

6.1 PRODUCTION PLANNING AND CONTROL

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RATIONALE

Diploma holders in wood technology are responsible for controlling production on the shop floor. For this purpose, knowledge in this area needs to be imparted to them.

DETAILED CONTENTS

1. Introduction to Production Planning and Control
 - Necessity of planning and control.
 - Functions of production, planning and control department
 - Factors determining control procedure.
 - Advantages of PPC.
 - Types of production.

2. Planning
 - Material planning and allocation.
 - Allocation for optimum utilization
 - Vendor development
 - Make or buy decision.
 - Break even analysis.
 - Process planning.
 - Procedure for process planning.
 - Process planning sheet.
 - Calculation of man and machine hours.

3. Production Control
 - Objectives
 - Routing
 - Loading and scheduling
 - Dispatching
 - Follow up

INSTRUCTIONAL STRATEGY

Efforts should be made to relate process of teaching with direct experiences in the industry. Students should be taken to various wood-based industrial units for clear conception of production planning and control.

RECOMMENDED BOOKS

1. Production Estimating and Costing by M Adithan and BS Pabla; Konark Publishers, Delhi
2. Production Planning Control and Management by KC Jain and NL Aggarwal; Khanna Publishers, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	10	20
2	20	45
3	18	35
Total	48	100

6.2 REPAIR AND MAINTENANCE OF WOOD WORKING MACHINES

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RATIONALE

Rapid automation has brought in expensive plant and equipment. Due to this, maintenance of equipment has become a critical factor. Diploma holders are required to undertake breakdown. For this purpose, knowledge and skills in the area of repair and maintenance is required, hence this subject.

DETAILED CONTENTS

1. Introduction to Maintenance (10 hrs)
 - 1.1 Importance of maintenance
 - 1.2 Different types of maintenance
 - 1.3 Importance of preventive maintenance
 - 1.4 Preparation of preventive maintenance schedules
 - 1.5 Predictive maintenance and its advantages
 - 1.6 Total productive maintenance
 - 1.7 Manpower planning and material management
 - 1.8 Safety and hazard aspects to the importance
 - 1.9 Installation of first aid and wash showers, their operations
 - 1.10 Display caution boards
 - 1.11 Maintenance equipment

2. Erection and Commissioning of Equipment (8 hrs)
 - 2.1 Surveying of place at which machinery is to be installed, use of dummy level and conventional methods
 - 2.2 Study of drawings of foundation of the equipment
 - 2.3 A basic introduction to rigging and levelling of machinery (use of spirit levels and modern day equipment,
 - 2.4 General considerations for layout of machinery for facilitating maintenance
 - 2.5 Trial after commissioning and deriving preventive maintenance and breakdown maintenance manual on the plant

3. Sequence of Maintenance Operations (6 hrs)
 - 3.1 Procedure
 - 3.2 Disassembly of machine tool
 - Preparation of disassembly
 - Disassembly sequence and rules

- Examples of disassembly
- Designing parts for facilitating assembly and disassembly
- 3.3 Washing of parts
- 3.4 Fault finding
- 3.5 Preparation of assembly in fitting and in balancing of parts
- 3.6 Assembly of mechanisms and machines

- 4. Repairing of Machine Components (6 hrs)
 - 4.1 Study of standard and non-standard components
 - 4.2 Detailed study for repair of non-standard components
 - 4.3 Repair versus Replacement

- 5. Lubrication (8 hrs)
 - 5.1 Lubricant sources and composition
 - 5.2 Properties of specific lubricants and their selection for various conditions i.e. study of lubricant grades
 - 5.3 Frequency of lubrication and identification of areas where lubrication is required. Lubrications in specific components such as sliding bearings, gears, chains, metal working seals and packing
 - 5.4 Different lubrication systems - wick, forced, splash and gravity
 - 5.5 Handling and storage of lubricants
 - 5.6 Lubricant conditioning and disposal
 - 5.7 Concept of tribology

- 6. Maintenance Planning, Scheduling and Documentation (10 hrs)
 - 6.1 Standard times for maintenance work
 - 6.2 Spares planning
 - 6.3 Work measurement
 - 6.4 Requirement of maintenance manual and study of contents of maintenance manual
 - 6.5 Brief introduction to computerized maintenance record
 - 6.6 ISO standards for maintenance documentation

LIST OF PRACTICALS

1. Preparation of prevention maintenance check
2. Case study on trouble free maintenance
3. Equipment/machine levelling and alignment
4. Maintenance of material handling equipment – pulley blocks, hand operated cranes, fork lifts, hydraulic jacks, mobile cranes, winches

5. Use of lubrication equipment like oil gun, grease gun
6. Removing old lubricant, cleaning and replenishing the machine with fresh lubricant
7. Performance loss as a result of loose belt/straining limits – loss of efficiency
8. Checks on repaired equipment

INSTRUCTIONAL STRATEGY

The teacher while imparting instructions is expected to lay greater emphasis on the practical aspects of maintenance. Efforts should be made in the practical classes that student perform practical exercises individually. It is also important to make use of audio visual aids/video films to show specific operations.

RECOMMENDED BOOKS

1. Industrial Maintenance by HP Garg; S Chand and Co.
2. Maintenance Engineering and Management by RC Mishra and K Pathak, Prentice Hall of India Pvt. Ltd., Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	10	20
2	8	15
3	6	12
4	6	15
5	8	18
6	10	20
Total	48	100

6.3 COMPUTER APPLICATIONS IN WOOD BASED INDUSTRY

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RATIONALE

Information Technology and computer have great influence on all aspects of our life. In order to prepare a diploma holder in this field to work in computerized environment, it is essential that they are exposed to applications of computer related to their area of work, hence this subject.

DETAILED CONTENTS

1. MS Power Point

1.1 Getting started in power point:

- Understanding what power point is and what it does
- starting power point
- Creating a presentation: using the auto content, wizard, using a template, creating a blank presentation
- Saving the presentation
- Power point's five views: slide view, outline view, slide sorter view, notes page view, slide show view
- Creating and editing slides

1.2 Developing your presentation

- Changing the layout of a slide
- Modifying a slide master
- Changing the design template
- Outlining your presentation – creating a presentation from a word outline
- Rearranging your slides
- Previewing your slide show

1.3 Bringing a presentation to life

- Inserting objects in your presentation like graph/chart from excel, pictures, sound, video clip, organization chart etc
- Drawing objects in power point: Autoshapes, other objects
- Repositioning, resizing and aligning
- Objects, working with borders, fills, shadows and 3-D effects, selecting and grouping objects
- Animating an object: setting preset animations, setting custom animations, playing a sound or video clip

- 1.4 Analyzing the presentation: assigning transitions and timings, creating build slides, creating hidden slides, setting slide timings when rehearsing
- 1.5 Setting up the slide show
2. MS Access

Introduction to databases and MS-access, Creating a new database, opening and moving around an existing database, adding new data and editing a database table, displaying and searching for data, printing data from an access database, creating reports in access.
3. Windows

Using different accessories like note pad, paint and word pad. Different operations, setting using help files
4. Internet

Use of Internet through explorer and netscape navigator
5. Use of software for design of wooden articles and engineering structures like touses, roofs, joints etc.
6. Project

INSTRUCTIONAL STRATEGY

This is a practice-oriented course. Teachers are expected to demonstrate the use of software on computers. Emphasis should be laid in practice in using software on computers by students individually.

RECOMMENDED BOOKS

1. MS Office 2000 for Everyone by Sanjay Saxena, Vikas Publishing House, New Delhi
2. Office 97 by S. Hill, BPB Publications, New Delhi
3. Internet for Every one by Alexis Leon; Leon Techworld, Chennai
4. The ABCs of Microsoft Office 97 Professional Edition by Guy Hart – Davis, BPB Publications, New Delhi

6.4 ENTREPRENEURSHIP DEVELOPMENT

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RATIONALE

Entrepreneurship Development is one of the core competencies of technical human resource. Creating awareness regarding entrepreneurial traits, entrepreneurial support system, opportunity identification, project report preparation and understanding of legal and managerial aspects can be helpful in motivating technical/vocational stream students to start their own small scale business/enterprise. Hence, this subject.

DETAILED CONTENTS

- (1) Entrepreneurship
 - 1.1 Concept/Meaning
 - 1.2 Need
 - 1.3 Entrepreneurial competencies

- (2) Entrepreneurial Support System
 - 2.1 District Industry Centres (DICs)
 - 2.2 Commercial Banks
 - 2.3 State Financial Corporations
 - 2.4 Small Industries Service Institutes (SISIs), Small Industries Development Bank of India (SIDBI), National Bank for Agriculture and Rural Development (NABARD), National Small Industries Corporation (NSIC) and other relevant institutions/organizations at State level

- (3) Market Survey and Opportunity Identification
 - 3.1 Assessment of demand and supply in potential areas of growth
 - 3.2 Considerations in product selection
 - 3.3 Data collection for setting up small ventures

- (4) Project Report Preparation
 - 4.1 Preliminary Project Report
 - 4.2 Techno-Economic feasibility report
 - 4.3 Project Viability

- (5) Managerial Aspects of Small Business
 - 5.1 Principles of Management
 - 5.2 Operational Aspects of Production
 - 5.3 Finance Accounts and Finance
 - 5.4 Marketing Techniques
 - 5.5 Personnel and Inventory Management

- (6) Legal Aspects of Small Business
- 6.1 Elementary knowledge of Income Tax, Sales Tax, Patent Rules, Excise Rules
- 6.2 Factory Act and Payment of Wages Act

INSTRUCTIONAL STRATEGY

Emphasis should be laid on developing entrepreneurial skills amongst the students by teaching practical aspects. Teacher should give some industrial projects and report writing tasks.

RECOMMENDED BOOKS

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
2. Entrepreneurship Development by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi
3. Handbook of Small Scale Industry by PM Bhandari
4. Marketing Management by Philip Kotler, Prentice Hall of India, New Delhi
5. Project Planning and Entrepreneurship by TR Banga

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	6	10
2	12	22
3	10	16
4	8	12
5	14	20
6	14	20
Total	64	100

6.5 MAJOR PROJECT WORK

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The industry/practice based major project work is intended to place students for project oriented practical training in actual work situations for the stipulated period with a view to:

- i) Develop understanding regarding the size and scale of operations and nature of work in which students are going to play their role after completing the courses of study.
- ii) Develop understanding of subject based knowledge given in the class room in the context of its application at work places.
- iii) Develop first hand experience and confidence amongst the students to enable them to use and apply polytechnic/institute based knowledge and skills to solve practical problems in the world of work.
- iv) Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values.

This practical training cum project work should not be considered as merely conventional industrial training in which students are sent at work places with minimal supervision. This experience is required to be planned and supervised on regular basis by the polytechnic faculty. For the fulfillment of above objectives, polytechnic may establish close linkage with 8-10 relevant organization for providing such an experience. It is necessary that each organization is visited well in advance and activities to be performed by students are well defined. The chosen activities should be such which are of curricular interest to students and of professional value to industrial/field organizations. Each teacher is expected to supervise and guide 5 - 6 students.

Effort should be made to identify actual field problems as project work for the students. Project selected should not be too complex which is beyond the level of the students. The placement of the students for such a practical cum project work should match with the competency profile of students and the project work assigned to them. Students may be assessed both by industry and polytechnic faculty. The suggested performance criteria is given below :

- (1) Punctuality and regularity
- (2) Initiative in learning/working at site
- (3) Level/proficiency of practical skills acquired

- (4) Ability of solve live practical problems
- (5) Sense of responsibility
- (6) Self expression/communication skills
- (7) Interpersonal skills/Human Relation
- (8) Report Writing Skills
- (9) Viva Voce