

Bachelor of Science of Plantation Management

External Degree

Prospectus and

By-Laws

Faculty of Agriculture and Plantation Management
Wayamba University of Sri Lanka
Makandura, Gonawila

2020

Name of Degree

Name of Degree	English	Bachelor of Science in Plantation Management External Degree
	Sinhala	විද්‍යාවේදී වැවිලි කළමනාකරණ බාහිර උපාධිය
	Tamil	பெருந்தோட்ட நிர்வாகத்தில் விஞ்ஞானமாணி வெளிவாரிப் பட்டம்
Abbreviated qualification	English	B.Sc. (PM)

An Introduction to the B.Sc. (Plantation Management) External Degree Programme

B.Sc. (Plantation Management) degree programme is offered by the Faculty of Agriculture and Plantation Management of Wayamba University of Sri Lanka. This degree programme is a new dimension of managerial and technological development specially designed for senior and middle level managers, executives, technical officers in the plantation and related sectors towards corporate level development. From the global point of view, it is evident that the success of business and industry has a greater bearing upon scientific and conceptual professionalism mainly to face future challenges to be competitive and sustainable. In the past, the higher education institutes in Sri Lanka have not developed programmes to attract the management or executive level personnel in the plantation sector to provide them with opportunities in upgrading their educational background to degree level. This is the first time in Sri Lankan history that a local university has come forward to develop a degree program in Plantation Management targeting the senior and middle level managers, executives, technical officers in the plantation sector. Hence the objectives of this programme are as follows:

- To provide a high degree of scientific background in advanced plantation crop production technology and aspects of management (conceptual and theoretical).
- To help plantation managers and executives to identify global changes with regard to technology, external environment, tendencies of markets for plantation crops, consumer behaviour and social trends.
- To improve the skills in diagnosing production, technological, market, labour and management problems on micro and macro basis.

The study programme is basically targeted for the officers from the Plantation Management Companies, Tea Small Holder Development Authority, Rubber Development Department, Tea Board, Coconut Cultivation Board, Crop Research Institutes (TRI, RRI, CRI, SRI), Department of Export Agriculture, Department of Agriculture, Department of Agrarian Services, Department of Animal Production and Health, National Livestock Development Board, Janatha Estate Development Board (JEDB), Sri Lanka State Plantation Cooperation (SLSPC), Mahaweli Authority, Banks and other relevant institutions in the country. According to the

recruitment criteria all recruits to the degree programme should have substantial level of working experience in their field of specialization and should be employed.

The three year B.Sc. (Plantation Management) degree program was first introduced in 2006 and study program had 120 credits. In 2013 curriculum of the B.Sc. (Plantation Management) study program was revised first time under HETC/UDG/EDP grant. During the curriculum revision new course modules were introduced and the credits were reduced from 120 to 93. Again curriculum was revised according to SLQF guidelines in 2019. In the second curriculum revision new course modules and optional courses were introduced and increased credit number to 100 again. This revised curriculum will be in operation from year 2020 with 15th Intake.

Wayamba University of Sri Lanka

The Wayamba University of Sri Lanka (WUSL) is one of the 15 National Universities coming directly under the University Grants Commission (UGC) of Sri Lanka and the WUSL was established in 1999 at Kuliyaipitiya in the North Western Province (NWP) of Sri Lanka, under the provisions stipulated in the University's Act. No 16 of 1978. The WUSL was set up in three locations (Makandura, Kuliyaipitiya and Labuyaya) with six faculties.

The WUSL is a result of the elevation of two (2) Affiliated University Colleges (AUCs) initially to the status of a campus and later to the status of a full-fledged National University. In 1991, the UGC established a number of AUCs in the country with the aim of conducting two year Diploma level vocational programs for the students who had completed their Advanced Level Examination and who were unable to get admission to the local National Universities. In 1991, including the Open University of Sri Lanka there were 08 National Universities in Sri Lanka. The AUC of North Western Province (NWP) was established along with a number of other AUCs and the Diploma programs it was supposed to conduct at the AUC (NWP) were Diploma in Home Science and Nutrition, and Diploma in Agricultural Sciences. The Agricultural Sciences program was located at Makandura and the Home Science and Nutrition program was located at Kuliyaipitiya and these two Diploma Programs were affiliated respectively to Peradeniya and Kelaniya Universities.

In 1996 a number of new universities were established by elevating the existed AUCs in the country and in this context the AUC (NWP) was initially, elevated to the status of a campus of the Rajarata University of Sri Lanka and it was named as Wayamba campus of the Rajarata University of Sri Lanka. In 1999 the Wayamba Campus of Rajarata University of Sri Lanka was elevated to the status of a full-fledged National University and it was named as Wayamba University of Sri Lanka (WUSL).

The Faculty of Agriculture and Plantation Management and the Faculty of Livestock, Fisheries & Nutrition were established at Makandura which is situated in between Colombo and Kuliyaipitiya. The main University is located at Kuliyaipitiya, and the Faculty of Applied Sciences, the Faculty of Business Studies and Finance and Faculty of Technology are

established in Kuliyaipitiya premises. Faculty of Medicine is established in Labuyaya Premises. In addition to the six Faculties there are seven (7) units and centres namely: Information Communication Technology Centre (ICTC), Health Centre, the Physical Education Unit, Staff Development Centre (SDC), Career Guidance Unit (CGU) and the External Affairs Unit. The ICTC, CGU and the Health Centre maintain separate Units in both Makandura and Kuliyaipitiya Premises. The total student population is around 4,429 in all six faculties with a number of 209 academic staff members and 470 administrative, academic support and non-academic staff members. The WUSL offers, nineteen (19) undergraduate degree programs leading to General degree (duration 03 years) and Special degree (duration 04 / 05 years) along with Postgraduate degrees leading to Masters and PhDs.

When considering the development of the WUSL it has a paramount role to play in the coming years and the goals, objectives and activities, and the officers responsible for are appropriately identified.

Vision and Mission of the University

Vision

“To be a leading higher education institute in Sri Lanka recognized for its outstanding academic programmes, innovative research, scholarship and outreach with the ultimate target of serving the mankind”

Mission

“To develop highly qualified and responsible citizens who contribute to the improvement of society and sustainable development of the country”

University continuously designs and develops programs for undergraduates and produce quality and relevant graduates. Further, it also designs and develops an advanced, comprehensive academic and professional training for all the levels of managers with a view to enabling them to be effective and efficient in their respective organizations, meeting the national development goals of the country.

University formulates empirical vs conceptual researches in different disciplines in searching for knowledge through systematized efforts to gain new knowledge, helping policy makers at all the levels; institutional, national & international.

Having these values, *i.e.* designing and developing quality undergraduate programs, and producing quality graduates in respective disciplines, providing academic and professional training in order to be more efficient and effective, and searching for new knowledge through research, it's goals, objectives along with activities have been formulated.

There is a well-qualified academic staff in most of the Departments and their contribution during the past decade towards the development of the body of knowledge is commendable and a substantial recognition has been earned by the lecturers and the graduates from the industry and the society through dissemination of knowledge, research, community services and other outreach activities.

With the great commitment of the students, lecturers and the other academic, administrative and support staff, the services are delivered, targets are met, and the organizational development is ensured reasonable levels of resources both human and physical, are needed in order to achieve an acceptable growth and development in all the aspects of the University.

Graduate Profile

Graduate in ‘Bachelor of Plantation Management’ of the Wayamba University of Sri Lanka enriches with:

- a multi-disciplinary ‘Knowledge’ on the fundamental theories and applications, both well-established and emerging, as well as the tools and techniques that are in use and relevant to those principally concerned areas in agriculture, in broad, and plantation management, in particular;
- ‘Technical and Life Skills’ so that he/she can apply such in those areas of interest with ‘Right Attitudes’ and an ‘Entrepreneurial Mindset’ to uplift the systems combining plantation management, and
- Work in harmony with the people in society, by better utilizing the physical, human and financial resources in hand, to support achieving the long-term development goals of the country.

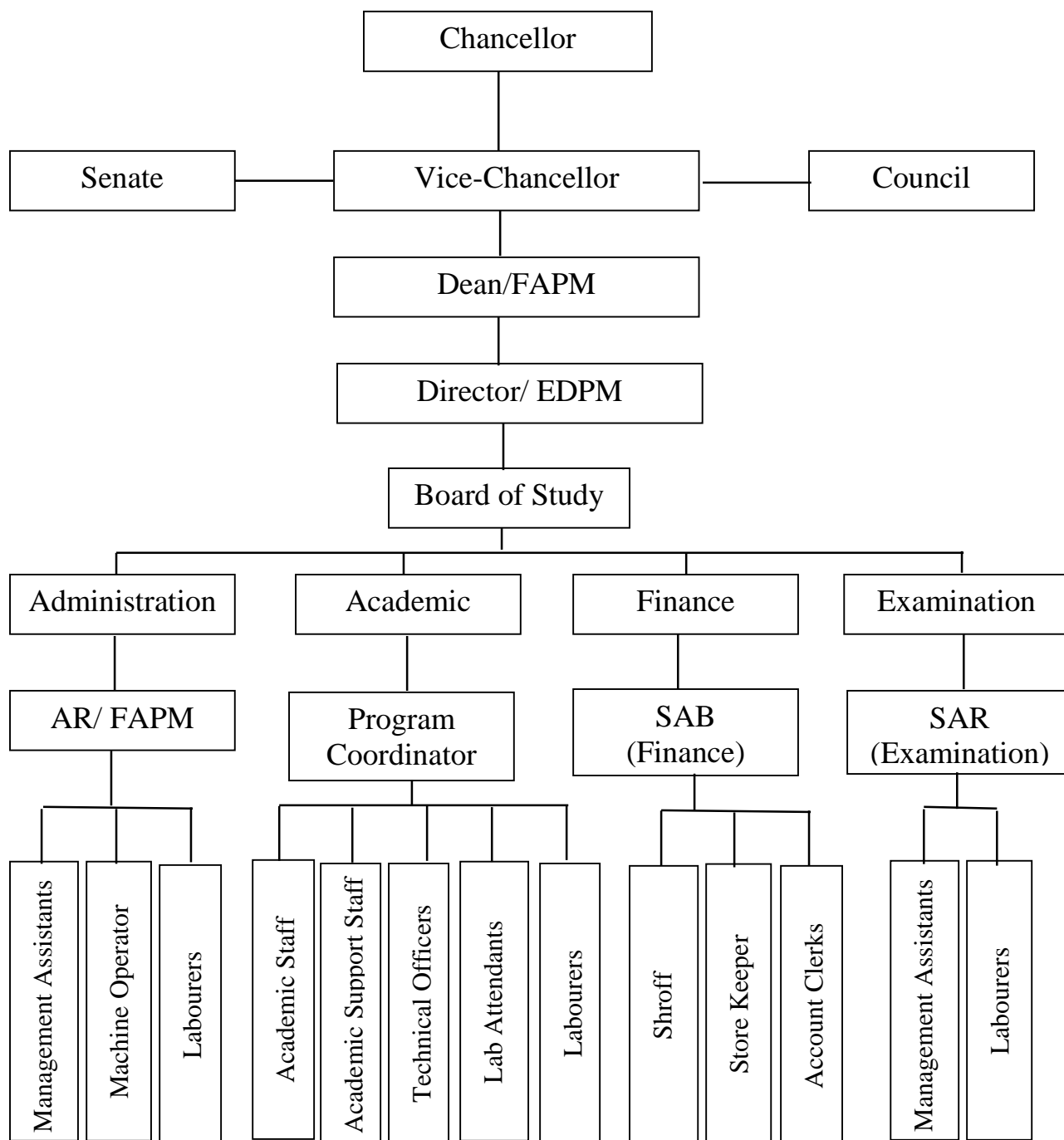
Program Outcomes

At the end of this program that provides students with an experiential-based learning opportunity in an academic environment supported by student-centered teaching, assessment and module-based learning methodologies and technologies that translate the contents provided in different coursework to reality, the Graduate from which with a breadth of multidisciplinary knowledge and exposure to the disciplines of agriculture, in general, and plantation management, in particular, would be able to:

- Utilize his/her analytical skills by independently assessing, interpreting and summarizing information/literature and other sources of facts and figures to come up with economical, sustainable and policy-based solutions.
- Apply those, together with technological know-how, in a holistic manner with innovative management and entrepreneurial perspective to manage resources and systems to fulfill the emerging needs of plantation industry.
- Use enquiry, construct arguments, investigate/research, critically analyze data, make judgments/decisions and propose solutions to emerging problems in agriculture, plantation management and allied sectors.
- Assess critically and comprehend scientific questions, stakeholder concerns and societal problems that formulate major issues to be addressed through innovative approaches/strategies/applied and/or basic research.
- Recognize the sector of plantation management as a service benefiting the mankind and the environment, and identify the issues, trends and perspectives related to this sector and their impact on national development;

- Communicate scientific and other information, efficiently and effectively, at different levels in written, graphic and/or verbal modes.
- Function as an effective leader, manager, or team player who is capable of exercising resourcefulness; demonstrate team spirit collaboratively, and working independently.
- Behave harmoniously with an appreciation of human and cultural diversity giving due respect for the values of the others, demonstrating professional integrity, ethical behavior and accountability and appreciate the diversity, global cultures, traditions and perspectives.
- Engage in life-long learning and undertake further training to further knowledge and skills.

Organizational Structure of B.Sc. (Plantation Management) External Degree Program



Composition of Board of Study of B.Sc. (Plantation Management) Degree Program

Dean / Faculty of Agriculture and Plantation Management
Director / External Degree Program
Program Coordinator / External Degree Program
Head of the Departments (Five HODs from each Department)
Senate Nominee
Senior Academic Staff member / Department of Plantation Management
Outside members (Four outside members representing plantation crops research Institutes/
Plantation or plantation related companies)
Administrative Coordinator (AR/FAPM)
Financial Coordinator (SAB / Common Support Unit)

Admission Criteria

Executives of plantation sector or institutions related to Plantation or Agriculture sector or Proprietary planters of above 24 years of age possessing any one of the following requirements may apply for admission.

- a) Higher National Diploma in Plantation Management (HNDPM) with one (01) year working experience in the relevant field
or
- b) National Diploma in Plantation Management (NDPM) or National Diploma in Plantation Extension Management (NDPEM) with two (02) year working experience in the relevant field
or
- c) Any other Diploma (Approved by the Senate) of which the minimum duration should be twelve months and awarded by a recognized institution related to Agriculture with three (03) year working experience in the relevant field
or
- d) Three (03) passes in G.C.E. (A/L) examination either in Bio Science or Agriculture or Mathematics or Commerce stream or Advance Level examination of Edexcel or Advance Level examination of Cambridge with four (04) year working experience in the relevant field.

Method of Selection

Application for admission shall be made on the prescribed form, obtainable from the Registrar WUSL and in the manner as may be prescribed. The candidates who fulfil the admission requirements will be called to appear for an aptitude test on basic agriculture and English language. Those who obtain minimum of 40% for each paper will be called for an interview and the selection of candidates for admission shall be in accordance with criteria prescribed by the senate whose decision shall be final and conclusive. Maximum number of students for a batch of B.Sc. (Plantation Management) degree is 300.

Registration

The Wayamba University of Sri Lanka (WUSL) functions as the registering and examining body in respect of the External degree of Bachelor of Science of Plantation Management. Curriculum offered for the degree will be available from WUSL on registering as an external student. On fulfilment of requirements, Degree will be awarded by the WUSL.

- a) Registration and renewal of registration of students shall take place during a time period as determined by the senate.
- b) The University shall register persons selected for admission, on the payment of fees as prescribed and they shall be subject to all the By-laws, Regulations and rules of the University.
- c) Every registered student shall be issued with a Students' Record Book (SRB) and Students' Identity Card bearing the photograph of the students concerned duly embossed with the seal of the University.
- d) Period of initial registration shall be for 01 year.
- e) Renewal of registration, should be done beginning of every year.
- f) For the renewal of registration, application be made on a prescribed form obtainable from WUSL. If the student failed to renew the registration studentship will be cancelled.
- g) Students should quote their Registration Number when they correspond either with the University of FAPM on any matter pertaining to the Degree.
- h) Students should produce their SRB and identity card at contact classes and Examination.

Registration could be cancelled at the discretion of the candidate at any time. However, the registration fee will not be refunded on cancellation of registration. Request for cancellation of registration will not be entertained from the candidates awaiting results of examination and from those awaiting disciplinary action for examination offences. If students cancelled their registration within one month from the date of commencement of the academic program, registration fee and course fee will be reimbursed.

Duration of the Degree

The programme is of three (03) year duration with two semesters of six month each per year. During each semester all relevant courses need to be completed (*i.e.* Contact sessions, assignments, examinations, etc.). However, candidates who register for the degree programme should complete it between **3 to 6 academic years** from the date of registration.

Mode and Medium of Instructions

Instructions, contact sessions, practical, preparation of course out conducted, hand-outs and lesson plans, assignments, continuous assessments and examinations will be in English medium.

Medium of instructions will be English and distance mode of education will be used in instructing the students. Printed learning materials will be made available through FAPM on payment of tuition fees. Students are expected to do self-studies using these learning materials and recommended references. Regular contact classes will be held to discuss students' problems related to subject matter. Whenever necessary online contact classes will be conducted. Regular practical sessions too will be conducted. Students may contact course instructors via e-mail or telephone to clarify matters related to subject matter.

Venues

The principal venue for formal classes, contact sessions, and oral presentations shall be the FAPM. In addition, other Faculties of Agriculture, Crop Research Institutes and other recognised Institutions will be used to conduct theory and practical sessions if necessary. The FAPM will have to seek prior approval from cooperating institutions for use of other venues. However, all examinations will be held at the FAPM, Makandura.

Course Structure

The three (03) year programme consists of 54 courses and a Capstone Project on Career Integrated Research & Seminar offered during six semesters (two per year) to include 100 credits, (one credit = 15 theory hours of learning or 30 practical hours). In preparing the programme a balance has been maintained among many basic sciences, applied sciences, management and extension & communication. The basic sciences are concentrated during the first two semesters, so that candidates who had no formal exposure to them prior to admission will have the opportunity to complete them during their first two semesters.

The Assignments and projects give an opportunity for candidates to offer subject matter of interest to their duties under the guidance of a supervisor from the resource panel. The Assignments may be in the form of formal lesson plan, analytical report etc. giving flexibility for the candidate to demonstrate originality.

The credit assigned to each course and the course contents may be revised by the FAPM if necessary.

Credit Requirements

The credit requirement should conform to those of other 3-year B.Sc. programmes conducted by the universities under SLQF guidelines of UGC. The total number of credits in the B.Sc.

(Plantation Management) degree program is 100. According to the SLQF guidelines the B.Sc. (Plantation Management) degree program is level 5.

Resource Panel

The panel of resource personnel who would be competent to undertake the delivery of courses and/ or practical is not a permanent group, because of the constant turnover of senior academic staff and researchers who work in different institutions. The FAPM, WUSL will identify a core group of resource persons who would be willing to serve in the resource panel.

This core group will be entrusted with the responsibility to prepare the lesson plans and related instructions / learning material, deliver the courses and evaluate the candidate. The resource panel could be updated every two years based on qualifications, work experience and availability.

Panel of Teachers - Internal Resource Persons

Name of the Lecturer	Designation
Prof. Udith Jayasinghe	Senior Professor
Prof. Chandana Abeysinghe	Professor
Prof. Jagath Edirisinghe	Professor
Prof. Nisha Kottearachchi	Professor
Prof. Kapila Yakandawala	Professor
Prof. Rupika Abeynayake	Professor
Prof. Prasanthi Perera	Professor
Prof. Thilak Attanayaka	Professor
Prof. Keminda Herath	Professor
Prof. Bandara Gajanayake	Professor
Prof. Indika Herath	Professor
Dr. Wasantha Gunathilake	Senior Lecturer
Dr. Jayantha Weerakkody	Senior Lecturer
Dr. Bandula Ranaweera	Senior Lecturer
Dr. Sarananda Hewage	Senior Lecturer
Dr. Wajira Balasooriya	Senior Lecturer

Dr. D.R. Gimhani	Senior Lecturer
Dr. Geethi Pamunuwa	Senior Lecturer
Dr. Kusum Wijesinghe	Senior Lecturer
Dr. Kamani Rathnayake	Senior Lecturer
Dr. Amani Wijesinghe	Senior Lecturer
Dr. Menuka Udugama	Senior Lecturer
Dr. Sasika Guruge	Senior Lecturer
Dr. Wiswajith Kandegama	Senior Lecturer
Dr. Priyanwada Warakagoda	Senior Lecturer
Dr. Surantha Salgadu	Senior Lecturer

Overall Responsibility

The overall administration of the programme will be the responsibility of the FAPM, WUSL and the Department of Plantation Management of the FAPM. For this purpose the Senate of WUSL will appoint a Board of Study. All academic, administrative and financial decisions will be taken by BOS and approval must be taken from Faculty Board of FAPM and Senate before implement of these decisions. The responsibility of the implementation of specific courses could be assigned to different Departments of study in which the subject is dealt in other degree programmes of the University. This would include the preparation of theory material, planning for practical, identification of laboratories, delivery of the course and evaluation. Much of the theory will be implemented as a self-study course module. However, special discussion sessions will be required to be conducted by the course instructor at different locations to expand upon identified topics, clarify questions, and obtain feedback. Such sessions will help to monitor the progress of candidates.

Aims

- i. To conduct courses to achieve the general objective of the Faculty to produce innovative skilled manpower for the plantation sector through undergraduate education.
- ii. To provide opportunities for managerial, executive and technical level employees of the plantation sector to improve and develop technical and managerial skills in plantation management by,
 - a. Offering theoretical and practical knowledge in accordance with the B.Sc. (Plantation Management) degree course of the Faculty.

- b. Arranging practical classes, expose students to laboratory techniques and instrument handling.
 - c. Arranging visits to relevant organizations to gain knowledge in practical applications of relevant study areas.
- iii. To provide opportunities for students to do Capstone projects to develop their skills in problem identification, collection and analysis of data, writing reports, presentation and defending results.
- iv. Provide basic knowledge in resource economics and develop an awareness of ethics and responsibilities of sustainable management of energy, soil, water, forest and other natural resources.

General Learning Outcomes

- I. During the first year, students will learn and understand the basic agronomic concepts, analytical tools, computer applications, software handling, mathematical applications, and principles of economics and management.
- II. During the second and third years students will learn in detail the agronomic and postharvest processing aspects of all plantation crops.
- III. Students will also acquire advanced knowledge on management concepts and tools such as planning and auditing, marketing and resource management, finance and taxation in plantation management needed to perform successfully at executive or management level positions.
- IV. Blend business management practices necessary in plantation industry with an understanding on interaction between technology, human activity and plantations.
- V. Develop abilities to handle and solve problems of a wide variety of issues pertaining to the field of plantation management and to address complex issues.

Schedule of Courses

During three academic years 49 GPA and 6 non-GPA courses are offered. Principles of Agricultural Chemistry (XPM 11012) is identified as a non-GPA prerequisite course. Principles of Agricultural Chemistry (XPM 11012) can be exempted by the students those who have pass grade (s) for Chemistry in GCE A/L examination. For Non-GPA courses pass marks (≥ 40) should be obtained. Six optional courses are offered in each semester of third year. Three optional courses should be obtained in each semester of third year. Except optional courses all other courses are compulsory.

Year 1 Semester I

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 11012	Principles of Agricultural Chemistry	02	20:20:60	Non GPA, Pre-requisite course
2	XPM 11022	Botany of Crops	02	20:20:60	
3	XPM 11032	Principles of Crop Physiology	02	20:20:60	
4	XPM 11042	Fundamentals of Management	02	30:00:70	
5	XPM 11052	Principles of Soil Science	02	20:20:60	
6	XPM 11062	Principles of Environmental Science	02	30:00:70	
7	XPM 11072	Applied Mathematics	02	30:00:70	
8	XPM 11082	Information & Communication Technology	02	15:30:60	
9	XPM 11091	Professional & Life Skills for Managers - I	01	10:10:30	Non GPA
Total Credit			14		

Year 1 Semester II

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 12102	Principles of Economics	02	30:00:70	
2	XPM 12112	Principles of Marketing	02	30:00:70	
3	XPM 12123	Tea Agronomy	03	30:30:100	
4	XPM 12133	Coconut Agronomy	03	30:30:100	
5	XPM 12143	Rubber Agronomy	03	30:30:100	
6	XPM 12152	Water Resource & Irrigation Management	02	20:20:60	
7	XPM 12162	Computer Applications	02	20:20:70	
8	XPM 12171	Professional & Life Skills for Managers - II	01	10:10:30	Non GPA
Total Credit			17		

Year 2 Semester I

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 21183	Tea Manufacturing, Processing & Value Addition	03	30:30:100	
2	XPM 21193	Coconut Manufacturing, Processing & Value Addition	03	30:30:100	
3	XPM 21203	Rubber Manufacturing, Processing & Value Addition	03	30:30:100	
4	XPM 21212	Farm Machinery Management	02	20:20:60	
5	XPM 21222	Plant Nutrition & Fertilizer Management	02	20:20:60	
6	XPM 21233	Crop Protection: Pest, Disease & Weed Management	03	30:30:90	
7	XPM 21241	Career Planning & Development	01	10:10:30	Non GPA
8	XPM 21252	Applied Statistics	02	20:20:60	
Total Credit			18		

Year 2 Semester II

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 22262	International Trade & Market Management	02	30:00:70	
2	XPM 22272	Human Resource Development & Management	02	30:00:70	
3	XPM 22282	Socio-Economic, Policy & Legal Environment for Plantation Management	02	30:00:70	
4	XPM 22293	Agronomy & Manufacturing of Export Agricultural Crops	03	30:30:100	
5	XPM 22303	Agronomy & Manufacturing of Potential Plantation Crops	03	30:30:100	
6	XPM 22312	Crop Improvement & Production Technologies	02	20:20:60	
7	XPM 22322	Plantation Forestry	02	30:00:70	
8	XPM 22332	Eco-Friendly Technologies & Organic Agriculture	02	30:00:70	
9	XPM 22342	Development Communication & Extension	02	30:00:70	Non GPA
Total Credit			18		

Year 3 Semester I

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 31353	Livestock & Fisheries Integration to Plantations	03	30:30:90	
2	XPM 31362	Livestock Product Development	02	20:20:60	
3	XPM 31372	Project Analysis & Management	02	30:00:70	
4	XPM 31382	Waste Management	02	30:00:70	
5	XPM 31392	Commercial Horticulture	02	20:20:60	Optional
6	XPM 31402	Commercial Field Crop Production	02	20:20:60	Optional
7	XPM 31412	Applications of Biotechnology in Plantation Management	02	20:20:60	Optional
8	XPM 31422	Energy Production & Management	02	20:20:60	Optional
9	XPM 31432	MIS & e-Commerce	02	20:20:60	Optional
10	XPM 31442	Food Processing Technology	02	20:20:60	Optional
11	XPM 31452	Quantitative Techniques for Decision Making	02	20:20:60	
Total Credits			17		

* Students should select 3 optional courses out of 6

Year 3 Semester II

No	Course code	Course Title	No. of Credits	T:P:IL	Remarks
1	XPM 32462	Risk & Disaster Management in Plantation Sector	02	30:00:70	
2	XPM 32472	Financial Accounting & Management	02	30:00:70	Optional
3	XPM 32482	Resource Planning & Management in Plantations	02	20:20:60	Optional
4	XPM 32492	Plant Tissue Culture Technologies	02	20:20:60	Optional
5	XPM 32502	Quality Management in Agri-Food Chains	02	30:00:70	Optional
6	XPM 32512	Landscaping Technology & Management	02	20:20:60	Optional
7	XPM 32522	Tourism Management in Plantations	02	20:20:60	Optional
8	XPM 32532	Research: Methodology & Communication	02	20:20:70	
9	XPM 32541	Expert Seminar: Recent Advancements in Plantation Management	01		Non GPA
10	XPM 32556	Capstone Project on Career Integrated Research & Seminar	06		
Total Credits			16		
Grand Total Credits			100		

* Students should select 3 optional courses out of 6

Course Content and Intended Learning Outcomes

Course Code	XPM 11012			Course Title	Principles of Agricultural Chemistry		
Year	1	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with basic knowledge on principles, concepts and theories of chemistry facilitating application of acquired knowledge in food and agriculture with emphasis on plantation sector.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe the basic properties of states of matter.
- Explain structure, reactivity and properties of chemical substances.
- Solve problems involving mass relationships of chemical reactions.
- Apply knowledge to separate and analyze chemical compounds.
- Evaluate the importance of basic chemical constituents of foods and agrochemicals.

Course Capsule:

Role of chemistry in Food and Agriculture; Matter: what is matter, states of matter, properties of matter, classification of matter; Units and Measurements: units of measurements, scientific notation, significant figures, rounding off numbers; Atom and Atomic structure: modern atomic theory, subatomic particles, atomic number and mass number, atomic mass unit, isotopes; The Periodic Table of Elements: periodic properties, electronic configuration; Chemical Bonding: valence electrons and Lewis structure, octet rule, ions and ionic compounds, covalent bonds, coordinate bonds, metallic bonds, polar and non-polar bonds, inter and intra molecular forces; Mass Relationships in Chemical Reactions: Avogadro number and molar mass of an element, chemical reactions and chemical equations, balancing chemical reactions (stoichiometry), limiting reagent of a chemical reaction; Overview of Food chemistry: food chemistry-scope and importance, water in food, functional and chemical properties of carbohydrates, lipids and proteins in food, effect of processing on chemical properties of carbohydrate, lipid and proteins; Agrochemicals: fertilizers and pesticides, pesticide formulation, biochemical action of pesticides, advantages and disadvantages of pesticides; Quantitative chemical analysis: Quantitative analysis-volumetric method, Quantitative analysis-Instrumental methods - chromatography, UV visible spectrophotometer

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Chang, R and Cruickshank, B. (2004). Chemistry. McGraw-Hill, Newyork, America.
- Khopkar, S.M. (2008). Basic Concepts of Analytical Chemistry, New Academic Science, London, England.
- Lee, F. (2012). Basic Food Chemistry, Springer Science and Business Media.

Course Code	XPM 11022			Course Title	Botany of Crops	
Year	1	Semester	I	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the students knowledge on botany of crops to facilitate them to apply in cultivation of plantation crops

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the centres of crop origin and describe the importance of crop wild relatives
- Illustrate the cellular structure, functions and reproduction
- Explain the diversity of the plant kingdom
- Describe the structure, function and morphological diversity of crops
- Explain the importance of pollination and seed biology in establishment of crops

Course Capsule:

Origin of cultivated plants - Origin of agriculture, Evolution of food habits, Crop wild relatives and Centers of origin of cultivated plants; Cellular structure -Organization of the plant cell: Cell organelles and their functions, plant tissues and organs; Cellular reproduction - Mitosis, Meiosis, Significance of mitosis and meiosis in the continuity of crop life; Diversity of the plant kingdom and Classification of higher plants; Morphology of the plant kingdom - morphology, modifications, function & structure of leaves, stems, roots and flowers; Pollination - Pollination in plants, pollination types, pollination syndromes, pollination in crop production systems; Seed biology - Structure of a seed, seed germination, dormancy, breaking seed dormancy and seed dispersal

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Bell, A.D. (2008). Plant Form: An Illustrated Guide to Flowering Plant Morphology. Timber Press. UK.
- Raven, P.H., Singer, S., Mason, K.A., Johnson, G.B., and Losos, J. (2016). Biology. (11th Edition). New York, NY: McGraw-Hill Education.
- Taylor, D.J., Green, N.P.O. and Stout G.W. (2005). Biological Science 1 and 2. (3rd edition). R. Soper (Editor) Cambridge University Press, UK.
- Willmer, P. (2011). Pollination and Floral Ecology. Princeton University Press. USA.

Course Code	XPM 11032			Course Title	Principles of Crop Physiology		
Year	1	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge and skills on physiological processes and behavioral and functional changes of crops to facilitate them to apply in plantation crop management.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain main physiological processes of plants.
- Identify and design management practices to improve crop productivity based on the knowledge on crop physiology.
- Analyze and interpret growth patterns of plants.
- Use relevant laboratory and field equipment precisely to generate, analyze and interpret data /information.

Course Capsule:

Plant growth patterns; Growth curve; Measurement and analysis of plant growth; Photosynthesis; Respiration; Plant water relationship; Plant hormones and growth regulators; Photoperiodism, Short-day and long-day plants, Importance of Dark period, Hypothetical Mechanism; Vernalization; Fruit growth and development; Fruit ripening; Control of fruit ripening; Unfruitfulness; Methods to control unfruitfulness;

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Costa De, W.A.J.M. (2000). Principles of Crop Physiology, University of Peradeniya
- Frank B. Salisbury and Cleon W. Ross. (1985). Plant Physiology, Wadsworth Publishing Company, Fisiología vegetal –pp 540.
- Milthorpe, F. L. and Moorby, J. (1979). An Introduction to Crop Physiology. 2nd Edition
- Victor Sadras and Daniel Calderini (2009). Crop Physiology: Applications for Genetic Improvement and Agronomy.

Course Code	XPM 11042			Course Title	Fundamentals of Management	
Year	1	Semester	I	Credits	02	Theory (hr)
						30
						00
						Independent Learning (hr)
						70

Aim of the Course:

To explore the principles, techniques, and concepts needed for managerial analysis and decision-making of an organization through planning, organizing, influencing, and controlling process.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the roles of the contemporary manager in the modern organization and to define the managerial function
- Describe the effective management skills needed to maximize individual and organizational productivity
- Formulate and resolve managerial problems through the use of situation analysis

Course Capsule:

Introduction to Management; The evolution of management theory; Organizational environment; The global environment; Planning; Organizing; Organizational control and culture; Motivation; Leaderships; Group and teams; Human resource management; Innovation; Entrepreneurship; Communication

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Cole, G. A. (2004). Management theory and practice. Cengage Learning EMEA.

Daft, R. L. (2012). Management. Cengage Learning

Freeman, R. E. (2010). Strategic management: A stakeholder approach. Cambridge university press.

Samson, D., and Daft, R. L. (2012). Fundamentals of management. Cengage Learning Australia.

Course Code	XPM 11052			Course Title	Principles of Soil Science		
Year	1	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge on basic soil properties, their importance for plant growth and development, different soil types along with their potentials and limitations for crop production.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the nature of soils based on their formation and the role of soil in crop production.
- Use of laboratory and field equipment to determine basic soil properties.
- Identify different soil types in Sri Lanka with special consideration on potentials and limitations for agriculture.

Course Capsule:

Introduction to Soil Science, Weathering of rocks and minerals and soil formation; Soil profiles and soil horizon identification; Soil physical properties: Soil colour, Texture, Structure, Bulk density, Particle density, Porosity, Soil water retention; Soil chemical properties: Clay minerals and their properties, Charge Formation and Retention of Nutrients, Cation Exchange Capacity, Soil Reaction; Biological properties: Soil flora and fauna, Role of soil organisms on soil functions, Soil Organic Matter, Soil Fertility and Crop Production; Soils of Sri Lanka: Major soil types of Wet and Dry Zones; Problem soils; Salt affected soils, Acid sulfate soils; Soil degradation and Minimizing land degradation.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

The Nature and Properties of soils. 13th Edition. Nyle C. Brady and Ray R. Weil (2002). ISBN 81-7808-625-5
Soils and Soil Fertility. 15th Edition. Fredrec R. Troeh and Louis M. Thompson (1993) Oxford University Press.
Food & Agriculture Organization of the United Nations (2017). *Soil Bulletins* : <http://www.fao.org/soils-portal/resources/soils-bulletins/en/>
FAO (1998) World Reference Base for Soil Resources. World Resources Report No. 84. FAO, Rome.

Course Code	XPM 11062			Course Title	Principles of Environmental Science		
Year	1	Semester	I	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge required to understand the concepts of environment, ecosystem services and processes, global and national environmental issues and to identify sustainable environmental management strategies.

Outcomes:

At the end of this course, the student should be able to;

- Describe the concept of environment and its basic components, ecosystem services and processes.
- Explain global and national environmental issues in terms of environmental degradation.
- Identify sustainable environmental management options for major environmental issues.

Course Capsule:

Environment and basic components; Ecosystem services, processes and interactions; Nutrient cycling; Biodiversity and conservation; Biomes; Environmental degradation and issues; Natural disasters; Aquatic, terrestrial, air and noise pollution; Environmental monitoring and management; Environmental regulations of Sri Lanka; Sustainable production and consumption

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Daniel B. Botkin & Edward A. Keller Environmental Science: Earth as a Living Planet. 9th Edition) ISBN-13: 978-1118427323, ISBN-10: 1118427327.

William Cunningham & Mary Cunningham. Principles of Environmental Science. 9th Edition. ISBN-13: 978-1260219715, ISBN-10: 1260219712.

Linda R. Berg, David M. Hassenzahl, Mary Catherine Hager Visualizing Environmental Science. 4th Edition. ISBN-13: 978-1118169834, ISBN-10: 1118169832

Course Code	XPM 11072			Course Title	Applied Mathematics		
Year	1	Semester	I	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide students with the basic concepts and theories in mathematics to facilitate them to apply in Plantation Crop Management.

Intended Learning Outcomes:

At the end of this course, the student should be able to:

- Explain the different types of functions and graphs to interpret data
- Use matrices as a convenient structure for linear equations and inequalities
- Solve problems related optimization to use set theories and perform relevant operations
- Apply calculus to solve real world problems

Course Capsule:

Number line: Integers; Irrational numbers; Rational numbers; Natural numbers; Prime numbers; Suds, Indices and their mathematical operations; Element of set theory notation: Set builder form, Equality of two sets, Disjoint sets, Finite and Infinite sets, Union and intersection of sets, set operations, Venn diagrams; Introduction to Matrix algebra; Introduction to function, Domain, Co-domain and Range of a function, Types of functions and their properties, Graphs of functions, General equation for a straight line, Parabola, Circle; Introduction to calculus: Limits, Differentiation, Integration and their applications.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Thomas W. Judson, Stephen F. Austin (2008), 'Abstract Algebra Theory and Applications', State University.
R.S Aggarwal (2013), 'Part I - Senior Secondary school Mathematics for Class 12'. BharatiBhawan

Course Code	XPM 11082			Course Title	Information and Communication Technology		
Year	1	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide students with the basic knowledge and skills in Information and Communication Technology required to increase the students' efficiency and productivity for their academic and professional careers in-line with the state-of-the-art technologies in information technology.

Intended Learning Outcomes:

At the end of this course, the student should be able to:

- Describe the basic terminology and concepts of Information and Communication Technology (ICT)
- Practice the basic operations in the desktop environment in Microsoft Windows.
- Explain the concepts of Internet, networking and communication technologies
- Use effective information searching and digital communication technologies via internet
- Demonstrate the proper care, maintenance and safe use of ICT equipment.

Course Capsule:

Basic Concepts of ICT; Software & Hardware; Working with Operating Systems; Setting the environment of a computer, Digital storing and managing data, Files and folder handling; Computer Network; Working with internet; Internet services and related technologies; Social media and effective use of social networks; Working with online collaboration tools; Maintenance of computer system; Computer ethics

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Afriyie, B.S., (2012) Concise Information and Communication Technology (ICT) Fundamentals. ISBN: 978-1-4669-4712-2(e)

Arora, A., (2015) Computer Fundamentals and Applications. ISBN: 978-93259-7160-8

LMS, <https://lmsm.wyb.ac.lk/course/index.php?categoryid=191>

Walsh, T., (2005) Introducing ICT: Basic to Intermediate. ISBN: 978-0717137565

Course Code	XPM 11091			Course Title	Professional & Life Skills for Managers - I		
Year	1	Credits	I	Credit	1	Theory	10
						Practical (hr)	10
						Independent Learning (hr)	30

Aim of the Course:

To provide the learner with knowledge on, and insight with regard to the importance of acquiring of, certain life and professional skills so that he/she can start to harness the power of his/her mind to develop, learn and achieve more in life.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the importance of acquiring certain key components/attributes that are specified under the ‘personal skills’ for a professional to build up and maintain a healthy body and mind.

Course Capsule:

Students are exposed to a series of interactive workshops/sessions on personal development conducted by a ‘Trained Career Guidance Counselor’. The specific areas to cover would include, but are not limited to, the concepts, importance and practice of **foundation skills** (how to learn best; achieve basics of emotional intelligence: *Self-preservation, Self-Motivation, Self-esteem, Self-control and Assertiveness*; manage time and maximize resources), **basic skills and strategies** (listen and take effective notes; actively read; improve memory skills; excel at taking test; express students writing and speech) and understand the habits of highly effective students/people to become an effective professional.

Assessment:

Continuous assessment: 100% (by way of systematic in-session work / reviews / feedback from the peers & trainer).

References:

Beatty, R. H. (1989). The perfect cover letter. Wiley.

Covey, S. R., and Covey, S. (2020). The 7 habits of highly effective people. Simon & Schuster, USA.

Grussendorf, M. (2007). English for presentations. Oxford University Press, UK

Trilling, B., and Fadel, C. (2009). 21st century skills: Learning for life in our times. John Wiley & Sons, New York, USA.

Course Code	XPM 12102			Course Code	Principles of Economics		
Year	1	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with an introduction to the economic concepts, theories and analytical techniques to recognize and make effective decisions to address everyday problems in real world situations with special emphasis on the plantation sector.

Intended Learning Outcomes:

At the end of this course, the student should be able to:

- Explain basic economic concepts and terminology in appropriate contexts
- Explain the relationship between supply, demand, and prices in an economy.
- Describe how buyers and sellers compete and cooperate in markets in determining prices
- Apply the concept of marginal in economic decision-making
- Discuss how production is organised in a firm

Course Capsule:

Microeconomics: Define Economics, The Economic Problems / Economic Systems, Basic concepts in Economics; Theory of Consumer Behaviour - Nature of Demand, Concept of Utility –Equilibrium for a Single Commodity, Indifference Curve, Budget Line and the Equilibrium, Changes to the Consumer Demand, Elasticity of Demand; Theory of Producer Behaviour- Nature of Supply, The Equilibrium of the Market; Theory of Firm - Introduction, Factor –Product Relationship, Factor- Factor relationship, Product – Product Relationship; Theory of Cost -Short Run Cost Functions, Long Run Cost Functions; Theory of Price –Introduction, Market Structures and Pricing;
Macroeconomics: Use of Macroeconomic concepts in agriculture with special emphasis on the plantation sector; Macroeconomic Indicators; Economic Growth and the Business Cycle

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Richard Lipsey (1995). An Introduction to Positive Economics. 8th Edition

Gregory Mankiw (2016). Principles of Economics. 9th Edition, Cengage Learning

Martin Kolmer (2017). Principles of Microeconomics: An Integrative Approach, Springer Publishing

Annual Reports, Central Bank of Sri Lanka

Course Code	XPM 12112			Course Title	Principles of Marketing	
Year	1	Semester	II	Credits	02	Theory (hr)
						30
						Practical (hr)
						00
						Independent Learning (hr)
						70

Aim of the Course:

To introduce students with key concepts of marketing and encourage them to relate these concepts to contemporary practice in general and plantation sector in particular.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Summarize the foundational principles of marketing
- Describe the steps in the strategic marketing process
- Evaluate various approaches in market segmentation and targeting
- Apply reasoned arguments in the development of an appropriate and sustainable marketing mix

Course Capsule:

What is marketing; Basic concepts, Practice, Ethics; Strategic Marketing; The marketing environment; Segmentation, Targeting, Positioning, Managing 7Ps: Product [branding, packaging, labelling, quality, new product development], Price [Markup pricing, competitive pricing, loss leader pricing, multiple pricing, optional product pricing, penetration pricing, premium pricing, product bundle pricing, skim pricing, by-product pricing] Place [conventional channels, vertical distribution systems, horizontal systems, multichannel systems] Promotion Strategies [advertising, public relations, sales promotion], Physical [layout, design, ambience ease of movement], Process [transaction process, web design], People [customer service, Customer relationship management]

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Abeysekera, N. (2019) Marketing පිටිමෙලක්, Sadeepa Publishers, Colombo, Sri Lanka
- Diasz, L (2013) Strategic Marketing: Marketing strategies for Sri Lankan Business entities, Soft Wave Printing & Packaging, Colombo, Sri Lanka
- Kotler, P., Keller, K., Koshy, A., and Jha, M. (2009). Marketing Management, (South Asian Perspective), Dorling Kindersley (India) Pvt. Ltd. Licensees of Pearson Education in South Asia.
- Kotler, P., and Armstrong, G. (2010). Principles of marketing. Pearson education, New York, USA

Course Code	XPM 12123			Course Title	Tea Agronomy		
Year	1	Semester	II	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide students with knowledge and skills on agronomic practices of tea cultivation processing of tea, facilitating them to achieve potential productivity in sustainable manner.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain origin, distribution and present status of tea industry.
- Describe selection and generation of planting materials.
- Describe and apply agronomic practices to increase the productivity of tea.
- Pluck tea leaves by maintaining good plucking standards and plucking table.
- Analyse and rectify the problems related to the agronomic practices of tea.

Course Capsule:

History of tea cultivation in the world and Sri Lanka; Statistics; Soils and climatic requirements; Botany of tea; Different tea Jats; Planting materials; Cultivar selection and recommendations; Nursery management; Land preparation; Soil conservation and rehabilitation; Lining, marking and holing; Planting; Training of tea bushes up to bearing; Shade tree management; Fertilizer use; Weed management; Pest and disease management; Identification and management of nutrient deficiencies; Pruning; Plucking.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Anon (2008). Tea Circulars, Talawakelle, Sri Lanka, Tea Research Institute of Sri Lanka.

Willson, K.C., Clifford, M. N. (1992). Tea Cultivation to Consumption. Springer

Zoysa, A.K.N. (2008). Handbook on Tea, 1st Edition, Talawakelle, Sri Lanka, Tea Research Institute of Sri Lanka.

Course Code	XPM 12133			Course Title	Coconut Agronomy	
Year	1	Semester	II	Credits	03	Theory (hr)
						30
						Practical (hr)
						30
						Independent Learning (hr)
						100

Aim of the Course:

To provide the students with knowledge and skills on establishment and management of coconut cultivations so that they will be able to achieve potential productivity to maximize profitability.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe the current extent, production, and contribution to Sri Lankan Economy.
- Explain the soil and climatic requirement,
- Describe and practice the cultural operations from nursery management to harvesting.
- Evaluate a cost analysis for a coconut cultivation.
- Analyze the trends and current threats of coconut cultivation and explore innovative solutions to mitigate the threats

Course Capsule:

Current status of coconut cultivation in Sri Lanka: Current extent, Production and contribution to GDP, Soil and climatic requirements, Varieties and forms, Production of planting material, Field planting, Nutrient management, Soil and moisture conservation, Weed management, Pest and disease Management, Replanting, Intercropping, Cost Analysis of a coconut cultivation; Cost:benefit Ratio, Trends and current threats of coconut cultivation, Explore the innovative solutions to mitigate the threats.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Pethiyagoda, U. (1980). Hand book on Coconut cultivation. CRI Publication.
- Shelvy S. (2011). Cultivation practices of Coconut. Collage of Agriculture Vellayani.

Course Code	XPM 12143			Course Title	Rubber Agronomy	
Year	1	Semester	II	Credits	03	Theory (hr)
						30
						Practical (hr)
						30
						Independent Learning (hr)
						100

Aim of the Course:

To provide the students with knowledge and skills on establishment and management of rubber cultivations, so that they will be able to achieve potential productivity and maximize profitability in rubber plantation in a sustainable manner.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the current extent, production, and contribution to the Sri Lankan economy from Rubber sub sector.
- Identify the soil and climatic requirements suitable for cultivation of Rubber.
- Describe the good cultural operations of rubber cultivation from nursery to tapping.
- Conduct a cost analysis for both large and small scale Rubber cultivations.

Course Capsule:

Current status of rubber cultivation in Sri Lanka: Current extent, production, contribution to GDP and other production related statistics of Rubber subsector; Botany and agronomy of Rubber: Botany of Rubber plant; Soil and agro-climatic requirements; Land preparation; Soil and moisture conservation; Recommended clones, Nursery management; Field establishment and up keep; Weed management; Plant nutrition and fertilizer application; Integrated pest and disease management; Latex production and Tapping: Physiology of latex production and latex flow; Harvesting (tapping); Yield stimulation, Rain guards; Cost analysis for a rubber cultivation.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Handbook of Rubber. (2001). Vol. 1. Agronomy. Eds. L.M.K. Tillekeratne and A. Nugawela. Rubber Research Institute of Sri Lanka, Dartonfield, Sri Lanka. pp 198 – 206
- Jayasinghe, C. K., (2001). Common diseases. In Handbook of Rubber. Vol. 1. Agronomy. Eds. L.M.K. Seneviratne, P., 2001. Management of rootstock and budwood nurseries. In Handbook of Rubber. Vol. 1. Agronomy. Eds. L.M.K. Tillekeratne and A. Nugawela. Rubber Research Institute of Sri Lanka, Dartonfield, Sri Lanka. pp 54– 67
- Tillekeratne and A. Nugawela. Rubber Research Institute of Sri Lanka, Dartonfield, Sri Lanka. pp 97 – 113
Tillekeratne, L. M. K., Nugawela, A., (2001). Minimizing crop losses due to interference of rain on tapping. In

Course Code	XPM 12152			Course Title	Water Resource and Irrigation Management	
Year	1	Semester	11	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the students with knowledge and skills to manage the sustainable water resources and to design, operate and evaluate irrigation systems so that they will be able to apply knowledge and skill for the efficient use of water in plantation sector.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the soil-plant-water relationship.
- Explain the components of irrigation scheduling.
- Schedule the components of irrigation, crop water requirement.
- Design an irrigation system for a given crop.
- Describe the importance of studying watershed Management.
- Identify common watershed problems.

Course Capsule:

Soil plant water relationship: Types of soil water, Soil moisture constants; Water losses from the soil, Irrigation scheduling: Crop water requirement; Methods of estimation and calculation of evapo-transpiration, Frequency of irrigation, Water application methods: conventional; surface irrigation advance: sprinkler and drip irrigation, Comparison of irrigation efficiency among conventional and advance irrigation methods. Introduction to watershed, Factors to be studied in developing a watershed management program, Use of Arial photography and remote sensing in watershed management, Sedimentation of reservoirs, Rain water harvesting.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Michael, A.M. (2003). Irrigation Theory & Practice. Vikas Publishing House India ISBN:0-069-2484-3
Megh . R. goyal (2014). Sustainable Micro Irrigation Principles & Practices. Apple Academic Press
Davis Twomey (2016). Irrigation & Water Management. Syrawood Publishing House

Course Code	XPM 12162			Course Title	Computer Applications	
Year	1	Semester	II	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the knowledge and skills on effective use of computer applications in Microsoft Office environment to increase the students efficacy and productivity in their academic and professional careers.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Prepare a document using a word processing software.
- Prepare a data sheet using a spreadsheet software.
- Design a presentation using a presentation software.
- Create a database using a database management software

Course Capsule:

Introduction to office suite, Working with word processing software (MS Word) using common features for document preparation, Printing options; Working with spreadsheets applications (MS Excel) using common features to prepare spreadsheets, calculations and data analysis; Working with graphical presentation software (MS PowerPoint) to create effective presentations; Concepts in database, Working with database management software (MS Access) to create databases.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Hunt, B., and Clemens, B., (2017) Illustrated Microsoft Office 365 & Office 2016 Fundamentals. ISBN: 978-1-305-87894-5
- Lambert, J., and Frye, C., (2015) Microsoft Office 2016 Step by Step. ISBN: 978-0735699236
- Alexander,M., and Richard, K., (2015) Access 2016 Bible Edition 1.ISBN: 9781119086543

Course Code	XPM 12171			Course Title	Professional and Life Skills for Managers - II		
Year	1	Credits	II	Year	1	Theory (hr)	10
						Practical (hr)	10
						Independent Learning (hr)	30

Aim of the Course:

To provide the learner with knowledge on, and insight with regard to the importance of acquiring of, certain personal and interpersonal skills in order to communicate and interact with other people, both individually and in groups, involved with an educational institute effectively.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the importance of acquiring certain key components/attributes that are specified under the ‘personal’ and ‘interpersonal’ skills to communicate and interact with others involve with teaching and education management effectively.
- Explain the importance of working by a professional according to certain key components specified under the ‘leadership skills’.

Course Capsule:

Andrew L. Friedman (2012). Continuing Professional Development Lifelong Learning of Millions

Assessing You: The First Step in Career Planning, Alberta Community and Social Services, 60.

Stephen R Covey (1989). The 7 Habits of Highly Effective People, USA 381.

Students are exposed to a series of interactive workshops/sessions on personal development conducted by a ‘Trained Career Guidance Counselor’. The specific areas to cover would include, but are not limited to, the concepts, importance and practice of: Verbal and non-verbal communication; Listening skills; Effective questioning; Interview skills; Team and group work; Stress and Anger Management, and Emotional intelligence, Planning and organization; Managing change; Problem solving and Decision making skills; Negotiation skills; Conflict resolution and Rapport building to become an effective professional.

Assessment:

Continuous assessment: 100% (by way of systematic in-session work / reviews / feedback from the peers & trainer)

References:

Goleman, D. (2006). Emotional intelligence. Bantam Press, London, UK.

Goldsmith, M. (2010). What got you here won't get you there: How successful people become even more successful. Profile books.

Greener, S., Bournier, T., and Rospigliosi, A. Graduate Employment. Bookboon, London, UK.

Wadkar, A. J. (2016). Life Skills for Success. SAGE Publishers, California, USA.

Course Code	XPM 21183			Course Title	Tea Manufacturing, Processing and Value Addition		
Year	2	Semester	I	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide knowledge and skills on basic principles of tea manufacturing and product development and value addition of tea so that students will be able to apply them in the tea industry.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- List the different types of made tea in the world
- Describe manufacturing steps of black and green tea
- Identify the different value added products of tea and describe manufacturing steps
- Explain importance of product development and value addition to tea
- Analyze and rectify the problems related to manufacturing of tea

Course Capsule:

Principles of tea manufacturing; Different types of made tea: Black tea (Fully fermented), Oolong tea (Semi-fermented), Green tea (Unfermented tea) and special types of tea grades. Different types of black tea: Pure orthodox, Orthodox-rotorvane and CTC; Manufacturing steps of tea (Black and green tea): Withering, pan drying and steaming for green tea; Rolling; Different types of rollers (Orthodox roller, Rotorvane, CTC roller), Preconditioning of leaf, Dhools and grade out-turn, Roll breaking, Oxidation (Fermentation) for black tea, Firing (Drying), Sifting and grading, Packing, Quality tasting. Importance of product development and value addition; different value added products of tea: packeted tea, tea bags, scented tea, instant tea, tea wine, carbonated tea, ice tea, Tea cosmetic products, Tea sweet and bakery products, Tea pharmaceutical products, Handmade special teas; Tea blending

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Keegel, E. L. (1958). Tea Manufacture in Ceylon. Tea Research Institute of Ceylon, pp 179.

Panda, H. (2016). Cultivation and Manufacture of Tea. Asia Pacific Business Press Inc. pp 574.

Zoysa, A.K.N. (2008). Handbook on Tea, 1st Edition, Talawakelle, Sri Lanka, Tea Research Institute of Sri Lanka.

Course Code	XPM 21193			Course Title	Coconut Manufacturing, Processing and Value Addition		
Year	2	Semester	I	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide the students with knowledge and skills of manufacturing different types of coconut products, product development, value addition and quality control so that they will be able to apply them in coconut industry.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe the current status of coconut product industry of Sri Lanka.
- Identify the primary and value added coconut products.
- Describe the manufacturing process of kernel products, husk products, shell products, and export oriented value added coconut products.
- Evaluate cost analysis of primary and value added coconut products.
- Analyze the trends and current threats of coconut industry and explore the innovative solutions to mitigate the threats

Course Capsule:

Current status of coconut product industry of Sri Lanka: Current Annual nut production and potential and limitations, Primary and value added coconut products and their contribution to GDP, Manufacturing process of Kernel **Products:** DC, Copra, Conventional Coconut oil, Virgin coconut oil, coconut milk etc.; **Husk Products:** Coconut fiber, Fiber oriented export products, Export oriented coco peat and husk chips products; **Shell Products:** Charcoal and Activated carbon etc. Export oriented value added coconut products: Grow media bags. Coconut water etc., with special reference to quality standards. Cost Analysis of primary and value added coconut products: Trends and current threats of coconut industry and explore the innovative solutions to mitigate the threats

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Anon (2012). Compete Book on Coconut & Coconut Products. Asia Pacific Business Press.

Ohler, J. G. (2009). Modern Coconut Management – Palm Cultivation & production. Practical Action. ISBN-13:978-18533676

Course Code	XPM 21203			Course Title	Rubber Manufacturing, Processing and Value Addition		
Year	2	Semester	I	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide the students with knowledge and skills on collection of quality field latex and processing it into Ribbed Smoke Sheets (RSS), Crepe Rubber, Centrifuged latex, Technically Specified Rubber (TSR) and principles involved in conversion of raw rubber into value added rubber products, so that students will be able to apply them in the rubber industry.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the current contribution and importance of the rubber manufacturing subsector to the economy and identify the potentials & limitations.
- Describe the field latex preservation methods.
- Identify the primary and value added rubber products.
- Describe the processing of field latex into Ribbed Smoked Sheets (RSS), Crepe Rubber, Centrifuged latex and Technically Specified Rubber (TSR).
- Describe the basic principles involved in converting raw Rubber into value added products.
- Describe the importance of treating waste water from a rubber factory.

Course Capsule:

Chemistry of latex; Tapping implements and latex collecting utensils; Collection of field latex and preservation; Estimating the quality of dry rubber in field latex; RSS manufacture process; Crepe rubber manufacture process; Centrifuged latex manufacture process; Processing of Technically Specified Rubber (TSR) and Specialty Rubbers; Principles of rubber value added product manufacture; Waste water treatment in Rubber factory; Global Rubber market and elements of natural rubber industry supply chain.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session

End semester assessment: 60%

References:

Tillekeratne, L M K, Nugewella, A and Seneviratne, W M G (2003). *Handbook of Rubber, Vol. 2, Processing*, Rubber Research Institute of Sri Lanka, Dartonfield, Agalawatta, Sri Lanka.

Ciesielski, A (1999) *An Introduction to Rubber Technology*, iSmithers Rapra Technology Ltd., Southampton, USA.

Hofmann, W. (1989) *Rubber technology handbook*, Hanser Publishers, Germany.

Cheremisinoff, N P (1993) *Elastomer Technology Handbook*, CRC Press, Inc., Boca Raton, Florida, USA.

Course Code	XPM 21212			Course Title	Farm Machinery Management		
Year	2	Semester	1	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge and skills required in selection, operation and maintenance of farm machinery so that they will be able to apply the knowledge and skills in the efficient use of machinery in the plantation sector.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify the potential of different farm power sources.
- Explain the operation of an internal combustion engine.
- Explain the operation and maintenance of different systems of a farm tractor.
- Describe the operation and maintenance of farm implements.
- Evaluate the potential use of advance farm machinery over conventional ones.

Course Capsule:

Farm power sources: Potential of different power sources, Internal combustion engines: Basic engine components, Terminology connected with engine power, Classification of heat engines, Compare four stroke and two stroke engines, Explain the operation of diesel and petrol engines, Operation and maintenance of: Fuel system, Cooling system, Power transmission system, Electrical and ignition system, Lubrication system and hydraulic system. Farm implements used in: Land preparation, Seed and plant establishment, Irrigation, Plant protection, Weed control, Harvesting etc., Use of crawler track type tractors, Operation of combine harvesters,

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Amit Deogirikor, Atul Mohod and Dhonda, K.G. (2018). Text Book on Farm Machinery & Power. Shri Rajalaxmi Prakashen Aurangabad.

Anon. (2016). Farm Power & Machinery. ICAR India

Mohd. Muzamil (2019). Sure Success Farm Power & Machinery – Agricultural Engineering. Kalyani publisher

Course Code	XPM 21222			Course Title	Plant Nutrition and Fertilizer Management		
Year	2	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge on different types of nutrients and their role in crop growth, different fertilizers for managing nutrients, while minimizing the loss of nutrients.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain different plant nutrients, their functions and deficiency symptoms
- Describe different types of fertilizers used in Sri Lanka, their characteristics and formulate fertilizer mixers.
- Illustrate the strategies to increase the fertilizer use efficiency in plantation sector.
- Describe the effects of plant nutrient mismanagement and their impacts on the environment.

Course Capsule:

Introduction to plant nutrition; Classification of nutrients and their functions in plants, Nutrients absorption; Deficiency symptoms and toxicities; Factors affecting nutrients uptake by plants. Soil nutrients losses; Soil fertility parameters and their assessment; Types of fertilizers; Formulations of mixed fertilizers; Integrated Plant Nutrient Management System (IPNMS); Effects of nutrient mismanagement and minimizing the adverse impact

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Plant Nutrition and Soil Fertility Manual. (Second Edition) J. Benton Jones, Jr. 2012. CRS Press. Taylor and Francis. New York (free download- available)

Soils and Soil Fertility. 15th Edition. Fredrec R. Troeh and Louis M. Thompson (1993) Oxford University Press.

Food & Agriculture Organization of the United Nations (2017). *Soil Bulletins* : at <http://www.fao.org/soils-portal/resources/soils-bulletins/en/>

The Nature and Properties of soils. 13th Edition. Nyle C. Brady and Ray R. Weil (2002). ISBN 81-7808-625-5

Course Code	XPM 21233			Course Title	Crop Protection: Pest, Disease and Weed Management		
Year	2	Semester	I	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	90

Aim of the Course:

To provide the students with knowledge and skills required to identify biotic and abiotic factors causing crop damages, develop sustainable crop protection and pest management programmes, with special emphasis on ecofriendly approaches and novel techniques, so that students will be able to enhance the crop productivity through improvement of crop health.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the ecology of pest, disease and weed problems, their management systems.
- Identify major pest problems of crops and assess the damage caused by pests.
- Describe the principles, strategies and methods of crop protection from pests.
- Compare different pest management methods.
- Plan a sustainable integrated crop protection/pest management programme with appropriate novel strategies and methods.

Course Capsule:

Biotic and abiotic factors that damage crops; Development of pest problems in agro-ecosystems; Biology and ecology of major pest groups; insects and others; Insect population management methods; Identification of different pest groups; Assessment of pest damages; Disease development process by plant pathogens, Symptoms and signs of diseases; Identification of plant diseases; Plant disease control; Introduction to weeds ; Common weeds of cropping systems; Biology and ecology of weeds; Principles of weed management; Ecological concepts for the sustainable weed management; Conventional and novel strategies of weed management; Principles of pest management; Conventional and non-conventional crop protection techniques; Natural and applied methods of pest management; Natural and synthetic pesticides: Pesticide classification and formulations ; Safe and efficient use of pesticides; Development of pest management programmes for different cropping systems; Integrated Pest Management and Integrated Crop Management.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

George B. Lucas, Lee Campbell, (2012). Introduction to Plant Diseases: Identification and Management, Springer Science and Business Media, Germany

Little V. A., (1972). General and Applied Entomology, Harper and Row, USA

Robert L. Zimdahl, (2018). Fundamentals of Weed Science, Academic Press, UK

Robert F. Norris, Edward P. Caswell-Chen and Marcos Kogan , 2002, Concepts in Integrated Pest Management, Prentice-Hall, USA

Course Code	XPM 21241			Course Title	Career Planning & Development		
Year	2	Credits	I	Credit	1	Theory	10
						Practical (hr)	10
						Independent Learning (hr)	30

Aim of the Course:

To provide the knowledge and insight to the student on the importance of career planning and talent management to become a professional with a ‘continuous professional development’ (CPD).

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Develop a ‘Continuous Professional Development’ Plan to cover a specific period of time.
- Monitor and evaluate the progress of his/her own professional life and to make appropriate adjustments, where needed.

Course Capsule:

Students are exposed to a series of in-class sessions and interactive workshops on career planning and talent management conducted by a ‘Trained Career Guidance Counsellor, where a special attention would be placed on the development of a CPD and monitoring and evaluation of this plan for its success, and make the necessary adjustments based on reflective practice.

Assessment:

Continuous assessment: 100% (by way of systematic in-session work / reviews / feedback from the peers & trainer).

References:

- Ariyawansa, R. G. (2008). Employability of graduates of Sri Lankan universities. Sri Lankan Journal of Human Resource Management, 1(2), 91-104.
- Corfield, R (2009) Successful Interview Skills: How to Prepare, Answer Tough Questions and Get Your Ideal Job, Kogan Page Publishers, London, UK.
- Greener, S., Bournier, T., and Rospigliosi, A. Graduate Employment. Bookboon, London, UK.
- Hager, P., and Holland, S. (Eds.). (2007). Graduate attributes, learning and employability (Vol. 6). Springer Science & Business Media, Berlin, Germany
- Hammer, S., Star, C. and Green, W. (2009) Facing up to the challenge: why is it so hard to develop graduate attributes? Higher Education Research and Development, 28(1), pp. 17-29

Course Code	XPM 21252			Course Title	Applied Statistics	
Year	2	Semester	I	Credits	02	Theory (hr)
						30
						Practical (hr)
						00
						Independent Learning (hr)
						70

Aim of the Course:

To provide students with the basic concepts on probabilities and basic statistical theories to apply them in decision making process in plantation management.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify relevant variables on a given case in agriculture and plantation management
- Identify the discrete and continuous probability distributions and compute probabilities
- Carryout quantitative and qualitative data collection, analyze using appropriate descriptive statistics to draw information
- Use one sample and two sample statistical test for hypothesis testing about means
- Develop a Simple Linear Regression model to extract relevant information.

Course Capsule:

Descriptive statistics: Tabulation methods; Graphical methods; Numerical method; Introduction to inferential statistics: Estimations: Point and interval estimation, Null and alternative hypothesis; Errors and power of test, One tail and two tail tests, t-tests; Introduction to analysis of variance: Correlation; Simple linear regression.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Mark L. Berenson, David M. Levine, Timothy C. Krehbiel; 10th Edition, 20012 'Basic Business Statistics', Prentice Hall.

Terry Sincich, Pearson College Division, 5th Edition, 1995 'Business Statistics by Examples'.

Frank H. Dietrich, Nancy J. Shafer; 1990 'Business Statistics: An Inferential Approach', Dellen Pub. Co.

Alexander M. Mood, Franklin A. Graybill, Duane C. Boss; 3rd Edition, 1984 'Introduction to the Theory of Statistics', McGraw-Hill.

Course Code	XPM 22262			Course Title	International Trade and Market Management		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge and skills required to understand how firms trade and make strategic decisions in international markets.

Intended Learning Outcomes:

At the end of this course, the student should be able to:

- Compare various trade theories relating to international business
- Compare different levels of regional economic organizations and their implications on international trade
- Explain the impact of trade agreements on businesses
- Describe the Sri Lankan export and import procedures
- Explain EPRG Framework in addressing the way on how strategic decisions are made in firms

Course Capsule:

Globalization and trade; Basis for trade; Theories of international trade; International business strategy; Foreign Direct Investment; Regional economic integration and trade agreements; Export procedures; Import procedures; Global production; Outsourcing & logistics; Global marketing and R & D; EPRG framework; Auction markets; Standardization and adaptation in international marketing; International product and brand marketing; International marketing channels; Pricing for international markets, Ethics in international business

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Wild, John J, Wild, Kenneth L. and Han, Jerry C. Y. (2008), International Business: The Challenges of Globalization (Fourth Edition), Pearson Prentice Hall, Upper Saddle River, NJ

Carbaugh, R.J (2009) International Economics, 12th Edition, South Western Cengage Learning, USA

Cateora, P., Gilly, M. & Graham, J. (2011). International Marketing, 15th edition. ISBN # 9780073529943

Course Code	XPM 22272			Course Title	Human Resource Development and Management		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge and skills relevant to human resources development and management to facilitate them to apply Human Resource Management principles and theories to enhance work force productivity.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Analyze human resource requirement and to prepare a recruitment plan for an organization
- Prepare the job descriptions and specifications to select best suitable persons
- Prepare a training and development plan for an organization
- Establish performance review system for an organization
- Apply motivational theories to motivate people
- Develop a procedure for employee conflict minimizing system to the organization through labor relations

Course Capsule:

Introduction to Human Resource Management; Human Resource Development; Human resource planning; Preparing job description and specification, Employee recruitment and selection; Employee training and development; Performance management in organizations; Employee relations, Conflict management in organizations; Health and safety management; Compensation and reward management; Motivation of employees and team building.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Armstrong, M. (2009). Handbook of Human Resource Management Practice, 11th edition, Kogan Page India Pvt
Opatha, HHDNP. (2002). Employee Discipline Management. , Colombo: Godage International Publishers (pvt) Ltd

Course Code	XPM 22282			Course Title	Socio-Economic, Policy and Legal Environment for Plantation Management		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with first-hand information needed to understand and critically evaluate the various facets of development of a country, in general, and development of plantation sector and agriculture sector in Sri Lanka, in particular.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Use different measurements and development indicators to assess the socio-economic development of Sri Lanka in relation to other countries.
- Explain the basic theories that can be used to develop an economy and applicability of which to the development of plantation sector in particular.
- Explain the role of human resources, technology, research and legal environment in the process of economic development.
- Describe, by comparing & contrasting, the different types of plans, programs and projects that can be used as well as strategies available to develop the plantation sector.
- Critically evaluate the key strengths and weakness of agricultural policy scenarios/frameworks with special reference to land, price, credit, food, marketing and environmental policies.

Course Capsule:

Role of Plantation Sector, and Agriculture as a Whole, in Economic Development; Development Indicators; Population & Development; Theories of Agriculture Development; Technology & Development; Research & Development Environment & Development; Human Resource Development; Development Planning; Introduction to Agricultural Policy; Input & Output Price Policy; Land Policy; Environmental Policy; Food & Nutrition Policy; Trade & Marketing Policy; Credit Policy; Trends & Challenges in Agricultural and Plantation Sector Development

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Department of Census & Statistics Sri Lanka Official Web Site: <http://www.statistics.gov.lk/>

Food & Agriculture Organization of the United Nations (2017). *The Future of Food & Agriculture - Trends and Challenges*, Rome, Italy.

Course Code	XPM 22293			Course Title	Agronomy and Manufacturing of Export Agricultural Crops		
Year	1	Semester	II	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide the students with knowledge and skills on agronomy and processing of export agricultural crops so that students will be able to apply them to enhance the profitability of the plantation sector.

. Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the Current status of export agricultural crops in Sri Lanka.
- Explain the soil and climatic requirement for different export agricultural crops.
- Describe the cultural operations of export agricultural crops from nursery management to processing.
- Evaluate cost analysis of different export agricultural crops.
- Analyze the trends and current threats of export agricultural crops.
- Explore the innovative solutions to mitigate the threats.

Course Capsule:

Current status of export agric. crops in Sri Lanka: Current extent, production, distribution and contribution to GDP, Soil and climatic requirement of export agricultural crops in Sri Lanka, Major export agricultural crops and their varieties, Propagation and nursery management, Field planting, Soil and moisture conservation, Pest and disease management, training and maintenance, Harvesting, Post harvesting operations, Processing and value addition, Grading, Quality standards, Value added export agricultural crops products. Cost Analysis of export agricultural crops, Trends and current threats of export agricultural crops, Explore the innovative solutions to mitigate the threats.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Farooqi, A.A., Sreerama, B.S., and Srinivasappa, K.N. (2005). Cultivation of Spice Crops. University Press India (Pvt.) Ltd.
- Gunathilake, H.A.J., Liyanage, M.D. and Fernando, M.T.M. (1994). Agronomy Performance of Intercrops in Coconut Based Cropping Models. CRI publications.

Course Code	XPM 22303			Course Title	Agronomy & Manufacturing of Potential Plantation Crops		
Year	2	Semester	II	Credits	03	Theory (hr)	30
						Practical (hr)	30
						Independent Learning (hr)	100

Aim of the Course:

To provide knowledge and skills on agronomy and processing of minor and potential plantation crops so that students will be able to apply them to enhance the profitability of such crops.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the importance of minor and potential plantation crops
- Describe agronomic and processing practices of minor and potential plantation crops for increasing the production and productivity.
- Identify the different value added products of minor and potential plantation crops and describe manufacturing steps of them
- Analyze the problems related to the agronomic and processing practices of minor and potential plantation crops

Course Capsule:

Oil palm, Sugarcane, Cashew, Arecanut, Palmyrah and Kitul : Origin; History and distribution; Botany; Soils and climatic requirements; Planting materials; Varieties and their selection criteria; Nursery management; Land preparation; Field establishment; Fertilizer use; Pest and disease management; Other post-establishment practices; Harvesting; Manufacturing and processing; Product development and value addition.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Anon. (2003). Cashew Cultivation Principles and Technology, Ed. Jayasekera, S.J.B.A. and Jayasekera, N.E.M., Sri Lanka Cashew Corporation, Sri Lanka, Colombo, 257p.
- Bakker, H. (1999). Sugar Cane Cultivation and Management. Springer
- Mandal, R.C. (2000). Cashew Production and Processing Technology, Jodhpur, New Delhi, AGROBIOS, 195p.
- Roger P. Humbert. (1963). The Growing of Sugar Cane Elsevier. Pp 722.

Course Code	XPM 22312			Course Title	Crop Improvement and Production Technologies		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide students with the knowledge on plant breeding and advanced production technologies so that they can apply suitable techniques for enhancement of production in plantation and agriculture sectors.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the conventional plant breeding methods.
- Identify the appropriate improvement method for a given crop under given conditions.
- Differentiate conventional and protected agriculture systems.
- Appraise the importance of smart and protected agriculture systems for crop production.

Course Capsule:

Crop improvement through conventional breeding- Introduction to plant breeding; Mendelian inheritance, Breeding methods; Domestication, Introduction, selection methods; mass selection, pureline selection: hybridization methods; Bulk selection, Pedigree selection, Single Seed Descent method, Backcross method; Advanced Production technologies- Protected agriculture: Introduction to protected agriculture, evolution and current status, Greenhouse structures and protected agriculture models: Smart agriculture- Introduction to smart agriculture, Smart Agriculture technologies.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Acquaah G. (2012) Principles of Plant Genetics and Breeding (2nd Edition) John Wiley & Sons, Ltd. West Sussex, UK.
- Deogirikar A. (2019) Protected Cultivation and Secondary Agriculture, Rajlaxmi Prakashan, Aurangabad, India
- Singh B., Singh B. (2015) Advances in Protected Cultivation. New India Publishing Agency, New Delhi, India

Course Code	XPM 22322			Course Title	Plantation Forestry		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide knowledge on forest management and agroforestry concepts so that students will be able to manage the plantation forest resources and agroforestry systems in a sustainable manner.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe scientific management of forests
- Explain sustainable forest management
- Identify different agroforestry systems and their ecological, economic and social principles
- Prepare management plans for the productive and protective forests with respect to their functions
- Plan, design and manage different agroforestry systems
- Describe forest management practices to productive forests

Course Capsule:

Introduction to forest management; Principles of sustainable forest management; Forest nurseries and plantation establishment; Silvicultural practices in forestry; Silvicultural systems; Forest measurements and tree measurements; Forest harvesting techniques; Forest growth modeling; Forest management plan preparation; Forest certification.

Introduction to agroforestry; Classification of agroforestry systems; Advantages of agroforestry; Establishment and management practices of common agroforestry systems in Sri Lanka; Species selection; Ecological interactions; Evaluation of agroforestry practices; Planning and designing of agroforestry systems in plantations.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

An Introduction to Agroforestry, P.K. Ramachandran Nair, 1993, Klgwer academic publishers.

Forest Management and Planning, First Edition, Pete Bettinger, Kevin Boston , Jacek P. Siry , Donald L. Grebner, 2010, Academic Press.

Plantation Forestry in the Tropics, Second Edition, Julian Evans, 1999, Oxford Science publications.

Course Code	XPM 22332			Course Title	Eco-friendly Technologies and Organic Agriculture		
Year	2	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge and skills required to identify the eco-friendly technologies and organic farming concepts and methods to inculcate and practice organic agriculture as an agricultural system for healthy human life, healthy environment and sustainable development.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the values and principles of eco-friendly technologies and organic farming
- Select appropriate organic management practices for farm management
- Identify challenges for organic agriculture in Sri Lanka
- Promote organic farming and consumption of organic food in the society.

Course Capsule:

Eco-friendly technologies and its applications in agriculture, Introduction to Organic Farming; Integrated Farm Management Systems; Organic Soil Management and Crop Nutrition: composting, mulching, green manuring, cover crops, organic fertilizers, biofertilizers etc., Weed management, pest and disease management; Livestock management, Organic certification, environmental concerns and marketing challenges

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Anne Larkin Hansen. The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farm. ISBN-13: 978-1603424790, ISBN-10: 1603424792

Girri, B., Prasad, R., Wu Q. S. and Verma, A. 2019. Biofertilizers for sustainable Agriculture and Environment. Springer, Switzerland

John Williams Barrow. Sustainable Agriculture: Principles and Practices. 1st Edition, ISBN-13: 978-1682865736, ISBN-10: 1682865738

Sarath Chandran, Unni M.R & Sabu Thomas Organic Farming: Global Perspectives and Methods. 1st Edition. ISBN: 9780128132722

Course Code	XPM 22342			Course Title	Development Communication and Extension	
Year	2	Semester	II	Credits	02	Theory (hr)
						30
						Practical (hr)
						00
						Independent Learning (hr)
						70

Aim of the Course:

To provide the students with knowledge and skills required to identify and use the concepts, and practices of development communication and extension, with special reference to plantation and agriculture sectors to support stakeholders and policy makers, establishes conducive environments, assesses risks and opportunities and promotes information exchanges to create positive social change via sustainable development

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe terms, principles and practices in communication development and extension.
- Facilitate the stakeholders and policymakers using the techniques of communication development and extension.
- Apply communication development and extension principles and practices for sustainable development in the plantation and agricultural sectors

Course Capsule:

Introduction to communication development and extension, Meaning and definitions of development, Process of development, Models and theories of development, The concept of development communication, Definitions of development communication, Roles and goals of development and communication, Development Support Communication, behavior change, social marketing, social mobilization, media advocacy, communication for social change and community participation Agricultural extension, it's goal and role, principals of effective extension work, motivation, adoption and diffusion of agricultural and plantation sector innovation, barriers on adoption and diffusion, motivation techniques and application, laws of adult learning, role of rural and women in sustainable development in plantation and agriculture sector, planning monitoring and evaluation in extension given special emphasis on agriculture and planation sector.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Karthikeyan, C., Sendilkumar, R. and Jaganathan D.A. (2008). Textbook of Agricultural Extension Management. Kindle Edition Atlantic Publisher.
- Dubey, V.K. and Indira Bishnoi. (2008). Extension Education & Communication. New Age International Pvt. Ltd., Publishers, New Delhi.

Course Code	XPM 31353			Course Title	Livestock and Fisheries Integration to Plantations	
Year	3	Semester	I	Credits	03	Theory (hr)
						30
						Practical (hr)
						30
						Independent Learning (hr)
						90

Aim of the Course:

To provide knowledge and skills to develop sustainable production systems through integration of livestock and fish to plantation sector while meeting national demands and conserving the natural resource base in Sri Lanka

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Acquire knowledge on the integration of livestock and fish to common plantations, benefits and limitations
- Describe how resources are managed and utilized in integrated systems with livestock, fish and plantations
- Develop a productive and sustainable integrated farm in a plantation with livestock and fish

Course Capsule:

Introduction to sustainability, complementarity and integration; Basis of livestock, fish, and crop combinations; Advantages of integration of livestock and fish to commercial plantations; Introduction to integrated farming systems; Common livestock based integrated farming systems in plantations: cattle, swine, poultry, duck, goat; Role of fish as a component of an integrated system; Fish integration with common plantations: inland fish and ornamental fish; Planning and management of a commercial farm with livestock and fish integrated to a plantation; Constraints and future potentials

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Edens, T. (1984). Sustainable Agriculture and Integrated Farming Systems, Michigan State University Press.
- Food and Agriculture Organization of the United Nations. (2003). Integrated Livestock-Fish Farming Systems, FAO.
- Rajibar, M.C. (2019). Organic Farming and Livestock Management in Integrated Farming: An Agro-entrepreneur manual to successful integrated farm production.
- Mane, R.V. (2016). Integrated Farming System: A strategy for Sustainable Farm Production and Livelihood Security, Scitus Academics.

Course Code	XPM 31362			Course Title	Livestock Product Development		
Year	3	Semester	I	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide students with knowledge and skills required for handling, processing and packaging of livestock products while maintaining nutritive value and food safety.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain about various marketable livestock products
- Explain the livestock product processing and development technologies
- Elaborate the practices of manufacturing of livestock food products maintaining nutritive properties, sensory parameters and microbial safety
- Evaluate good manufacturing practices on commercial livestock products

Course Capsule:

Milk: collection, pasteurization, sterilization and their packaging. Milk products: curd and yoghurt, condensed milk, milk powder, packaging and their storage. Meat: slaughtering, processing, packaging, storage and transportation. Meat products; frozen meat, sausages, meat balls, fingers, salted meat, ham and bacon production, packaging and storage. Meat products canning. Good manufacturing practices (GMP) to be followed during livestock products processing and development.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Geurts, T.J., Walstra, P. and Wouters, J.T.M. (2006). Dairy Science and Technology, 2nd Edition, CRC Press, Boca Raton, Florida, USA.

Singh, S. (2014). Dairy Technology, New India Publishing Agency.

Singh, V.P. (2015). Principles of Meat Technology: 2nd Revised and Expanded Edition, New India Publishing Agency.

Lawrie, R.A. (1998). Meat Science, Fifth Edition, CRC Press, Boca Raton, Florida, USA.

Course Code	XPM 31372			Course Title	Project Analysis and Management		
Year	3	Semester	I	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge and skills required to identify and analyze a project, with special emphasis on plantation sector, for its feasibility and select for implementation, and in turn, monitor the progression and evaluate for overall success of it using the standard theory and practice in project management.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe on the feasibility (i.e. *ex-ante*) and success (i.e. *ex-post*) of any project using appropriate methods and techniques used in project analysis, monitoring and evaluation.
- Explain how to select a suitable project for implementation using the standard ‘Core’ and ‘Supplementary’ processes use in project management theory to.
- Prepare a detailed project report for a potential client on a given project (with special reference to agriculture / plantation sector).

Course Capsule:

Project: Definition and Life Cycle; Core Project Management Processes – Scope, Schedule, Budget and Quality; Supplementary Project Management Processes – Team, Stakeholder, Information, Risk and Contract; Project Benefits and Costs; Incremental Net Benefit; Measures of Project Worth: Selection & Assessment Criteria; Discounted Measures; Present and Future Value of Money; Net Present Value & Benefit Cost Ratio; Internal Rate of Return; Sensitivity Analysis; Cost Effectiveness Analysis; Project Monitoring and Evaluation; Practical - Conceptualization Group Work; Project; Mind Mapping & Poster Preparation; Tutorials & Development of Cases; Compilation of Individual Project Report for an identified business project

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Gittinger, J. P., “Economic Analysis of Agricultural Projects”, Economic Development Institute (Washington, D.C.), Johns Hopkins University Press, 1972.
- Jayasinghe-Mudalige, U. K., “Application of Project Management Principles for Professional Development”, Staff Development Center, Wayamba University of Sri Lanka, 2012 (ISBN 978-955-8746-96-7).

Course Code	XPM 31382			Course Title	Waste Management	
Year	3	Semester	I	Credits	02	Theory (hr)
						30
						Practical (hr)
						00
						Independent Learning (hr)
						70

Aim of the Course:

To provide students with the knowledge and skills required to describe and identify appropriate waste management methods to abate polluted water, air and soil environments.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Classify different types of waste and describe their sources and characteristics.
- Describe methods for solid waste management, wastewater treatment and treatment of polluted air.
- Explain principles and applications of bioremediation and phytoremediation
- Identify appropriate remediation strategies with respect to a given situation following environmental regulations in Sri Lanka.

Course Capsule:

Introduction to waste management; Types and sources of waste, Physical, chemical and biological properties of waste, Waste management methods and bioremediation; Unit operations in solid waste management; Landfilling, incineration, Unit operations in wastewater treatment; Activated sludge, anaerobic digesters; Unit operations in biotreatment of polluted air; Biofilters, biotrickling filters, bioscrubbers; Resources from waste; Environmental laws, guidelines and social responsibility for waste management in Sri Lanka

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Evans, G.M. and Furlong, J.C. 2011.Environmental Biotechnology-Theory and Application, second edition, Willey and Blackwell
- Diaz, L.F., Savage, G.M. and Eggerth, L. L. 2005. Solid Waste Management, Volume 1, United Nations Environment Programme.

Course Code	XPM 31392			Course Title	Commercial Horticulture		
Year	3	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide students with the knowledge and understanding of the horticultural sector and expose them to the commercial scale production technologies of horticultural crops so that students can apply those in their careers in agriculture.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify horticultural crop types for commercial production
- Determine the ecological and technological requirements for commercial production of horticultural crops
- Suggest on appropriate production technologies for a given horticultural crops
- Develop a production plan for a given crop

Course Capsule:

Current status of the horticulture sector; Introduction to commercially important horticultural crops - fruits, vegetables, ornamental plants; Crops and varieties; Planting materials; General cultural practices; Orchard establishment and management; Training and pruning of fruit trees; New technologies for commercial horticultural crop production - Soilless culture and greenhouse growing; Export processing; Harvesting and postharvest considerations; Marketing channels - Local and export markets; Emerging trends in horticulture sector; Developing commercial scale production plans for horticultural crops.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Adams, C.R., Bamford, K.M. and Early, M.P. (2013). Principles of Horticulture (2nd Edition). Elsevier Publishing.
- Nair, B., Singh, K.P. and Chand, P. (2014). Fundamentals of Vegetable Crop Production. Scientific Publishers.
- Prasad, S. and Kumar, U. (1999). Greenhouse Management for Horticultural Crop Production. Agrobios (India).
- Crop Technology, Department of Agriculture Sri Lanka [Online]. Available at: <https://doa.gov.lk/index.php/en/croptechnology>.

Course Code	XPM 31402			Course Title	Commercial Field Crop Production		
Year	3	Semester	1	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide students with knowledge and an understanding of the field crop sector and expose them to the commercial scale production technologies of paddy, other cereals, pulses, condiments and root and tuber crops to assist students for their careers in agriculture.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify different field crops for commercial scale production
- Determine the ecological and technological requirements for commercial production of field crops
- Describe appropriate production technologies for field crops
- Develop a cropping plan for a given land integrating field crops

Course Capsule:

Introduction to field crops; Current status of field crop sector; Crops and varieties; Climatic requirements; Paddy cultivation technology; Commercial seed paddy production; Cultivation technology of other cereals, pulses, and condiments; Onion true seed production, postharvest operations and storage; Root and tuber crops; Planting materials; Production technologies; Processing and value addition of cereals, Pulses and root and tuber crops. Local and export markets; Emerging trends in field crops sector; Developing cropping plans with integration of field crops.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Pratley, J.E. (2003). Principles of Field Crop Production. Oxford University Press.
- Joshi, M. (2018). Textbook of Field Crops. PHI Learning Pvt. Ltd.
- Acquaah, G. (2001). Principles of Crop Production: Theory, Techniques and Technology. Prentice Hall.
- Crop Technology, Department of Agriculture Sri Lanka [Online]. Available at: <https://doa.gov.lk/index.php/en/croptechnology>.

Course Code	XPM 31412			Course Title	Application of Biotechnology in Plantation Management		
Year	3	Semester	I	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with basic knowledge on principles and applications of different biotechnological approaches to facilitate them to select the most applicable strategies in solving problems faced in plantation and agriculture sectors.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the science underpinning DNA molecule and gene cloning that is necessary for the DNA based innovations.
- Explain the importance of protein/pharmaceutical production by recombinant DNA technology (RDT) by highlighting the global and Sri Lankan market scenario in RDT products.
- Prepare a report on commercially available genetically modified (GM) crops emphasizing the development mechanisms, their advantages, and potential negative effects.
- Explain the principles and applications of DNA typing technology in relation to agriculture, plantation crops, and animal related industries.
- Appraise the significance of the “Biosafety” and “Patenting” aspects of biotechnology to benefit the society, in general, and agriculture and plantation sector, in particular.

Course Capsule:

Introduction, history and scope of biotechnology; DNA, gene, chromosome and genome relationships and genetic variations; Recombinant DNA technology (RDT) and overview of global protein market; Genetically modified (GM) plants with developmental mechanisms and scientific perception; DNA typing technology: Principles and applications; Biotechnological applications in animal industry; Biosafety and patenting aspects of biotechnology; Importance of biotechnology for plantation sector in Sri Lanka.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Nair A.J. (2008) Introduction to biotechnology and genetic engineering. <https://thunderbooks.files.wordpress.com/2009/05/introduction-to-biotechnology-and-genetic-engineering-infinity-2008.pdf>
- N.S Kottearachchi (2013) Utility of DNA Markers in rice breeding. European International Journal of Science and Technology. 2 (8) 111-222
- D. B. R. Swarnathilaka, N. S. Kottearachchi and W. J. S. K. Weerakkody. (2016) Factors Affecting on Induction of Microrhizomes in Ginger (*Zingiber officinale* Rosc.), Cultivar Local from Sri Lanka. British Biotechnology Journal, 12 (2), ISSN 22231-2927
- Jeremy W. Dale, Malcom Von Schantz, Nick Plant (2012) From genes to genome: Concepts and applications of DNA technology (3rd Edition)

Course Code	XPM 31422			Course Title	Energy Production and Management	
Year	3	Semester	I	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the knowledge of energy production and skills on energy management in domestic and industrial levels.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Apply the concepts of energy, power, work, energy conversion, the law of conservation of energy and energy efficiency in production and management
- Explain critically on energy and its impact
- Explain the potential of different energy sources and importance of utilizing sustainable energy sources
- Illustrate the relationship between the current socio/economic state and accessibility to low cost abundant energy sources in Sri Lankan and global context

Course Capsule:

Theory
Introduction to concepts of energy, power, work, energy conversion, the law of conservation of energy and energy efficiency, with simple energy calculations; Introduction to energy consumption and production, environmental effects and energy demand in different sectors; Introduction to renewables and sustainable energy sources (wind, solar, hydro, biomass, etc.); Introduction to economic, technical, and sustainability issues involved in the integration of renewable energy systems. ; Introduction to energy distribution, energy storage and smart grid;
Practical
Introduction to energy measuring instruments; Thermal energy resources and their uses: Introduction to energy saving in domestic and industrial scale: Introduction to solar energy, conversion of solar energy into electricity: photovoltaic cells, Wind energy conversion systems; working principle of a hydro power plant; Introduction to biomass to thermal and electricity conversion; Introduction to Energy storage techniques

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Cassedy, E. S., Grossman, P. Z. (2017). Introduction to Energy: Resources, Technology, and Society. India: Cambridge University Press. ISBN:9781107605046, 1107605040
- Da Rosa, A. V. (2012). Fundamentals of Renewable Energy Processes. Netherlands: Elsevier Science. ISBN:9780123978257, 0123978254
- Khodorovsky, M. Y., Magaril, E. R. (2014). Energy Production and Management in the 21st Century: The Quest for Sustainable Energy. United Kingdom: WIT Press. ISBN:9781845648176, 184564817X

Course Code	XPM 31432			Course Title	MIS and E-Commerce	
Year	3	Semester	I	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the students with knowledge on Management Information Systems showing the information systems that support business process and the purpose of managing the organization in an efficient way and capturing the potential of the information systems for competitive advantage in the business world.

Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the role of information systems applied for management in organizations
- Demonstrate the trends and issues related to information systems
- Analyze information security risk
- Evaluate Management Information Systems used a given in organizations

Course Capsule:

Introduction to MIS: Definition of MIS, Characteristics of MIS, Use of MIS, Components of MIS. MIS in managerial work: Roles of managers, Functions of organization, How MIS help for managerial work. Data management: Define general data management concepts and terms, Practice database approach to data management, working with MIS Communication in MIS: Define the terms communications and telecommunications and describe the components of a telecommunications system, Identify and describe Internet, Intranet, and Extranet. Enterprise Resource Planning (ERP): Use of ERP in business management. Information security: Analyze information security risk, Prepare a data disaster recovery plan. MIS and Agribusiness: Application of MIS small and large agribusiness firms, Evaluate case studies.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Kenneth C. Laudon, Carol Guercio Traver E-Commerce 2019: Business, Technology and Society, Global Edition 15th Edition ISBN-13: 978-1292303178 ISBN-10: 1292303174

Kenneth C. Laudon, Jane P. Laudon (2019). Management Information Systems: Managing the Digital Firm, 16th Edition

R. Kelly Rainer, Brad Prince, Hugh J. Watson (2017). Management Information Systems 4th Edition Wiley.

Course Code	XPM 31442			Course Title	Food Processing Technologies		
Year	3	Semester	1	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide students with knowledge and skills required to process food for preservation and value addition using existing food processing technologies while maintaining nutritive value and food safety.

Intended Learning Outcomes:

At the end of this course, the student should be able to:

- Describe the requirements of food processing technologies
- Identify and apply suitable food processing technologies for various food types
- Evaluate the suitability of different food processing technologies for various food products
- Design appropriate packaging for processed food products

Course Capsule:

Introduction, causes for food deterioration. Food processing technologies; heat preservation, fermentation, dehydration, salting, chemical preservation, refrigeration and freezing. Food packaging; selecting, designing and type of packaging based on type of products.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Food Preservation and Processing Technology. Guide book for students. (2018). Niranjala Perera and Kanchana Hettiarachchi. Godage Publilshers.

Fruit Processing. (1996) Arthey D and Ashurst, P.R. Blackie Academic Professional, London.

Dehydration of foods. (1996) Barbosa-Canovus G.V. and Vega Mercado, H. Chapman and Hall, New York.

Course Code	XPM 31452			Course Title	Quantitative Techniques for Decision Making	
Year	3	Semester	I	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To provide the students with knowledge and skills required to identify and use proper quantitative technique to process and analyze data, interpret outcomes of analysis, synthesis them to make decisions and report with special emphasis on plantation sector.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify and prescribe proper quantitative techniques to analyze variety of data generated in plantation sector.
- Use different quantitative techniques properly with the help of a statistical software to analyze data and interpret outputs of the analysis.
- Synthesis the information in statistical outputs and make decisions accordingly
- Prepare reports of analysis for potential clients on a given set of analyzed data (with special reference to agriculture / plantation sector).

Course Capsule:

Introduction; Terminology; Notations and definition; Collection of data; Exploratory data analysis; Association between variables; Regression analysis and applications; Analysis of time series data and applications; Index numbers and applications; Introduction to linear programming.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Wisniewski, M., (2016). *Quantitative Methods for Decision Makers (6th Edition)*, Pearson Education Limited, United Kingdom.
- Sørensen, H, Ekstrom, C T, (2011). *Introduction to Statistical Data Analysis for the Life Sciences*, CRC Press, Taylor & Francis Group, USA.

Course Code	XPM 32462			Course Title	Risk & Disaster Management in Plantation Sector		
Year	3	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To provide the students with knowledge and skills required to identify different types of disasters along with their primary and secondary impacts and assess the risk imposed by disasters with special emphasis on plantation sector, and in turn, develop disaster management plans to enhance the resilience of the plantation sector for disasters.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe different types of disasters along with their impacts.
- Conduct risk and vulnerability assessments for disasters, with special emphasis on the plantation sector.
- Describe disaster mitigation and adaptation actions to enhance resilience of the plantation sector for disasters.
- Develop a disaster management plan based on the core theories of disaster management (with special reference to agriculture / plantation sector).

Course Capsule:

Concept of disasters; Disaster classifications; Characterization of disasters; Primary and secondary Impacts of disasters; Global and national disasters of significance; Methods of disaster impact and risk assessment; Disaster management; Response; Recovery; Mitigation and preparedness for plantation related disasters; Climate system; Climate change; Adaptation and mitigation for climate change.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Amarasinghe, E. F. G. The Employers' Federation of Ceylon. (1929-1994).
- De Silva, S. R. (2005). Leave, holidays, and overtime in the private sector. Employers Federation of Ceylon.
- Employers Federation of Ceylon (2000). Handbook for plantations; Labor law.
- Employers Federation of Ceylon (2000). Handbook for Plantations: Labor-management relations. Sri Lanka
- Field, C.B. and Barros, V.R. (Eds.). 2014. *Climate change 2014: impacts, adaptation, and vulnerability* (Vol. 1). Cambridge and New York: Cambridge University Press.
- Lipper, L., McCarthy, N., Zilberman, D., Asfaw, S. and Branca, G. eds., 2017. *Climate smart agriculture: building resilience to climate change* (Vol. 52). Springer.

Course Code	XPM 32472			Course Title	Financial Accounting and Management		
Year	3	Semester	II	Credits	02	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

To gain and develop fundamental accounting skills including how financial statements are prepared. Further to explore the differences in financial accounting for different businesses with an understanding of the frameworks underpinning accounting practices.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify and classify the elements of financial statements through applying accounting principles and concepts
- Interpret the purpose, form and content of the three main financial statements; income statement, balance sheet and cash flow statement
- Compare the financial ratios to make financially sound decisions
- Differentiate partnership accounts and their features

Course Capsule:

Introduction to accounting Fundamental accounting concepts; Analyzing, recording and classifying transactions; Adjusting entries; Trial balance; Manufacturing account; Trading; Profit and loss account; Balance sheet; Cash flow statement; Cash budget; Financial ratios; Partnership accounts

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Hermanson, R. H., and Edwards, J. D. (2010). Accounting principles. Endeavour International Corporation, Houston, Texas, USA.

Kimmel, P. D., Weygandt, J. J., and Kieso, D. E. (2018). Financial accounting: Tools for business decision making. John Wiley and Sons.

Weygandt, J. J., Kimmel, P. D., and Kieso, D. E. (2015). Accounting principles. John Wiley and Sons.

Wild, J. J., Shaw, K. W., and Chiappetta, B. (2015). Fundamental accounting principles. McGraw-Hill Education.

Course Code	XPM 32482			Course Title	Resource Planning and Management in Plantations	
Year	3	Semester	II	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To develop the skills and knowledge of the students to gauge the theoretical concepts of planning and managing resources including land, labour and capital in plantations to apply appropriate methods and tools to allocate resources in a sustainable manner.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain key theoretical concepts of resource planning, management and sustainable development
- Discuss the importance and challenges of planning and managing land, labour and capital resources in plantations.
- Demonstrate an understating of the approaches used to allocate and manage renewable and non-renewable resources.
- Develop a management plan as a solution to a resource related problem.

Course Capsule:

Resource planning and environmental management - concepts and importance; Sustainable development; Environmental valuation and assessment; Land resource planning and management - history of land ownership, approaches to land resource planning and management, present corporate structure in plantations with respect to resource availability – large vs smallholders, Labour availability and productivity indices, current and emerging issues with respect to labour and strategies to overcome them; Integrated water resource management; Renewable and non-renewable resource management; Role of social and ethical dimensions in environment and resource planning; Resource allocation and risk assessment in plantations; Use of remote sensing and GIS for environmental analysis and planning

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Barrow, C.J (2006). Environmental Management for Development. 2nd Edition, Taylor and Francis.
- Paul Selman (1999). Environmental Planning: The Conservation and Development of Biophysical Resources. Sage Publications
- Tom Tietenberg (2008). Environmental and Natural Resource Economics. 8th Edition. Prentice Hall.
- Handbook and Guidelines for Environmental Management and Sustainable Development – UNDP

Course Code	XPM 32492			Course Title	Plant Tissue Culture Technologies		
Year	3	Semester	II	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge on theoretical and applied aspects of plant tissue culture and skills on establishing and maintaining a tissue culture laboratory so that the students can apply that knowledge and skills in research and commercial production

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the basic concept of totipotency and fundamental objectives of plant tissue culture
- Describe the minimum requirements necessary to establish commercial plant tissue culture laboratory emphasizing low cost options to minimize cost
- Apply micropropagation techniques for mass production and *in vitro* conservation
- Appraise the crop improvement through plant tissue culture techniques
- Apply *in vitro* culture techniques for secondary metabolite production

Course Capsule:

Concept of totipotency; Fundamental objectives of plant tissue culture; Brief history of plant tissue culture; Laboratory designing, equipment and maintenance; Sterilization techniques used in plant tissue culture; Composition of plant tissue culture medium; Preparation of Stock solutions and plant tissue culture media; Low cost options to run household plant tissue culture laboratory; Stages of micropropagation, Different regeneration pathways of micropropagation, Production scheduling and Guidelines for shipping micropropagated plantlets, Micropropagation of plantation crops; *In vitro* methods of germplasm conservation; Plant tissue culture techniques for crop improvement: embryo rescue, *in vitro* mutagenesis, dihaploid production via anther culture, protoplast culture and somatic hybridization, production of genetically modified crops; Strategies enhancing *in vitro* secondary metabolite production; Bioreactors for mass production; Production and applications of artificial seeds.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Neumann, K. H., Kumar, A., and Imani, J., (2009), Plant Cell and Tissue Culture- A Tool in Biotechnology: Basics and Application, Springer, Berlin, Heidelberg. Pp. 43-46, 51-63, 67-74, 91-138, 181-225.
- Bhojwani, S. S, and Razdan, M. K., (1996), Plant tissue culture: Theory and practice, a revised edition Elsevier India Pvt. Ltd New Delhi India. Pp. 1-18, 19-28, 39-62, 95-124.

Course Code	XPM 32502			Course Title	Quality Management in Agri-Food Chains	
Year	3	Semester	II	Credits	02	Theory (hr)
						30
						00
						Independent Learning (hr)
						70

Aim of the Course:

To provide the students with knowledge on identification and analysis of possible food safety hazards, with special emphasis on plantation sector to select a suitable certification system to reach local and global market for overall success in Agri-Food chain.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Understand the possible health and the environmental hazards in the Agri-food chain.
- Identify the principles of HACCP to assure food safety.
- Distinguish the different standards and requirements of global quality management systems of food safety and appropriateness of a particular QMS.
- Develop a food safety plan to avoid/minimize risks in Agri-food chain.

Course Capsule:

Environmental Management System (EMS), Occupational Safety and Health (OHSAS), Rainforest Alliance Sustainable Agriculture Standard, Principles of food safety and applications of Good Agriculture Practices (GAP), Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP); Principles of Hazards Analysis of Critical Control Point (HACCP); Food Safety Management System –ISO 22000:2018; Agri-Food Management System related other standards ; Quality Requirements for local and export market

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Food and Agriculture Organization of the United Nations (1993). Manual of Food Quality Control: Quality assurance in the food control chemical laboratory, Food & Agriculture Org. ISBN9251034036, 9789251034033.
- Newslow, D. (2013). Food Safety Management Programs: Applications, Best Practices, and Compliance. CRC Press. 143982679X, 9781439826799
- Theuvsen, L., Spiller, A., Peupert, M., and Jahn, G. (2007). Quality management in food chains. Wageningen Academic Publishers, ISBN9086866050, 9789086866052
- Jongen, W.M.F. and Meulenberg, M.T.G. (2005). Innovation in agri-food systems. Wageningen Academic Publishers, ISBN9086866662, 9789086866663

Course Code	XPM 32512			Course Title	Landscape Technology and Management		
Year	3	Semester	II	Credits	02	Theory (hr)	20
						Practical (hr)	20
						Independent Learning (hr)	60

Aim of the Course:

To provide the students with knowledge and skills on principles of landscape plant selection, establishment and management, facilitating them to apply in designing and management of landscape sites in an aesthetically pleasing, ecologically sound and sustainable manner.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Describe the potential functions and benefits of landscaping
- Categorize landscape plants based on their growth habits and management practices
- Explain the methods of planting in artificial situations and interior spaces
- Adopt relevant integrative technology in establishment and management of landscape plants
- Apply the knowledge on elements and principles of landscape designs for creative and unique designing of indoor and outdoor spaces

Course Capsule:

Introduction, functions and benefits of landscaping; Aesthetic, functional and ecological principles underpinning planting designs; Classification of materials used in landscaping; Soft landscape materials: establishment and management and problems encounter with soft landscape materials; Designing, establishment and management of hedges, borders, flower beds and lawns; Elements and principles of landscape designs and its applications; Planting in artificial situations: roof gardens, green walls and interior landscaping; Planting designs in residential gardens, office environments and commercial establishments

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

- Crawford, S. (2016). Arboriculture: Cultivation and Management of Trees, Shrubs and Vines. Syrawood Publishing House,
- Graf, A.B. (2003). Tropica: Color cyclopedia of exotic plants and trees. (4th Edition) Roehrs Company.
- Hessayon, D.G. (1997). The Lawn Expert. Expert Books, UK.
- Hitchmough, J. and Cameron R.W.F. (2016). Environmental Horticulture: Science and Management of Green Landscapes. CAB International, UK.

Course Code	XPM 32522			Course Title	Tourism Management in Plantations		
Year	3	Semester	II	Credits	2	Theory (hr)	30
						Practical (hr)	00
						Independent Learning (hr)	70

Aim of the Course:

The aim of this course is to give the student a thorough understanding of the tourism sector as a potential industry within the plantation environment which is a niche tourism segment emerged with novel concept of sustainable and nature based eco-friendly agro-tourism.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

1. Explain definitions of sustainable tourism and describe the main characteristics of the tourism sector in the context of globalization and sustainability;
2. Analyze present multidimensional positive and negative impacts and effects of tourism on plantation development.
3. Identify concepts and approaches to enhance the potential contribution of tourism to plantation development.
4. Describe sustainable agro-tourism project as a non-crop diversification strategy for economic and social development in plantation sector.

Course Capsule:

Introduction: Opportunities, Concepts and need of sustainable tourism in plantation environment; Tourism and its forms: Types of tourism (Agro-tourism, ecotourism and etc); How did tourism evolve?; How ecotourism has been used as a tool for conservation and sustainable development; Business in plantation tourism: How does the tourism industry work?; Analysis of condition for business in agri-tourism: Analysis of locality and facility, Marketing of services in rural tourism and agri-tourism, The tourism Market: Who is the eco-tourist and what are they seeking in a vacation? Basic infrastructure for plantation tourism, Importance of hospitality management in plantation tourism, Management practices for better service. Understanding all the market players-from travel agents to non-profits. Tourism Planning for plantations, Destination marketing techniques that work proven techniques for using tourist dollars for long-term sustainability, Managing the impacts of tourism on the local environment and culture, How to start a sustainable agri-tourism enterprise in a plantation environment, How to become an agri-tourism successful entrepreneur, what visitors expect, customer relations, income streams, liability, and marketing. Prepare an agri-tourism enterprise project proposal (Project report) for bank finance, documents required for bank finance and checklist and other useful resources. Planning tools for communities impacted by tourism, educating the tourist, Full day visit to an upcountry tea garden with tourism potential for practical experience.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

References:

Abeysekera, N. and S. Ganewatta (2015) Tourism in Sri Lanka: The Way Forward, Shaakya Publishers, Colombo, Sri Lanka.

Fennell, D. (2008) Ecotourism. Third edition. London & New York: Routledge.

Course Code	XPM 32532			Course Title	Research Methodology & Communication	
Year	3	Semester	II	Credits	02	Theory (hr)
						20
						Practical (hr)
						20
						Independent Learning (hr)
						60

Aim of the Course:

To develop a research orientation among the scholars and to acquaint them with fundamentals of research methods and be practically exposed to the main components of a research framework. Once equipped, the research scholar would be well-placed to conduct disciplined research under supervision in an area of his/her choice.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain the basic framework of research process.
- Explain various research designs and techniques available to carry out an applied research.
- Identify various sources of information for literature review and collection and analysis of data.
- Recognize the ethical dimensions of conducting applied research.
- Develop a project proposal with proper layout by following standard methodology and correct language handling to facilitate conducting an independent research under supervision.

Course Capsule:

Theory (Through Expert Seminar ; Teaching Sessions; LMS)
Introduction to research – the role of research, research process overview; Philosophies and the language of research theory building; Thinking like a researcher – understanding concepts, constructs, variables, and definitions: Problems and Hypotheses – defining the research problem, formulation of the research hypotheses; Research design – experimental and non-experimental research design, Field research and survey research; Selecting appropriate Qualitative and Quantitative Methods (Data collection; Questionnaire designing, Sampling techniques, Methods of Analysis); Processing and analysis of data; Determining resource requirement; Ethical issues in conducting research; Components of a standard project proposal / research paper / report; Research communication
Practical (Student Centered In-Class and Field Work)
Group work on ‘mind mapping’ of the research process; Classification of research philosophies as applicable to applied research in agro-technology; Individual work supported by peer evaluation on the use of various concepts, constructs, variables and definitions; Formulation of research problem, hypotheses and appropriate design; Creating a detailed plan of practical activities; Development of an individual project proposal; Project proposal defence

Assessment:

Continuous assessment:	40% (Individual / Group class activities)
End semester assessment:	60% (Project proposal 30%; Proposal defence 30%)

References:

- D' Antonio, P. (2019). Publish or Perish-and Your Peril. Nursing History Review: Official Journal of the American Association for the History of Nursing, 27(1), 12-14.
- Katz, M. J. (2009). From Research to Manuscript: A guide to scientific writing. Springer Science & Ciarrochi, J. E., Forgas, J., & Mayer, J. D. (2006). Emotional intelligence in everyday life. Psychology Press/Erlbaum (UK) Taylor & Francis. Business Media, Berlin, Germany.
- Sahu, P. K. (2013). Research Methodology: A guide for researchers in agricultural science, social science and other related fields (Vol. 432). Nadia: Springer.

Course Code	XPM 32541			Course Title	Expert Seminar: Recent Advancements in Plantation Management		
Year	3	Semester	II	Credit	01	Theory	10
						Practical (hr)	10
						Independent Learning (hr)	30

Aim of the Course:

To provide the learner with updated knowledge with regard to the emerging trends and issues in plantation and other export crop sectors, with such updated knowledge they will be able to perform as successful professional agribusiness or plantation managers.

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Explain latest developments in the plantation and other export crop sectors
- Explain important issues in plantation and other export crop sectors when the products move forward along the supply chain.
- Analyze the current issues related to the plantation and other export based agribusiness industries and suggest remedial measures to overcome identified issues.

Course Capsule:

Students will be exposed to the latest developments, current issues and potential corrective measures related to the plantation and export based agribusiness industries.

Assessment:

Continuous assessment: 30% -Home Assignment, 10% - Activity in the Contact Session
End semester assessment: 60%

Course Code	XPM 32556			Course Title	Capstone Project on Career Integrated Research and Seminar		
Year	3	Semester	II	Credits	06	Theory (hr)	
						Practical (hr)	
						Independent Learning (hr)	

Aim of the Course:

To provide knowledge and skills on preparation of project proposal, planning, collecting data/information, analyzing and interpreting data, concluding results of given project so that students will be able to apply them in conducting a project

Intended Learning Outcomes:

At the end of this course, the student should be able to;

- Identify and explain the problems (topic) in Plantation Agriculture sector
- Write the objectives of the project
- Select the appropriate methods to carry out the selected project considering available resources
- Collect data and interpret the finding
- Write discussion, suggestions, recommendations and conclusions of project
- Do the oral presentation of findings
- Prepare the project report

Course Capsule:

Student will select a project, develop and perform it under the supervision of a member of academic staff of the university; Students are first required to search the literature relevant to their project and plan their project work; Students are requested to present their findings in front of an examination Board appointed by the BOS and submit the report according to the given guidelines.

Assessment:

Conduct and preparation of the project report:	50%
Seminar presentation:	40%
Student performance (Evaluated by supervisor):	10%

Methodology of Conducting the Degree Programme

The methodology has been carefully planned taking into consideration, the many factors that are important from the point of view of the plantation sector organizations, which are mentioned below;

- (a) Difficulty of Plantation sector executives to allocate time for a full time/ part time / weekend/staggered or modular basis course;
- (b) Inability of Plantation companies to release their executives for courses on full-time basis or for continuous longer periods;
- (c) Potential for self-learning/ individualized learning which is acceptable as an effective method; and
- (d) Integrated learning process with technological / electronic media.

Analysis of the above factors reveals that the distance education method is the most appropriate and effective method for the proposed degree programme. This method will include the following major components:

- (a) Self-learning study material providing effective motivating features,
- (b) Contact sessions / programmes to help the participants with required guidance, discussions, instructions, explanatory lectures, etc.
- (c) Personal guidance
- (d) Study centers
- (e) Audio-visual aids which will gradually be leading to high Technological / electronic media
- (f) Practical sessions in the field / laboratories
- (g) Well-structured and pre-planned visits to selected plantations, regional centers, and institutes.
- (h) Self-assessment questions / check lists
 - i. Tutor-less tutorials, assignments and continuous assessments
 - ii. Evaluation and examinations.

Distance Mode

In distance education method, the self-learning material is considered as the major mode of operation. In this process there are five models identified by educationists for application as indicated below with functions.

- i. Correspondence
- ii. Correspondence and contact sessions
- iii. Correspondence and media
- iv. Correspondence, media and contact sessions
- v. Correspondence, media, contact sessions and instructors assistance

The terms referred to as in (i) to (iv) correspondence based on self-learning material is the vital and crucial aspect in the distance learning process, and the relationship of a teacher and student

will be successfully adopted by operating the last model No. (v) *i.e.* "Correspondence, media, Contact Sessions and Instructors Assistance". Hence, it is emphasized that the methodology of degree programme should be basically considered as bi-lateral communication process by means of correspondence based on Printed Self Learning Material. Instructors during the contact sessions at different locations will expand upon identified topics, classify questions, obtain feedback and monitor the progress of students.

Role and Responsibility of the Learner Participant

The concept of distance education method to be used could be described as "self-study process to be operated by means of correspondence based on self-learning modules which should essentially include contact sessions, practical sessions, assignments, instructor assistance and continuous assessment".

It is therefore obvious that under the proposed self / distance education method study process is entirely based on self-learning method. **Hence it is the sole responsibility of the student / learner for the following.**

- (a) Should successfully complete the course modules by self-studies;
- (b) Actively and regularly participate in a contact sessions and practical/field sessions as stipulated;
- (c) Successfully complete and submit all assignments for assessment;
- (d) Follow the relevant guidance and directives of the instructor/supervisor and other mode of education such as media etc.;

Successfully complete the examinations of all course modules.

It is prudent to mention that the participants / students who are enrolled for the degree programme will have to play a vital role to become successful in their endeavour.

Evaluation of Courses

a) Credit

A credit is a time based quantitative measure assigned to a course unit and indicates the rating of the unit in working towards a degree.

One credit is equivalent to 15 lecture hours or 30 practical hours throughout the semester.

b) Assessment of Course Units

Courses will be evaluated by examinations (Theory and Practical), assignments, reports and presentations as applicable to each course. The mode of evaluation will be communicated to students by the Director/Program Coordinator at the beginning of the semester.

The marks allocated for courses, which include practical, will be weighted in proportion to the number of units of practical and theory in that course, so that two practical units (credits) are equivalent to one unit (credit) of theory.

c) Number of Attempts for Sitting Examinations (As approved by the Senate of the Wayamba University)

A student shall not be permitted more than **three (03) sittings** for the examination of any course unit.

Under no circumstances (*i.e.* Even with acceptable Medical Certificates) a student be permitted to sit an examination if he/she has completed a period of **six (06) academic years** from the date of registration for the course.

d) Upgrading

A student who obtains either an E, D, D+ or C- for a particular course unit may re-sit the examination in respect of the course unit for the purpose of improving the grade on condition that the best grade obtainable is C. If a student obtains a lower grade in attempting to improve the grade of the later attempt, will be entitled to the best grade obtained in the previous attempt.

Final Evaluation

Courses in a semester will be evaluated by examination held during that semester. The details of written examination for each course will be as follows;

Credits	Credits Structures		Number of Questions and Marks allocation			Time allocation (hr.)	
	Theory	Practical	MCQ	Structured	Essay	Theory	Practical
3	30	30	20 (30%)	5 (40%)	2 (30%)	3.00	3.00
2	30	00	20 (30%)	4 (40%)	2 (30%)	2.50	-
2	20	20	20 (25%)	4 (50%)	1 (25%)	2.00	2.00
2	15	30	20 (25%)	2 (50%)	1 (25%)	1.50	3.00
1	10	10	100%			Case base assessment	

Note: Percentages given in the parenthesis are marks allocation in each section

The practical component of courses will be assessed continuously or by examination.

For non-credit course student should pass the relevant examination.

The proportion of marks allocated for courses which include practical will be weighted according to the number of units of practical and theory in the course, such that two practical units are equivalent to one unit of theory. The final marks for a course will be allocated as follows;

Home Assignments,	= 30%
Activity in the contact session	= 10%
Final Examination	= 60%
Total	= 100%

Grading Scheme:

Marks	Grade	Grade point
≥ 90	A+	4.0
85-89	A	4.0
80-84	A-	3.7
75-79	B+	3.3
70-74	B	3.0
65-69	B-	2.7
60-64	C+	2.3
55-59	C	2.0
50-54	C-	1.7
45-49	D+	1.3
40-44	D	1.0
< 40	E	0.0
For Non-GPA Course		
≥ 40	P	0.0

Students are required to obtain minimum of 35% for each section evaluated *i.e.* Assignments/ Tutorials, Theory examinations and Practical examinations. To pass a course student should obtain minimum average of 40%.

Evaluation of Special Project

Capstone Project on Career Integrated Research & Seminar (XPM 32556) will be assessed continuously and marks will be allocated as follows;

Conduct of project and preparation of the project report	50%
Seminar presentation	40%
Student performance (Evaluated by supervisor)	10%
Total	100%

Grade Point Average (GPA)

Grade point average (GPA) is the credit - weighted arithmetic mean of the Grade Point Values. The GPA is calculated by dividing the total credit - weighted Grade Point Value by the total number of credits. GPA shall be computed to the Second decimal place.

For example, a student who completed one course unit of three credit, four course units each of two credits and one course unit of one credit with grades A, B, C, D, E and B+, respectively, would have the following GPA.

$$\begin{aligned}
&= \frac{(3 \times 4.0) + (2 \times 3.0) + (2 \times 2.0) + (2 \times 1.0) + (2 \times 0.0) + (1 \times 3.3)}{3+2+2+2+2+1} \\
&= \frac{12.0 + 6.0 + 4.0 + 2.0 + 0.0 + 3.3}{12} \\
&= \frac{27.3}{12} \\
&= 2.28
\end{aligned}$$

All course units that a student has registered for shall be taken into account in calculating the final grade point average (FGPA) at the time of awarding the degree.

Appointment of Examiners and Conduct of Examinations

Board of Examiners is appointed by the senate on the recommendation of the Faculty Board and the BOS for each examination which consists Chief Examiner and other Examiners for setting, moderation and scrutinizing of question papers and for marking of answer scripts. Supervisors and invigilators are appointed by the BOS to conduct the examinations. All examinations are held within the Faculty premises. The University Examination Branch is responsible in multiplying question papers and other matters such as issuing admission cards, registration, attendance, release of results etc. Examinations are conducted in a similar fashion as for the internal students.

Provisions for Re-scrutinization Marks & Grades of Undergraduates

Provisions shall be made for undergraduates to submit requests for verification of their examination marks and grades, if they wish to do so.

The provision requesting re-scrutinization of marks and grade shall be limited only during the two weeks immediately following the results of an examination. An application form issued by the office should be duly filled and forwarded along with a receipt of non-refundable payment, of Rs. 500/= (per a subject) make to the Shroff.

Award of Classes and Degree

Classes will be awarded based on the final grade point average (FGPA). Following is the criteria proposed by the UGC which to being implemented. If repeated no class will be avoided.

First Class

A student may be awarded a First Class provided he/she

(a) obtains a minimum FGPA of 3.70

and,

(ii) Completes the relevant requirements within three academic years

Second Class (Upper Division)

A student may be awarded a Second Class (Upper Division) provided he/she

(i) Obtains a minimum FGPA of 3.30

and,

(ii) Completes the relevant requirements within three Academic years

Second Class (Lower Division)

A student may be awarded a Second Class (Lower Division) provided he/she

(i) Obtains a minimum FGPA of 3.00

and,

(ii) Completes the relevant requirements within three Academic years

Award of Degree

To be eligible for the Degree of B.Sc. (Plantation Management), a student must have completed all courses including Non-GPA courses and obtained at least a D grade for each course he/she studied at the end semester examinations and obtained a minimum FGPA of 2.0 and completed the relevant requirements within a period of six (6) academic years.

Awards at the Annual Convocation

Following award will be presented at the Annual Convocation.

Lalan Plantation Gold Medal

To the best overall performance in B.Sc. (Plantation Management) External Degree Programme in the Faculty of Agriculture & Plantation Management.

Absence from Examinations (As Approved by the Senate of the Wayamba University)

- (a) If student fail to attend examinations due to a medical reason, such absence should be reported to the Assistant Registrar of the Faculty of Agriculture and Plantation Management by valid Medical Certificate immediately within Seven (07) days. All Medical Certificates should conform to the format of a Medical Certificate issued by a Government Hospital and should be obtained from one of the following medical officers;

University Medical Officer (UMO)

District Medical Officer

Consultant Specialist in the relevant field

Head of Government Base Hospital
Government Hospital
Ayurvedic Physician registered in the Ayurvedic Medical Council

Under exceptional circumstance Medical Certificates issued by Private Hospitals or private practitioners might be accepted by the University Medical Officer or the Medical Board.

- (b) Student who fall ill during an examination session, such illness should immediately be reported to the University Medical Officer at the University Medical Center. If such illness occurs at residence or elsewhere during an examination period, the student or his/her guardian should inform the Assistant Registrar/ FAPM within seven (7) days by a tele-mail followed by a letter indicating the nature or illness, doctor consulted, name of examination paper of which he/she was unable to appear, together with a relevant Medical Certificate.
- (c) In the case of a student who, having completed the theory paper is unable to appear for the practical due to valid medical reasons, the results (including the theory paper) will not be released until the practical paper is completed on a later occasion.