

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/866-B

15th July 2017

OFFICE ORDER

Sub.: Value Added Course on "Agricultural Waste Management" by Department of Agriculture

Students are hereby informed that Department of Agriculture is offering a value added course on "Agricultural Waste Management" from 04th August 2017. So, interested students can enroll on or before 4th August 2017. For more information, students are advised Dr. R. C. Dhaker (Head, Department of Agriculture)


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Course title: Agricultural Waste Management

Course Outcomes:-

1. Definition of different waste management methods like MBO, landfilling, composting and incineration.
2. Introduction with best management practices in agriculture.
3. Definition of waste management and basic principles like RRR.
4. Investigate the benefits of waste management in farms.

UNIT-1

Introduction to agricultural waste management, Nature and characteristics of agricultural waste and their impact on the environment, Kinds of wastes, Classification, role of soil and plants in waste management,

UNIT-2

sources of waste, impact of waste on soil and plant quality, Biological processes of waste management, Utilization and Recycling of Agricultural waste, Potential of Recyclable Crop Residues and its management,

UNIT-3

In-situ management of agriculture waste, Composting and Vermicomposting for bio conservation of biodegradable waste, Biogas Technology, Agricultural waste and water, air and animal resources,

UNIT-4

Impacts of waste on human, animal health and environment. Management of bedding & litter, wasted feed, run-off from feed lots and holding areas and waste water form dairy parlors, agro-waste recycling through farming system, waste management machineries, environmental benefit of waste management.

Practical

1. Collection and preparation agricultural waste sample.
2. Determination of pH, EC, CECe, heavy metals, BOD, COD, TSS, TDS, NH₄, Total P, and dissolved reactive P. Nutrient status (N, P, K, secondary and micronutrients) analysis of agricultural waste.
3. Waste management equipment operation, Maintenance and safety hazards, computer software and models.
4. Survey of different agri waste from live stock, dairy, poultry, food processing, fruit & vegetable and agri-chemicals,
5. Preparation of compost, Vermicomposting, biogas and analysis of compost.

Shantanu Singh Shekhar



OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/986-A

17th August 2017

OFFICE ORDER

Sub.: Value Added Course on "Auto-CAD (Electrical Software)" by Department of Electrical Engineering

Students are hereby informed that Department of Electrical Engineering is offering a value added course on "Auto-CAD (Electrical Software)" from 18th September 2017. So, interested students can enroll on or before 1st September 2017. For more information, students are advised Mr. V. Siva Brahmaiah Rama (Head, Department of Electrical Engineering)


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Mewar University, Gangrar, Chittorgarh

Department of Electrical Engineering

Value Added Course on Auto-Cad (Electrical Software)

Course Code: VAC-EE-1(2017-18)

Course Outcomes:-

At the end of this course, students will be able to draw maps for all facilities, make electrical wiring for each map, and design an electrical panel that controls all the electrical installations of a facility and students will be able to draw a 2D design from scratch.

UNIT-1

6hrs

Introduction:- AutoCAD Electrical, GUI **Project:-** Introduction to Project Manager, Working with Projects, **Drawing:-** Adding a Drawing, Create a new Drawing, Drawing Properties, **Insert a Component, Connecting a component,** Create a Library Symbol, Symbol Builder, Circuit Builder, Inserting a One-line Motor Circuit, Inserting a Dual One-line Power Feed Circuit, Copy circuitry, Save circuit to icon menu

UNIT-2

6hrs

Component Tools: - Inserting Components, Relocating Components, Inserting a Child Components, Aligning and Editing the Components, Catalog Information, Component Attribute Tools, **Wires:-** Wire layers, Wire types, Insert wire, Modify wire **Signal Arrows:** - Source arrow, Destination arrow **Ladder tools:** - Wire numbers, Automatic wire numbers, Wire tagging, PLC I/O wire numbers, **Wire Number Edit.**

UNIT-3

6hrs

PLC:- Generate PLC Layout Modules, PLC parametric selection, Module layout, Insert PLC modules, Edit PLC module, PLC Database File, **Point to Point Wiring Tools:-** Introduction to Connector Diagrams, Inserting Connectors, Editing & Modifying Connectors, Link components by dashed lines, **Grouping Wires.**

UNIT-4

7hrs

Conversion tool:- Convert text, Convert block, Convert wires, Convert arrows, Special Explode, **Panel Layout:-** Foot Prints, Footprints from Schematic list, Footprints from icon menu, Din rails, Balloons, Wire Annotations, Create Assembly, Editing & Modifying Footprints, Creating Own Footprint **Terminals:** Placing a Terminal, Terminal Editor.

UNIT-5

7hrs

Audit:- Missing Catalog, Electrical Audit, Signal Error/ List, Drawing Audit **Generate Reports:-** Types of schematic reports, Generate a schematic report, Types of panel reports, Generate a panel report, Run automatic reports, Automatic report generation, **Import/Export:-** To Spreadsheet, From Spreadsheet

R. v. s. R. v. s.



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/977-A

16th August 2017

OFFICE ORDER

Sub.: Value Added Course on "CONSTITUTION OF INDIA" by Department of Legal Studies.

Students are hereby informed that Department of Law is offering a value added course on "CONSTITUTION OF INDIA" from 4th September 2017. So, interested students can enroll on or before 1st September 2017. For more information, students are advised to contact Mrs. Asha Rawat (Head, Department of Law).


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Constitutional law of India I

Unit-I	Introductory: Salient Features of the Constitution. Nature of the Indian Federalism: Preamble, Citizenship.
Unit-II	State, Fundamental Rights, Directive Principles of State Policy and Fundamental Duties.
Unit-III	Union and State Executive: President, Governor, Election, appointment, Powers, Position: Council of Ministers, Prime Minister, Parliamentary System of Government Union and State legislature; Lok Sabha, Vidhan Sabha Rajya Sabha, and Vidhan Parishad Composition : Speaker, Chairman; Privileges; Legislative procedure
Unit-IV	Union-State Judiciary : Supreme Court and High Court, Composition and Powers, Writs
Unit-V	Union-State Legislative Relationship-Distribution of legislative powers, Administrative and financial relationship

Constitutional law of India-II

Unit 1	Service under the Union and the State, Constitutional protection to civil servants; Public Service Commission of the Union and the States Art. 300 A – Property Rights, Service Tribunals.
Unit 2	Freedom of Trade, Commerce and Intercourse : State Liability in Contracts and Torts, Suit by and against the State
Unit 3	(a) Emergency provisions-National, State and Financial (b) Elections : Election Commissions, Constitution Powers & Functions, Powers of Parliament and State Legislature with regard to election laws.
Unit 4	Amendment of the Constitution-Constitutionality of Ordinary Laws and Amendment Laws, Doctrine of Judicial Review and restraints upon it, judicial activism, special rules of constitutional interpretation and constitutionalism, Doctrine of Basic Structure - Major Amendments & their Constitutional Value
Unit 5	Local self government their constitution functions and powers.

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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/151-A

03rd February 2018

OFFICE ORDER

Sub.: Value Added Course on "Design of Substation" by Department of Electrical Engineering

Students are hereby informed that Department of Electrical Engineering is offering a value added course on "Design of Substation" from 12th March 2018. So, interested students can enroll on or before 1st March 2018. For more information, students are advised Mr. V. Siva Brahmaiah Rama (Head, Department of Electrical Engineering)


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Mewar University, Gangrar, Chittorgarh

Department of Electrical Engineering

Value Added Course on Design of Substation

Course Code: VAC-EE-2 (2017-18)

Course Outcomes:-

At the end of the course, the student will be able to

1. Describe the main consideration in the process of substation design
2. Outline the working principles of substation switching equipment
3. Explain the different types of bus configurations
4. Design criteria of substation grounding and protection

UNIT-I - INTRODUCTION

Background, Need Determination, Budgeting, Financing, Traditional and innovative Substation Design, Site Selection and Acquisition, Design, Construction and Commissioning Process
Distribution system planning and automation, Load characteristics, Distribution Transformers, Design of Substations, primary and secondary systems, Voltage drop and power loss calculations, Voltage regulation and capacitor application, Distribution system modeling and simulation, Distribution system protection, Distribution system reliability, Electric power quality, Distributed generation and storage

UNIT-II - HIGH VOLTAGE SWITCHING EQUIPMENT

Ambient conditions, Disconnect switches, Load Break switches, high speed ground switches, power fuses, circuit switches, circuit breakers.

UNIT-III - TYPES OF SUBSTATIONS & BUS/SWITCHING CONFIGURATIONS

Transmission substation, distribution substation, collector substation, switching substations, gas insulated substations, air insulated substations, bus configurations: single bus, double bus, double break, main and transfer bus, double bus, single breaker, ring bus, break-and-a-half, Comparison of configurations.

UNIT-IV - DESIGN OF SUBSTATION GROUNDING AND PROTECTION

Reasons for substation grounding system, accidental ground circuit, Design criteria-Actual Touch and step voltage, soil resistivity, grid resistance, grid current, use of the design equations, selection of conductors, grounding fence, other design considerations. Lightning stroke protection-lightning parameters, empirical design methods. Substation fire protection-Fire hazards, fire protection measures, fire protection selection criterion.




OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/767-8

06th July 2017

OFFICE ORDER

Sub.: Value Added Course on "Entrepreneurship" by Department of Management

Students are hereby informed that Department of Management offering a value added course on "Entrepreneurship" from 2th August 2017. So, interested students can enroll on or before 31st July 2017. For more information, students are advised to contact Mr. Rajesh Bhatt Sir (Head, Department of Management)


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VALUE ADDED COURSE

Entrepreneurship

Course Outcome:

- By completion of this paper students can familiarize the participants with concepts, techniques and skills of entrepreneurship
- Enable them to become successful entrepreneurs

Unit 1

Introduction: Definition of Entrepreneur, Internal & External Factors, Function of an Entrepreneur, Theories of entrepreneurship, Stages in Entrepreneurial Process

Unit 2

Promotion of a Venture: Opportunity Analysis, External Environmental Analysis Economic, Social & Technological, Legal Requirements of Establishment of a new Unit, Raising of Funds, Venture Capital Sources & Documentation Required

Unit 3

Entrepreneurial Behavior: Innovation & Entrepreneur, Entrepreneurial Behavior & Psycho Theories, Social Responsibility

Unit 4

Entrepreneurial Development Programme: Entrepreneurial Development Programme, their Role, Relevance & Achievements, Role of Government in Organizing Entrepreneurial Development Programme, Critical Evaluation

Unit 5

Role of Entrepreneur: Role of Entrepreneur in Economic Growth as an Innovator, Generation of Employment Opportunity, Bringing about social stability, Role in Export Promotion & Import substitution, International Entrepreneurial Opportunities, Forex Earnings.

W
(Rajesh Shetty)



**OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No.: MU/RO/2017/975-A

16th August 2017

OFFICE ORDER

Sub.: Value Added Course on “Environmental Pollution Control” by Department of Civil Engineering.

Students are hereby informed that Department of Civil Engineering is offering a value-added course on “Environmental Pollution Control” from 5th September 2017. So, interested students can enroll on or before 1st September 2017. For more information, students are advised to contact Mr. Avinesh Kumar (Head, Department of Civil Engineering)


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VALUE ADDED COURSE
ENVIRONMENTAL POLLUTION CONTROL

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50 Marks
External Examination: 50 Marks
Duration of Examination: 03 Hours

Course Objective:

To provide students with balanced information regarding different elements of pollution and its control measures and to make students aware of statutory controls for pollution control.

Course Outcome:

Understand the types and sources of environmental pollution, Comprehend the impact of pollution on the environment, Analyze and evaluate different pollution control measures, Apply pollution control techniques: You will learn practical techniques to control pollution in different environmental media such as air, water, and soil. You will also learn how to use different pollution control equipment and technologies. Develop solutions to environmental pollution problems.

UNIT-I	Environmental pollution- interrelationship between various forms of pollution, Surface water pollution surveys, Integrated river basin water management, Restoration of water bodies, Water quality parameters and optimization of treatment, Water quality changes by domestic use, Radioactive materials, Thermal pollution and underground disposal, Types of water pollutants and their effects, Instrumentation for water quality and treatment, Role of wastewater treatment as pollution control measure.
UNIT-II	Air pollution control strategy- basic approaches, Areas of legal responsibility, Source identification, Particulate control and control of gases and vapours, Factors affecting control approach selection, Air pollution control technology, Settling chambers, Filters, Electrostatic precipitators, Wet scrubbers, Entrainment separators, Gas adsorption, Gas absorption and combustion.
UNIT-III	Land pollution- pollution cycle, Ecological factors in plant site selection, Ecological aspects of vegetation control, Noise pollution, The physics of sound and hearing, Effects of noise, Sources, Instruments and techniques for noise measurements - light and glare pollution - light and its characteristics, Glare, Outdoor lighting and glare sources, Corrective procedures.
UNIT-IV	Environmental impact analysis- physical, Social, Aesthetic and economic assessment of highway project, Mining and power plants, Legislative control, Water pollution laws and regulations, Air pollution control act of India, Chimney heights, Land pollution laws and regulations.

Recommended Books:

- Rao C S, Environmental Pollution Control Engineering, New Age International (P) Ltd, 2007
- Goel P K, Water Pollution Causes, Effects and Control, New age International (P) Ltd, 2006
- Birdie G S and Birdie J S, Water Supply and Sanitary Engineering, Dhanpat Rai & Sons
- Bethea R M, Air Pollution Control technology, Van Nostrand Reinhold Co., 1978
- Water Pollution Act and Air pollution act of Govt. of India
- Relevant Indian Standards & factory Acts

Anurag
Arshal Kumar



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/ 0058-A

15th January 2018

OFFICE ORDER

Sub.: Value Added Course on "Food Fermentation Techniques" by Department of Life Science

Students are hereby informed that Department of Life Science offering a value added course on "Food Fermentation Techniques" from 01st February 2018. So, interested students can enroll on or before 31st January 2018. For more information, students are advised Prof. (Dr.) Chetan Kumar Sharma (Head, Department of Life Science).


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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
VALUE ADDED COURSE: FOOD FERMENTATION TECHNIQUES

Course Outcomes:

- CO1: The course aims to provide fundamental insights to exploit microbes for manufacturing of products which have huge industrial significance.
- CO2: The course blends science and engineering with various biochemical processes to obtain products such as food, chemicals, vaccines, medicine
- CO3: Through this course, they also learn about microbiology of milk, fermented dairy products, industrially important microorganisms and process of industrial production of alcohol, beer, wine, SEP and mushrooms.
- CO4: Students in this course will learn about microbes in food, spoilage of food and preservation techniques of food.
- CO5: At the end of the course, the student will have a better appreciation for the role of microbes in industry using technology

SYLLABUS

Unit 1 Fermented Foods

Definition, types, advantages and health benefits

Unit 2 Milk Based Fermented Foods

Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process

Unit 3 Grain Based Fermented Foods

Soy sauce, Bread, Idli and Dosa: Microorganisms and production process

Unit 4 Vegetable Based Fermented Foods

Pickels, Saeurkraut: Microorganisms and production process

Unit 5 Fermented Meat and Fish

Types, microorganisms involved, fermentation process

Probiotic Foods

Definition, types, microorganisms and health benefits

SUGGESTED READINGS

1. Hui YH, Meunier-Goddik L, Josephsen J, Nip WK, Stanfield PS (2004) Handbook of food and fermentation technology, CRC Press
2. Holzapfel W (2014) Advances in Fermented Foods and Beverages, Woodhead Publishing.
3. Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan
4. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer

PRACTICALS:

- 1) Creation of yogurt, pickles, bread, and other bakery and culinary products.
- 2) Production of alcoholic biofuels and other beverages such as beer, wine, liquors, and ethyl alcohol.

Sparky
(Pankaj Kumar Teli)



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/767-A

06th July 2017

OFFICE ORDER

Sub.: Value Added Course on "Foundations of Business strategy" by Department of Management.

Students are hereby informed that Department of Management offering a value added course on "Foundations of business strategy" from 2th August 2017. So, interested students can enroll on or before 31st July 2017. For more information, students are advised to conduct Mr. Rajesh Bhatt Sir (Head, Department of Management)


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VALUE ADDED COURSE
Foundation of Business Strategy

Course Outcome:

- By completion of this paper students can get the Strategic Management, Creating and Understanding of the Environment Scanning.
- Creating and Understanding of the Formulation of Strategies, Implementation of Strategies and Evaluation of Strategies.

Unit –I –INTRODUCTION OF STRATEGIC MANAGEMNT

Strategic Management: introduction, nature & scope, need, strategic decision making. Mission & Objectives need for explicit mission, Components of mission statement, Formulation of mission & objectives and their specificity.

Unit-II -ENVIRONMENT SCANNING

Scanning the Environment: Types of environment, Scanning of Socio economic, Technological, Political environment, Techniques for environmental analysis. Industry analysis: Porter's approach, Environmental threat & opportunity profile.

Unit-III -INTERNAL ANALYSIS

Internal analysis: Value chain analysis, Factors of internal analysis; Marketing & distribution. R&D & engineering, Production & operations, Finance & accounting, Corporate resources & personal factors, Analyzing strengths & weaknesses of enterprise (SWOT).

Unit –IV -STRATEGY FORMULATION & CHOICE

Strategy Formulation: Generic strategy alternatives; Stability, Expansion, Retrenchment, Combination, Strategy variations, BCG matrix, GE 9 cell matrix, Hofer's model.

Unit V- IMPLEMENTATION & CONTROL

Strategic Implementation & control: Behavioural aspects, Strategy evaluation & control

W
(Rajesh Shetty)



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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/978-A

17th Aug 2017

OFFICE ORDER

Sub.: Value Added Course on "Installation & Repair of consumer Electronic Products" by Department of Electronics & Communication Engg.

Students are hereby informed that Department of Electronics & Communication Engg is offering a value added course on "Installation & Repair of consumer Electronic Products" from 5th Sept 2017. So, interested students can enroll on or before 5th Sept, 2017. For more information, students are advised to contact Mr. Gaurav Sharma (Head, Department of ECE)


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INSTALLATION AND REPAIR OF CONSUMER ELECTRONICS PRODUCTS

UNIT I

LCD-LED TV and Monitor

Basic Principle, Working and Operation of LCDLED TV and Monitor, Installation, Repair Maintenance and Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices

Cable TV and DTH Services

Basic Principle, Working and Operation of Cable TV and DTH Services, Installation and Checking, Repair Maintenance, Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices

UNIT II

DVD Player and Home Theatre System

Basic Principle, Working and Operation of DVD Player and Home Theatre System, Installation, Repair, Maintenance, Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices.

FM Radio-Cordless Phone-Hair Dryer

Basic Principle, Working and Operation of FM Radio- Cordless Phone-Hair Dryer, Installation, Repair, Maintenance, Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices.

UNIT III

Induction Stove and Microwave Oven

Basic Principle, Working and Operation of Induction Stove and Microwave Oven, Installation, Repair, Maintenance, Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices.

Air-Conditioner

Basic Principle, Working and Operation of Air Conditioner, Installation, Repair, Maintenance, Serving and Practice, Fault Diagnosis and Error Remover Techniques and Practices.

UNIT IV

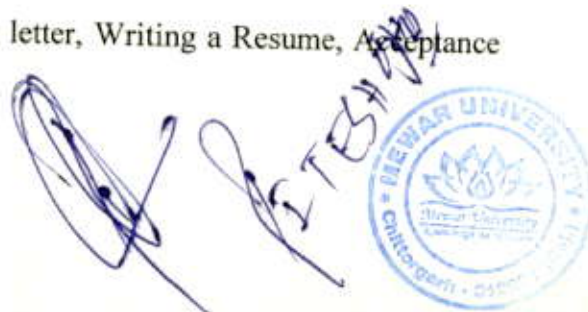
Soft Skills and Communication

Communication, verbal and non-verbal communication, Building professional relationship, Relationship at work , Making the most of personal and professional relationships, Competency Description, Managing Difficult Business Relationships,

Interview Techniques: Planning For the Interview, Preparing for an Interview, Interview Formats, Stages of the Interview, Types of Interview Questions

Best Bet for Interview Preparation: Mock Interviews, Benefits of Mock Interviews Experience & Skills,

Curriculum Vitae: Overview, types of CV, Covering letter, Writing a Resume, Acceptance Letter, Thank You Letter.



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2017/969-A

16th August 2017

OFFICE ORDER

Sub.: Value Added Course on "Work Design and Ergonomics" by Department of Mechanical Engineering.

Students are hereby informed that Department of Mechanical Engineering is offering a value added course on "Work Design and Ergonomics" from 4th September 2017. So, interested students can enroll on or before 1st September 2017. For more information, students are advised to contact Mr. Kapil Nahar (Head, Department of Mechanical Engineering).


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Name of Course: Work Design and Ergonomics

Type of Course: Value Added Course

Course Code: ME-12017

Academic Year: 2017-18

Duration of course: 45 Hours

Course Outcomes

Students will be able to:

- (a) Provide appropriate allowances for the jobs under analysis.
- (b) Rate a worker engaged on a live job and calculate basic, allowed and standard time for the same.
- (c) Calculate the basic work content of a specific job for employees of an organization. Thereby they will be able to calculate the production capacity of man power of an organization.
- (d) Devise appropriate wage and incentive plan for the employees of an organization.
- (e) Assess the occupational environmental factors like heat stress, noise, and vibration and RSPM level in the industry.
- (f) Analyze the level of risk in a job causing stress, fatigue and musculoskeletal disorders and design appropriate work systems.

Unit-1

Productivity: Definition, reasons for low productivity, methods to improve productivity, work-study and productivity

Human factor in work-study: Relationship of work-study man with management, supervisor & workers, qualities of a work-study man.

Method-study: Definition, objectives, step-by-step procedure, questioning techniques, charts and diagrams for recording data. Like outline process charts, flow process charts, multiple activity charts, two handed process chart, string diagram, travel chart, cycle graph, Chrono-cycle graph, therbligs, micro motion study and film analysis, Simo chart, principles of motion economy. Development and installation of new method.

S → /k
(Sunita Katheria)

The logo of the University of Jammu is circular, featuring a central emblem with a tree and a book. The text around the emblem reads "UNIVERSITY OF JAMMU" at the top and "WISDOM BETTER KNOWLEDGE BETTER" at the bottom. Below the logo, the text "UNIVERSITY OF JAMMU" is printed.

Unit-2

Work-Measurement: Definition, various techniques of work-measurement work-sampling, stopwatch time study & its procedure, Job selection, Equipment and forms used for time study, rating, methods of rating, allowances and their types, standard time, numerical problems, predetermined - time standards and standard data techniques.

Incentive: Meaning, objectives of an incentive plan, various types of incentive plans.

Design of Workplaces and Hand Tools: Work Design Analysis, Designing for Hand Use, Types of Injuries and Disorders

Unit-3

Ergonomics: Introduction, history of development, man-machine system and its components. Introduction to structure of the body- features of the human body, stress and strain, metabolism, measure of physiological functions- workload and energy consumption, biomechanics, types of movements of body members, strength and endurance, speed of movements. NIOSH lifting equation, Lifting Index, Maximum acceptable Weights and Forces, Distal upper extremities risk factors, Strain Index, RULA, REBA. Applied anthropometry - types, use, principles in application, design of work surfaces and seat design. Visual displays for static information, visual displays of dynamic information, auditory, tactual and olfactory displays and controls. Assessment of occupational exposure to noise, heat stress and dust. Effect of vibration/ noise, temperature, illumination and dust on human health and performance.

Reference Books:

1. Barnes Ralph M., "Motion & Time study: Design and Measurement of Work", Wiley Text Books, 2001.
2. Marvin E, Mundel & David L, "Motion & Time Study: Improving Productivity", Pearson Education, 2000.
3. Benjamin E Niebel and Freivalds Andris, "Methods Standards & Work Design", McGraw Hill, 1997.
4. International Labour organization, "Work-study", Oxford and IBH publishing company Pvt. Ltd., N.Delhi, 2001.
5. Sanders Mark S and McCormick Ernest J, "Human Factors in Engineering and Design", McGraw-Hill Inc., 1993.

