POST GRADUATE DIPLOMA COURSE IN
WOOD & PANEL PRODUCTS TECHNOLOGY

PROSPECTUS 2023 - 2024

ICFRE-Institute of Wood Science & Technology

(An Autonomous body of the Ministry of Environment Forest & Climate Change, Govt. of India)

Delivering innovative solutions to Industry, Society and Environment


32nd Batch
One Year Post Graduate Diploma in
Wood and Panel Products Technology (PGDWPPT), 2021-22
Institute of Wood Science & Technology (IWST), Bangalore, India

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INSTITUTE OF WOOD SCIENCE AND TECHNOLOGY (IWST)

(An Autonomous body of the Ministry of Environment Forest & Climate Change, Govt. of India)

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Preface

Human resource development is about the "people" dimension in management. Training is an important HRD tool that seeks to prepare an individual to perform efficiently in the profession of his choice. IWST is committed to hone in the best of human values with technological competence in the one-year Post Graduate Diploma Course (PGDC) training in Wood and Panel Products Technology.

Global concerns for Environment and Bio-diversity Conservation in recent years are shared by the Nation and are reflected in various National Policies. Complexity of values attached to Environment, Forests, Bio-diversity often seems to conflict with the basic needs of human survival. The role of wood products, research and training of personnel in this sector of manufacturing technology are even more critical now than ever before and here in IWST we are ever eager to inculcate a sense of balance between environment and responsible development.

IWST (erstwhile IPIRTI) since its inception in the year 1962 is especially mandated for research and training on all aspects of wood products / composites with hand holding in the R & D requirements of Plywood and other wood based Panel Sectors from the beginning. It has established itself as the premier training institute to meet the HRD needs of the wood based industry in the country.

Post Graduate Diploma Course in Wood and Panel Products Technology offered by the Institute, the only one of its kind in the country, is richly valued by the allied panel industries and the Diploma holders in this subject are in high demand. Since the establishment of a training center in 1989 more than 800 graduates have successfully completed the PG Diploma Certificate course. Almost all of them have been placed in Plywood and other allied wood Industries all over the Country.

The PG diploma course provides a unique opportunity to the young Science and Engineering graduates for a career in one of the green industrial processing sectors viz. wood based industry, responsible for processing wood and other renewable fiber materials to meet certain vital human needs in most environment friendly manner.

This brochure provides brief information about the PG Diploma Course offered by ICFRE-IWST for Science and Engineering graduates.

Bangalore
October 2023

Director

1. INTRODUCTION

The Government of Mysore had set up a Forest Research Laboratory (FRL) at Bangalore in 1938. In the initial years, work was carried out mainly on properties and uses of different timber species, essential oils, other non-wood forest products and protection of wood and trees from pests and diseases. In 1956, this laboratory was organized as a regional centre of Forest Research Institute and Colleges, Dehradun. In 1977, Sandal Research Centre was set up to undertake research on wide-ranging aspects of genetics, silviculture and management of sandal, a valuable tree well distributed all over Southern India. In 1977, the marine centers of Wood Preservation Branch, Forest Research Institutes & Colleges, Dehradun functioning at Vishakhapatnam, Madras, Goa and Kochi were transferred to Forest Research Laboratory, Bangalore.

From a modest beginning in 1962 as a cooperative research laboratory IPIRTI was an internationally recognized research and training institute in the field of panel products from wood and other lignocellulosic (renewable fibers) materials located in Bangalore. The institute was an autonomous organization of the Ministry of Environment and Forests, Government of India. Now, Indian Plywood Industries Research & Training Institute (IPIRTI) is merged with Institute of Wood Science & Technology(IWST) under umbrella of Indian Council of Forest Research and Education (ICFRE) on 22nd of October 2022 (OM No. F.No.16-1/2022RT).

2. VISION& MISSION

To attain excellence in wood science and forestry research to generate the desired value for forest and wood based products in a sustainable eco-friendly way.

To generate and disseminate the advance knowledge and technological solutions for addressing issues related forest and wood based products to the society on a sustainable basis through research, education and extension.

3. RESEARCH AND DEVELOPMENT ACTIVITIES

The institute is specially mandated to undertake research on all aspects of wood and panel products made from wood and other renewable materials.

Divisions:

- Wood Properties and Processing Division
- Plywood and Panel Product Technology Division
- Forest Protection Division
- Silviculture and Forest Management Division
- Extension Division
- Facilities and Services Division

4. TRAINING PROGRAMMES

The training Centre with modern training facilities for mechanical wood industries was established in erstwhile IPIRTI with the assistance of FAO/UNDP/GOI in the year 1989 to cater the HRD needs of wood based industry in the country. The Institute offers one-year Post Graduate Diploma Course (PGDC) in Wood and Panel Products Technology (WPPT).

In addition, short term vocational courses are organized on various aspects related to WPPT and other allied subjects. Courses are also organized for forest officers for enhancing their appreciation about the role of technology in efficient utilization of wood and development of wood alternates from renewable fibers.

5. PG DIPLOMA COURSE

The PGDC in WPPT aims at imparting professional knowledge and skills with regard to processing technologies for efficient utilization of wood through conversion into engineered wood and a variety of panel materials/products viz. plywood, particle/fiber board, block board, flush door etc. The course also includes processing technology on bamboo mat based panel products and adhesive technology. Standardization aspects with respect to quality management and BIS certification are dealt with in detail. Working knowledge on use of computers and internet is also imparted. Emphasis is given not only to theoretical background of various technologies but also practical and hands on exercises. The PGDC in WPPT is the only course of its type available in the country that has been widely recognized by the Industry. Annual intake of candidates for the course is restricted to 40.

5.1 Eligibility and Admission Procedure

Candidates possessing degree in Science (B.Sc. in Chemistry/ Physics/ Mathematics/ Agriculture/ Forestry/ Engineering B.E./ B. Tech.) from any recognized University are eligible to apply for the PGD course. Candidates are selected from all over the country on the basis of marks obtained in the qualifying examination. Preference in admission is given to candidates sponsored by industries or organizations. Upper age limit is 28 years as on 1st November of the course year. Relaxation in age limit for SC/ST/OBC/PH is as per the Government of India rules. There is, however, no age limit for sponsored candidates.

5.2 Hostel accommodation

There is a Trainees' Hostel (only for boys) inside the campus. Accommodation is provided on twin sharing basis and Hostel charges are Rs. 9,000/- per trainee annually. Trainees are required to bring their own bed linen, mosquito nets, blanket (woolen), towel etc. No accommodation is provided for spouse and children of the trainees (IPIRTI Campus Rules – Annexure-1).

5.3 Boarding

Mess facilities in the hostel are provided through a contractor on cost sharing basis. The mess facilities are compulsory for all trainees staying in the hostel. Present charges are about Rs.6000/- per month, per candidate, Trainees need to bear mess charges on monthly basis (Trainees Hostel Rules – Annexure-2).

5.4 Training Methods

Class room teaching

Class room lectures are designed to enhance the trainees' ability to comprehend the analytical methods, which help trainees to assimilate knowledge through interaction with the faculty members. In class room lectures, audio-visual aids are used very frequently.

In Plant Training

The aim of in plant training is effective absorption of essentials of technologies, processes and practices learnt during theory and lab practicals through implementation in simulated factory floor conditions. Trainees deal with various production processes at the institute's in-house pilot plant facilities complete in all respects related to saw milling, saw doctoring adhesive manufacturing/plywood/block board manufacturing, testing and evaluation etc.

Computer Facilities

Computer will be provided to student with internet facility during the training period for accessing information, project works, assignments etc.

Study tour and Excursions

The excursion visits and study tour are aimed at broadening the perspective of the trainees from actual production systems view point. This also helps the trainees to

1. Learn about strategic approaches used in some factories and to identify critical areas for improvement.

2. Observe merits and demerits of various processing methods adopted by different factories and have discussions with the factory personnel regarding improvement in quality and productivity.

Seminars

Seminar presentations by trainees are organized with a view to develop effective communication skills and to bring out leadership qualities.

Industrial Internship/Training

The aim of industrial attachment is to provide exposure from primary processing to final product making and problems related to wood science and technology and their solutions. Students are expected to do whole process, problem based study and learn the gap between ideal and actual practices followed by industries in commercial wood products manufacturing and study/ suggest the remedial measures to the problems.

5.5 Sports and Entertainment

Sports and Entertainment facility are available for the trainees are given below:
Table Tennis, Volleyball and other indoor games,
Television (For restricted hours only).

5.6 Evaluation and Grading

Module wise evaluation system of trainee's performance is designed to encourage them for active participation in all the components of the training viz. class room lectures, laboratory/in plant practical classes, seminars, project work, excursions and tours, as also general conduct. Evaluation system helps each trainee to measure his achievement in various activities that are essential to make him a professional.

5.4 Course fee

The Course fee is Rs. 94,000/- which is payable at the time of admission. The fees includes Rs. 6500/- as caution deposit & Rs. 6000/- as mess advance which is refundable at the time of completion of the course subjected that no dues are pending from the trainees (fee structure is available on page 8). These amounts are to be deposited in the form of demand draft on any nationalized bank drawn in favor of 'IPIRTI Corpus Fund' payable at Bangalore within two weeks of issue of letter regarding selection or before the commencement of the course whichever is earlier. Candidates sponsored by members of IPIRTI Society are eligible for concession as approved by the Board of Governors.

6. CAMPUS SELECTION

The Institute facilitates recruitment of successful trainees through campus interview, which is arranged towards the end of the course. During the year 2021-22, the institute could place all the trained candidates (100%) in the wood based Industries in various parts of the country. The average package per annum was 3.5 lakh.

7. TEACHING FACULTY

The teaching faculty comprises of highly qualified and experienced scientists and technical staff in addition to guest faculty invited from recognized institutes and/or industry. Guest Faculties from the field of specialization in management and quality control in industry are invited from highly reputed management institute in IIFM, Bhopal to conduct course on management.

8. COURSE FEE

The application fee is 500/- and Course fee is Rs. 94,000/- which is payable at the time of admission. The fees include Rs. 56,500/- as caution deposit and Rs. 6,000/- as mess advance which is refundable at the time of completion of the course subjected that no dues are pending from the trainees. These amounts are to be deposited in the form of demand draft on any nationalized bank drawn in favor of 'THE DIRECTOR IWST-TRAINING' payable at Bangalore within two weeks of issue of letter regarding selection or before the commencement of the course whichever is earlier.

* Account Details:
Account Number: IWST Training Account
Account Number: 392002010007384
IFSC: UBIN0539201
UNION BANK OF INDIA
Malleshwaram - Bangalore

Fee structure:			
a)	Tuition fees (Non-refundable)	:	65000/-
b)	Hostel lodging charge (Non-refundable)	:	9000/-
c)	Caution deposit-Lab (Refundable)	:	3500/-
d)	Study tour (Non-refundable)	:	6000/-
e)	Caution deposit- Hostel (Refundable)	:	3000/-
f)	Mess Charges (Advance)	:	6000/-
g)	Sports & Cultural Activities	:	1500/-
	Total	:	**94000/-**

PLYWOOD PLANT

PARTICLE BOARD PLANT

POST GRADUATE COURSE CONTENT

Module	Topic	Coordinator	Marks	Time (Weeks)
Module 1	Forestry and Wood Science	Dr. M K Dubey	75	03
Module 2	Veneer Production, Saw Milling & Saw Doctoring Technology	Shri. Uday D N	200	08
Module 3	Adhesive Technology	Ms. Sujatha D	200	08
Module 4	Particle/Fiber Boards and Panel Composites from Wood & other Lignocellulosics	Shri. Prakash V	100	04
Module 5	Testing and Standardization of Panel Products	Shri. Anand N	75	02
Module 6	Wood Working and Panel Product Application	Dr. Pradeep Kr. Kushwaha	100	02
Module 7	Human Resource Management	IIFM Bhopal	50	04
Module 8	Industrial Attachment/Internship	Head PPPT	100	12

SAW MILLING PLANT

SAW DOCTORING PLANT

POST GRADUATE COURSE CONTENT
Module 1: Forestry and Wood Science

Objectives: To get basic understanding of Forestry, Agroforestry, TOFs, Wood based industries- scenario opportunities & challenges. Fundamental knowledge of wood as material science, various wood products and processing technologies.

Duration: 3 weeks including assessments.

Assessment		
Particulars	Weightage (%)	Marks
Theory consist of quiz; multiple/short answers etc.	40	30
Assignment	20	15
Practical	40	30
Total	**100**	**75**

Syllabus: Theory

Forestry

- **Forest & Forestry**; Role of forests in climate mitigation.
- Agroforestry, scope and importance in context to wood-based industries.
- **Introduction to Forest Certification**
- **Wood based industries in India** - definition, general characteristics, challenges & outlook for the future.

Wood as a material

- **Introduction to wood**; Basic terms related with wood; Why wood is Good? Characteristics and uses of wood.
- **Structure of wood**: Planes of wood; Macroscopic features; Microscopic features of wood; Chemical constituent of woods.
- **Physical properties of wood**: Density; Moisture content; Shrinkage & swelling; Anisotropic behavior
- **Wood mechanics**: Strength, stiffness, compressive strength, tensile strength, hardness, nail and screw holding etc.
- **Natural durability of wood**; Wood destroying organisms: Fungus, Insects, termites and marine borers

Wood products and processing technologies

- **Types of wood products and wood-based composites** (Plywood, MDF, Particleboard, LVL, OSB etc.)
- **Wood drying** (principle of seasoning, main types of kilns).
- **Wood preservation** principles, requirement of an ideal preservative, methods of treatment
- **Emerging wood technologies**: Chemical modification; Thermal modification; Wood Plastic Composites, Dielectric heating of wood; CLT etc.

Module 2: Veneer Production, Saw Milling & Saw Doctoring Technology

Objective: The objective of this study is to learn about different plywood manufacturing machines and their techniques for veneering, veneer production, sawmills and saw blade doctoring.

Duration: 8 weeks including assessments.

Assessment		
Particulars	Weightage (%)	Marks
Theory : Weekly Snap test and Main Exam at the end	40	80
Weekly Assignments	10	20
Practical: Weekly snap tests, Record writing and Main Exam	40	80
Weekly Assignments	10	20
Total	**100**	**200**

Syllabus:

VENEERING: THEORY & PRACTICAL

General layout for veneer and plywood mill - Objectives, type of arrangement, machines, equipment, space requirement.

Log storage - Need for storage, dry storage, wet storage, precautions in storage.

Steaming and boiling - Heating schedules, effect of heating on properties of wood, advantages and disadvantages of heating.

Preparation of logs for peeling - Cross cutting, debarking and cleaning.

Log centering - purpose and economic importance of centering, centering errors and their influence on veneer yield, methods of centering.

Veneer peeling lathe - Machine parts, cutting action, undesirable movement of wood on lathe, play in lathe machine parts, spindle overhanging, dynamic equilibrium and slackness. Peeling lathe settings-setting of knife, setting of pressure bar and setting of the gap.

Rotary cutting of veneer - Lathe settings and veneer quality, mechanism of veneer formation, type A and type B veneer, effect of pressure bar compression and temperature on veneer yield. Peeling defects, their cause and control - thickness variation, roughness, loose veneer corrugation, raised grain, torn grain, bump formation, wooliness, knife and pressure bar marks. Maintenance of peeling lathe - general procedures, lubricants and lubrication, storage of spare parts for replacement.
Veneer Clipping - Functions, types, clipping efficiency, clipping allowance, veneer yield, dry clipping.

Veneer drying - Purpose, drying variables, moisture movement in veneers during drying, special measures for controlling final moisture content, drying defects and their control, types of dryers, drying time, dryer productivity, dryer capacity. Preparation of flitches for slicing - sawing patterns, cutting plan, tangential cutting, radial cutting, box flitches, half sawn flitches, quarter sawn flitches.

Veneer slicer - Machine parts, cutting action, advantages of slicing, undesirable movement of wood on slicer, play in slicer machine parts, feed by pawl and ratchet, feed to a stop plate offset on vertical face veneer slicer, heat distortion, effect of speed of cutting on veneer quality, slicer settings and veneer quality - setting of knife, setting of pressure bar, effect of knife and pressure bar settings on veneer quality. Tenderizing and veneer finger jointing.

Matching of sliced decorative veneers - Side matching or drawn across, book matching or tuned over or cathedral matching, quartered matching, half quartered matching. Slicing defects, their causes and control. Maintenance of slicer-general maintenance procedure, lubrication.

Knife grinding machine and grinding wheels - Knives, grinding machines, composition, abrasives, grain size, grade, structure, bond, wheel selection, grinding head, grinding bed, coolant, grinding procedures, maintenance. Jointing and splicing of veneers.

Glue spreaders - Components of the machine, operation and maintenance. Hydraulic presses - cold and hot.

Trimming - Machines and operation.

Drum and belt sanders - Machines and operation.

Hydraulic system - Pascal's law, advantages & disadvantages over mechanical system. Pneumatic system.

Boilers - Boiler house, types of boilers and their working methods, problems and remedies, boiler water treatment.

Different measuring instruments - Micrometer, vernier caliper, dial gauge, thickness gauge, bevel protractor, horizontal gap indicator, knife angle indicator, knife height gauge. Types of electric motors used in different machines used in a plywood factory.

Log centering - Peeling lathe parts and operational functions, lathe setting with instruments. Changing of peeling lathe knife. Collection of data on logs, peeling of logs. Collection of veneers/reeling and clipping of veneers. Measurement of veneer recovery, yield calculation, quality evaluation, drying of veneers, shrinkage and moisture content.

Slicer parts and operational functions, setting of slicer with instruments, changing of knife, flitching and boiling, collection of veneers and drying. Quality evaluation of veneers. Jointing of veneers, matching of veneers, veneer recovery measurement and yield calculation. Splicing of veneers, knife grinding, grinding wheel fixing, dressing operation of grinder, concave grinding, cleaning of knife, bevel angle setting, honing, wire edge removal and micro beveling. Thermic fluid boiler parts and functions. Steam boiler parts and functions.

Saw Milling & Saw Doctoring: Theory

Saw Milling Technology

Introduction to sawmills, log storage and log yard operations. Layout of sawmills, ripping and cross cutting. Conversion of logs, cutting patterns, safety in sawmill, band saw machines, circular saw machines. Edger and multiple rip saws machine, material handling and conveyors. Small diameter log processing, partial taper and full taper. Sawn timber sawing variations, size control, seasoning, productivity improvement, finger jointing and edge lamination. etc.

Saw Doctoring Technology

Saw yield - kerf loss, sawmill tool economy, sawmill tool maintenance, edge of cutting tools. Composition of saw-tools, grinding wheels and grinding, glossary for maintenance of circular saws and band saws. Calculations - circular saws, feeds and speeds, methods of improving wear resistance of saw teeth, tungsten

carbide tipped saws. Saw tensioning, band saw cracks, composition of knife steels, planning the saw shop, preventive maintenance. Swaging and spring setting, straining methods of band saws, saw tooth profile, cutting speed.

Saw yield - kerf loss, sawmill tool economy, sawmill tool maintenance, edge of cutting tools. Composition of saw-tools, grinding wheels and grinding, glossary for maintenance of circular saws, calculations - circular saws and tungsten carbide tipped saws. Glossary for maintenance of band saw blades, saw tensioning, band saw cracks, feeds and speeds. Methods of improving wear resistance of saw teeth, composition of knife steels. Planning the saw shop in sawmill. Preventive maintenance and store keeping.

Band saw - wide and narrow band saws, effect of quality production of swaged and spring set saws, straining methods of band saws, tooth profile, cutting speed, chip formation with relation to feed speed, depth of cut and density.

Circular saw - ordinary spring set saws and TCT saws, saws for ripping, cross cutting and trimming, horse power requirements.

Saw Milling Technology (Practical)

General demonstration of saw milling operation: Vertical band head-rig, narrow band saw machine parts and functions including log carriage, wide band saw parts and functions including log carriage, log yard operations/ grading. Mill alignment: Head rig, re-saws and multiple edger, edger saw fixing and handling of circular saws, selection of saws of multiple edger and cross cut machine, calculation of sets and fixing the saws at the edger for various sizes, sawing operation, head-rig, re-saw, edger and cross cut saws, operation of head rig and set works, operation of re-saw for maximum recovery and quality control, sawmill operation.

Sawing of small girth logs, machinery, operation, cross cutting of sawn timber, stacking of sawn timber for air drying, mill maintenance, seasoning kilns, batten preparation and core composing for flush door and block board. Finger jointing and edge lamination.

Saw Doctoring Technology (Practical)

Safety of hand tools and machinery. Levelling and tensioning, spring setting, fabrication of setting gauges and straight edges. Carbide tip brazing and brazing by electrical and oxy-acetylene methods, face and side grinding of TCT saws. Plate saw sharpening by grinding machine, plate saw sharpening and gulleting by manual grinder, sharpening of planer knives and cutters. Maintenance of hand saw axes and saw chain. Preventive maintenance of equipment's for TCT, circular and wood working tools, circular saw alignment, setting and control. Trouble shooting in circular and TCT saws.

Safety of hand tools and machinery, levelling, tensioning and back gauging. Spring setting, jointing by oxy-acetylene welding and brazing.

Finishing of joints, profile grinding by grinding machines. Swaging, pneumatic and manual, sharpening by grinding machines.

Preventive maintenance of equipment for band saw blade maintenance, preparation for stellite tipping and welding of stellite tips. Side grinding, alignment and band wheel maintenance, trouble shooting in band saws.

Sl. No.	Title of the book	Author/Editor Name	Call No.
01	Plywood manufacturing practices	R. F. Baldwin	674.243 BAL
02	Fibre & Particleboards bonded with inorganic binders	Moslemi	674.86:666:96 MOS
03	Modern sawmill Technology	Vernon S White	674.093/WHI
04	Principles of wood science and technology	Kollmann, Franz F. P.	634.0.81:62/KOL
05	Studies on wood in relation to ecological factors	Varghese, Mohan	634.0.16/.18/VAR
06	Information sources on building boards from wood and other fibrous materials		674.861 UNI
07	Handbook of wood chemistry and wood composites	Rowell, Roger M.	634.0.81:54/ROW
08	The chemistry and processing of wood and plant fibrous materials	Kennedy, John F.	676.1/KEN
09	Forest products and wood science	Shmulsky, Rubin	634.0/SHM
10	Plywood Manufacturing practices in India	Nath, S.K.	674.243(54)/ NAT

Faculty Theory and Practical's

Sh. Uday D Nagammanavar, Scientist-F
Sh. Prakash V, Scientist-D
Sh. Ashok Kumar A.C, System Administrator

Practical's Faculty

Sh. K.B. Basavarajaiah

Sh. D. Ravi
Sh. K. Kalyan Chakravarthy
Sh. Jagadeesha
Sh. Arjun
Sh. Harshavardhan. D
Sh. B.R. Chandrashekar

Module 3: Adhesive Technology

Objective: To understand the chemistry and fundamentals of adhesion. It also emphasis on the application of adhesives in different wood composites.

Duration: 08 weeks including assessments.

Assessment		
Particulars	Weightage (%)	Marks
Theory consist of Weekly test and an Exam at the end of Module	80	100
Weekly Assignments	20	100
Total	**100**	**200**

Syllabus:

THEORY

Basic chemistry - Atomic weight, molecular weight, mole concept, equivalent weights, ionic bond, covalent bond, hydrogen bond and Vanderwal forces.

Chemical constituents of wood - Cellulose, hemicelluloses, lignin, extractives. Dimensional stabilization of wood, cross laminating, surface coatings, heat treatment, bulking treatments with various bulking agents, acetylation, cross linking of structural units.

Analysis of raw materials- Preparation of standard solutions of potassium hydrogen phthalate. Standardization of sodium hydroxide, and hydrochloric acid solutions. Estimation of purity of formalin, Para formaldehyde, and. Estimation of free formaldehyde in urea formaldehyde resins. Determination of methanol content in formalin solution.

General aspects of resins, raw materials and resin manufacture - Introduction to synthetic

resins and adhesives, raw materials, resources, characteristics, safety aspects in handling raw materials and resin manufacture. Wood adhesives - types, classification - natural and synthetic origin.

Polymers - Nature of chemical bonds, functional group and its importance in polymerization process, classification of polymers based on monomers. Types of chemical reactions with reference to addition and condensation polymerization.

Theory of adhesion - Forces of cohesion and adhesion of matter in relation to wood, bonding/adhesion mechanism, mechanical adhesion, specific adhesion, aspects of glue line in wood bonding, development of glue line, effect of glue line thickness on bonding.

Phenolic resins - phenol formaldehyde (PF) reaction mechanism, preparation of phenol formaldehyde resin; Partial replacement of phenol with naturally occurring phenolic materials-

Correlation: Scatter diagram, correlation co-efficient and its properties, Regression, fitting of simple linear regression, Trends and concepts in forestry research, Principles of design of experiments ANOVA, Completely Randomized design (CRD), RBD, Transformation of Data, Sample vs. complete enumeration, Simple random sampling (With & without re- placement, Stratified random sampling, Statistics applications.

Preparation of phenol cardanol formaldehyde(PCF), phenol lignin formaldehyde (PLF), Phenol soya formaldehyde resin and tannin based adhesives.

Amino resins - urea formaldehyde (UF) reaction mechanism, preparation of urea formaldehyde, urea melamine formaldehyde resins (UMF and melamine urea formaldehyde resin (MUF).

Adhesive compositions - Fillers and extenders, solvents, tackifiers, thinners, catalysts, plasticizers, thickeners, accelerators, pigments, preservatives, factors affecting glue mixing. Working properties of resins and adhesives - non-volatile content, viscosity, water tolerance, gelation time, pH value, storage life of resin, pot-life of adhesive mix.

Spreading and assembly - Mechanical glue spreader, components of glue spreader and their functions, factors affecting the spread, adhesive spread and coverage, causes of spreading problems, organizing assembly place, plywood construction, method of doing assembly, important factors in assembly work, gluing faults caused by wrong assembly.

Pre-pressing - Concepts and terminologies of pre-pressing technique, advantages and limitations of pre-pressing technique, required facilities and layout.

Hot pressing - effect of moisture content of veneers, effect of pressure and temperature pressure calculations, press schedules for different adhesives, dual cycle pressing.

Gluing faults and remedies - Delamination, blisters, pre-curing, bleed through, warping, starved joints, spotty bonding.

Sanding and finishing - Use of putty for repairing plywood - types of putty, nitrocellulose based and UF based putties and putty application

Decorative overlays and laminates - Types of overlays, advantages of overlaid panels, process for the manufacture of overlays and overlaid panels.

PRACTICALS

Preparation of standard solutions of potassium hydrogen phthalate. Standardization of sodium hydroxide, and hydrochloric acid solutions. Estimation of purity of formalin, Para formaldehyde, and. Estimation of free formaldehyde in urea formaldehyde resins. Determination of methanol content in formalin solution

Preparation of conventional and modified PF resins, UF resin and UMF, CPF resin, Characterization of the resins prepared, Amino resin adhesive formulation for MR grade plywood, PF resin adhesive formulation for BWR and BWP grade plywood, Adhesive application and Plywood making (Laboratory scale).

Suggested Readings

Pizzi, A.., 1983. Wood Adhesive-Chemistry & Technology, Vol 1 & 2, Marcel Dekker Inc, New York.
Pizzi, A, Mittal, K.L., 2003(Revised). Hand Book of Adhesives, Marcel Dekker Inc, New York.
Schultz, J., and M. Nardin. 1994. Theories and mechanisms of adhesion. In A. Pizzi and K.L. Mittal, eds. Handbook of Adhesive Technology, pp. 19–33. Marcel Dekker, New York.
S.K.Nath 2010. Plywood Manufacturing Technology, India.
Sujatha.D, Mamatha B S and Mohanty B N. 2018.Synthetic resin adhesives for panel products.
Terry Sellers.1985. Plywood & Adhesive Technology, Marcell Dekker Inc, New York.
Vogel. 2013. Vogel's Quantitative Chemical Analysis (6th Edition)

Faculty Theory

Ms. Sujatha. D, Scientist – F
Sh. Thanigai K, Scientist – E
Dr Mamatha. B. S, Scientist – E

Practical's Faculty

Ms. Sujatha. D, Scientist – F
Sh. Thanigai K, Scientist – E
Dr Mamatha. B. S, Scientist – E
Sh. Munikrishna
Sh. Srinivas Murthy
Sh. Nagabhushan

Module 4: Particle/Fiber Boards and Panel Composites from Wood & other Lignocellulosic

Objective: To get knowledge of the manufacturing of various wood composites like particle board, hard-board and MDF. The course also describes the block boards, flush doors, compregs, bamboo and bamboo composites.

Duration: 4 weeks including assessments.

Assessment (Total marks 100)		
Particulars	**Weightage (%)**	**Marks**
Theory consist of Weekly test and an Exam at the end of Module	80	80
Weekly Assignments	20	20
Total	**100**	**100**

SYLLABUS:

Particle/Fiber Boards and Panel Composites from Wood & other Lignocellulosic

Particle board (wood and other lignocellulosic materials) - Introduction, particle preparation, drying of particles, adhesives, inorganic binders, additives, adhesive binding, mat forming, hot pressing, dimensioning and sanding, oriented particle board, mineral binders for particle board, formaldehyde emission in particle board.

Fiber board including MDF - Historical aspects of fiber board development, classification of fiber board based on density range, raw materials, adhesives and adhesive blending, dry and wet processes for manufacturing fiber boards, applications, insulation boards.

Basics of Bamboo, Bamboo harvesting, conditioning and treatment. Basics of composite including theory of adhesion.

Bamboo composites - Characteristics of raw material i.e. bamboo mats, strips; bamboo mat based composites, bamboo laminates and bamboo strand lumber - Manufacturing technology, important strength characteristics and end uses.

Compregs - Process of making compregs, adhesives, and uses.

Block boards and flush doors - core preparation, veneers, adhesives, construction, hot press schedules.

Sl. No.	Title of the book	Author/Editor Name	Call No.
01	Modern particleboard	Thomas M. Maloney	674.86/MAL
02	Particle board manufacture	Miller, Howard A.	674.86 MIL
03	Medium Density Fibreboard	FEROPA/FIRA	674.863/EUR
04	Fibre & Particleboards bonded with inorganic binders	Moslemi	674.86:666:96 MOS
05	Principles of wood science and technology	Kollmann, Franz F. P.	634.0.81:62/KOL
06	Information sources on building boards from wood and other fibrous materials		674.861 UNI
07	Handbook of wood chemistry and wood composites	Rowell, Roger M.	634.0.81:54/ROW
08	The chemistry and processing of wood and plant fibrous materials	Kennedy, John F.	676.1/KEN
09	Forest products and wood science	Shmulsky, Rubin	634.0/SHM
10	Wood Technology	M. B. Shrivastava	634.0.81/SHR

11	Bamboo as an Engineering Material	Dr Jules janssen Dr G. Boughton Dr N.S. Adkoli Mr M.P. Ranjan Dr Cherla B. Sastry Dr P.M. Ganapathy Dr I. V. Ramanuja Rao Dr K. Ghavami Mr K. Ravindran	691.12:01/JAN
12	Mechanical Properties of Bamboo	Jules J. A. Jasssen	633.58.539.3/JAN
13	Bamboo in construction - An introduction	D L Jayanetti	633.58:693/JAY
14	Paperboard and board	Robert R.A. Higham	674.862/HIG

Faculty Theory and Practicals

Sh. Uday D Nagammanavar, Scientist-F
Ms. Sujatha. D, Scientist – F
Dr. Mamatha. B. S, Scientist – E
Dr. Vipin Kumar Chawla, Scientist-E
Dr. Pradeep Kushwaha, Scientist
Sh. Prakash V, Scientist-D
Dr. K. Ch. Varadarajulu, Scientist

Practical's Faculty

Sh. K. Kalyan Chakravarthy
Sh. Jagadeesha
Sh. Arjun
Sh. Harshavardhan
Sh. B.R. Chandrashekar

Module 5: Testing and Standardization of Panel Products

Objectives: To get understanding of testing and standards related to wood based panel products. Training on testing of products made from wood and other lignocellulosics.

Duration: 2 weeks including assessments.

Assessment (Total marks 100)		
Particulars	**Weightage (%)**	**Marks**
Theory consist of quiz; multiple/short answers etc.	80	80
Assignments	20	20
Practical	40	30
Total	**100**	**75**

SYLLABUS:

Theory

- Test methods for different panel materials/products from wood and other lignocellulosic materials.
- Role of National Standardization Organization (Bureau of Indian Standards).
- Specifications related to different wood based panel material as per Indian Standards.
- Introduction to Indian standards on wood based composites Testing of Physical and mechanical properties of panel products and the standards requirements Plywood Block Board Particle Board Door Shutters Panel products from other lignocellulosic including Bamboo

Basic Statistics:

Basic concepts of Statistics, Definition, History, variables of statistics, types and sources of data, Graphical representation of data i.e. bar, pie, histogram, frequency polygon, frequency curve, Measures of central tendencies: mean, mode, median, G.M., H.M., Measure of dispersion: Range, S.D., Variance & C.V., Measures of skewness & kurtosis, Theory of estimation & confidence intervals, Test of significance, Sampling distributions-x^2,t,F,

Human resource, Financial, and Accounting Management:

Principles of management, management as science and art, functions of management. Planning, organizing, staffing and controlling. Introduction to HRM, recruitment, training, motivation, appraisal of employees. Labor management and Conflict Management. Effective Communication and Conflict Management. Principals of Financial Accounting and Records Maintenance. Principles of Costing and Cost Management. Cash and Credit Management. Financial statements. Trading and Profit & Loss Account, balance Sheet Time value of money, cost of capital, financial decisions Risk Management: Insurance.

Training in Basic computer education will be an integral of the PGD programme.

Important Specifications converted in the course includes Plywood/Block Board

1. Method of tests	
IS 1734	Methods of test for plywood (Parts 1 to 20 in one volume)
2. Product Specifications	
IS: 303	Specification for general purpose plywood.
IS: 710	Specification for marine plywood
IS: 4990	Specification for shuttering plywood
IS: 1328	Veneered Decorative Plywood - Specification
IS:5509	Specification for fire retardant plywood
IS: 1659	Specification for block boards

Particle Board

1. Method of tests	
IS 2380	Methods of tests for wood particle boards and boards from other lignocellulosic material
2. Product Specifications	
IS: 3087	Specification for wood particle boards (Medium density) for general purposes.
IS: 3097	Specification for veneered particleboards
IS: 12823	Specification for pre-laminated particleboard
IS: 12406	Specification for medium density fiberboards for general purposes
IS:14587	Specification for pre-laminated medium density fiber board
IS:14276	Specification for cement bonded particleboard
IS:15786	Specification for pre-laminated cement bonded particleboard

Flush Doors

1. Method of tests	
IS 4020	Methods of tests for Door shutters
2. Product Specifications	
IS: 2202 (PT 1 and 2)	Specification for Flush door (Solid core).
IS: 2191 PT 1 and 2)	Specification for Flush door (Hollow core).
IS: 1003	Specification for Panel door

Practical

Dimensions, Moisture content, Resistance to water, Resistance to micro-organisms, Modulus of Elasticity, Modulus of Rupture, Glue shear strength, Tensile strength, Adhesion of plies, Water adsorption, Swelling, Internal Bond Strength, Screw withdrawal strength, Door testing (all tests) etc.

Suggested Readings

- Relevant Indian Standards. (Indian/ International standards)
- Study Notes
- Walker JCF (2006) Primary Wood Processing: Principles and Practice; Springer.
- Franz F.P. Kollmann, E.W. Kuenzi,A.J. Stamm (1975). Principles of Wood Science and Technology: II Wood Based Materials, Springer

Faculty

- Mr. AN: Anand Nandanwar
- Mr. KMC: Kiran MC
- Dr. VR: Varada Rajulu KC
- Mr. RK: Ram Kumar VR
- Dr. MR: Manish Ranjan

Module 6: Wood Working and Panel Products Applications

Objectives: To acquire fundamental knowledge of wood as material science, various wood products and processing technologies. Also to get basic understanding of wood-based industries-scenario opportunities and challenges

Duration: 2 weeks including assessments.

Assessment: The trainees will be assessed as per following table:

Description	Weightage (%)	Marks
Theory consist of quiz; multiple/short answers etc.	60	60
Practical	40	40
Total	**100**	**100**

Conventional Woodworking and Finishing

1. Fundamentals of Woodworking

- Wood as a Material": (Information about types of wood, identification of wood, defects in wood both natural and due to attack of insects).
- Properties and uses of wood and panel material (Physical properties, mechanical properties, electrical and acoustical properties).
- Information about types and advantages of seasoning the wood and drying defects

2. Basic Mechanical processing

- Basic workshop calculations like measurement of length, area & volume.
- Working examples on measuring of length, area & volume in British and metric system.
- Working examples on conversion on pressure, power, work done, cutting speed and feed, conversion of temperature.
- "Wood as a layered composite material" like ply board, block board, flake board, glue lam, laminated veneer lumber, cross laminated timber.
- "Wood as a particle composite material" like particle board, medium density fiber board & chip board.

3. Practical on Conventional Woodworking and Finishing

a. Introduction about Hand Tools, Major Operations in Woodworking, Basic Carpentry and Wood Joints. Safety Precautions and Tool Handling Procedure. Solid Wood Processing by Cutting Tools, Shaping Tools, Drilling Tools and other Carpentry Tools.

b. Workshop Safety Precaution, Practical Demonstration on Cutting, Planning, Marking and Surface Inspection and Measuring and Chiseling. Sharpening Techniques of Cutting Tools.

c. Processing of Basic Joints like "Lap joint, Mitre Joint, Dovetail Joint and Tenon-Mortise Joint.

d. Portable Power Tools Demonstration and practicing of Circular Saw and Jig Saw. Demonstration and Practicing of Classical Table Saw, Vertical Band Saw and Radial Arm Saw. Surface Planer, Thicknesser and Horizontal Mortiser.

e. Demonstration and Practicing of Sliding Table Panel Saw Machine - Grooving, Ripping and Cross Cutting.

4. Fundamentals of CNC POD & Rail in 3 Axis Router.

- Introduction about Conventional, NC and CNC Machines
- Machine details, axes details, configuration process.
- Safe practices in woodworking.

Faculty:

Dr. Pradeep Kumar Kushwaha
Mr. K N Prahallad
Mr. H.S. Shashikumar
Mr. C R Vijayakeshava

Technical Support:

Mr. HC Shiv Prasad
Mr. B.M. Chandrasen

Suggested Readings:

- Making Herirloom Boxes by Peter Lloyd – Paperback - 2 Nos.
- The Nature of Woodworking: The Quiet pleasures of crafting by Hand by Rodney Frost Paper Back -2 Nos.
- Human Dimension and interior Space: A Source Book of Design Reference Standards by Julius Panero –Hard Cover – 2 Nos.
- Furniture: World Styles from Classical to Contemporary by Judith Miller – Hardcover-2 Nos.
- The Art of Japanese joinery by Ktyosi Seike –Paper back: 2 Nos
- The Complete Book of Woodworking by Landauer Pub –Paperback – 2Nos.
- Woodworking Basics: Mastering the Essentials of Craftsmanship: An Integrated approach with Hand and Power Tools by Peter Korn –Paperback –
- Understanding Wood finishing: How to select and apply the right finish: 2 by Bob Flexner -Paper back - 2 Nos.
- The Complete Guide to Joint Making by John Bullar – Paper Back -2 Nos. \ILLUSTRATED Cabinet Making – How to design and Construct Furniture that Works – 2Books – (Author Bill Hylton).
- The Complete Illustrated Guide to Furniture & Cabinet Construction -2 Books (Author Andy Rae)

- The Complete Illustrated Guide to Working with Wood – 1Book (Author Andy Rae).
- Work Book Modern Woodworking – 1Book (Author Willis H. Wagner and Clois E. Kicklighter.
- Hoadley, RB (1990) Identifying wood: accurate results with simple tools. Taunton Press.
- Inderdev and Kumar S (1993) Wood Preservation in India, Publisher: Forest Research Institute, Dehra Dun
- Shmulsky, R and Jones, D (2019) Forest Products and Wood Science: An Introduction, 7th Edition, Wiley-Blackwell
- Walker JCF (2006) Primary Wood Processing: Principles and Practice; Springer.

Module 7: Human Resource Management

Objective: To develop and understand human behavior in an around and in industries. The objective of this course is to prepare students for competitive world by developing their personal and professional skills.

Human resource, Financial and Accounting Management:

Principles of management, management as science and art, functions of management. Planning, organizing, staffing and controlling. Introduction to HRM, recruitment, training, motivation, appraisal of employees. Labor management and conflict management. Effective communication and conflict management. Principals of financial accounting and records maintenance. Principles of costing and cost management. Cash and credit management. Financial statements. Trading and profit and loss account, balance sheet, time value of money, cost of capital, financial decisions, Risk Management: Insurance.

Production management, Quality control & Marketing management:

Principles of quality control and assurance (QC), organizing quality control in a plywood industry, structure, objectives, seven tools of quality measurement relevant to plywood manufacturing, application of QC in wood based panel industry, SQC, chance causes, assignable causes, quality characterization, selection of sub groups, control charts for measurements and construction, pattern of control charts, attributes charts, process capability studies, interpretation, uses and risks of control charts, quality assurance programme.

Total quality management (TQM) - introduction, objectives and importance of TQM in plywood industries - quality management in plywood industry, Quality circles, pollution control, waste management, effluent treatment for chemical and adhesive waste, ISO 9000-2000, ISO 14001 EMS, Production planning in wood based industries machine/capacity utilization, time and motion study, job scheduling, elements of work study, (methods and measurement), pollution control. Waste management and effluent treatment of wood and other wastes from wood based panel products, energy management logistics and supply chain management trading procedures. Auction systems, basics of marketing management. Strategic marketing and 4 Ps of marketing, marketing information systems product promotion.

Faculty

- Dr. Manmohan Yadav
- Dr. M.D. Omprakash
- Dr. Ashutosh Verma
- Dr. Jayashree Dubey
- Dr. Jigyasa Bisaria
- Dr. Balkrishna Upadhyay

Module 8: Industrial Attachment/Internship

Objective: The aim of industrial attachment is to provide exposure from primary processing to final product making and problems related to wood science and technology and their solutions. Students are expected to get involved in process, problem based study and learn the gap between ideal and actual practices followed by industries in commercial wood products manufacturing and study/ suggest the remedial measures to the problems.

CLASSROOM

ANNEXTURE-1

IWST

IPIRTI Campus, Bangalore

Post Graduate Diploma Course in Wood and Panel Products Technology

Rules and Regulations for Examinations

1. General

The Post Graduate Diploma Course in Wood and Panel Products Technology provides an exciting opportunity for fresh science and engineering graduates for career in the wood based industry sector. It involves both theoretical and practical training in the science and art of manufacturing panel materials from wood and other renewable natural fibers for various end use applications.

Academic year is generally from November to October of the next calendar year. The eleven-month course, divided in two semesters, includes theory and practical classes, demonstrations, seminars, project work, study tour etc. The performance of the trainees is assessed through snap tests, theory and practical examinations at the end of each semester. The Project work and tours are also assessed.

Scheme of Examination

Examinations are conducted in module wise and each module comprising of theory and practical Examinations as mentioned below:

Attendance:

80% attendance in theory and practical classes is compulsory for a trainee to be eligible for taking examination. Absence in even a single theory/practical class on any day will be computed as absence for half a day absence, and one theory and one practical class on the same day will be computed as absence for one day, unless permitted by the concerned teacher and agreed to by the officer-in-charge training for reasons to be recorded in writing. Trainees whose attendance falls short of 80% in a particular module will not be allowed to appear at the examination.

Award of PG Diploma in WPPT

Post Graduate Diploma will be awarded to trainees who are found successful in the examinations. Merit list will be drawn based on total marks obtained in the modules examination of the related academic year and the following classes will be given:

First Class with Distinction	:	70% and above
First Class	:	60 and above and below 70%
Second Class	:	50 and above and below 60%
Pass Class	:	35 and above and below 50%

Medals and Prizes

Following medals are awarded to the meritorious trainees from each course:

1. Dr. Narayanamurthi's Memorial Gold medal for the trainee securing highest total marks.
2. Smt. Ravikal Kamath, Gold Medal
3. Century Ply Board's Silver medal for the trainee standing second in the merit list.

LOG CENTRING

PEELING

LIBRARY

HOSTEL

ANNEXTURE-2

IWST, Bangalore

Rules and Regulations of the Trainees Hostel

The following are the Rules and Regulations of the IPIRTI Campus Hostel

A. General

1. All trainees are required to behave and conduct themselves in a disciplined way.

2. Each room of the hostel has been provided with the items as per list pasted on the backside of the door in each room. Occupancy of each room is restricted to only two trainees. Hostel inmates are expected to maintain all the items provided to them including furniture and fixtures in a good condition. Any breakages or malfunctioning of the articles should be reported immediately to the Officer-in-charge, Hostel.

3. Defacing of walls, furniture is strictly prohibited. Good hygiene has to be maintained in all the living rooms, common room and surrounding areas.

4. Economy in use of water and electricity must be observed at all times. All the light switches, geysers, water taps, etc. should be switched-off or closed when not in use.

5. Furniture provided in the common room should not be disturbed and good usage of such items is necessary. The common room has been provided with a TV placed in the TV cabinet which should be handled carefully. Any damage caused to the furniture and fixtures provided will be dealt seriously and calls for reimbursement from the trainees depending upon the seriousness of damages/food and tea carrying to common room is strictly prohibited.

6. The common room will be closed at 10 p.m. by group leader of the trainees/security men. It will be opened only in the morning at 7 a.m.

7. One of the trainees will work as group leaders by rotation for liaison between Officer-in-Charge, Hostel and trainees.

8. Good hygiene should be maintained in all the public places especially in bath-rooms, toilets, common-room, etc Throwing of all paper bills, plastics, shampoo cover, thrashes, etc. should be avoided and have to be deposited in dustbins provided. Smoking/Alcoholic drinks are strictly prohibited within campus.

9. The trainees who want to have their rooms moped must tell the sweeper to mop in their presence only once a week i.e., on Saturday.

10. Trainees in their own interest have to secure their valuables, cash, in their safe custody. Institute is not at all responsible for any theft, damage or loss, etc.

11. The hostel is meant only for trainees. No outsiders are allowed to stay in the hostel.

B. Mess

12. Boarding is mandatory for all hostel inmates (trainees). The Mess charges are calculated as a package on monthly basis. On the day of official tour outside Bangalore/Vacation rebates will be allowed, as decided by the authorities.

13. A trainee has to avail leave with prior permission from OIC, HOD/Jt. Director and also inform the OIC, Hostel and in writing the Canteen Contractor about his leaving the Hostel. For a period of leave of more than 4 days, rebate in mess charges will be decided from time to time. No rebate will be allowed for the extended leave period unless the same is intimated in advance and duly approved by the authorities.

14. A trainee shall get a 50% rebate on mess charges provided he goes on leave for minimum 4 days, and 100% rebate for more than 7 days.

15. If the trainee returns to Hostel later than the date mentioned in his leave application, he shall get rebate only till the date mentioned in his application.

16. The trainees shall pay the Mess charges on or before 10th of each month failing to pay a fine of 50/- per day will be charged. Only vegetarian food will be served in the hostel at the rates approved by the Food Committee. One trainee on the Food Committee will be nominated by Estate officer as a food committee member.

17. The following timings will be observed in the hostel canteen for catering.

Morning coffee/Tea	..	6.00 a.m. to 6.30 a.m
Breakfast	..	7.30 a.m. to 8.30 a.m
Lunch	..	1.00 p.m. to 2.00 p.m
Refreshments	..	5.30 p.m. to 6.15 p.m
Dinner	..	8.00 p..m to 9. 30 p.m

Food will not be served in the rooms or in the common room. Trainees must not take food/tea to their rooms or to the common room.

C. Games and Sports

18. Trainees can play games badminton/T.T. between 5.30 - 6.30 p.m. at the venue meant for these games. Trainees are required to dress appropriately for games.

19. Playing games inside hostel quadrangle is strictly prohibited.

Issued by the order of the Director

Officer-in-Charge,
IPIRTI Campus Hostel

Physics Lab

AWTC Lab

ANNEXTURE-3

INSTITUTE OF WOOD SCIENCE AND TECHNOLOGY (IWST)

(An Autonomous body of the Ministry of Environment Forest & Climate Change, Govt. of India)
Post Bag No-2273, HMT Link Road, OFF Tumkur Road, Yeshwanthpur, Bengaluru, Karnataka 560022
Ph.: 080-22190101, 23341731, 22190117; 080-30534037; 080-30534005; Fax: 0091-80-23340529
E-mail: director_iwst@icfre.org; director.iwst@gmail.com; sujathad@icfre.org
Web sites: http://iwst.icfre.gov.in;

Application form for admission to One Year Post Graduate Diploma Course in Wood and Panel Products Technology 2023-2024

Application form No. (For office use only) .....

Transaction ID/D.D. No .....

Dated .....

Bank Name .....

Amount …….....……

Affix Passport Size Photograph

APPLICATION FORM

I. GENERAL (1-7)

1.	Name of the candidate (in BLOCK CAPITAL LETTERS)	
2.	i) Age, as on 1.11.2023 ii) Date of birth as recorded in SSLC/ Matriculation Certificate	Years Day Month Year
3.	Name of your Father/Guardian and Occupation	
4.	Full postal address for communication (in Block capitals) with phone/mobile no. and email: State to which you belong to	

5.	Do you belong to Reservation Category. Say Yes/No If Yes, please furnish the category you belong (enclose certificate)	Yes No SC/ST/OBC
6.	Are you a Sponsored candidate by Wood based Industry	Yes No
7.	Whether you need Hostel Accommodation	Yes No

II Academic Record

8. Educational Qualifications:

Sl. No.	*Exam passed	Subject Branch	Year of passing	No. of attempts	Board/ University	Maximum Marks	Marks obtained	% of Marks	Class declared	Remarks
	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										

N.B: *Please use additional sheets, if need be.
Please enclose attested copies of certificates (original certificates not to be sent)

III. FOR SPONSORED CANDIDATES

9. If your answer is 'Yes' for item No.6 under I, please forward this application through your Sponsoring Authority:

I hereby sponsor Shri ..... Graduated from .....

University for undergoing One Year Post Graduate Diploma Course in Wood and Panel Products Technology at IPIRTI, Bangalore.

Date: .....

Signature of the Sponsoring
Authority with their company seal

Place: .....

Declaration:

IV I hereby declare that the particulars furnished in this form are true to the best of my knowledg and belief. If any information is found to be untrue/false, I am liable to be disqualified from PG Diploma Course.

Date: .....

Signature of the Candidate

CHEMISTRY LAB

BIOLOGY LAB

ICFRE-Institute of Wood Science & Technology

(An Autonomous body of the Ministry of Environment Forest & Climate Change, Govt. of India)
2H6C+G52, 18th Cross Rd, Kodandarampura, Malleshwara, Bengaluru, Karnataka 560022
Ph.: 080-22190101, 23341731, 22190117; 080-30534037; 080-30534005; Fax: 0091-80-23340529
E-mail: director_iwst@icfre.org; director.iwst@gmail.com; sujathad@icfre.org
Web sites: http://www.iwst.icfre.gov.in;

LANDMARK - IWST (PIRTI Campus), BANGALORE