

# **Prospectus 2019 - 2020**

**(Senate Approval: 218.05.03)**

**FACULTY OF AGRICULTURE  
RAJARATA UNIVERSITY OF SRI LANKA  
Puliyankulama  
Anuradhapura  
Sri Lanka.**

**Tel: +94 25 2221610, +94 25 2221613**

**Fax: +94 25 2221610**

**Email: [ar@agri.rjt.ac.lk](mailto:ar@agri.rjt.ac.lk)**

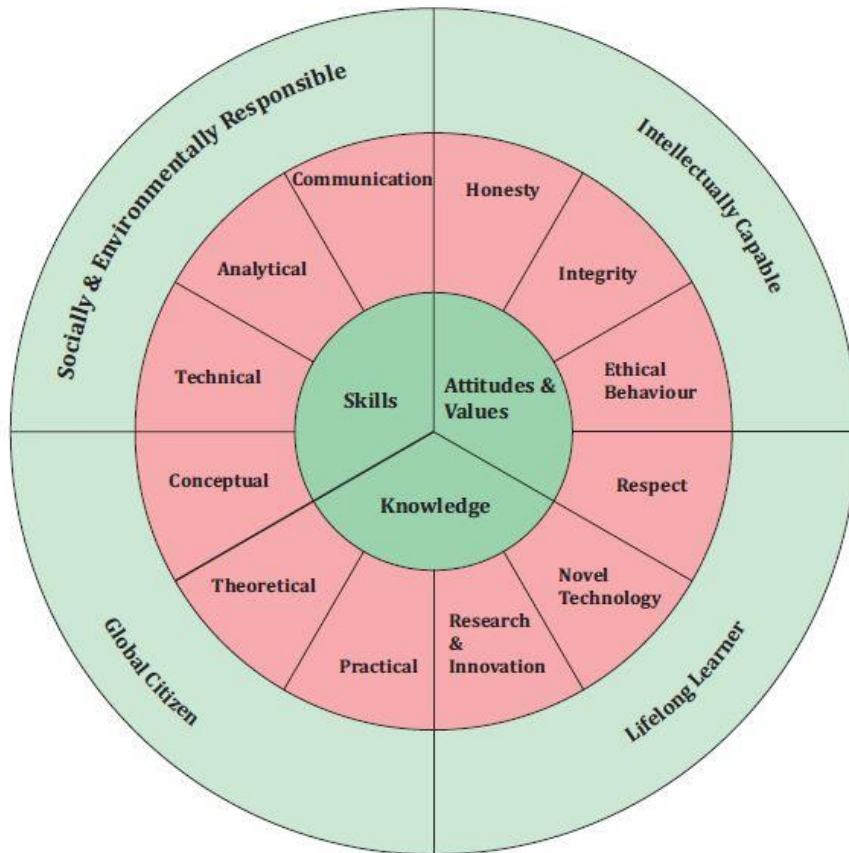
*Vision*

*To be a dynamic, innovative and renowned centre for  
Excellence in Agriculture*

*Mission*

*To produce innovative and dynamic graduates with  
sound knowledge and requisite skills towards achieving  
a sustainable development in Agriculture, through  
creating a conducive environment for teaching,  
learning, research and dissemination of knowledge.*

## GRADUATE PROFILE



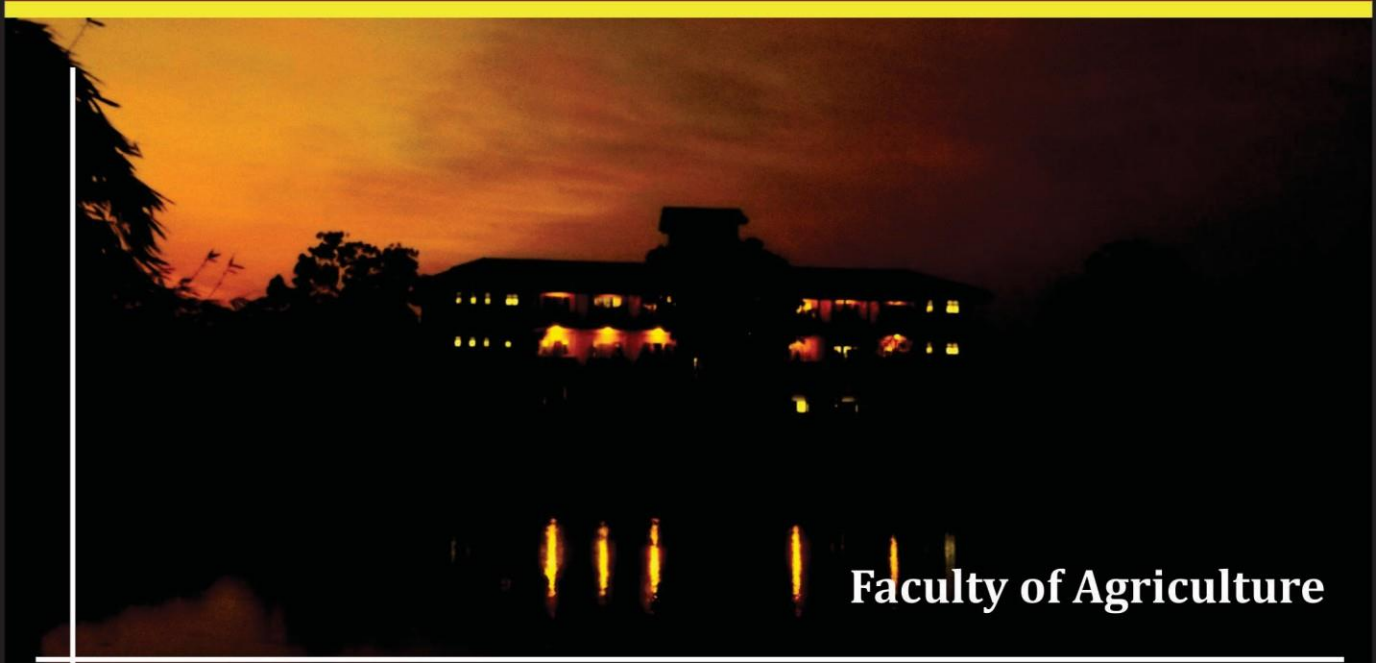
**The main aim of the degree programme is to provide students with a comprehensive tertiary-level education in agriculture and related areas of learning to produce competent graduates for global arena.**

## CONTENTS

	Page
1.0 INTRODUCTION TO RAJARATA UNIVERSITY OF SRI LANKA	
1.1. SENIOR EXECUTIVES OF THE RAJARATA UNIVERSITY OF SRI LANKA	1
1.2. DEANS OF FACULTIES	1
2.0 INTRODUCTION TO FACULTY OF AGRICULTURE	
2.1. OFFICERS OF THE FACULTY OF AGRICULTURE	3
2.2. MEMBERS OF THE FACULTY BOARD	3
2.3. MEMBERS OF THE ACADEMIC STAFF	4
3.0 UNITS AND OTHER SERVICES	
3.1. ENGLISH LANGUAGE TEACHING UNIT (ELTU)	7
3.2. COMPUTER CENTRE	7
3.3. AGRICULTURE LIBRARY	7
3.4. FACULTY FARM	7
3.5. SPORTS FACILITIES	8
3.6. HEALTH CARE	8
3.7. STUDENT COUNSELING	8
3.8. FACULTY CAREER GUIDANCE UNIT	8
3.9. FACULTY OUTREACH CENTRE	8
4.0 ADMISSION REQUIREMENTS	
4.1. LOCAL ENTRANTS	9
4.2. INTERNATIONAL ENTRANTS	9
5.0 COURSE OUTLINE	
B.Sc. AGRICULTURE DEGREE (CORE PROGRAMME)	9
5.1. DEPARTMENT OF AGRICULTURAL ENGINEERING AND SOIL SCIENCE	11
5.2. DEPARTMENT OF AGRICULTURAL SYSTEMS	12
5.3. DEPARTMENT OF ANIMAL AND FOOD SCIENCES	13
5.4. DEPARTMENT OF PLANT SCIENCES	15
5.5. ENGLISH LANGUAGE TEACHING UNIT (ELTU)	17
5.6. COMPUTER CENTRE	18
5.7. COMMON COURSES	18
6.0 COURSE OUTLINE	
B.Sc. AGRICULTURE DEGREE (ADVANCED PROGRAMME)	19
6.1. DEPARTMENT OF AGRICULTURAL ENGINEERING AND SOIL SCIENCE	22
6.2. DEPARTMENT OF AGRICULTURAL SYSTEMS	26
6.3. DEPARTMENT OF ANIMAL AND FOOD SCIENCES	30
6.4. DEPARTMENT OF PLANT SCIENCES	34
6.5. ENGLISH LANGUAGE TEACHING UNIT (ELTU)	39
7.0 EXAMINATION AND ASSESSMENT PROCEDURE	40



**Rajarata University of Sri Lanka  
Mihintale**



**Faculty of Agriculture**

## 1.0 INTRODUCTION TO RAJARATA UNIVERSITY OF SRI LANKA

The Rajarata University of Sri Lanka (RUSL) was established on 07<sup>th</sup> November, 1995 under the section 25 of the University act number 16 of 1978 by amalgamation of resources of the Affiliated University colleges in the Central, North Western and North Central provinces. Over the years, the University has developed to become a centre of excellence in higher education in the North Central Province as well as in Sri Lanka. The academic programmes of the RUSL are offered by six faculties namely; Agriculture, Applied Sciences, Management Studies, Medicine and Allied Sciences, Social Sciences and Humanities and Technology. The main administrative complex, the Faculties of Applied Sciences, Management Studies, Social Sciences and Humanities and Technology are located at Mihintale while the Faculty of Agriculture and Faculty of Medicine and Allied Sciences are located at Puliyankulama and Saliyapura, respectively.

### 1.1 SENIOR EXECUTIVES OF THE RAJARATA UNIVERSITY OF SRI LANKA

Chancellor	Ven. Ethalawatunuwawe Gnanathilaka Thero
Vice Chancellor	Dr. B.A. Karunaratne
Registrar	Mr. A.M.G.B. Abeyasinghe
Bursar	Mr. D.D. Upananda
Librarian	Mrs. A. S. Siriwardana

### 1.2 DEANS OF FACULTIES

Agriculture	Prof. A.M.J.B. Adikari
Applied Sciences	Prof. W.M. Sriyani
Management Studies	Prof. W.P. Wijewardena
Medicine and Allied Sciences	Dr. S.D. Pilapitiya
Social Sciences and Humanities	Prof. C.R. Withanachchi
Technology	Dr. K.G.P.B Jayathilaka

## 2.0 INTRODUCTION TO FACULTY OF AGRICULTURE

The Faculty of Agriculture was established in 2001 with the aim of developing sustainable agricultural systems particularly focused on the production environment of the Dry Zone of Sri Lanka utilizing rural farm settings and natural resources effectively. To achieve this goal, Faculty of Agriculture offers a Bachelor of Science Honours degree in Agriculture [BScHons (Agriculture)], of four-year duration. The Bachelor degree programme comprises of semester-based teaching evaluations in eight semesters, during which different courses are offered by the four academic Departments, namely Agricultural Engineering and Soil Science (ES), Agricultural Systems (AS), Animal and Food Sciences (AF) and Plant Sciences (PS).

The core programme spanning through the first five semesters is compulsory for all students. During the 6th and 7th semesters, students can select the specialization module on their preference.

The specialization modules are;

- Agricultural Biology
- Agricultural Economics and Extension
- Agricultural Engineering
- Agricultural Systems and Management
- Animal Production and Technology
- Crop Science
- Environmental Soil Management
- Food and Postharvest Technology

At the end of the 7th Semester, students receive one month industrial training with an industry. During the 8th semester, each student is required to conduct an individual research project under the guidance of supervisor/s in the selected specialization module.

In each course, one credit unit is equal to 15 hours of lectures or 30 hours of practical work/tutorials/assignments/field visits. Courses are identified by a course code with two letters and four numerical digits. The two upper case letters indicate the Department that offers the course. The first numerical digit indicates the academic year, the second the semester and the last two are the identification numbers of the course in the respective Department.

Example: - AS 1101 Microeconomic Theory (Agricultural Systems) (Year 1) (Semester I) (Course No. 01)

For example, AS 1101 indicates Microeconomic Theory. Subject code indicates that the Department of Agricultural Systems offers this course during the first year, first semester and the course number is 01.

The above notation will be followed by a series of numerical digits within parentheses to indicate the number of credits of the course, theory hours and practical class hours per week.

Example:- AS 1101 (2/25:10) Microeconomic Theory is a two credit course carrying 25 hours of lectures and 10 hours of practical/tutorial work.

English language and Information Technology are offered by the ELTU and the computer centre respectively to enhance students' communication skills and employment opportunities. The prospectus includes information on all courses offered during the core programme and the specialization modules along with the regulations pertaining to the degree programme.

Students who complete all the requirements successfully are awarded the Bachelor of Science Honours degree in Agriculture.



**2.1 OFFICERS OF THE FACULTY OF AGRICULTURE**

Dean	Prof. A.M.J.B. Adikari
Heads of Departments	
Agricultural Engineering and Soil Science	Dr. G.V.T.V. Weerasooriya
Agricultural Systems	Dr. A.M.K.R. Bandara
Animal and Food Sciences	Prof. (Mrs.) W.A.D. Nayananjalie
Plant Sciences	Dr. D.M.D. Dissanayake
Senior Assistant Librarian	Mrs. W.P.T. Dilrukshi
Assistant Registrar	Mrs. K. Nathiparan
Farm Manager	Mr. B.W.N.J. Samaraweera
Assistant Bursar (On Contract)	Mr. N.B.C.D. Nandasena

**2.2 MEMBERS OF THE FACULTY BOARD**

Dean (Chairperson)	
Heads of Departments	
Agricultural Engineering and Soil Science	
Agricultural Systems	
Animal and Food Sciences	
Plant Sciences	
All permanent Senior Professors, Professors and Associate Professors	
All Permanent Senior Lecturers and Lecturers	
Two members elected among the Lecturers (Probationary) of the Faculty	
Computer Instructor	
English Instructor	
Two students elected by the students of the Faculty	
Three external persons among persons of eminence in the areas of study relevant to the Faculty	
Assistant Registrar (Secretary / Convener)	
Members on invitation	
Senior Assistant Librarian	
Lecturer (Probationary)	
Coordinator of ELTU	
Assistant Bursar	
Farm Manager	



**2.3 MEMBERS OF THE ACADEMIC STAFF****Department of Agricultural Engineering and Soil Science**

M.G.T.S. Amarasekera	B.Sc. (Agric.), M.Phil., Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Soil Fertility Management
D.M.S. Duminda	B.Sc. (Agric.), (Ruhuna, Sri Lanka), M.Sc. (Kelaniya, Sri Lanka), Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Soil Fertility Management
M.H.J.P. Gunarathna	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Sc. (IRRI/CLSU, Philippines), Ph.D. (Kagoshima, Japan)	Senior Lecturer	Water Management
G.V.T.V. Weerasooriya	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka), Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Farm Power and Machinery
D.M.S.H. Dissanayaka	B.Sc. (Agric.), M.Phil. (Peradeniya, Sri Lanka), Ph.D. (Saitama, Japan)	Senior Lecturer	Water Management
N.S. Abeysingha	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Sc. (Jayawadanapura, Sri Lanka), Ph.D. (IARI, India)	Senior Lecturer	Watershed Management
M.K.N. Kumari	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Water Management
A.J. Fernando	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Agricultural Engineering
P.D. Kahandage	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Sc. (Peradeniya, Sri Lanka), M.Phil. (Ruhuna, Sri Lanka)	Senior Lecturer	Farm Power and Machinery
J.P.H.U. Jayaneththi	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Sc. (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Soil Microbiology
K.G.S. Nirmanee	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Sc. (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Remote Sensing and GIS
R.A.S.S. Rathnayake	B.Sc. (Agric.) (Peradeniya, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Soil Survey and Classification
E.J. Kosgolgedara	B.Sc. (Agric.) (Rajarata, Sri Lanka)	Lecturer (Prob.)	Farm Power and Machinery

**Department of Agricultural Systems**

G.A.S. Ginigaddara	B.Sc. (Agric.), M.Phil. (Peradeniya, Sri Lanka), Ph.D. (AIT, Thailand)	Professor	Agricultural Systems
S.N. Dissanayake	B.Sc. (Agric.), M.Phil. (Peradeniya, Sri Lanka), Ph.D. (Queensland, Australia)	Senior Lecturer	Agricultural Economics
A.P.S. Fernando	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Agricultural Economics
A.M.K.R. Bandara	B.Sc. (Agric.), M.Sc., Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Bio Statistics
K.P.P. Kopyawattage	B.Sc. (Agric.), M.Sc. (Peradeniya, Sri Lanka), Ph.D. (USA.)	Senior Lecturer	Developmental Extension
S.M.C.B. Karalliyadda	B.Sc. (Agric.), M.Sc. (Peradeniya, Sri Lanka)	Lecturer	Agricultural Extension
S.P. Dissanayake	B.Sc. (Special) in Agriculture (Rajarata, Sri Lanka)	Lecturer (Prob.)	Agricultural Systems
N.M.K.C. Premarathne	B.Sc. (Agric.) (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Agricultural Economics

**Department of Animal and Food Sciences**

A.M.J.B. Adikari	B.Sc. (Agric.) (Peradeniya, Sri Lanka), M.Sc. (NDRI, India), Ph.D. (Virginia Tech, USA)	Professor	Animal Genetics and Breeding Molecular Genetics
W.A.D. Nayananjalie	B.Sc. (Agric.), M.Sc. (Peradeniya, Sri Lanka), Ph.D. (Virginia Tech, USA)	Professor	Animal Nutrition
S.C. Somasiri	B.Sc. (Agric.) M.Sc., M.Phil. (Peradeniya, Sri Lanka) Ph.D. (Massey, New Zealand)	Senior Lecturer	Animal Nutrition & Crop Livestock Farming Systems
N.W.I.A. Jayawardana	B.Sc. (Agric.), M.Sc., M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Food and Nutrition
R.H.G.R. Wathsala	B.Sc. (Agric.) (Rajarata, Sri Lanka) M.Sc. (Peradeniya, Sri Lanka), M.Sc. (Unina, Italy)	Lecturer	Aquaculture and Fisheries
M.A.A.P. Kumari	B.Sc. (Agri. Tech. & Mgt.) (Peradeniya, Sri Lanka) M.Sc. (Ghent University, Belgium)	Lecturer (Prob.)	Poultry Production Meat Science
D.W.M.M.M. Kumari	B.Sc. (Agri. Tech. & Mgt.), M.Sc. (Peradeniya, Sri Lanka), Ph.D. (UPLB, Philippines)	Lecturer (Prob.)	Food Chemistry & Biochemistry
W.V.V.R. Weerasingha	B.Sc. (Agri. Tech. & Mgt.), M.Sc. (Peradeniya, Sri Lanka),	Lecturer (Prob.)	Dairy Science

**Department of Plant Sciences**

P.A. Weerasinghe	M.Sc., Ph.D. (AUN, Czechoslovakia)	Senior Professor	Plant Tissue Culture
D.A.U.D. Devasinghe	B.Sc. (Agric.), M.Phil., Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Horticulture
W.C.P. Egodawatta	B.Sc. (Agric.), M.Sc. (Peradeniya, Sri Lanka), Dr. Sc. (ETH-Zurich-Switzerland)	Senior Lecturer	Crop Science
L.K.W. Wijayarathne	B.Sc. (Agric.) (Ruhuna, Sri Lanka), M.Sc. (Agric.) (Peradeniya, Sri Lanka), Ph.D. (Manitoba, Canada)	Senior Lecturer	Entomology
T.A.B.D. Sanjeewa	B.Sc. (Agric.), M.Sc., M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Weed Science and Crop Ecology
M.C.M. Zakeel	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Agricultural Microbiology and Molecular Biotechnology
D.M.D. Dissanayake	B.Sc. (Agric.), M.Sc. (Moscow), Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Agronomy and Field Crop Production, Mushroom Production, Organic Agriculture
W.M.R.S.K. Warnasooriya	B.Sc. (Agric.), M.Sc., M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Forestry and Plantation Management
U.G.A.I. Sirisena	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Sc. (Peradeniya, Sri Lanka), Ph.D. (Peradeniya, Sri Lanka)	Senior Lecturer	Entomology and Pest Management
H.M.D.A.K. Herath	B.Sc. (Agric.) (Rajarata, Sri Lanka) M.Phil. (Peradeniya, Sri Lanka)	Senior Lecturer	Genetics and Plant Breeding
G.D.A. Nalaka	B.Sc. (Agric. Tech. & Mgt.), M.Sc. (Peradeniya, Sri Lanka), D. Agri. (Kyoto, Japan)	Senior Lecturer	Forestry and Plantation Management
K.R.E. Padmathilake	B.Sc. (Agric.), M.Sc. (Peradeniya, Sri Lanka), M.Sc. (Waterloo, Canada)	Lecturer	Plant Physiology
T.D.C. Priyadarshani	B.Sc. (Agric.), M.Phil., M.Sc. (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Plant Pathology
H.C.D. Wijayawardhana	B.Sc. (Agric.) (Rajarata, Sri Lanka), M.Phil. (Peradeniya, Sri Lanka)	Lecturer (Prob.)	Floriculture & Landscape Horticulture

**English Language Teaching Unit**

A.A.M. Nizam	B.A (Languages) (Sabaragamuwa, Sri Lanka), M.A Linguistics (Kelaniya, Sri Lanka)	Lecturer	English
S.M.C. Bandara	B.A.(English) (Rajarata, Sri Lanka), M.A.(Linguistics) (Peradeniya, Sri Lanka), Dip. in English	Instructor	English

**Computer Centre**

E.D.T. Somarathna	B.Sc. (Physical Sc.), M.Sc. (Peradeniya, Sri Lanka)	Computer Instructor	Computer Technology
-------------------	---	---------------------	---------------------

### **3.0 UNITS AND OTHER SERVICES**

#### **3.1 English Language Teaching Unit (ELTU)**

The English Language Teaching Unit (ELTU) was established to offer a short intensive course of English for new entrants, along with the establishment of the Faculty of Agriculture in 2001. The unit offers compulsory non-GPA courses and it is compulsory for all undergraduates to obtain a pass in English in order to graduate.

The ongoing courses of English in each semester comprise three components; Language structure, Reading & writing and Oral (Listening and Speech).

The English Language Laboratory, which comes under the ELTU was inaugurated in year 2007 and comprises of computers and audio-visual facilities for students to do self-studies to uplift their knowledge and skills in English.

#### **3.2 Computer Centre**

The faculty Computer Centre provides services including free internet access to both students and staff of the Faculty of Agriculture. It consists of a local area network with microcomputers and a file server. Two basic computer-courses are offered to undergraduates during the first year of the degree programme. Students have the accessibility to utilize resources in the computer centre at any time in their undergraduate period.

#### **3.3 Agriculture Library**

The library of the Faculty of Agriculture of the Rajarata University of Sri Lanka was established in year 2001. It is rich in a collection of most essential text books, to cover all subject areas pertaining to Agriculture, physical education, computer science, literature, English, history and books for general reading. Library also comprises of a well-organized collection of Periodicals, Encyclopedias, Dictionaries, Year books and Handbooks in Agriculture, etc.

Books in the library are arranged according to subject order using the DDC classification system and are formed in a numerical sequence from 000-999. Journals are arranged in the alphabetical sequence by the title. Bibliographic information on the whole collection of the library is stored in the computer database to assist the user. The library has the membership of the Agriculture information network (AGRINET) to share the resources such as CD-ROM searching, exchanging content pages and inter-library loan services. All borrowed library materials should be returned to the library at the time of completion of the degree programme to receive the degree certificate.

#### **3.4 Faculty Farm**

Agricultural farm of the faculty, located closer to the faculty main premises at Puliyankulama which is mainly used for student training programmes in crop production, animal production and for research work of students and academic staff. Faculty farm also provides beneficial influence to uplift the knowledge on farming activities of neighbouring farmers so as to favour the dissemination of agricultural knowledge in wider community. At present lowlands are used for seed paddy production while uplands are allocated to medicinal gardening, orchards, protected culture and pasture. Livestock section includes poultry, cattle, buffalo, goat, sheep,

rabbit and miscellaneous poultry units. In addition, duck and fish integration unit and biogas production unit are maintained. Eggs, chicken meat, yoghurt, curd and ice cream are produced as livestock products. Seed paddy, mushroom, vegetables and fruits are other farm products available seasonally. The management of the farm is under the supervision of the Farm Manager. Assistant Farm Manager, Field Supervisor and farm staff are assisting the Farm Manager to maintain the farm as a commercial venture.

### **3.5 Sports Facilities**

Physical training has been identified by the faculty as an essential component in the academic career of the students. The Faculty provides necessary facilities including indoor gymnasium for the students to involve in physical training activities. Sports equipment are provided by the Department of Physical Education of the University. A Physical Education Instructor is available to assist the students in their sports activities. Sports events such as inter-university, inter faculty, and inter- agriculture faculty are organized annually.

### **3.6 Health Care**

Outpatient treatments are available through a visiting medical officer who visits the faculty twice a week. Those who need in-house treatment are referred to the Teaching Hospital at Anuradhapura.

### **3.7 Student Counselling**

The counselling unit at the faculty guides the students in personality development, handling health care and coping with psychological problems. To achieve this task effectively, faculty utilizes the services of trained student counsellors appointed from among the senior academic staff of the Faculty.

### **3.8 Faculty Career Guidance Unit**

Faculty career guidance unit, located in the faculty premises, guides students in developing their personality and planning their career paths and job shadowing activities. Workshops, seminars and other career guidance activities are organized by the Academic Counsellor in Career Guidance to fulfil this task mainly in connection with main Career Guidance Unit located at Mihintale premises. In addition, regular soft skill development camps for students are conducted by trained academic staff of the faculty.

### **3.9. Faculty Outreach Centre**

The faculty outreach centre was established in year 2011 and plays a major role in community development programmes in the region and beyond. Programmes are conducted smoothly through the centre, in a sustainable way with the participation of students, academic staff and community.

## 4.0 ADMISSION REQUIREMENTS

### 4.1. Local entrants

In order to be eligible for admission to the Faculty of Agriculture, a candidate should have obtained at least "S" Grade passes for three subjects in one sitting from any of the following combinations at the G.C.E. (A/L) examination.

- (I) Chemistry, Physics and Biology
- (ii) Chemistry, Physics or Mathematics, Biology or Agricultural Science
- (iii) Chemistry, Biology, Agricultural Science or Mathematics

### 4.2. International entrants

Candidates with impressive results of an examination deemed equivalent to G.C.E (Advanced Level) Examination of Sri Lanka are eligible to apply for admission to the faculty through University Grants Commission of Sri Lanka (<http://www.ugc.ac.lk>).

## 5.0 COURSE OUTLINE

### B.Sc. AGRICULTURE DEGREE (CORE PROGRAMME)

Year 1 Semester 1			Year 1 Semester 2		
Course Code		Course Title	Course Code		Course Title
ES	1101 (1/10:10)	Agro-meteorology	ES	1201 (2/15:30)	Introductory Soil Science
ES	1102 (2/20:20)	Analytical Chemistry	ES	1202 (2/15:30)	Soil, Plant and Water Relationship in relation to Irrigation
ES	1103 (2/15:30)	Basic Engineering Physics**	AS	1201 (2/15:30)	Principles of Agricultural Extension
ES	1104 (2/15:30)	Farm Power and Mechanization	AS	1202 (2/20:20)	Microeconomics
AS	1101 (1/10:10)	Agriculture and Development	AS	1203 (1/10:10)	Agricultural Marketing
AS	1102 (2/20:20)	Basic Mathematics**	AF	1201 (2/25:10)	Anatomy and Physiology of Farm Animals
AF	1101 (1/12:06)	Principles of Animal Production and Health Management	AF	1202 (2/25:10)	Animal Feeding and Nutrition
PS	1101 (2/20:20)	Principles of Agronomy	AF	1203 (2/20:20)	Biochemistry
PS	1102 (2/15:30)	Plant Systematics	PS	1201 (2/15:30)	Principles of Horticulture
PS	1103 (2/20:20)	Principles of Plant Physiology	PS	1202 (2/20:20)	Principles of Entomology
EG	1100 (3/30:30)	General English**	EG	1200 (3/30:30)	General English**
IT	1100 (2/15:30)	Computer Literacy**	IT	1200 (2/15:30)	Computer Literacy**
CC	1100 (1/05:20)	Social Harmony and Peace			

Year 2 Semester 1			Year 2 Semester 2		
Course Code		Course Title	Course Code		Course Title
ES	2101 (1/05:30)	Field Practices of Soil and Water Management	ES	2201 (1/10:10)	Applied Hydrology
ES	2102 (2/15:30)	Machinery Systems Engineering	ES	2202 (3/30:30)	Soil Fertility and Plant Nutrition
AS	2101 (2/25:10)	Management Theory and Practice	AS	2201 (2/20:20)	Basic Statistics
AF	2101 (2/25:10)	Poultry and Swine Production	AS	2202 (2/20:20)	Introduction to Farming Systems
AF	2102 (2/25:10)	Principles of Food Science and Technology	AS	2203 (2/25:10)	Macroeconomics
PS	2101 (3/40:10)	Field Crop Production	AF	2201 (2/25:10)	Ruminant Management
PS	2102 (5/15:180)	Crop Production and Management Technologies	AF	2202 (1/15:00)	Principles of Aquaculture
PS	2103 (2/25:10)	Genetics and Breeding	AF	2203 (2/25:10)	Principles of Postharvest Technology
EG	2100 (3/30:30)	General English**	PS	2201 (2/25:10)	Plantation Crop Production I
			PS	2202 (1/10:10)	Principles of Forestry
			PS	2203 (3/35:20)	Agricultural Microbiology and Phytopathology
			EG	2200 (2/15:30)	General English**
			CC	2200 (0/05:50)	Career Development**

Year 3 Semester 1		
Course Code		Course Title
ES	3101 (3/15:60)	Engineering Drawing and Land Survey
ES	3102 (2/15:30)	Irrigation and Water Management
AS	3101 (2/20:20)	Economics of Farm Production and Management
AS	3102 (2/15:30)	Developmental Extension and Agricultural Institutions
AS	3103 (2/25:10)	Experimental Methods in Agricultural Research
AF	3101 (3/00:90)	Practical Animal Production
AF	3102 (0/00:45)	Practical Training on Postharvest Technology
PS	3101 (2/25:10)	Plantation Crop Production II
PS	3102 (2/15:30)	Pomology
PS	3103 (2/25:10)	Pest and Disease Management

*Subjects superscripted with \*\* denote that they are credited and not contributing to the GPA*

### **Vacation Training Programme**

1. Tractor Training Course (Refer ES 2102)



**COURSE CAPSULES****5.1 Department of Agricultural Engineering and Soil Science****ES 1101 (1/10:10) Agro-meteorology**

Introduction to meteorology; Weather and climate; Nature and composition of atmosphere; Instrumentation in agro-meteorology; Formation of precipitation; Climate of Sri Lanka; Climate change and its impact on agriculture

**ES 1102 (2/20:20) Analytical Chemistry**

Analytical chemistry and its relevance to agricultural science; Laboratory safety and first aid; Precision and accuracy and data interpretation; Terminology and basic concepts of analytical chemistry; Quantitative and qualitative analysis; Principles of analytical instruments

**ES 1103 (2/15:30) Basic Engineering Physics**

Introduction to basic engineering physics, units and measurement of physical quantities; Dynamics: linear motion, angular motion, mass, force and acceleration; Mechanics of machine: work, energy and power, turning effect of force, work done by torque, friction, simple machines; Statics: vectors, force in equilibrium, Introduction to heat energy, thermometry and quantity of heat; Fluid statics: definitions, properties of fluids, hydrostatic pressure, measurement of fluid pressure; Fluid dynamics: Bernoulli's theorem, continuity equation

**ES 1104 (2/15:30) Farm Power and Mechanization**

Indigenous farm technology; Mechanization and appropriate mechanization; Sources of farm power; Applied green technology; Principles of power transmission; Tractors and prime movers

**ES 1201(2/15:30) Introductory Soil Science**

Introduction to soil science and concept of soil; Rock cycle; Properties of rocks and minerals; Weathering of rocks and minerals; Factors and processes of soil formation; Soil profile; Basic interpretation of soil physical (soil structure, texture, moisture, air, infiltration, consistency, aggregate stability) chemical (soil pH, EC, CEC, acidity, alkalinity, soil organic matter) and biological aspects (soil fauna and flora); Introduction to soils of Sri Lanka

**ES 1202 (2/15:30) Soil, Plant and Water Relationship in relation to Irrigation**

Soil water relationships: soil physical properties influencing irrigation, soil water, Soil moisture interpretation, soil moisture constants, soil moisture measurements; Plant water relationships: factors affecting to absorb, conduct and transpire water, critical moisture stages of plants and moisture extraction pattern of root system; Water requirements of crops: evapotranspiration, measurements and estimations; Irrigation scheduling: irrigation criteria, irrigation strategy; Efficiency of irrigation systems; Water movements in soil

**ES 2101 (1/05:30) Field Practices of Soil and Water Management**

Basic management of dry zone soils; Soil conservation and plant nutrient management; Estimation of field capacity and infiltration rate; Irrigation and drainage system layout; Water harvesting techniques; Reporting and analysing of meteorological data

**ES 2102 (2/15:30) Machinery Systems Engineering**

Soil dynamics for tillage; Farm production engineering; Machinery for land preparation; Primary tillage implements, secondary tillage implements; Sowing and planting machines; Fertilizer distributors; Harvesters and threshers; Water lifting devices; Safety in agricultural operations; Introduction to traction

**ES 2201 (1/10:10) Applied Hydrology**

Hydrological cycle; Precipitation: estimation, graphical representation, frequency analysis, test of consistency; Interception; Infiltration; Rainfall-runoff relationships: runoff types, factors affecting runoff, methods of runoff computation, hydrograph and flood analysis; Measurement of stream flow velocity and discharge; Introduction to groundwater hydrology

**ES 2202 (3/30:30) Soil Fertility and Plant Nutrition**

Introduction to soil fertility, factors governing soil fertility and their relative importance; Plant nutrients and their classification, nutrient dynamics in the soil, nutrient uptake by plants, physiological roles of nutrients in plants; Organic manure, inorganic fertilizers and amendments; Fertilizer application techniques; Site-specific nutrient recommendations; Introduction to problem soils and remedial measures

**ES 3101 (3/15:60) Engineering Drawing and Land Survey**

Engineering drawing: geometrical engineering drawing, multi view projections; Detailing of mechanical and civil engineering drawing; Isometric drawing; Introduction to AutoCAD 2D and 3D drawings; Land Surveying: introduction to surveying methods employed for mapping; Levelling techniques used for contouring; Cut and fill calculations; Surveying and levelling applications in agriculture

**ES 3102 (2/15:30) Irrigation and Water Management**

Introduction to irrigation systems in Sri Lanka; Water movement in conduits; Water flow through open channels; Measurement of water flow; Water quality for agriculture: contaminants, factors, problems; Irrigation methods: uncontrolled flooding, border irrigation, furrow irrigation, basin irrigation, drip irrigation, sprinkler irrigation; Drainage: introduction, systems, problems and remedial measures

**5.2 Department of Agricultural Systems****AS 1101 (1/10:10) Agriculture and Development**

Agricultural Contribution by Agriculture to economic development; Growth in agriculture; Agricultural institutes; Agricultural statistics; Development issues in agriculture

**AS 1102 (2/20:20) Basic Mathematics**

Number line; Inequalities, functions and their graphs; Geometry: line, parabola and circle; Introduction to trigonometric functions; Introduction to calculus; limits and continuity, derivatives, differentiation of logarithmic, trigonometric and algebraic functions; Application of differentiations; Introduction to integration and its application; Introduction to matrix algebra

**AS 1201 (2/15:30) Principles of Agricultural Extension**

Understanding rural communities; Basics of communication and communication models; Adoption and Diffusion of Innovations; Teaching methods and materials; Supporting activities for extension; Agricultural extension models; Agricultural extension institutes in Sri Lanka

**AS 1202 (2/20:20) Microeconomics**

Microeconomic Concepts and Analysis; Scope of economics; Theory of the consumer behaviour; Theory of the firms; Production and cost curves; Theory of markets

**AS 1203 (1/10:10) Agricultural Marketing**

Evolution of marketing; Marketing functions; Marketing management; Marketing channels; Marketing efficiency; Consumer behaviour; Commodity marketing; Marketing policies; Marketing problems and remedial measures

**AS 2101 (2/25:10) Management Theory and Practice**

Introduction to organizational and human resource management; Basic concepts of organizational management; Organizational communication; Key result areas of human resource management; Leadership; Team work and decision making

**AS 2201 (2/20:20) Basic Statistics**

Introduction to scale of measurements; Introduction to population; Sample and sampling methods; Graphical method of data presentation: frequency distribution, histograms, stem and leaf plots, box plots; Numerical method of data presentation: measures of central tendency and dispersion; Concept of probability; Probability distributions; Sampling and distribution of sample mean and proportions; Principles of hypothesis testing; Estimation tests: t-test; Simple linear regression and correlation; Introduction to analysis of variance

**AS 2202 (2/20:20) Introduction to Farming Systems**

System approach to agriculture; Types and classification; Farming systems from Sri Lanka; Interactions among different components of farming systems; Evaluation of farming systems; Introduction to Farming System Research and Development (FSR)

**AS 2203 (2/25:10) Macroeconomics**

Introduction; National Income Accounting; Macro-economic issues: growth, inflation, unemployment, interest rate, exchange rate, technology and budget deficits; Aggregate Demand and Supply; IS-LM framework; Monetary and fiscal policies

**AS 3101 (2/20:20) Economics of Farm Production and Management**

Theory of production and cost; Decision making under risk and uncertainty; Farm management functions and decisions; Farm resource management; Farm planning and budgeting; Farm record keeping; Farm business analysis and farm investment analysis

**AS 3102 (2/15:30) Developmental Extension and Agricultural Institutions**

Developmental extension; Facets of development; Community development approaches; Understanding community dynamics; Community based organizations: Role of public, private and NGO sector in development; Use of ICT for agricultural extension; Participatory communication; Participatory rural appraisal; Agricultural institutions

**AS 3103 (2/25:10) Experimental Methods in Agricultural Research**

Introduction to principles of experiment design; Complete block designs: CRD, RCBD, LSD; Covariance analysis; Factorial experiment; Compounding in factorial experiments; Fractional factorial experiments; Designs for special situations; Incomplete block designs

**5.3 Department of Animal and Food Sciences****AF 1101 (1/12:06) Principles of Animal Production and Health Management**

Importance of livestock in agriculture; Subdivisions of livestock; Domestication and classification of farm animals; Farm animal breeds; Comprehensive view of the livestock industries in Sri Lanka; Livestock production systems; Importance of animal genetics and its components; Farm animal - environment interaction; General approach to farm animal health management; Major diseases and outbreaks; Prevention of diseases; Techniques and equipment in animal production and health management; Career opportunities in animal agriculture

**AF 1201(2/25:10) Anatomy and Physiology of Farm Animals**

Introduction and terminology; Anatomy and physiology of digestive, reproductive, mammary, nervous, endocrine systems of farm animals; Estrous cycle and its manipulation in farm animals; Artificial Insemination (AI), heat detection and Assisted Reproductive Techniques (ART); Anatomy and physiology of fish

**AF 1202 (2/25:10) Animal Feeding and Nutrition**

Introduction; Classification of feeds, basal feeds, protein supplements, mineral supplements, vitamin supplements, feed additives, dry forages, forages fed green; Locally available feed ingredients; Forage, forage establishment & management, defoliation management; Grazing and grazing management, forage intake, forage quality, yield estimation; Forage conservation; Feed nutrients; Proximate analysis of feedstuffs; Total digestible nutrients; Apparent digestibility; Metabolisability; Energy utilization

**AF 1203 (2/20:20) Biochemistry**

Classification, structure, properties and functions of carbohydrates, proteins, lipids, enzymes and vitamins; Metabolism of carbohydrates, proteins and lipids; Quantitative and qualitative tests for carbohydrates, proteins and lipids

**AF 2101 (2/25:10) Poultry and Swine Production**

Introduction; Poultry breeds, incubation, hatching and brooding of chicks, management of growers and layers, broiler production, housing, feeding and equipment, common diseases and prevention, management of breeders; Swine breeds, planning, housing and feeding, system of rearing, management of piglings, fatteners, sows and boars, herd composition, common diseases and prevention

**AF 2102 (2/25:10) Principles of Food Science and Technology**

Introduction; Food constituents, their properties and nutritive aspects; Unit operations in food industry; Food deterioration; Principles of food preservation; Science and technology of processing different types of food; Cereal and cereal products, pulses, nuts and oil seeds, milk and milk products, meat, fish and eggs, fruits and vegetables, fats and oils, spices and beverages, introduction to food and nutrition

**AF 2201 (2/25:10) Ruminant Management**

Introduction; Cattle, buffalo, goat and sheep breeds, calves, heifers, dry cow and cow management practices, housing, feeding and equipment; Herd composition; Milking and clean milk production; Common diseases & prevention; Important management practices of buffalo, goat and sheep

**AF 2202 (1/15:00) Principles of Aquaculture**

Role of aquaculture and its present status in Sri Lanka; Classification of aquatic biota; General characteristics of fish; Introduction to aquaculture systems, freshwater aquaculture, brackish water aquaculture, mariculture; Site selection and construction of farms, selection of species for aquaculture, fish breeding techniques, feeds and feeding and fish harvesting methods; Integration of aquaculture with crops and livestock farming

**AF 2203 (2/25:10) Principles of Postharvest Technology**

Introduction; Food losses, major causes of food losses; Classification of harvested products; Postharvest physiological changes during ripening of fruits, vegetables and cereals; Maturity of crops; Quality evaluation of harvested produce; Postharvest treatments; Drying basics and principles, grain processing technology, storage, psychrometric properties of moist air, psychrometric chart, psychrometric processes and their application

**AF 3101(3/00:90) Practical Animal Production**

Management practices of cattle, buffalo, goat/sheep, poultry, pig, and micro livestock, aquaculture and fisheries; Hay and silage production; Feed processing; Meat and milk processing; Slaughtering and processing; Farm records, designing and planning; Quality of animal derived food products; Farm visits and trainings

**AF 3102 (0/00:45) Practical Training on Postharvest Technology**

The students are required to be present for one week training at Institute of Postharvest Technology in Anuradhapura

**5.4 Department of Plant Sciences****PS 1101 (2/20:20) Principles of Agronomy**

Agriculture and agronomy; Evolution of agriculture; Influence of climatic factors on crop production; Agro-ecological regions of Sri Lanka; Land preparation; Sowing and crop establishment; Fertilizer management in crops; Weed biology and control; Introduction to irrigation agronomy; Plant growth analysis

**PS 1102 (2/15:30) Plant Systematics**

Plant taxonomy; Botanical nomenclature and taxonomic hierarchy; Botanical terminology; Morphology of field crops (Family: *Poaceae*, *Leguminosae*, *Cucurbitaceae* and *Solanaceae*), plantation crops (Family: *Theaceae*, *Rubiaceae*, *Euphorbiaceae*, *Sterculiaceae*, *Arecaceae*), spices (Family: *Myrtaceae*, *Miristicaceae*, *Piperaceae*, *Zingiberaceae*, *Orchidaceae*), fruit crops (Family: *Musaceae*, *Rutaceae*, *Bromeliaceae*, *Caricaceae*, *Anacardiaceae*)

**PS 1103 (2/20:20) Principles of Plant Physiology**

Introduction; Plant water relationships; Solute and photo assimilate transport; Photosynthesis; Respiration; Plant hormones and growth regulators; Photo-morphogenesis; Physiology of seeds; Physiology of fruit setting and ripening; Senescence and abscission; Measurements of physiological parameters; Assessment of plant nutrients

**PS 1201 (2/15:30) Principles of Horticulture**

Horticulture industry; Plant propagation techniques; Growing media and nursery management; Pruning and training; Applications of plant growth regulators; Harvest and postharvest aspects of horticultural produce

**PS 1202 (2/20:20) Principles of Entomology**

Evolution of insects; Structures and modifications of insect body; Morphology and physiology of insect body systems; Insect vision; Metamorphosis and post-embryonic development; Taxonomy and nomenclature; Agriculturally important insect orders: Odonata, Orthoptera, Isoptera, Hemiptera, Homoptera, Thysanoptera, Neuroptera, Diptera, Coleoptera, Hymenoptera and Lepidoptera; Insect ecology; Insect behaviour

**PS 2101 (3/40:10) Field Crop Production**

Present status of field crop sector; Field crops and their role; Varieties, nursery techniques, land preparation, crop establishment, management, harvesting and postharvest aspects of rice and other cereals, legumes, oil crops, root & tuber crops, condiments and industrial crops (fibre crops and Tobacco); Field crop-based production systems

**PS 2102 (5/15:180) Crop Production and Management Technologies**

Theoretical aspects of vegetable (local, exotic, leafy) production; Vegetable seed production and improvement; Practical aspects of crop production: varieties, nursery techniques, land preparation, crop establishment, crop management and harvesting of rice, other cereals, pulses, oil crops, root and tuber crops and condiments and vegetables; Field diagnosis and management of pest and disease

**PS 2103 (2/25:10) Genetics and Breeding**

Introduction to genetics; Fundamentals of Mendelian genetics; Deviations of Mendel's law: incomplete dominance, co-dominance, lethals, pleiotrophy, penetrance and expressivity, multiple alleles, sex linked genes, multiple genes and epistasis, quantitative traits, estimating genetic variance and heritability; Cytogenetics; Linkage and crossing over; Introduction to population genetics; Principles of Plant Breeding; Germplasm conservation and utilization; Introduction to PPB

**PS 2201 (2/25:10) Plantation Crop Production I**

**Tea, Rubber and Sugarcane:** Introduction, history and current status; Climate, soil and their influence on yield; Cultivar/clonal recommendations; Nursery management; Land preparation; Field establishment; Crop management; Harvesting; Manufacture and value addition.

**PS 2202 (1/10:10) Principles of Forestry**

Introduction to forest ecosystems; Role of forests; Principles of forest ecology; Forest dynamics and ecological succession; Ecosystems in Sri Lanka; Biodiversity and conservation; Natural forest management; Introduction to agroforestry and silviculture

**PS 2203 (3/35:20) Agricultural Microbiology and Phytopathology**

**Agricultural Microbiology:** Classification of microorganisms; Light microscopy; Microbial identification; Morphology and structure of bacteria, fungi and bacteriophages; Other types of microorganisms; Microbial nutrition and growth; Microbial habitats; Control of microbes; Lac-operon, bacterial recombination; BNF; Mycorrhizal symbiosis; Microbial biotechnology. **Phytopathology:** Causes of plant diseases; Disease symptoms and signs; Disease development and cycles; Plant pathogenic diseases; Disease triangle; Plant defence mechanisms; Principles of plant disease control; Yield losses due to plant diseases

**PS 3101 (2/25:10) Plantation Crop Production II**

**Coconut and EACs:** Introduction, history and current status of the sector; Climate, soil and their influence on yield; Cultivar recommendations; Nursery management; Land preparation; Field establishment; Crop management; Harvesting; Manufacture and value addition

**PS 3102 (2/15:30) Pomology**

Present status of fruit crop sector; Varieties/cultivars, ecological requirements, planting materials, crop establishment, management, harvesting and postharvest aspects of fruit crops; Underutilized fruit crops; Modern practices in orchard management

**PS 3103 (2/25:10) Pest and Disease Management**

**Pests:** Terminology; Pest population dynamics and pest status; Principles of pest management; Pest management methods: cultural, physical, mechanical, biological, regulatory and IPM; Pests of paddy, other cereals, legumes, oil crops, spice crops, horticultural crops, ornamental plants, over-matured crops and stored products. **Diseases:** Symptomatology, diagnosis and management of agriculturally important disease categories (damping off, collar rot & root rots, anthracnose, leaf spots, blights, blast, mildews, vascular wilts, mosaic and yellowing etc.); IDM under different crop production systems



## 5.5 English Language Teaching Unit (ELTU)

### EG 1100 (3/30:30) General English

**Listening:** Advertisements, announcements, songs, dialogues/conversations, short talks; **Speaking:** Greeting and leave-taking, introducing oneself, introducing others and responding to introductions, engaging in phatic communion, leave taking, asking for information and giving information, talking about self and family, talking about likes and dislikes, expressing ability, impromptu speeches; **Reading:** Simple prose texts, simple poems, advertisements, notices, news items, notes and messages; **Writing:** Short paragraphs, letters – informal, notes, messages, descriptive texts (describing a person, object and place); **Grammar:** 'Be' and 'Have' as full verb, tenses- simple present, present continuous, present perfect, present perfect continuous, and pronouns; **Vocabulary:** dictionary skills

### EG 1200 (3 /30:30) General English

**Listening:** TV/radio news, announcements, advertisements, dialogues and conversations, discussions, short talks; **Speaking:** Role-plays, communicative activities, telephone conversation, *etc.*; **Reading:** Longer descriptive and narrative texts, advertisements, notices, poems, news items, letters to the editor written in simple English, matrimonial columns, *etc.*; **Writing:** Paragraphs on various topics, notes and messages, notice, formal letter and e-mail; **Grammar:** Tenses: simple past, past continuous, past perfect, clause elements : subject, verb, object, complement, adverbial, basic sentence patterns: SV, SVO, SVA, SVC, SVOC, determiners with emphasis on articles, prepositions; **Vocabulary:** Compound nouns, compound adjectives, words and phrases connected to relationships, words and expressions related to likes, dislikes and desires, binomials e.g. odds and ends, spick and span, expressions with 'do' and 'make', phrasal verbs

### EG 2100 (3/30:30) General English

**Listening:** Dialogues/conversations, interviews, short talks, discussions; **Speaking:** Take part in telephone conversations, take part in discussions, asking for and giving information, thanking, responding to thanks, apologizing, responding to an apology, requesting, asking for permission, granting permission, offering, accepting, refusing politely, agreeing, disagreeing, asking for clarification, expressing opinion on familiar topics with a reasonable degree of accuracy, asking for opinion, expressing ability, delivering a welcome speech and proposing the vote of thanks; **Reading:** Long descriptive and narrative prose texts, long expository texts, poems, informal and formal letters, e-mails, news items, short reports; **Writing:** Notes, telephone messages, formal letters and short essays; **Grammar:** Tenses: future simple, future continuous, future perfect, prepositions, determiners, modal verbs, conditional types 1, 2 and 3 and different types of questions; **Vocabulary:** Prefixes and suffixes, vocabulary related to telephoning, vocabulary related to work, collocations and phrasal verbs

### EG 2200 (2/15:30) General English

**Listening:** Conversations/telephone conversations, short texts, interviews, mini-lectures on topics relevant to students, short talks and songs; **Speaking:** Agreeing, disagreeing, asking for clarification, expressing opinion on familiar topics with a reasonable degree of accuracy, asking for opinion, asking for and giving directions, requesting a favour, granting a request, declining a request and giving reasons for not granting a request; **Reading:** Prose texts, advertisements, news items, poems, extracts from short stories/novels and short newspaper articles; **Writing:** Describing a process, essays, e-mails, notices and a set of instructions; **Grammar:** Imperative, reported speech, different types of questions, passive voice, prepositions and pronouns; **Vocabulary:** Uncountable nouns, words that occur only in the plural, countable and uncountable with different meanings, abstract nouns, collective nouns, global problems and phrasal verbs



## 5.6 Computer Centre

### **IT 1100 (2/15:30) Computer Literacy**

Basic Concepts of ICT, Computers and Computer System; Introduction to Word Processing; Getting Started with Microsoft Word; Adjusting environment settings; formatting of text, symbols and paragraphs; Working with tables, graphics and charts; Use of mail merge; Setting up pages and printing, introduction to electronic presentation; Getting started with MS PowerPoint; Modifying and formatting presentations; Working with drawings, graphics and charts; Setting up presentation slides and printing, Internet and e-mail; Benefits, security and risks in Internet; e- learning

### **IT 1200 (2/15:30) Computer Literacy**

Introduction to spreadsheet management; Getting Started with Microsoft Excel; Basic file operations; Adjusting environment settings; Formatting cells and worksheets; Working with functions; Formatting/modifying charts; Setting up pages and printing, Introduction to database management; Getting Started with Microsoft Access; Planning and creating databases; Creating/modifying tables; Creating queries; Designing Forms; Designing Reports and Introduction to Web Designing using HTML

## 5.7 Common Courses

### **CC 1100 (1/05:20) Social Harmony and Peace**

Self realization and vision building; Social disharmony and aggressive behaviour; Cross cultural understanding; Understanding of human differences; Negotiation and mediation skills; Student activism and violence in universities; Responsibilities (duties) and rights of a university student; Approaches in building social harmony and peace; Aesthetic and interactive activities

### **CC 2200 (0/05:50) Career Development**

Introduction to career development; Knowing about myself; Explore my career options; Opportunities in the work-world; The road-map for a successful career; Personal Branding; Creating my Future

## 6. COURSE OUTLINE

### B.Sc. AGRICULTURE DEGREE (ADVANCED PROGRAMME)

Courses offered during advanced programme by four departments are listed below. For each of the advanced course module, students are required to register for a minimum of 20 credits in year 3 semester 2 and 10 credits in year 4 semester 1, including all compulsory courses listed under respective modules. During year 4 semester 1, students are required to undergo a one-month training in a selected industry. During year 4 semester 2, students are required to undertake a research project under the guidance of a supervisor which carries 6 credits.

Year 3 Semester 2					
Course Code		Course Title	Course Code		Course Title
ES	3201 (2/20:20)	Agricultural Waste Management	ES	3219 (2/15:30)	Watershed Management
ES	3202 (2/15:30)	Climate Change and Agriculture	ES	3220 (2/15:30)	Workshop Engineering
ES	3203 (2/15:30)	Computer Programming	AS	3201 (2/20:20)	Extension Education
ES	3204 (2/25:10)	Electronics in Agriculture	AS	3202 (2/15:30)	Agricultural Project Management
ES	3205 (2/25:10)	Engineering Structure Development	AS	3203 (2/25:10)	Rural Sociology
ES	3206 (2/25:10)	Food Process Engineering	AS	3204 (3/40:10)	Econometrics
ES	3207 (2/15:30)	Groundwater Engineering	AS	3205 (3/30:30)	Natural Resource Economics
ES	3208 (2/15:30)	Integrated Water Resource Management	AS	3206 (2/25:10)	Agricultural Development and Policy
ES	3209 (2/15:30)	Irrigation Engineering	AS	3207 (2/25:10)	International Trade
ES	3210 (2/15:30)	Land Use Planning	AS	3208 (2/25:10)	Risk Management in Agriculture
ES	3211 (2/20:20)	Management of Problem Soils in Sri Lanka	AS	3209 (2/20:20)	Sustainable Agriculture
ES	3212 (2/20:20)	Precision Agriculture	AS	3210 (2/25:10)	Traditional Technology in Sri Lankan Agriculture
ES	3213 (2/15:30)	Remote Sensing and GIS in Agriculture	AS	3211 (2/25:10)	Livestock Production Systems
ES	3214 (2/15:30)	Soil and Ecosystems	AS	3212 (2/20:20)	Conservation Agriculture
ES	3215 (3/30:30)	Soil Microbiology	AF	3201 (2/25:10)	Animal Genetics and Breeding
ES	3216 (2/15:30)	Soil Survey and Classification	AF	3202 (2/25:10)	Dairy Product Processing Technology
ES	3217 (2/30:00)	Rice Soil Management	AF	3203 (2/25:10)	Meat and Egg Product Technology
ES	3218 (2/25:10)	Thermodynamics	AF	3204 (2/25:10)	Inland and Ornamental Fisheries

AF	3205 (2/25:10)	Disease Management in Farm Animals	PS	3206 (2/25:10)	Organic Crop Production
AF	3206 (2/25:10)	Wildlife Conservation and Management	PS	3207 (2/25:10)	Bio-energy Crops
AF	3207 (2/25:10)	Postharvest Technology of Cereals and Legumes	PS	3208 (2/25:10)	Medicinal Plants
AF	3208 (2/25:10)	Postharvest Techniques in Fisheries	PS	3209 (2/25:10)	Weed Science
AF	3209 (2/25:10)	Food Chemistry	PS	3210 (2/20:20)	Cottage Farming Enterprises
AF	3210 (2/25:10)	Food and Nutrition	PS	3211 (3/30:30)	Biotechnology and Molecular Techniques
AF	3211 (2/25:10)	Food Preservation	PS	3212 (2/20:20)	Plant Tissue Culture
AF	3212 (2/25:10)	Food Safety and Quality Management	PS	3213 (2/20:20)	Advanced Entomology
AF	3213 (2/15:30)	Food Analysis	PS	3214 (2/25:10)	Advanced Phytopathology
AF	3214 (2/25:10)	Food Packaging Technology	PS	3215 (2/25:10)	Plant Breeding Techniques
PS	3201 (2/25:10)	Rice Technology	PS	3216 (2/25:10)	Crop Physiology
PS	3202 (2/25:10)	Plantation Crop Technology I	PS	3217 (2/25:10)	Germplasm Conservation
PS	3203 (2/15:30)	Floriculture	PS	3218 (1/00:30)	Plant Science Colloquium
PS	3204 (2/15:30)	Controlled Environmental Agriculture	EG	3200 (3/30:30)	Professional English**
PS	3205 (2/25:10)	Plantation Forest Management			

<b>Year 4 Semester 1</b>					
	<b>Course Code</b>	<b>Course Title</b>		<b>Course Code</b>	<b>Course Title</b>
ES	4101 (2/25:10)	Advanced Agricultural Machinery and Management	AF	4104 (1/00:30)	Seminar in Animal Science
ES	4102 (2/25:10)	Design Philosophy	AF	4105 (2/25:10)	Postharvest Technology of Fruits and Vegetables
ES	4103 (2/25:10)	Energy Production and Management	AF	4106 (2/25:10)	Food Microbiology
ES	4104 (2/15:30)	Reservoir Designing and Management	AF	4107 (1/10:10)	Sensory Evaluation of Foods
ES	4105 (2/15:30)	Soils of Sri Lanka	AF	4108 (2/20:20)	Food Product Development
ES	4106 (2/20:20)	Techniques in Soil, Plant, Water and Fertilizer Analysis	AF	4109 (1/00:30)	Seminar in Food and Postharvest Technology
ES	4107 (2/15:30)	Water Resources of Sri Lanka	PS	4101 (2/30:00)	Advanced Field Crop Production
AS	4101 (2/25:10)	Entrepreneurship, Agribusiness and Value Chain Development	PS	4102 (2/25:10)	Plantation Crop Technology II
AS	4102 (2/25:10)	Human Resource Management	PS	4103 (2/15:30)	Landscape Horticulture
AS	4103 (3/30:30)	Rural Development and Development Communication	PS	4104 (2/20:20)	Forest Conservation
AS	4104 (2/25:10)	Agro-forestry Systems Management	PS	4105 (2/30:00)	Climate Change and Crop Production
AS	4105 (2/20:20)	Household Food Security Systems	PS	4106 (2/25:10)	Agro-ecology
AS	4106 (2/15:30)	Agro-ecotourism	PS	4107 (3/30:30)	Integrated Pest Management
AS	4107 (2/15:30)	Statistical Software for Data Analysis **	PS	4108 (2/25:10)	Applied Microbiology
AS	4108 (2/20:20)	Research Methods and Scientific Writing	PS	4109 (2/15:30)	Clinical Plant Pathology
AF	4101 (2/25:10)	Applied Animal Nutrition	PS	4110 (2/15:30)	Stored-Product Entomology
AF	4102 (2/25:10)	Micro Livestock Production	CC	4102 (2/00:120)	Industrial Training**
AF	4103 (1/10:10)	Feed Processing			

*Subjects superscripted with \*\* denote that they are credited and not contributing to the GPA*

# DEPARTMENT OF AGRICULTURAL ENGINEERING AND SOIL SCIENCE



**DEPARTMENT OF AGRICULTURAL ENGINEERING AND SOIL SCIENCE****(1) AGRICULTURAL ENGINEERING****Year 3 Semester 2****Compulsory Courses**

ES 3205 Engineering Structure Development  
 ES 3206 Food Process Engineering  
 ES 3207 Ground Water Engineering  
 ES 3209 Irrigation Engineering  
 ES 3213 Remote Sensing and GIS in Agriculture  
 ES 3218 Thermodynamics  
 ES 3219 Watershed Management  
 EG 3200 Professional English

**Optional Courses**

ES 3201 Agricultural Waste Management  
 ES 3202 Climate Change and Agriculture  
 ES 3203 Computer Programming  
 ES 3204 Electronics in Agriculture  
 ES 3208 Integrated Water Resource Management  
 ES 3212 Precision Agriculture  
 ES 3220 Workshop Engineering

**Year 4 Semester 1****Compulsory Courses**

ES 4101 Advanced Agricultural Machinery and Management  
 ES 4104 Reservoir Designing and Management  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific Writing

**Optional Courses**

ES 4102 Design Philosophy  
 ES 4103 Energy Production and Management  
 ES 4106 Techniques in Soil, Plant, Water and Fertilizer Analysis  
 ES 4107 Water Resources of Sri Lanka

**(2) ENVIRONMENTAL SOIL MANAGEMENT****Year 3 Semester 2****Compulsory Courses**

ES 3201 Agricultural Waste Management  
 ES 3210 Land Use Planning  
 ES 3211 Management of Problem Soils in Sri Lanka  
 ES 3213 Remote Sensing and GIS in Agriculture  
 ES 3215 Soil Microbiology  
 ES 3216 Soil Survey and Classification  
 ES 3217 Rice Soil Management  
 EG 3200 Professional English

**Optional Courses**

ES 3208 Integrated Water Resource Management  
 ES 3214 Soil and Ecosystems  
 ES 3219 Watershed Management  
 AS 3201 Extension Education  
 AS 3202 Agricultural Project Management  
 PS 3206 Organic Crop Production

**Year 4 Semester 1****Compulsory Courses**

ES 4105 Soils of Sri Lanka  
 ES 4106 Techniques in Soil, Plant, Water and Fertilizer Analysis  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific Writing

**Optional Courses**

ES 4103 Energy Production and Management  
 ES 4107 Water Resources in Sri Lanka  
 AS 4106 Agro-ecotourism  
 PS 4103 Landscape Horticulture



**COURSE CAPSULES****6.1. DEPARTMENT OF AGRICULTURAL ENGINEERING & SOIL SCIENCE****ES 3201 (2/20:20) Agricultural Waste Management**

Introduction to waste management concepts; Waste treatment methods and systems; Solid waste management; Plastic waste management; Composting; Biogas as an environmental management tool; Legal aspects of waste management

**ES 3202 (2/15:30) Climate Change and Agriculture**

Greenhouse gases; Global warming; Climate change; Intergovernmental Panel on Climate Change; United Nations Framework Convention on Climate Change; Kyoto protocol; Impact of climate change on agriculture, fisheries, biodiversity and eco systems; Climate change and Sri Lanka: vulnerability, adaptation, and mitigation; Carbon foot print; Climate change modelling, GCMs and scenario building

**ES 3203 (2/15:30) Computer Programming**

Introduction to computer programming; Computer programming fundamentals; Array, branching and looping; Sequential and random files, computer programming languages; Introduction to a computer language (Eg: Visual Basic); Design, code and debug programmes using the language; File handling and database management using the programming language

**ES 3204 (2/25:10) Electronics in Agriculture**

Basic concepts and terminology: Ohm's Law, Kirchhoff's Laws, electricity AC/DC; Electrical circuit analysis; Electrical measuring equipment; Identification of basic electrical and electronic components; Electrical characteristics and measurements of capacitor and inductors; Semiconductor components: diodes, transistor, thyristors, transducers for measurement and operation; Introduction to the component of basic control systems; Introduction to mechatronics

**ES 3205 (2/25:10) Engineering Structure Development**

Introduction; Strength of material: tensile, compressive, shear and torsion effects, stress-strain relationship, equilibrium of rigid body, analysis of simple, supported trusses, beam and evaluation of engineering structures; Fundamentals of planning farm buildings: building materials, parts of farm building, concrete structures, wood preservation; Applications of engineering structures, road construction and fencing

**ES 3206 (2/25:10) Food Process Engineering**

Introduction; Physical properties of agricultural materials; Unit operations and operation techniques: mechanical transport, mechanical processing, mechanical separation, heat and mass transfer operations, drying; Packaging; Cleaning of process equipment; Cleaner production

**ES 3207 (2/15:30) Groundwater Engineering**

Subsurface environment; Groundwater: aquifers, aquifer properties, Darcy's Law and groundwater movements, Groundwater potential; Groundwater exploration and well hydraulics; Groundwater recharge and artificial recharging techniques; Groundwater quality; Groundwater pollution

**ES 3208 (2/15:30) Integrated Water Resource Management (IWRM)**

Introduction to IWRM; Principles of IWRM; Water for life; Stakeholders and their role; Water and gender; Multidisciplinary approach; Socio-economic dimensions of IWRM; Water demand management; Use of PRA tools in IWRM; Conflict management in water sector

**ES 3209 (2/15:30) Irrigation Engineering**

Design, hydraulics and evaluation of surface and sub surface irrigation methods; Water flow in



open channels; Water measurement and control structures; Components, hydraulics, scheduling, evaluation, system maintenance and troubleshooting of sprinkler and drip irrigation systems; Modern trends in micro irrigation

**ES 3210 (2/15:30) Land Use Planning**

Introduction, important land qualities and related characteristics in agriculture, matching of crop requirements with land characteristics; Soil survey and mapping; Use of GIS in land use planning; Land evaluation methods; Land use systems in Sri Lanka; Sustainable land management

**ES3211 (2/20:20) Management of Problem Soils in Sri Lanka**

Distributions and description of problem soils in Sri Lanka; Natural and anthropogenic causes leading to problems; Impact on the productivity and environment; Rehabilitation and conservation of problem/degraded soils

**ES 3212 (2/20:20) Precision Agriculture**

Basics, strategies and tools; GPS technology; GIS in precision agriculture, mapping of land and crop information using GIS techniques; Application of different sensor technologies for collecting data; Application of remote sensing; Yield mapping; Variable Rate Technology (VRT) in precision agriculture; Site specific management strategies used in precision agriculture

**ES 3213 (2/15:30) Remote Sensing and GIS in Agriculture**

Introduction to Geographic Information Technology (GIT); Principles of remote sensing, components of remote sensing systems; Concept of Geographical Information Systems (GIS), components of GIS, common operations and approaches in GIS, hardware and software use in GIS; Applications of remote sensing and GIS in agriculture

**ES 3214 (2/15:30) Soil and Ecosystems**

Ecosystem types, role of soil in ecosystems, dynamic nature of elements, sources of pollutants, interaction between different ecosystems, effect of nutrient accumulation in soil and water bodies; Impact of anthropogenic aspects on the sustainability of ecosystems; Significance of wet lands; Healthy management of ecosystems, legal enactments of soil and ecosystem management

**ES 3215 (3/30:30) Soil Microbiology**

History of soil microbiology; Soil biota-diversity distribution; Microbial interaction; Microbial biomass; Microbes in rhizosphere; Soil enzymes; Biodegradation of agro-chemicals and organic matters; Microbiology of nutrient cycles; Bio fertilizers

**ES 3216 (2/15:30) Soil Survey and Classification**

Historical development of soil survey and classification; Systems of soil surveys; Detailed soil profile description; USDA soil taxonomy, orders of soil described in USDA soil taxonomy; Other soil classification systems

**ES 3217 (2/30:00) Rice Soil Management**

Introduction; Morphology; Physical and chemical properties; Microbiology under submergence; Nutrient transformation and availability; Problems and their amelioration

**ES 3218 (2/25:10) Thermodynamics**

Basic concepts and definitions; Energy and the first law of thermodynamics, the second law of thermodynamics; Entropy; Vapor power cycles, gas power cycles, refrigeration cycles; Psychometrics

**ES 3219 (2/15:30) Watershed Management**

Watershed: characteristics, delineation of boundaries; Principles of watershed management; Legal

aspects of watershed management environmental impact assessment; Soil erosion in a watershed: types of soil erosion, mechanics of soil erosion and estimation of soil erosion-USLE, MUSLE, RUSLE and other process based models; Principles and methods of soil and water conservation, conservation structures; Participatory integrated watershed management; Prioritization of watersheds; Socio economic evaluation of watershed management projects; Use of GIS and remote sensing in watershed management

### **ES 3220 (2/15:30) Workshop Engineering**

Introduction to engineering workshop and practices; Operation and maintenance of workshop machinery and equipment; Metal and wood work; Familiarization in welding, lathe operations; Fabrication of components; Combined project work in engineering drawing and workshop practice; Workshop management; Safety of workshop

### **ES 4101(2/25:10) Advanced Agricultural Machinery and Management**

Soil mechanics and tillage, traction and rolling resistance, optimum soil condition for tillage, relevant soil properties, mechanics of interaction between soil and tillage equipment and traction devices; Testing and evaluation of farm machinery; Concepts of machinery management; Machinery depreciations; Fluid machinery

### **ES 4102 (2/25:10) Design Philosophy**

Introduction: design concept, existing design, prototype models and commercial applications; Design development: analysis, identification of variables; Ergonomics, selection of materials and safety measures; Cost estimation of prototype and commercial models; Standardization, simplification, testing and evaluation of designs; Patent rights

### **ES 4103 (2/25:10) Energy Production and Management**

Introduction to basic principles and definitions; Different types of direct and indirect energy sources; Importance of renewable energy; Solar power: solar cells, solar dryers; Mini hydro generation plants and their establishment criteria; Wind power: uses, wind mills; Biogas: biogas plants, construction details; Bio fuels: bio diesel and bio ethanol, energy production from biomasses and steam generation; Other renewable energy sources; Calculation on energy conservation; Combustion of fuel and gasification; Energy losses; Environmental impacts

### **ES 4104 (2/15:30) Reservoir Designing and Management**

Reservoir, reservoir headwork; Cascade systems, evaluation of cascade systems; Reservoir sedimentation and control measures; Present status of reservoirs in Sri Lanka; Design procedure of small reservoirs/farm ponds

### **ES 4105 (2/15:30) Soils of Sri Lanka**

Development of soil studies in Sri Lanka; Physiography and land systems; Great soil groups and soil series of wet, intermediate and dry zone; Risks and limitations; Management of soils of Sri Lanka

### **ES 4106 (2/20:20) Techniques in Soil, Plant, Water and Fertilizer Analysis**

Sampling and sample preparation for analysis; Extraction of soil nutrients; Principles of gravimetry, volumetry, turbidimetry and potentiometry; Analytical techniques of colorimetry, flame photometry and atomic absorption spectrometry; Analysis of soil, plant, water and fertilizers for nutrients; Interpretation of results

### **ES 4107 (2/15:30) Water Resources of Sri Lanka**

Rainfall of Sri Lanka; Rivers and river basins of Sri Lanka, river basin management; Trans basin water diversions; Water resource development regions; Groundwater resources of Sri Lanka; Major irrigation schemes; Human impact on water resources

# DEPARTMENT OF AGRICULTURAL SYSTEMS



**DEPARTMENT OF AGRICULTURAL SYSTEMS****(3) AGRICULTURAL ECONOMICS AND EXTENSION****Year 3 Semester 2****Compulsory Courses**

AS 3201 Extension Education  
 AS 3202 Agricultural Project Management  
 AS 3203 Rural Sociology  
 AS 3204 Econometrics  
 AS 3205 Natural Resource Economics  
 AS 3206 Agricultural Development and  
 Policy  
 EG 3200 Professional English

**Optional Courses**

AS 3207 International Trade  
 AS 3208 Risk Management in Agriculture  
 AS 3209 Sustainable Agriculture  
 ES 3208 Integrated Water Resource  
 Management  
 ES 3210 Land Use Planning  
 ES 3213 Remote Sensing and GIS in  
 Agriculture

**Year 4 Semester 1****Compulsory Courses**

AS 4101 Entrepreneurship, Agribusiness and  
 Value Chain Development  
 AS 4102 Human Resource Management  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific  
 Writing

**Optional Courses**

AS 4103 Rural Development and  
 Development Communication  
 AS 4104 Agro-forestry Systems Management  
 AS 4106 Agro-ecotourism  
 ES 4103 Energy Production and Management

**(4) AGRICULTURAL SYSTEMS AND MANAGEMENT****Year 3 Semester 2****Compulsory Courses**

AS 3202 Agricultural Project Management  
 AS 3203 Rural Sociology  
 AS 3208 Risk Management in Agriculture  
 AS 3209 Sustainable Agriculture  
 AS 3210 Traditional Technology in  
 Sri Lankan Agriculture  
 AS 3211 Livestock Production Systems  
 AS 3212 Conservation Agriculture  
 EG 3200 Professional English

**Optional Courses**

AS 3205 Natural Resource Economics  
 ES 3201 Agricultural Waste Management  
 ES 3202 Climate Change and Agriculture  
 ES 3208 Integrated Water Resource  
 Management  
 ES 3210 Land Use Planning  
 ES 3213 Remote Sensing and GIS in  
 Agriculture  
 AF 3206 Wildlife Conservation and  
 Management

**Year 4 Semesters 1****Compulsory Courses**

AS 4104 Agroforestry Systems Management  
 AS 4105 Household Food Security Systems  
 AS 4107 Statistical Software for Data  
 Analysis  
 AS 4108 Research Methods and Scientific  
 Writing

**Optional Courses**

AS 4101 Entrepreneurship, Agribusiness  
 and Value Chain Development  
 AS 4102 Human Resource Management  
 AS 4103 Rural Development and  
 Development Communication  
 AS 4106 Agro-ecotourism



## **6.2. DEPARTMENT OF AGRICULTURAL SYSTEMS**

### **AS 3201 (2/20:20) Extension Education**

Domains of learning; Phases of learning; Adult education; Approaches to agricultural extension; General agricultural extension approach; Commodity specialized approach; T and V approach, Agriculture extension participatory approach; Project approach; Farming system development approach; Cost sharing approach; Educational institutional approach; Advantages and disadvantages of those; Preparation and distribution of teaching materials; Systematic in-service training; Local verification trials; Services of SMS analysis of experimentation and evaluation; Adoption and diffusion of innovations; Extension management; Monitoring and evaluation of extension programmes; Task of agricultural extension

### **AS 3202 (2/15:30) Agricultural Project Management**

Definition of projects; Importance of project analysis and project cycles; Economic and financial aspects of projects, identifications, quantification and valuation of costs and benefits of projects; Network analysis; Extended benefit cost analysis; Use of computer software for project analysis

### **AS 3203 (2/25:10) Rural Sociology**

Concept of sociology; Structure of rural society; Rural urban differences; Kinship and value systems; Social change; Social differentiation and stratification; Institutions, social organizations; Social cohesion and disintegration; Design and management of dry zone settlements; Culture and its implications; Power and decision making in agriculture

### **AS 3204 (3/40:10) Econometrics**

Two variable regression model, method of Ordinary Least Squares, Classical Normal Linear Regression model (CNLRM); interval estimation, confidence intervals for parameters, hypothesis testing; Regression analysis and analysis of variance; Prediction, reporting and evaluation of regression results; linear regression models; Multiple regression: estimation, problems of inferences; Dummy variables; Multicollinearity; Heteroscedasticity; Autocorrelation; Model specification and diagnostic testing; Qualitative response regression models

### **AS 3205 (3/30:30) Natural Resource Economics**

Environment and natural resources; Classification of natural resources; Economic efficiency; Sufficient and necessary conditions for economic efficiency; Pareto optimism, externalities, property rights, public goods and market failure; Introduction to allocation of depletable and renewable resources, recyclable resources, depletable-non-recyclable resources, replenishable/depletable resources; Renewable common property resources and storable renewable resources

### **AS 3206 (2/25:10) Agricultural Development and Policy**

Introduction to agricultural development; Theories of economic and agricultural development; Role of population, capital trade and technology in development; Human resource development; Role of agriculture in economic development; Introduction to agricultural policies in Sri Lanka: Land settlements, land reform policies, agricultural credit policies, marketing and pricing policies and agricultural institutions

### **AS 3207 (2/25:10) International Trade**

Introduction to global trading systems; Neo-classical trade theories; Gains from trade; Trade barriers; Tariff in a small open economy; Tariff in a large economy; Import and export quotas ; Export subsidies; Analysis of trade policies; Partial equilibrium models; Current trade issues

**AS 3208 (2/25:10) Risk Management in Agriculture**

Introduction, definition of risk, three principle types of agricultural risks - Production risks: weather events, pest and disease outbreaks, fire, windstorm; Market risks: risks like commodity and input price volatility; Exchange rate and interest rate volatility; Counterparty/default risks; Enabling environment risk: changes in government or business regulations, macro-economic environment, political risks, conflict, trade restrictions; Risk management strategies: mitigation, transfer and coping, introduction to quantitative techniques in assessing risk

**AS 3209 (2/20:20) Sustainable Agriculture**

Concept of sustainability in agriculture; Agricultural practices and their influence on sustainability of Agriculture; Elements of Sustainable Agriculture; Factors influencing agricultural sustainability; Interaction between agricultural inputs and environment; Sustainability of specific production systems and limitations; Ecological farming strategies; Research and Policy needs

**AS 3210 (2/25:10) Traditional Technology in Sri Lankan Agriculture**

Location of Sri Lanka in vitality in agricultural production, limitations experienced and technologies developed and adopted to overcome limitations; Traditional agricultural technologies: their efficacies, and limitations; Traditional management practices: their principles, advantages, disadvantages; Indigenous knowledge in agriculture; Present context; Measures to promote agricultural technological development and support needed

**AS 3211 (2/25:10) Livestock Production Systems**

Introduction to livestock production systems in Sri Lanka; Potential of livestock production systems in different eco-regions, benefits and constraints; Types of livestock production systems in Sri Lanka and beyond, characteristics of production systems, advantages and disadvantages, constraints and management practices; Animal waste management and utilization; Evaluation of crop-livestock integration systems

**AS 3212 (2/20:20) Conservation Agriculture**

Definitions and objectives of Conservation Agriculture, benefits and limitations; Practices adopted in Conservation Agriculture; Analyses of benefits of conservation agriculture in terms of sustainability of agriculture and determining factors; Promotion of Conservation agriculture among farmers and policy implications

**AS 4101 (2/25:10) Entrepreneurship, Agribusiness and Value Chain Development**

Definitions and concepts of entrepreneurship; Objectives and roles of entrepreneurship; Theory and practice of entrepreneurship; Scope of Agribusiness; Types of agricultural business management and organizations; Public policies affecting agricultural business; Concepts of value chain, value chain methodology and value chain analysis

**AS 4102 (2/25:10) Human Resource Management**

Role of human resource management in agricultural industries; Human Resource planning; Job specification; Employee motivation; Training and development; Performance management; Grievance handling; Health and safety in organizations; Industrial relations; Industrial labour law; Methods of empowering employee's, productivity, power and authority skills of good management; Managing the organizational environment

**AS 4103 (3/30:30) Rural Development and Development Communication**

Introduction to rural sector, rural poverty and rural demography; Support services, rural development societies and their role; Planning and implementation of rural development projects; Past and present rural development programmes in Sri Lanka and constrains; Analysis of rural development projects in the Asian region; The role of communication in development; Communication models and theories; Principles and practices of participatory communication;

Journalism and media use; Communication strategies in agricultural and national development; Planning and implementation of communication programmes for development

**AS 4104 (2/25:10) Agro-forestry Systems Management**

Describing agro-forestry system (AFSs); Development of the concept of AFSs; Benefits and problems; Classification of AFSs and their characteristics; Common AFSs in Sri Lanka; Components of AFSs; Species interactions with the environment of all kinds and determining dominance; selection and biological performance in AFSs; Sustainability of AFSs; Forest management strategies; AFSs and rural livelihoods; Related institutions and their role

**AS 4105(2/20:20) Household Food Security Systems**

Food security and insecurity, criteria used for defining food security; Household food security issues; Strategies and programmes with a household focus for improving food security; Household Food Security Systems, their role and institutional assistance

**AS 4106 (2/15:30) Agro-ecotourism**

Concepts and definitions, tourism and agro-ecotourism; Benefits of agro-ecotourism to farm development and farmer's income generation; Factors promoting agro-ecotourism; Farm planning and designing for tourism purpose; Training needs of farmers for planning and maintaining successful agro-ecotourism; Policy support and assistance needed for agro-tourism development

**AS 4107 (2/15:30) Statistical Software for Data Analysis**

Introduction to statistical software (SAS, MINITAB, R); summarizing data sets (numerically and graphically); One sample and two sample t-test; Analysis of variance models for single factor and factorial experiments; Analysis of data from unbalanced designs; Regression analysis; Non parametric data analysis; Categorical data analysis (introductions to logistic regression and log linear model)

**AS 4108 (2/20:20) Research Methods and Scientific Writing**

Literature review and identification of a research problem; Formulation of research proposal; Design experiments; writing reports, thesis and research papers; Communication of research findings; Scientific research ethics



# DEPARTMENT OF ANIMAL AND FOOD SCIENCES



**DEPARTMENT OF ANIMAL AND FOOD SCIENCES****(5) ANIMAL PRODUCTION AND TECHNOLOGY****Year 3 Semester 2****Compulsory Courses**

AF 3201 Animal Genetics and Breeding  
 AF 3202 Dairy Product Processing Technology  
 AF 3203 Meat and Egg Product Technology  
 AF 3204 Inland and Ornamental Fisheries  
 AF 3205 Disease Management in Farm Animals  
 AF 3208 Postharvest Techniques in Fisheries  
 AS 3211 Livestock Production Systems  
 EG 3200 Professional English

**Optional Courses**

AF 3206 Wildlife Conservation and Management  
 AF 3210 Food and Nutrition  
 AF 3212 Food Safety and Quality Management  
 ES 3201 Agricultural Waste Management  
 ES 3213 Remote Sensing and GIS in Agriculture  
 AS 3208 Risk Management in Agriculture  
 AS 3210 Traditional Technology in Sri Lankan Agriculture

**Year 4 Semester 1****Compulsory Courses**

AF 4101 Applied Animal Nutrition  
 AF 4102 Micro Livestock Production  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific Writing

**Optional Courses**

AF 4103 Feed Processing  
 AF 4104 Seminar in Animal Science  
 AF 4106 Food Microbiology  
 AF 4107 Sensory Evaluation of Foods  
 AS 4102 Human Resource Management

**(6) FOOD AND POSTHARVEST TECHNOLOGY****Year 3 Semester 2****Compulsory Courses**

AF 3202 Dairy Product Processing Technology  
 AF 3203 Meat and Egg Product Technology  
 AF 3207 Postharvest Technology of Cereals and Legumes  
 AF 3208 Postharvest Techniques in Fisheries  
 AF 3209 Food Chemistry  
 AF 3210 Food and Nutrition  
 AF 3211 Food Preservation  
 EG 3200 Professional English

**Optional Courses**

AF 3212 Food Safety and Quality Management  
 AF 3213 Food Analysis  
 AF 3214 Food Packaging Technology  
 ES 3206 Food Process Engineering  
 AS 3202 Agricultural Project Management  
 AS 3208 Risk Management in Agriculture  
 AS 3209 Sustainable Agriculture

**Year 4 Semester 1****Compulsory Courses**

AF 4105 Postharvest Technology of Fruits and Vegetables  
 AF 4106 Food Microbiology  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific Writing

**Optional Courses**

AF 4107 Sensory Evaluation of Foods  
 AF 4108 Food Product Development  
 AF 4109 Seminar in Food and Postharvest Technology  
 AS 4102 Human Resource Management  
 AS 4105 Household Food Security Systems

### 6.3 DEPARTMENT OF ANIMAL AND FOOD SCIENCES

#### **AF 3201 (2/25:10) Animal Genetics and Breeding**

Introduction; Animal genetic resources, conservation of animal genetic resources; Mendelian Inheritance; Concepts of quantitative and qualitative genetics; Principles of selection, response to selection; Heritability; Repeatability; Inbreeding; Phenotypic variation in economic traits and parameters for estimation; Breeding methods and systems of breeding

#### **AF 3202 (2/25:10) Dairy Product Processing Technology**

Chemical and physical properties of milk and milk constituents; Microbiology and spoilage of milk, milkborne diseases and zoonotic diseases; Dairy starter cultures, beneficial effects of fermented milk products; Processing of liquid milk and production of milk products: curd (*meeekiri/deekiri*), yoghurt, cheese, whey, manufacturing of butter, condensed milk, ice cream and dried milk powder, current trends in dairy technology research, novel product development

#### **AF 3203 (2/25:10) Meat and Egg Product Technology**

Slaughtering of farm animals, dressing and cuts, carcass quality, physical, chemical composition and structure of meat and egg, post mortem glycolysis, rigormortis, eating quality, nutritional value and functional properties, spoilage and microbiology, storage, preservation and processing of meat and eggs; utilization of by-products from the meat industry, HACCP system in animal based food industry

#### **AF 3204 (2/25:10) Inland and Ornamental Fisheries**

**Part I:** Present status and recent developments in inland fisheries in Sri Lanka; Resources of inland fisheries, rivers, reservoirs, perennial and seasonal tanks, estuaries; Fishing regulations; Supporting services of inland fisheries; Inland fish marketing network in Sri Lanka; Role of inland fishery societies

**Part II:** Present status and recent developments in ornamental fisheries in Sri Lanka; Ornamental fish varieties; Breeding; Feeds and feeding; Common aquarium plants, Design and maintenance of ornamental fish tank

#### **AF 3205 (2/25:10) Disease Management in Farm Animals**

Introduction; Basic epidemiologic principles in disease investigation, immunity, disease resistance and disease transmission; Common diseases caused by bacteria, virus, fungi, protozoa, metabolic and nutrient deficiencies; Clinical signs and pathogenesis of major diseases in cattle, goat, poultry, swine, other farm animals and fish; Zoonotic diseases; Eradication, prevention, management and treatment of diseases and parasites in farm animals and fish

#### **AF 3206 (2/25:10) Wildlife Conservation and Management**

Wildlife as an important component of ecosystems; Basic principles in wildlife conservation and management; Wildlife ordinance; Conservation of animal genetic resources; Animal biodiversity, important wildlife fauna in Sri Lanka; Farm animal diversity and their wild relatives; Human animal conflicts, effect of wildlife on agriculture; Potentials and limitations of wildlife management

#### **AF 3207 (2/25:10) Postharvest Technology of Cereals and Legumes**

Introduction; Physico-chemical properties and nutritive value of cereals and legumes; Grading systems, harvesting, threshing, drying, storage, milling, products of major cereals and legumes

#### **AF 3208 (2/25:10) Postharvest Techniques in Fisheries**

Introduction; Economic importance, nutritional value of marine and inland fish; Physical chemical composition and structure of fish muscle; Postharvest losses in fish, mechanisms and manifestations of spoilage in fish, on-board handling of fish, pre-storage treatments, cold chain



technology, hygiene and sanitation, pathogenic organisms related with fish and fish products, histamine poisoning, fish food quality control, fish processing and by-products

**AF 3209 (2/25:10) Food Chemistry**

Basic properties of water, protein, carbohydrates, lipids and their functions and reactions in food systems, enzymes in food, food pigments, food flavours, food additives, role of water activity in food stability, freezing and food stability

**AF 3210 (2/25:10) Food and Nutrition**

Introduction; Nutrients and their impacts on health, dietary fiber; Nutritional aspects of common foods: cereals, pulses, animal sources of food: meat, poultry, fish, shellfish, egg, milk, beverages, junk foods; Energy and nutrient requirements of human, malnutrition, nutrition and diseases, food allergies and intolerances, vegetarianism

**AF 3211 (2/25:10) Food Preservation**

Introduction; Food deterioration and losses; High and low temperature techniques, drying and water activity control, chemical preservation, fermentation, preservation by microwaves, emerging preservation techniques, combining of preservation techniques and monitoring the effectiveness of preservation techniques

**AF 3212 (2/25:10) Food Safety and Quality Management**

Introduction; Laws and regulations related to food safety and quality management; Concepts of food toxicology, adulterants and contaminants, food borne diseases and food safety hazards, genetically modified food products; Good manufacturing practices, food quality programs and quality systems, ISO, HACCP and laboratory accreditation, hygiene, sanitation and public health aspects in food industry

**AF 3213 (2/15:30) Food Analysis**

Introduction to laboratory analysis of food products; Laboratory safety; Sampling procedures; Estimation of pH and acidity, total solids, protein, fat/lipids, fibre, carbohydrates, ash and minerals; Principles of chromatography, spectroscopy and immunoassay

**AF 3214 (2/25:10) Food Packaging Technology**

Introduction; Packaging design and development, shelf life and quality of packaged products, use of metal cans, glass containers, plastics, paper and paperboard in food packaging, active packaging, modified atmosphere packaging, packaging of fruits, vegetables, fresh and processed meat products, fish and fish products and dairy products

**AF 4101(2/25:10) Applied Animal Nutrition**

Introduction; Balancing ration, methods of formulating feed mixtures, feeding standards; Estimation of nutrient requirements, energy requirements for maintenance, growth, and production, protein requirements for growth and lactation, requirement of minerals, vitamins and miscellaneous additives; Evaluation of feedstuffs for livestock, analytical methods for nutrient composition, obtaining samples for analysis, proximate analysis of feed, Van Soest procedure of fiber analysis, feeding trials, digestion and metabolism trials, measures of feedstuff energy, protein evaluation and physical evaluation of feedstuff

**AF 4102 (2/25:10) Micro Livestock Production**

Introduction; Importance of micro-livestock industry; Constraints and potentials of non-traditional farm animals; Rabbit farming; Miscellaneous poultry production (Ducks, Geese, Turkeys, Guinea Fowls, Pigeons, Quails); Guinea pig farming; Deer farming; Crocodile farming; Methods to promote uses of non-conventional animal products

**AF 4103 (1/10:10) Feed Processing**

Introduction, raw materials, processing methods, general processing operations; Particle reduction, mixing, pelleting, quality assurance, packing and marketing, manufacturing considerations, effect of feed processing on nutrients, potential hazards, prevention and methods of controlling

**AF 4104 (1/00:30) Seminar in Animal Science**

Student reviews and lead discussions on current problems and research findings in Animal Production; Students prepare a report and present on a relevant topic (selected by the student or assigned by the Lecturer In-Charge)

**AF 4105 (2/25:10) Postharvest Technology of Fruits and Vegetables**

Postharvest physiology and biochemistry of fruits and vegetables; Postharvest losses and factors involved in deterioration; Preharvest factors affecting postharvest quality; Fruit ripening and role of ethylene; Postharvest diseases; Harvesting and field handling; Packaging house operations, storage, transport, marketing, minimal processing and value addition

**AF 4106 (2/25:10) Food Microbiology**

Introduction and historical background; Major groups of microorganisms; Microorganisms in foods, estimation of microbial populations in food, factors affecting microbial growth, sources of microorganisms and food borne diseases, indicator organisms, detection of causative microorganisms, beneficial microorganisms and use of microorganisms in food industry, control of spoilage microorganisms

**AF 4107 (1/10:10) Sensory Evaluation of Foods**

Introduction to sensory evaluation; Sensory attributes and conducting sensory tests, test room, product and tasting panel, different types of sensory tests, analysis and interpretation of sensory data

**AF 4108 (2/20:20) Food Product Development**

Introduction to food product development; Designing new products, food needs and consumer preference, unit operations in product development, techniques and construction of flow charts, maintaining quality, cost estimation, safety and regulatory aspects in food product development; New trends in food product development and foods for the future

**AF 4109 (1/00:30) Seminar in Food and Postharvest Technology**

Identification of a topic relevant to food and postharvest technology for detailed literature survey, seminar presentation and preparation of a report



## DEPARTMENT OF PLANT SCIENCES



**DEPARTMENT OF PLANT SCIENCES****(7) CROP SCIENCE****Year 3 Semester 2****Compulsory Courses**

PS 3201 Rice Technology  
 PS 3202 Plantation Crop Technology I  
 PS 3203 Floriculture  
 PS 3204 Controlled Environmental  
 Agriculture  
 PS 3205 Plantation Forest Management  
 PS 3216 Crop Physiology  
 PS 3218 Plant Science Colloquium  
 EG 3200 Professional English

**Optional Courses**

PS 3206 Organic Crop Production  
 PS 3207 Bio-energy Crops  
 PS 3208 Medicinal Plants  
 PS 3209 Weed Science  
 PS 3210 Cottage Farming Enterprises  
 PS 3211 Biotechnology and  
 Molecular Techniques  
 PS 3212 Plant Tissue Culture  
 ES 3213 Remote Sensing and GIS  
 in Agriculture

**Year 4 Semester 1****Compulsory Courses**

PS 4101 Advanced Field Crop Production  
 PS 4102 Plantation Crop Technology II  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific  
 Writing

**Optional Courses**

PS 4103 Landscape Horticulture  
 PS 4104 Forest Conservation  
 PS 4105 Climate Change and Crop Production  
 PS 4106 Agro-ecology  
 PS 4107 Integrated Pest Management  
 AS 4104 Agro-forestry Systems Management

**(8) AGRICULTURAL BIOLOGY****Year 3 Semester 2****Compulsory Courses**

PS 3210 Cottage Farming Enterprises  
 PS 3211 Biotechnology and  
 Molecular Techniques  
 PS 3212 Plant Tissue Culture  
 PS 3213 Advanced Entomology  
 PS 3214 Advanced Phytopathology  
 PS 3215 Plant Breeding Techniques  
 PS 3218 Plant Science Colloquium  
 EG 3200 Professional English

**Optional Courses**

PS 3204 Controlled Environmental  
 Agriculture  
 PS 3206 Organic Crop Production  
 PS 3209 Weed Science  
 PS 3216 Crop Physiology  
 PS 3217 Germplasm Conservation  
 ES 3201 Agricultural Waste Management  
 ES 3213 Remote Sensing and GIS  
 in Agriculture

**Year 4 Semester 1****Compulsory Courses**

PS 4107 Integrated Pest Management  
 PS 4108 Applied Microbiology  
 AS 4107 Statistical Software for Data Analysis  
 AS 4108 Research Methods and Scientific  
 Writing

**Optional Courses**

PS 4105 Climate Change and Crop Production  
 PS 4109 Clinical Plant Pathology  
 PS 4110 Stored-Product Entomology  
 AS 4106 Agro-ecotourism  
 AF 4105 Postharvest Technology of  
 Fruits and Vegetables



#### 6.4. DEPARTMENT OF PLANT SCIENCES

##### **PS 3201 (2/25:10) Rice Technology**

Rice in perspective; Climatic requirement of rice; Rice growing soils: chemical changes in submerged soils; Water management in rice; Morphology, growth and development of rice; Photosynthesis and respiration; Rice plant characters vs yield ability; Physiological analysis of yield; Varietal development; Post production technology; Rice seed production; Rice production technologies and world food supply

##### **PS 3202 (2/25:10) Plantation Crop Technology I**

**Tea and Rubber:** Present status, potentials and constraints; Analysis of production systems; Processing (Tea: orthodox /CTC / green tea, *etc.* and Rubber: crepe / RSS / TSR / centrifuged latex *etc.*) and value addition; Quality management and certification; Marketing; Institutional support; Climate change influence; Research perspectives; Use of GIS in plantation management

##### **PS 3203 (2/15:30) Floriculture**

Floriculture industry; Cultivation and postharvest techniques of flowering, foliage and ornamental plants used for potting, bedding and floristry; Principles of "*Bonsai*", dried flower and foliage production; Floral design and composition; Research perspectives in floriculture

##### **PS 3204 (2/15:30) Controlled Environmental Agriculture**

Introduction to Controlled Environment Agriculture (CEA); Greenhouse designs and constructions; Manipulation of environment; Hydroponic crop production systems; Nursery techniques; Management of nutrients, irrigation and pests and diseases; Cultivation, harvesting and postharvest handling of major CEA crops; Research perspectives in CEA

##### **PS 3205 (2/25:10) Plantation Forest Management**

Introduction to plantation forestry/silviculture; Selection of tree species; Nursery management and field establishment; Silvicultural treatments and stand manipulation; Regeneration techniques/silvicultural systems; Forest mensuration and inventory; Harvesting of timber; Wood seasoning and preservation; Timber utilization; Natural forest management for timber production; Agro-forestry and social forestry for timber production

##### **PS 3206 (2/25:10) Organic Crop Production**

Present status, potentials and constraints of organic and alternative crop production; Transition to organic crop production; Nutrient management and crop protection in alternative cropping; Biodynamic cropping; Low external input sustainable agriculture (LEISA); Organic product certification; Research perspectives in organic crop production

##### **PS 3207 (2/25:10) Bio-energy Crops**

Bio-energy derived from biomass; Vexing and pressing issues of fuel fossils; Bio-energy from cellulosic biomass, starch, sugar and oils; Dedicated energy crops; Food production and ecosystem footprint of bio-energy crop production; Achievements and unresolved concerns

##### **PS 3208 (2/25:10) Medicinal Plants**

Introduction; Ethno botany and ethno medicine; Classification; Cultivation and management practices; Harvesting, postharvest handling and value addition; Marketing; Extension services for commercialization of medicinal plants; Chemical constituents; Improvement, Conservation and sustainable utilization

**PS 3209 (2/25:10) Weed Science**

Introduction to weed science; Weed biology; Noxious weeds; Weed competition; IWM; History of herbicides; Herbicide classification, formulations and modes of actions; Herbicide toxicity; Fate of herbicides in plant and soil (herbicide residues); Herbicide absorption by plants; Effects of environmental factors on herbicide activity; Resistance development; Safe use of herbicides; herbicide registration

**PS 3210 (2/20:20) Cottage Farming Enterprises**

**Mushroom farming:** Biology and production aspects of straw, oyster and button mushrooms; Substrate preparation and production of spawn; Pest and disease management in mushroom culture; Harvesting, postharvest and marketing aspects of mushroom. **Bee Keeping:** Honeybee species; Nutritive and medicinal properties of honey; Beehives; Biology and behaviour of honeybees; Establishment and management of apiaries; Honey and wax extraction and their products

**PS 3211 (3/30:30) Biotechnology and Molecular Techniques**

Eukaryotic chromosome; DNA replication and protein synthesis; Transposons, operons, cytoplasmic and mitochondrial DNA; Restriction enzymes; rDNA technology; Application of biotechnology in Agriculture: antibiotics, vaccines, fermentation and bioreactors; Anther culture; Protoplast isolation and fusion; DNA quantification; PCR; Gel electrophoresis; Blotting techniques; DNA libraries; Chromosome walking; Molecular markers: RFLP, RAPD, AFLP, SSR and SNP; DNA sequencing; Gene silencing and RNAi technology; Signal transduction; Human genome project

**PS 3212 (2/20:20) Plant Tissue Culture**

Introduction to plant tissue culture; Tissue culture laboratory organization; Aseptic environment and explants sterilization; Plant tissue culture media; Micro-propagation; Tissue culture systems (callus culture, suspension culture, somatic embryogenesis, protoplast culture; haploid production; Somaclonal variation; Production of disease free plants; Secondary metabolite production in *in vitro*; *In vitro* germplasm conservation; *In vitro* flowering and tuberization

**PS 3213 (2/20:20) Advanced Entomology**

Insect taxonomy; Advanced insect physiology; Insect ecology; Insect behaviour; Entomopathogenic nematodes; Plant-parasitic nematodes, their damage and management; Acarines; Molecular techniques in insect taxonomy; Current trends in entomology and pest management; Use of entomological software

**PS 3214 (2/25:10) Advanced Phytopathology**

Mechanisms of infection; Plant-pathogen interactions (anatomical, physical, physiological and chemical); Virulence of pathogens; Parasitism and disease development; Natural disease resistance in plants; Structural & biochemical, induced & systemic acquired resistance; Genetics of plant resistance; Plant disease epidemiology; Disease forecasting; Economic significance of plant diseases; Conventional and modern plant disease diagnosis and control; *Virus*: morphology, genetics, replication and pathogenesis, symptoms, transmission and virus free plants; Phytoplasmas; Integrated Disease Management (IDM)

**PS 3215 (2/25:10) Plant Breeding Techniques**

Introduction; Reproductive biology and breeding behaviour; Breeding systems; Pollination control: Incompatibility and male sterility; Breeding methods: Introduction and acclimatization, selection (Mass, Pure line, Recurrent) and hybridization (pedigree, bulk and backcross); Heterosis and hybrid seed production; Mutation breeding; Polyploidy; Molecular breeding techniques

**PS 3216 (2/25:10) Crop Physiology**

Importance of crop physiology for yield improvement; Crop yield improvement through manipulation of radiation interception and conversion; Determination of crop development by temperature and photoperiod; Partitioning of photosynthates and harvest index; Root and nutrient physiology; Physiological response of crops to environmental stress; Phyto-remediation and phytobial remediation

**PS 3217 (2/25:10) Germplasm Conservation**

Exploitation of plant genetic resources (PGR); Exploration techniques; Principles and methods of germplasm collection; Concept of valuation and rationale for PGR; Characterization and evaluation of PGR: morphometric, biochemical and molecular; Phylogenetic analysis; Fundamentals of PGR conservation; In-situ and ex-situ conservations; Institutions in PGR conservation

**PS 3218 (1/00:30) Plant Science Colloquium**

Seminar on current research trends in plant sciences

**PS 4101(2/30:00) Advanced Field Crop Production**

Present status, potentials and future trends in field crops; Physiological basis of growth and yield determination; Yield improvement; Physiological relationships of important field crops, Management and production constraints; Processing and quality control; Industrial uses of field crops; Seed production and varietal improvement; Research perspectives in field crops

**PS 4102 (2/25:10) Plantation Crop Technology II**

Present status, potentials and constraints in coconut, oil palm and EACs; **Coconut:** Processing & value addition (DC/oil/copra/fiber/coir/sap products, *etc.*), production systems, marketing and productivity improvement; **Oil Palm:** Cultivation, processing & value addition; **EACs:** Harvesting, processing & value addition, marketing and production systems; Quality standards and certification; Institutional support; Climate change influence; Research perspectives

**PS 4103 (2/15:30) Landscape Horticulture**

Principles and styles of landscape designing, implementation, and budgeting; Identification, establishment and maintenance of soft landscape materials; Research perspectives in landscape horticulture

**PS 4104 (2/20:20) Forest Conservation**

Introduction to forest conservation; Habitat destruction; Habitat fragmentation and landscape change; Over-harvesting; Invasive species; Climate change impacts on tropical forests; Overview on restoration ecology; Conservation planning and priorities; Role of people in conservation; Functional basis of tropical forests; Design and analysis of conservation studies

**PS 4105 (2/30:00) Climate Change and Crop Production**

Climate change and agro-ecosystems; Effects of CO<sub>2</sub> and temperature on Crops; Crop yield and global food security under changing climate; Climate change effects on plant-pest-natural enemy interactions; Weed, disease and pest epidemics under changing climate; Crop models for climate agricultural decisions; Breeding for heat and drought adaptations. Greenhouse gas mitigation in cropping systems; Current trends and future research directions

**PS 4106 (2/25:10) Agro-ecology**

Principles of ecology; Ecological viewpoint of agriculture; Applied agro ecology; Stress ecology; Bridging ecology and agronomy, Crop eco-physiological responses; Ecological concepts of crop, pathogen, pest and weed interactions

**PS 4107 (3/30:30) Integrated Pest Management (IPM)**

Emergence of pest problems; Evolution of pest management; Pest surveillance; Decision making in pest management; Ecological aspects of pest management; Host plant resistance; Sterile insect technique; Biological, microbial, cultural, physical, mechanical, regulatory and chemical pest management; Pesticide formulation and pesticide management; pesticide regulation; Case studies on IPM

**PS 4108 (2/ 25:10) Applied Microbiology**

Macro molecular interactions; Membrane transport; Actions of antibiotics; Regulation of prokaryotic gene expression; Microbial stress response; Quorum sensing; Biofilms, biosensors and biochips; BNF and its applications; Microbial synthesis of pharmaceuticals, organic acids, amino acids, vitamins and enzymes; Biofertilizers and biopesticides; Bioremediation and biodeterioration; Structure and function of immune system; Immunity to bacteria and viruses; Monoclonal and polyclonal antibodies

**PS 4109 (2/15:30) Clinical Plant Pathology**

Introduction; Isolation, purification, culturing, identification and preservation techniques of plant pathogenic fungi, bacteria, virus and phytoplasmas; Systematic approach in the diagnosis of unknown diseases/disorders; Conventional and molecular biological techniques in detection and identification of plant pathogens and nematodes; Controlling of plant pathogens, screening of fungicides, microbial bio control agents, resistance screening of crops; Plant health clinic

**PS 4110 (2/15:30) Stored- Product Entomology**

Introduction to stored-product entomology; Salient features of stored-product insects; Quantitative and qualitative losses caused by insects; Stored-product insects: classification, identification, biology, ecology and habitats; Infestation of grains and processed products; Detection and sampling; Population growth; Resistance development; Pest management methods in stores; Novel concepts in stored-product pest management; IPM in stores; Experimentation on stored-product entomology

**Training Programmes: Majors in Department of Plant Sciences**

Residential training on international standards and quality management of plantation crop produce in collaboration with NIPM

## 6.5 English Language Teaching Unit (ELTU)

### EG 3200 (3/30:30) Professional English

**Speaking:** Peer group discussions on an academic topic, presentations on academic topics, handle related questions of clarifications, suggestions, comments, *etc.*, conduct a meeting, chair a meeting, participate in a meeting, *etc.*, and take part in mock interviews; **Listening:** Effective notes, draw inferences from academic texts; **Reading:** Discourse markers, cause and effect, definitions, generalizations, comparisons and contrasts, complex texts; **Writing:** Summarize long academic texts, sequence markers with a fair degree of accuracy, notes, cause and effect, comparisons and contrasts, definitions, fact, opinion, *etc.* with minimum errors in academic writing, short reports/essays with a reasonable degree of accuracy and fluency, curriculum vitae; **Grammar:** Revision of reported speech, passive voice, dependent prepositions, *etc.*; **Vocabulary:** Vocabulary related to academic discipline

## **7.0 EXAMINATION AND ASSESSMENT PROCEDURES**

Examination is held as an end semester examination. Each academic year consists of two semesters and each semester comprises 75 working days (approximately 15 weeks).

### **7.1. Eligibility to Sit the Examination**

7.1.1. A student who does not have 80% attendance for both theory and practical classes of a course unit and has not satisfied the other course requirements stated by the lecturer in-charge of the course unit, the student should not be eligible to sit the end-semester examination. Medical certificates, sports and other official requests are taken into consideration in order to decide the eligibility of such students to sit the end-semester examination, under special circumstances (Approved by the Faculty Board).

7.1.2. Student shall support the absence for course work due to illnesses by a valid medical certificate, which is validated by the university Medical Board conforming to the format of a medical certificate issued by the following persons;

- University Medical Officer (UMO)
- District Medical Officer (DMO)
- Consultant medical specialist in the relevant field
- Head of a government base hospital
- Medical Superintendent of a provincial Ayurvedic/ government hospital
- Ayurvedic physician registered in the Ayurvedic Medical Council

7.1.3. A student who does not record 80% attendance for any course unit would be considered as referred and he/she shall sit the next immediately available examination with the consent of the relevant course coordinator/lecturer in-charge of the course unit. If he/she fails sit course/s on the next immediate available examination that attempt is considered as a lost attempt. The highest grade given in such an attempt would be a "C", regardless of the marks obtained at the examination.

7.1.4. A candidate shall submit all assignments, laboratory/ practical reports, specimen collections, *etc.*, related to continuous evaluations to be eligible to sit for end semester examination.

### **7.2. Applications for Examinations**

Applications for examinations are entertained two (02) weeks before the semester ends. Every application shall be made on the prescribed form, obtainable from the Examination branch of the Faculty.

### **7.3. Moderation and Scrutiny of Papers**

All question papers are moderated by subject experts nominated by the respective heads of Departments and would be scrutinized by a panel consisting of Dean, Heads of relevant departments and academic staff of the relevant department including lecturer/s in-charge of the course.

### **7.4. Evaluation Procedure**

7.4.1. Course evaluation is made on the basis of continuous assessment during the academic semester and the end-semester examinations.



7.4.2. The minimum duration of end semester examination shall vary according to the number of credits covered in the courses as follows:

One credit course	- 1 hour theory paper
Two credit course	- 2 hour theory paper
Three or more credit course	- 3 hour theory paper

7.4.3. The practical component of the course is assessed either continuously or by an end-semester examination/oral examination which will be a component of the practical assessment or as a separate examination.

7.4.4. The weightage of different assessments in a course shall be determined by the Lecturer in-charge and it shall be announced at the beginning of the semester. The assessment procedures for course/s shall be approved by the Faculty Board.

### Second Marking

The answer scripts shall be assessed by subject expert/s approved by the University Senate.

7.4.5. The research project during the Year 4 semester 2 shall be assessed continuously and marks will be allocated as follows.

Project Proposal	10 %
Student Profile	30 %
Final Presentation	30 %
Project Report	30 %

7.4.6. A hard-bound copy of final project report, certified by the supervisors and Head of the Department shall be submitted to the Examinations Branch and the Library of the Faculty on or before the last date specified for the report submission.

### 7.5. Scheme of Grading

7.5.1. A letter grade is given for each course. Cut off marks and corresponding grade points for each grade are given below. The grade shall be given to the final-rounded mark of each course.

Letter Grade	Percentage Mark	Grade Point
A+	≥90	4.0
A	85 -89	4.0
A-	80 – 84	3.7
B+	75 – 79	3.3
B	70 – 74	3.0
B-	65 – 69	2.7
C+	60 – 64	2.3
C	55 – 59	2.0
C-	50 – 54	1.7
D+	45 – 49	1.3
D	40 – 44	1.0
F	<40	0.0

7.5.2. A letter grade shall be offered for non-credit subjects following the same criteria as specified for other subjects

7.5.3. Of a course in which practical component is assessed, a student obtaining less than 40 marks either for theory or practical shall receive a Grade of "F".

7.5.4. A student who has obtained grade "F" shall sit the course examination at the first occasion the course is next offered.

7.5.5. Students are only allowed to repeat the examination of any course only in two consecutive attempts. The maximum grade given for a repeated examination shall be "C".

7.5.6. A student who obtains any grade less than "C" has an opportunity to repeat the course in a maximum of two consecutive attempts to improve his/her grading to a maximum of "C". If a student obtains a lower grade in latter attempt, he / she shall be entitled to the previous grade obtained at the first attempt.

7.5.7. A student who failed to sit a part of one or more components of a course of an end-semester examination without furnishing a valid reason to the Faculty Board shall be treated as a referred student and also one attempt for the subject of student will be lost.

7.5.8. A student who has completed a period of seven (07) academic years from the date of admission to the university shall not be permitted to sit any further course examinations offered by the faculty.

## 7.6. Final Grade Point Average

7.6.1. The Final Grade Point Average shall be computed as follows.

$$FGPA = \frac{\sum C_i G_i}{\sum C_i}$$

$G_i$  = Grade point of the course

$C_i$  = Number of credits of the course

7.6.2 A student must obtain a minimum FGPA of 2.00 to be eligible to receive the degree.

7.6.3 The level of performance shall be offered based on the FGPA as indicated,

Level of performance	FGPA
First Class	$\geq 3.70$
Second Class (Upper Division)	3.30 – 3.69
Second Class (Lower Division)	3.00 – 3.29
Pass	2.00 – 2.99

7.6.4. To be eligible to a class, a student shall successfully complete the degree programme within four (04) academic years, except for situations accepted by the Faculty Board and approved by the University Senate.

7.6.5 To award the degree the student shall complete all the compulsory courses including industrial training and research project and also complete minimum of 129 credits.

**7.7. Absence from Examinations.**

7.7.1 If a candidate failed to sit for a scheduled examination, the student shall be considered as a referred candidate, if the student failed to produce justifiable reasons to the Faculty Board or on medical grounds supported by a valid medical certificate obtained from a person mentioned in section 1.2.

7.7.2 A candidate who fell sick during the examination time should contact the university medical officer immediately. When a student falls sick at home or elsewhere during examination time, student's parents/guardians shall inform the Senior Assistant Registrar/Assistant Registrar (Examination) of the Faculty within 7 days by a tele mail, followed by a letter. Medical certificate shall also be sent to the same person within 14 days. Under exceptional circumstances if a student is unable to meet the deadline mentioned above, he/she shall send his/her appeal to the Faculty Board.

7.7.3 When the Faculty Board accept a medical certificate produced by a student absent at a semester examination, it is considered as the student has utilized one of the three attempts that the student has to sit for the examination of the course unit and the student shall pass the course unit in the two consecutive attempts.

**7.8. Number of attempts**

A student who could not pass a course unit in a maximum of three attempts shall sit for the examination of the same course unit only with a special permission granted by the Senate of the University.

**7.9. Effective date of the Degree**

The effective date of the B.Sc Agriculture degree shall be the last date of the stipulated examination of the fourth year second semester (eight semester) in B.Sc Agriculture concludes. For this to be effective, a candidate shall submit minimum number of two hard bound copies of the research project report by the prescribed date.

**7.10. Examination procedures, offences and punishments.**

Regulations made by the senate, Rajarata University of Sri Lanka under section 136 read with sections 29, 45 and 46 of the Universities Act No. 16 of 1978 as amended by the Universities (Amendment) Act No. 7 of 1985 are applicable.

**7.11. Repeat Students**

A student can repeat the examination of a course only twice, except for CC courses, which may be repeated up to a maximum of four times. All "F" grades should be improved at the first available opportunity. The maximum grade for an examination repeated shall be "C". A student who obtains any grade less than a "C" has the option to repeat the exam of that course and upgrade to a maximum of "C" grade.

Following regulations are cited as the Examination Procedures, Offences and Punishment Regulation No. 1 of 1989 with effective from October 1998

## **7.12. Examination Procedure**

### **7.12.1. Attendance**

A candidate is expected to be outside the examination hall at least 15 minutes before the commencement of each paper, but shall not enter the hall until Supervisor of the examination requested the candidate to enter the examination hall.

### **7.12.2. Seating**

On admission to the hall, a candidate shall occupy the seat allotted to him/her and shall not change it except on the specific instructions of the Supervisor.

### **7.12.3. Admission to hall**

A candidate shall not be admitted to the examination hall after the expiry of half-an-hour from the commencement of the examination. A candidate shall not be allowed to leave the hall until half an-hour has elapsed from the commencement of the examination or during the last 15 minutes of the examination period.

### **7.12.4. Student record book/Student identity card as identification documents**

A candidate shall have his/her student record book/student identity card and the admission card with him/her in the examination hall on every occasion he/she presents himself/herself for an examination. His/her candidature is liable to be cancelled if he/she does not produce the student record book/student identity card and admission card when requested to do so. If he/she fails to bring his/her student record book/ student identity card and the admission card, he/she shall sign a declaration in respect of the paper for which he/she had not produced the student record book/student identity card or admission card in the form provided for it, and produce the student record book/student identity card and/or admission card on the next occasion when he/she appears for the examination. If it is the last paper or the only paper, he/she is sitting, he/she shall produce the student record book/student identity card to the Registrar or the relevant Senior Assistant Registrar/Assistant Registrar within the next three working days. If a candidate loses his/her student record book/student identity card or admission card during the examination period, he/she shall obtain a duplicate of student record book/student identity card/admission card as the case may be from the Registrar or relevant Senior Assistant Registrar/ Assistant Registrar to produce at the examination hall.

### **7.12.5. Items that should not be brought into the examination hall**

A candidate shall not have any unauthorized document or written notes on his/her body or clothes or on the admission card, time table, student record book/student identity card etc. except items that are permitted. Books, notes, parcels, handbags, electronic and digital devices etc. which a candidate has brought with him/her should be kept outside the examination hall.

### **7.12.6. Copying**

No candidate shall copy or attempt to copy from any book or paper or notes or similar material or from the scripts of another candidate. A candidate shall neither help another candidate nor obtain help from another candidate or any other person. A candidate shall not allow to any other candidate to read anything written or performed by him/her. No candidate shall use any other unfair means or obtain or render improper assistance at the examination. If any candidate was found to have copied from another candidate by an examiner at the time of marking, the examiner shall report it to the examination branch for further actions.

### **7.12.7. Cheating**

No candidate shall submit any continuous assessments (practical book, assignments, project study or answer script etc.) which have been prepared wholly or partly by anyone other than the candidate.

**7.12.8. The items that would be allowed in the examination hall**

A candidate shall bring his/her own pens, ink, mathematical instruments, erasers, pencils or any other approved items, which he/ she has been instructed to bring. The use of a calculator shall be permitted only if the use of calculators is allowed for a paper.

Examination stationery (i.e. writing paper, graph paper, drawing paper, ledger paper, etc.) shall be provided at the examination hall. Papers other than those supplied shall not be used by the candidate. All material supplied, shall be left behind on the desk and not removed from the examination hall.

**7.12.9. Index number**

Every candidate shall enter his/her index number in the space provided in the answer scripts and/or answer books and each attachment as per the instructions given. A candidate, who inserts an index number other than his/her own on the answer script, is liable to be considered as having attempted to cheat.

A script that bears no index number or has an index number, which cannot be identified is liable to be rejected. No candidate shall write his/her name or any other identifiable mark other than the index number on the answer script.

**7.12.10. Rough work to be cancelled**

All calculations and rough work shall be done only on papers supplied for the examination, and shall be cancelled and attached to the answer script as per the instructions.

**7.12.11. Unwanted parts of answers to be crossed out**

Any answer or part of an answer, which is not to be considered for the purpose of assessment shall be neatly crossed out.

**7.12.12. Under Supervisor's authority**

Candidates should follow the instructions of the Supervisor and Invigilators during the examination and immediately before and after it.

**7.12.13. Conduct**

Every candidate shall conduct himself/herself in the examination hall and its premises so as not to cause disturbance or inconvenience to the Supervisor or the examination staff or other candidates. In entering and leaving the hall, student shall conduct himself/herself as quietly as possible. A candidate is liable to be excluded from the examination hall for disorderly conduct.

**7.12.14. Stopping work**

Candidates shall stop work promptly when ordered by the Supervisor/Invigilator to do so.

**7.12.15. Maintenance of silence**

Absolute silence shall be maintained in the examination hall and its premises. A candidate for any reason what so ever is not permitted to communicate or to have any dealing with any person other than the Supervisor/ Invigilator. The attention of the Supervisor/invigilator shall be drawn by the candidate by raising hand from where he/she is seated.

**7.12.16. Leaving the hall**

In case of an emergency, a candidate shall be permitted to leave the examination hall temporarily during the course of answering a question paper. The Supervisor/Invigilator may grant him/her permission to do so but the candidate will be under his/her surveillance.

**7.12.17. Impersonation**

No person shall impersonate a candidate at the examination, nor shall any candidate allow himself/herself to be impersonated by another person.

**7.12.18. Cancellation/ Postponement**

If in the opinion of the supervisor, a situation has arisen, which deems cancellation or postponement of the examination necessary, the supervisor shall stop the examination, collect the scripts already written and then report the matter as soon as possible to the Vice Chancellor/ Registrar.

**7.12.19. Making of statements**

The Supervisor/Invigilator is empowered to request any candidate to make a written statement in writing on any matter related to the examination arisen during the course of the examination and such statements shall be signed by the candidate. No candidate shall refuse to make such a statement or to sign it. Any violation of above, the Supervisor/Invigilator shall make his/her own statement and report the matter to the Senior Assistant Registrar/ Assistant Registrar (Examinations).

**7.12.20. Contact persons with respect to examination matters**

No candidate shall contact any person other than the Vice-Chancellor, Dean, Head of the Department, the Registrar or Senior Assistant Registrar/Assistant Registrar (Examinations) regarding any matter concerning the examination. Offences deemed to have been committed and shall be punished in respect of the offence in accordance with the provisions of the relevant section.

**7.12.21. Handing over the answer scripts**

All candidates shall hand over the answer scripts personally to the Supervisor/Invigilator and remain in his/her seat until authorized to leave the examination hall. No candidate shall hand over his/her answer script to an attendant, a minor employee or another candidate.

**7.12.22.** Under exceptional circumstances, the Supervisor in consultation with the Vice Chancellor/Registrar or Dean of the Faculty concerned may use his discretion in the enforcement.