

UNIVERSITY COLLEGE OF TECHNOLOGY SARAWAK
Bachelor of Technology (Hons) in Wood Products Processing (MQA/PA 9349)



PROGRAMME SYNOPSIS

Year 1 Semester 1

Course: EWT 3012 Biodiversity

Synopsis:

This course covers the concepts of biological diversity, with the emphasis on understanding all aspects of species diversity. Species diversity of the organisms surveyed prokaryotic organisms to higher plants and animals. Large groups of phyla or different divisions of the environment are discussed in terms of structural diversity, adaptation, impact to the environment. Importance of each group of organisms to humans will also be discussed.

Course: EWT 3023 Forest Science

Synopsis:

This course covers all type of important forests, forest component, as well as the characteristics of various forests found in in Malaysia and the rest of the world. The students are exposed to the forest ecosystem components which relates life with biotic and abiotic environment. Students will also be provided with information related to human relationships with a number of concepts that affect forest ecology such as biological diversity, forest disturbance and conservation. This course will teach students to discuss current issues, especially matters related to the economic and legal orally.

Course: EWT 3043 Non-Wood Bio-Resources

Synopsis:

The course presents basic general knowledge to some of the main bio-natural resources that are economically important to the country. Important wood and non-wood species will be introduced to students. At the end of the course, the students are expected to know properties of the materials and as well the manufacturing processing involved in producing of these products. This course will teach students to discuss current issues, especially matters related to the economic and legal orally.

Course: EWT 3053 Wood Identification and Anatomy

Synopsis:

This course discusses the general structure and properties of wood structure in particular diagnostic value. The course also describes techniques for the identification of wood and also provides detailed exposition of the physical and structural characteristics important for

commercial timber and also other forest product. Information relating to the tree classification, nomenclature and classification of timber as well as other forest product in Malaysia are also taught in this course so that students can learn the correct terminology used in the timber and other forest product trade.

Course: UCS 3112 Communication in the Workplace

Synopsis:

This course comprises of basic knowledge and skills in workplace communication, providing a fundamental exposure and guide to the various forms of communication in the workplace covering both verbal communications and written communication. These include practice in conveying ideas and opinions, writing proposals and business letters, preparing reports, oral communication and presentation.

Course: MPU 3113 Hubungan Etnik

Synopsis:

This course focuses on the concepts of culture and ethnic relations, especially emphasize on the latest development in Malaysia. It includes the concepts of ethnic relation, insights of ethnic relations in Malaysia in the aspects of economics, politics, constitutions and religions in Malaysia. It also discuss about the challenges for the enhancement of the ethnic relation and the roles of the government and the society.

Course: MPU 3312 Malaysian Economy

Synopsis:

This course provides the student with an overview of the Malaysian economy and its economic interaction with other countries. Various topics will be discussed, including: The fundamental of Malaysian Economic structure, government policies, economic sectors (agricultural and industrial, services), social issues (education, poverty, population, labour force) and economic plans and policies towards high income economy (Iskandar, NCER, ECER, SCORE, and SDC)

Year 1 Semester 2

Course: EWT 3033 Wood Physics and Mechanics

Synopsis:

This course discusses the anatomy and wood structure in general and diagnostic properties of wood. Information and knowledge on this topic is very important for the identification and classification of wood. Among other topics discussed are the microscopic features, physical, mechanical, strength, durability and quality and defects of natural wood.

Course: EWT 3083 Wood Machining and Manufacturing

Synopsis:

This course discusses the raw materials, resins, manufactured products, the application of product manufacturing technology, product standards and issues related to wood processing

industry. Emphasis is placed on processing technology and the timber industry activities to ensure efficiency of resource use raw materials efficiently and optimally. Among other topics discussed were commercial timber species, and the use of timber resources, physical and mechanical properties, adhesive and finishing, wood technology, and composite panel products, processing and furniture production and wood product quality management.

Course: EWT 3153 Wood Chemistry

Synopsis:

This course discusses the anatomical and chemical structure of wood components in more detail. Information and knowledge about the chemical characteristics are very important in determining the suitability of wood and non-wood materials for use in the end. Among other topics discussed were the strength of wood chemistry, wood polysaccharides, lignin, extractives, bark, pulp, the availability of wood and cellulose chemistry and biochemistry of wood decay.

Course: EWT 3373 Forest Management

Synopsis:

Students will be exposed to the definitions of forest plantations and the differential between forest plantations with other agricultural farms. Emphasis is also given to the design field, preparation of nursery, nursery care and the farm. Students are also taught related factors that affect farm and environmental issues as a result of forest plantations.

Course: EWT 3083 Wood Primary Processing Technology

Synopsis:

The overall purpose of this course is to provide students with an understanding of the complexity of the wood processing industry - an optimization problem where maximal value yields are sought from a limited amount of the basic commodity, wood, which is sorted according to its characteristics in order to meet the demands posed on the final product in terms of both aesthetics and technical properties. There is also the question of selecting the appropriate manufacturing methods

Course: MPU 3123 TITAS

Synopsis:

This course focuses on the concepts of culture and ethnic relations, specially emphasizes on the latest development in Malaysia. It includes the concepts of ethnic relations, insights of ethnic relations in Malaysia in the aspects of economics, politics, constitutions and religions in Malaysia. It also discuss about the challenges for the enhancement of the ethnic relation and the roles of the government and society.

Year 2 Semester 1

Course: EWT 3063 Wood Drying and Dimensional Stability

Synopsis:

This course focuses on the important of wood drying. *Woodworking*: when wood is used as a construction material, whether as a structural support in a building or in woodworking objects, it will absorb or desorb moisture until it is in equilibrium with its surroundings. Equilibration (usually drying) causes unequal shrinkage in the wood, and can cause damage to the wood if equilibration occurs too rapidly. The equilibration must be controlled to prevent damage to the wood. *Wood burning*: when wood is burned, it is usually best to dry it first. Damage from shrinkage is not a problem here, and the drying may proceed more rapidly than in the case of drying for woodworking purposes. Moisture affects the burning process, with unburnt hydrocarbons going up the chimney. If a 50% wet log is burnt at high temperature, with good heat extraction from the exhaust gas leading to a 100 °C exhaust temperature, about 5% of the energy of the log is wasted through evaporating and heating the water vapour. With condensers, the efficiency can be further increased; but, for the normal stove, the key to burning wet wood is to burn it very hot, perhaps starting fire with dry wood.

Course: EWT 3073 Statistics in Forestry and Forest Products

Synopsis:

This course will equip students with statistical methods for carrying out experiments in biology, principles and rules in an experiment with the use of experimental design and analysis. Techniques including analysis of variance to test treatment effects, using the LSD mean comparison, and contrast multiple range test. Linear regression methods to test the trends described curve-linear. Basic experimental design, including a completely randomized, randomized complete block, Latin square and split plot. Analysis of main effects and interactions in factorial experiments. Chi square and nonparametric methods. Practical covers the use of statistical software. Skills will be emphasized through practical incorporate the use of statistical software.

Course: EWT 3113 Wood Damage and Control

Synopsis:

This course discusses the causes of deterioration in wood, wood preservation and protection. Emphasis is given to the curing and drying of wood associated with the use of wood products, wood technology, wood science and applied biological sciences to ensure the quality of wood and wood products last longer. Among other topics discussed was the durability of wood, wood destroying agent, the method preservation, protection and treatment as well as economic aspects of wood in wood preservation.

Course: EWT 3123 Wood Adhesive and Adhesion Technology

Synopsis:

This course introduce the basic concepts of adhesion, and then build on these concepts with specific attention to wood. Upon completion of the course, students will have better understand the unique bonding characteristics of wood. They will be better prepared to analyze existing problems and performance, and evaluate new applications.

Course: EWT 3213 Pulp and Paper Technology**Synopsis:**

This course provides an overview of the relevant pulp and paper manufacturing process. This course will discuss the characteristics of wood and wood fiber, handling timber and wood chips, various methods of pulp used (including cookware, pulp processing, and recovery chemically), inventory stock paper machine, paper making, characteristics and testing pulp and paper, process control and environmental considerations for paper and pulp industry.

Course: UCS 3122 Professional English: Essential Communication Skills**Synopsis:**

This course provides a comprehensive reference guide on technical communication principles, skills and practice in workplace. It explains the principles of effective communication, both written and oral, and provides solid advice and practical guidelines on how to strengthen communication skills and produce good technical writing. It introduces the theory, specimen documents, suggested layouts and explanations that develop skills and understanding.

Course: UCS 3412 Bahasa Kebangsaan/English Language**Synopsis:**

Kursus ini membolehkan pelajar meningkatkan kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi secara lisan, konteks rasmi, kreatif dan bukan kreatif. Mata pelajaran ini disediakan untuk mempertingkatkan kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi dengan lisan dan tulisan dalam konyeks rasmi, kreatif dan bukan kreatif.

Course: MPU 3412 Co-curriculum**Synopsis:**

Students will take part in organizing university's and outside events to gain opportunity of training and learning of specific techniques and skills related to the themes of the events apart from participating in soft skills improvement programs while joining other outdoor sports activities. These will allow students to practice effective communication skills, both verbally or written, polish managerial skills while becoming leaders and managing events in the university, and cultivate awareness of lifelong learning while exposing to well-diversify of knowledge, skills and techniques.

Year 2 Semester 2

Course: EWT 3093 Forest Products Economics

Synopsis:

This course provides a comprehensive introduction to the important issues of the forest economics. The employment of the economic tools were used to study the allocation of land among alternative activities such as agriculture, grazing and forestry which impact upon the landscape. The general economic concepts of well-being, welfare measurement and economic rents before providing a synopsis of various environmental economic issues including non-market valuation, cost-benefit analysis and sustainable development.

Course: EWT 3133 Wood Quality Improvement

Synopsis:

This course discuss ways to improve quality of wood. Wood quality is very important to ensure that the next wood products of high quality. This course also emphasizes the properties of wood, types of wood modification for the purpose of getting quality wood sera methods appropriate modifications. Next, students will also learn the importance of wood modification for purposes of commercialization. Modification of wood is also very important for future development and the environment.

Course: EWT 3143 Wood Composites

Synopsis:

The course explain the production of wood-based composite materials from wood and non-wood natural resources. Timber classification based on the determination of the physical properties and mechanics are also discussed. Composite wood products such as plywood, chipboard, particleboard, MDF, laminated veneer lumber, compressed wood and other wood composites will be discussed. Advance operation to increase the use of wood composites value-added activities such as coatings and adhesives will also be focused. The use and importance of composite wood products nowadays also focused on improving the understanding of the students.

Course: EWT 3233 Environmental Impact Related to Wood Industry

Synopsis:

Poorly planned and implemented extraction of timber and non-timber products, industrial activities, construction of facilities for recreational activities in the forests and waste accumulation cause direct and indirect negative impacts on forest plant and animal resources, and on ecological functions of forests such as the conservation of biological diversity and carbon and water cycles. They also impact human health and the cultural and social foundations in and around areas of active forest utilization. The negative environmental

consequences vary in the severity, irreversibility and significance depending on the form of forest utilization. The impacts might be felt at the local level or have global significance.

Course: EWT 3293 Furniture Manufacturing Technology

Synopsis:

This course focuses on different classification and characteristics of furniture, ergonomics aspects, engineering design and technical documentation of furniture. It also covers the aspects such as stiffness and strength analysis of skeletal furniture, stiffness and strength analysis of case furniture, stiffness and strength analysis of upholstered furniture

Course: UCS 3212 Creativity and Innovation

Synopsis:

This subject explores creativity and innovation thinking skills with an exposure of principles of thinking, methods of generating ideas, creativity in problem solving techniques, creativity in writing as well as giving the experience of producing creative and innovative product through project given.

Year 3 Semester 1

Course: EWT 3033 Timber Trade and Industrial Law

Synopsis:

This course delivers an in-depth knowledge of trade flow of timber and timber products as well as non-wood forest products. This course will also touches on law related to wood based industry, the Labour law (Workers Act 1955, Workers Compensation Act 1952, Safety and Health Act 1994, Factory and Machinery Act 1967, environment related law (Environment quality Act 1974). This course also discuss the role of law in the management of the wood based industry. Students will be introduced to international trade practices and aspects of globalization and trade liberalization. In addition, they will be exposed to theories pertaining to international trade including topics on regional economic integration. Discussions on trade strategies relating to market entry, international market management as well as current issues in trade, including trade barriers, will also be included.

Course: EWT 3163 CAD/CAM Modelling for Wood Technology

Synopsis:

This wood products design course designed to introduce students to the basic construction architecture and some basic structure engineering in the design of wood products. Design techniques for wood component parts such as beam, columns and joinery techniques are introduced. In addition, students introduced to basic use of computer application in 2D and 3D perspective, the basic modelling and design using CAD/CAM Modellings. Students also have opportunity to design their own wood products using the know;edge taught to them.

Course: EWT 3183 Current Issues in Tropical Wood Industry**Synopsis:**

This course highlights the effects of global trends in the tropical wood industry on local wood production in Malaysia and actions and measures related to the issues. The discussion includes issues on shortage of wood resource, the effect of wood industry to the environment, and wood international trading. Special emphasis is given to policy making and amendment of Wood Industrial Act, Wood Certification, and International Standard Organisation (ISO). A case study will be conducted in this course.

Course: EWT 3403 Wood Finishing Technology**Synopsis:**

This course discuss ways to improve quality of wood by finishing. Wood quality is very important to ensure that the next wood products of high quality. This course also emphasizes the properties of wood, types of wood modification for the purpose of getting quality wood sera methods appropriate modifications. Next, students will also learn the importance of wood modification for purposes of commercialization. Modification of wood is also very important for future development and the environment.

Course: MPU 3212 Entrepreneurship Skills**Synopsis:**

This course also provides an understanding of an individual as entrepreneur and the process of creating and growing a new venture. The topics include theory of entrepreneurship, types of entrepreneurship, the importance of entrepreneurship and factors affecting entrepreneurship, entrepreneurship develop in Malaysia, entrepreneurial creativity and innovation, opportunity identification, business plan, business support system and form of business entities and relate legal requirements.

Year 3 Semester 2**Course: EWT 3298 Industrial Training****Synopsis:**

EIGHT weeks on job training at (any of the following) material suppliers, wood-based firms, government agencies and statutory bodies. Work experiences is recorded in work diary, training report and presentation upon completion.

Year 4 Semester 1

Course: EWT 3173 Energy from Biomass

Synopsis:

This course explores the potential of biomass energy to close the urban-rural energy gap, raise farmer incomes, and mend the environment. Its findings are instructive for other developing and medium-income countries exploring energy-for-all strategies. It also covers the promises and limitations of leading biomass energy technologies and resources for various distribution scales, including but not limited to household biogas digesters. It also provide the knowledge and understanding of biomass that is set to play an increasing role in the supply of energy, both in the industrialized world and in developing countries, as concern for the state of the global environment grows.

Course: EWT 3304 Final Year Project 1

Synopsis:

The module encompasses the methods of the project research, experimental design, data collection and analysis, results obtaining and interpretation, in order to solve the wood science and technology problems.

Course: EWT 3413 Engineered Wood Products

Synopsis:

This modules covers engineered wood products (EWP) including glued laminated timber, finger joints, plywood, stressed skin panels, mechanically and adhesive bonded web beams and connected and nail plated trusses. Significant developments in the range of EWPs for structural applications with materials such as laminated veneer lumber (LVL), parallel strand lumber (PSL), laminated strand lumber (LSL), prefabricated I-beams, metal web joists and 'massive' or cross-laminated timber (CLT) becoming more widely available will also be covers. These EWPs are typically manufactured by adhesively laminating together smaller softwood sections or laminates (e.g. glulam and CLT) or veneers or strands of timber (e.g. LVL, LSL and PSL). The varying performance of EWPs is influenced by the size of wood component used in the product. At one end of the spectrum smaller sections of timber are laminated and finger jointed to form sections of glulam, whilst at the other end, reconstituted board products such as oriented strand boards (OSBs) and medium density fibre boards (MDFs) use small wood strands or fibres bonded together.

Year 4 Semester 1

Course: EWT 3313 Forest Products Marketing

Synopsis:

This subjects provides general introduction about the types of marketable forest products and wood products marketing the latest in the market, the evaluation of wood products markets involving statistics on the global and local levels. Concepts and theories of marketing, strategic marketing of forest products, promotions and related agencies will also be discussed. In addition, wood quality and latest grading system was also introduced in this course. Import and export procedures for wood products is also included in the syllabus. Current issues related to marketing of forest products, problems and challenges are also discussed intended to expose students to the real situation outside the classroom.

Course: EWT 3314 Final Year Project 2

Synopsis:

The module encompasses the methods of the project research, experimental design, data collection and analysis, results obtaining and interpretation, in order to solve the wood science and technology problems.

Elective Subjects

Course: EWT 3103 Industrial Ecology

Synopsis:

This course discusses environmental issues and relationships with business, industry, technology and management of industrial development. Emphasis is given to the concept of the natural ecology and its application in the manufacture of industrial activities to ensure efficient process the use of resources by adopting optimization of resources and waste. Other topics discussed were the framework of physical, chemical and biological, and their relevance to consumer technology, governance, law and economics, design and operating environment, life cycle assessment and interpretation.

Course: EWT 3193 Timber Construction and Design

Synopsis:

This course focuses on one of the most prevalent methods of timber constructing buildings in Malaysia and the rest of the world. Key issues in the understanding of timber as a modern engineered construction material with controlled and documented properties, the background for design of structural systems based on timber and engineered wood products and the background for structural design of joints in structural timber systems will also be discuss.

Course: EWT 3223 Utilization of Wood Waste and Agricultural Residue

Synopsis:

This course is designed to evaluate wood waste and agriculture residue utilization in Malaysia, as well as issues related to the uses of recycling materials. At the end of the course, students will learn about the wood waste conversion techniques and the importance of conservation, management and sustainable use timbers from the forest and plantation.

Course: EWT 3323 Wood Industry Management and Finance

Synopsis:

This course focuses on the management and financial of wood industry in terms of theory and practical. Forestry has long been in a rather favorable position by offering a valuable raw material source in high demand. However, with rapidly changing end-user demands and cost competitiveness within the forest and wood chain as a whole, the industry needs to adapt. Explaining entrepreneurial action as part of a chain of comprehensive value-added processes leads to a new perception of forest production and wood processing.

Course: EWT 3333 Natural Bio-Products

Synopsis:

This course focuses on bio-products commodities derived from biomass. Bio-mas is any type of microbial, plant or organic material (both new or waste) that is available on a renewable or recurring basic. Bio-products include a broad range of commodities with applications to markets such as energy, transportation, chemicals, plastics, foods and food products, pharmaceutical, nutraceuticals, and various other consumers goods. The bio-products industry is a natural

extension of the forestry, non-timber forest products, biotechnology, agricultural, marine, materials and manufacturing industries. Bio-products from these sectors will form the new bio-economy. The bio-economy has potential to stimulate employment and generate wealth in rural communities.

Course: EWT 3423 Timber Engineering

Synopsis:

This course focuses on timber engineering in Malaysia and the rest of the world. Timber Engineering deals not only with the structural aspects of timber construction, structural components, joints and systems based on solid timber and engineered wood products, but also material behavior and properties on a wood element level. This course also discuss on the material behavior of solid wood and engineered wood products. Topics on the 'Basic properties of wood-based structural elements', 'Design aspects on timber structures' and 'Joints and structural assemblies', will also be discuss.

Course: EWT 3433 Furniture Design

Synopsis:

The techniques of wood furniture design cover the furniture specification, calculations, timber selection, types of design, joineries and quantitative aspect. This course introduces students to the technical drawing and techniques of wood furniture design and explains how to prepare technical drawings of furniture design manually and using auto-cad software. The quantitative aspect covers the discussion on the furniture design and costs. The practical training includes the technical drawing and hands-on training on wood furniture design and, visits to wood furniture factories.

Course: EEM 3523 Industrial Safety an Health

Synopsis:

The module covers basic practical safety such as electrical, fire, environment safety as well as occupational safety and health.