits

Circuit illustrating use of pressure reducer valves, sequence valve, counter balance valves, unloading valves with the use of electrical control, accumulators etc.

#### **Accumulators and Intensifiers:**

Types, function, application, selection and design procedure.

### **TEXT BOOKS**

1. Hydraulic Machines including fluidics – Dr. Jagdish Lal, Metropolitan Book Company pvt. Ltd., New Delhi
2. Introduction to Fluid Power – Sahastrabadhe – Nirali Prakashan, Pune

### **REFERENCE BOOKS**

1. Industrial Hydraulics – Pipenger & Hicks, Mc Graw Hill Company, New York
2. Fluid Power – Goodwin

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Machine Tool Technology**

**Total Theory Periods: 50**

**Total Marks in End Semester Exam: 80**

**Minimum number of class tests to be conducted: 2**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 337614 (37)**

**Total Tutorial Periods: 12**

## **UNIT - I**

**Cutting Tool** – types, requirements, specification & application

**Geometry of Single Point Cutting Tool** - tool angle, Tool angle specification system, ASA, ORS and NRS and inter-relationship.

### **Mechanics of Metal Cutting**

Theories of metal cutting, Chip formation, types of chips, chip breakers, Orthogonal and Oblique cutting, stress and strain in the chip, velocity relations, power and energy requirement in metal cutting.

## **UNIT - II**

### **Machinability**

Concept and evaluation of Machinability, Mechanism of Tool failure, Tool wear mechanism, Tool life, Tool life equation, Machinability index, factors affecting machinability.

### **Thermal Aspects in Machining and Cutting Fluid**

Source of heat in metal cutting and its distributions, temp measurement in metal cutting, function of cutting fluid, types of cutting fluid.

## **UNIT – III**

### **Design of Machine Tool Element**

Design of Lathe bed, Material and construction feature, various bed section, analysis of force under headstock, tail stock and saddle, torque analysis of lathe bed, bending of lathe bed, designing for torsional rigidity, use of reinforcing stiffener in lathe bed.

Design of Guide ways, Material and construction features, over turning diagram, Antifriction guide ways.

## **UNIT – IV**

### **Design of Speed Gear Box**

Drives in Machine Tool, classification, selecting maximum and minimum cutting speeds, speed loss, kinematic advantage of Geometric progression, kinematic diagrams, design of Gear Box of 6,9,12 and 18 speed.

## **UNIT – V**

### **Design of Feed Gear Box**

Elements of feed gear box, classification-Norton drive, draw key drive, Meander's drive, Design of feed gear box for longitudinal and cross feed and for thread cutting.

### **Machine Tool Installation and Maintenance**

Machine Tool installation, Machine Tool Maintenance, lubrication, reconditioning of machine tool.

### **Machine Tool Testing**

Testing, Geometrical checks, measuring equipment for testing, acceptance test for Lathe and Radial drilling machines.

## **TEXT BOOKS**

1. Machine Tool Engineering – G.R. Nagpal – Khanna Publishers, New Delhi

2. Fundamentals of Metal Cutting & Machine Tool – B.L. Juneja, G.S. Sekhan, Nitin Sethi – New Age Publishers – New Delhi

## **REFERENCE BOOKS**

1. Production Engineering – P. C. Sharma – S. Chand & Company – New Delhi

2. Production Technology – R.K. Jain – Khanna Publisher – New Delhi

3. Principle of Metal Cutting - G.C. Sen, A. Bhattacharya – New Central Book Agency (P) Ltd., Calcutta

4. Machine Tool Practices – Kibbe Richard R – PHI, New Delhi

5. Principles of Machine Tool – G.C. Sen, A. Bhattacharya – New Central Book Agency, Calcutta

## *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Computer Network**

**Total Theory Periods: 40**

**Total Marks in End Semester Examination: 80**

**Minimum number of Class tests to be conducted: Two**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 328632 (28)**

**Total Tutorial Periods: nil**

### **UNIT – I**

**NETWORK TOPOLOGIES AND PHYSICAL LAYER:** Transmission modes, Categories of network, The OSI model, DTE-DCE interface, Null Modem, OSI Physical Layer Components, FSK and PSK Modems, Balanced Modulator, V.34 and V.90 Modems

### **UNIT – II**

**NETWORK TOPOLOGIES AND PHYSICAL LAYER:** Basics of - Data Link Layer: Flow Control: Stop & Wait, Sliding Window, Error control: CRC, ARQ, Stop & Wait ARQ, Sliding Window ARQ, HDLC.

### **UNIT – III**

**LOCAL AREA NETWORKS:** Basics of - IEEE802.1, LLC, MAC, PDU; ETHERNET: Access Method: CSMA/CD, Addressing, Electrical Specification, Frame format, Implementation, Switched Ethernet, Fast Ethernet, Gigabyte Ethernet; Token Bus; Token Ring; FDDI; Wireless LAN-IEEE802.11.

### **UNIT – IV**

**OTHER OSI LAYERS:** Basics of - Network Layer, Transport Layer, Session Layer, Presentation Layer, Application layer; Principles of Internetworking, Internet Protocol: IP Addresses, Transport services, TCP services, TCP Header format.

### **UNIT – V**

**HIGH SPEED NETWORKS:** Basics of – High Speed LAN, Fast Ethernet systems, Gigabit Ethernet, FDDI, 100VG – Any LAN

### **TEXT BOOKS:**

1. “Data Communication and Computer Networking”, B.A. Forouzan, Tata McGraw Hill, 2nd Edition.
2. “Data and Computer Communications”, William Stallings; Pearson Education.

### **REFERENCE BOOKS:**

1. “Understanding Data Communications & Networks”, William A. Shay, 2nd. Ed., Thomson-Vikas
2. “Computer Networks – A Systems Approach”, LL Peterson & BS Davie, 3rd Ed., Elsevier
3. “Computer Networks – Fundamentals and Applications”, Rajesh, Easwarakumar, Balasubramanian, Thomson-Vikas
4. “Data and Network Communications”, Michael A. Miller, Thomson-Vikas

## *Chhattisgarh Swami Vivekanand Technical University, Bilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Medical Electronics**

**Total Theory Periods: 40**

**Total Marks in End Semester Examination: 80**

**Minimum number of Class tests to be conducted: Two**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Code: 328633 (28)**

**Total Tutorial Periods: Nil**

### **UNIT I**

**Man Instrument System:** Introduction to Man-Instrument System, Components of Man-Instrument System, Physiological System of the Body, Problems Encountered in Measuring a Living System.

### **UNIT II**

**Bio Electric Potential:** Sources of Bioelectric Potential, Bio Electrodes, Cardiovascular Measurements: The Heart and Cardiovascular System, Electrocardiography.

### **UNIT III**

**Measurements of Biological Parameters:** Measurement of Blood Flow, Measurement of Heart Sound, Measurement of Temperature, Ultrasonic Diagnosis.

### **UNIT IV**

**Patient Care and Monitoring:** The Elements of Intensive Care Monitoring, Pacemakers, Defibrillators, Electrical Safety of Medical Equipment.

### **UNIT V**

**Biotelemetry:** Introduction, Physiological parameters Adaptable to Biotelemetry, The components of a Biotelemetry System, Implantable Units, Applications of Telemetry in Patient care.

### **TEXT BOOKS:**

1. Biomedical Instrumentation & Measurement by L. Cromwell, F.J. Weibell and E.A. Pfeiffer, 2nd Ed., PHI
2. Principles of Medical Electronics & Biomedical Instrumentation, C Raja Rao & S.K Guha, University Press

### **REFERENCE BOOKS:**

1. Electronics in Medicine and Biomedical Instrumentation – Nandini K. Jog, PHI
2. Biomedical Instrumentation – Dr. A. Arumugam, Anuradha Agencies, Chennai.
3. Handbook of Biomedical Instrumentation by R.S. Khandpur, TMH Pub. Co.
4. Introduction to Biomedical Engineering, Domach, Pearson Education

*Chhattisgarh Swami Vivekanand Technical University, Bilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Machine Design – II**

**Total Practical Periods: 28**

**Total Marks in End Semester Exam: 40**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Lab Code: 337621 (37)**

**EXPERIMENTS TO BE PERFORMED**

Each student shall submit two-assembly design report along with the drawing for assembly/sub assembly for any mechanical system consisting of not less than four machine elements included in the syllabus.

## *Chhattisgarh Swami Vivekanand Technical University, Bilai (C G)*

**Semester: B.E. VI Sem.**

**Subject: Industrial Engineering Lab**

**Total Practical Periods: 28**

**Total Marks in End Semester Exam: 40**

**Branch: Mechanical Engg, Mechatronics Engg.**

**Lab Code: 337623 (37)**

### **EXPERIMENTS TO BE PERFORMED (MINIMUM TEN EXPERIMENTS)**

1. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method -men type flow process chart.
2. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method -material type flow process chart
3. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method -machine type flow process chart
4. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method – multiple activity chart.
5. Study of principles of fundamentals of hand motion.
6. Study & applications of principles of motion economy.
7. Performance of micro motion study of a job.
8. Problems in assignment of men & machines.
9. Training for a performance rating using walking exercises / audio visual aids.
10. Calculation of allowance for a job.
11. Standard time calculation problems.
12. Problems of wage incentive.
13. Case study of an industrial/service organization using a method study techniques.
14. Stop watch time study of a job.

## *Chhattisgarh Swami Vivekanand Technical University, Bhilai (C G)*

**Semester: VI**

**Subject: Managerial Skills**

**Total Practical Periods: 28**

**Total Marks in End Semester Exam: 40**

**Minimum number of class test to be conducted: 2**

**Branch: Common to all branches**

**Code: 300625 (46)**

**Total Tutorial Periods: NIL**

### **Unit-I**

Managerial Communication Skills: Importance of Business Writing: writing business letters, Memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

### **Unit-II**

Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

### **Unit-III**

Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment.

### **Unit-IV**

Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

### **Unit-V**

Creativity – a managerial skill, Trying to get a grip on creativity.

Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

### **Text & Reference Books:**

1. Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd,2006
2. How to develop a pleasing personality by Atul John Rego, Better yourself books, Mumbai, 2006
3. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969