Student Handbook

B.Sc. in Food Production & Technology Management

Faculty of Livestock, Fisheries & Nutrition, Wayamba University of Sri Lanka

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2017/2018 batch

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Wayamba University of Sri Lanka

Contents

1. WAYAMBA UNIVERSITY OF SRI LANKA

The Wayamba University of Sri Lanka was established as a fully-fledged university in 1999 with six faculties; Faculty of Livestock, Fisheries and Nutrition (FLFN), Faculty of Agriculture & Plantation Management (FAPM), Faculty of Applied Sciences (FAS), Faculty of Business Studies & Finance (FBSF), Faculty of Technology (FAT), Faculty of Medicine (FAM). These faculties are located in two premises; FAPM and FLFN in Makadura and FAS, FBSF, FAT, and FAM in Kuliyapitiya. The main administration division of the university operates from Kuliyapitiya.

1.1 Present Status of the University

The Wayamba University of Sri Lanka (WUSL) is well recognized as one of Sri Lanka's latest and modern learning and research institutions. WUSL is the leading education provider in Agriculture, Food & Nutrition, Applied Sciences, Business Studies & Finance, Technology and Medicine in Sri Lanka. The university has time to time introduced innovative job-oriented courses and curricular to cater to the needs of the stakeholders in many sectors. All degree programmes of WUSL are conducted in English and are well designed to equip students with information technology skills and mastery of English Language. Career guidance is given to all students beginning from the first year to focus well in their future careers. Today, nearly 4000 students are studying in the WUSL under the guidance of more than 160 academics.

1.2 Vision and Mission of the University

Vision

"To achieve and be recognized as a centre of excellence in higher education, research and development of technologies whilst training and developing human resources to meet national and global needs"

Mission

"To produce innovative, skilled and knowledgeable graduates who can give the lead in national and global development needs through formal educational programmes as well as to carry out research and development through outreach programmes in its mandated areas".

1.3 Officers of the University

Chancellor	*Deshabandu Prof. Tuley De Silva* *B.Sc. (Cey), B.Pharm. (Lond)* *M.Sc. (Manch), Ph.D. (Manch), D.Sc. (Hon.C)* *C.Chem (SL), F.I.Chem. (Cey.)*
Vice Chancellor	*Prof. E.M.P Ekanayake* *B.Sc. (Kelaniya, SL), M.Sc. (Kyushu, Japan),* *D.Sc. (Kyushu, Japan)*
Registrar	*Mr WA Don Chithrananda* *M.P.M (SLIDA), HDBM, B.A (Peradeniya, SL)*
Bursar	*Mr. G.Piyarathne* *BA (Peradeniya, SL), PGDHRA (Colombo, SL),* *MHRH (Colombo, SL)*

2. FACULTY OF LIVESTOCK, FISHERIES & NUTRITION

The Faculty of Livestock, Fisheries and Nutrition (FLFN) was established in 1999. The faculty is situated in a scenic location at Makandura (close to Pannala) of the North Western Province of Sri Lanka, about 60 km forwards north-east of Colombo on the Negombo-Kurunegala road, with close proximity to the major cities of Negombo, Kurunegala and Kuliyapitiya and the Bandaranaike International Airport.

FLFN is the only faculty in the Sri Lankan university system which, offers B.Sc. degree programme in food science and nutrition sectors. The faculty possesses a reputation for quality and excellence in higher education and research. With well a team of well qualified academic teaching staff and experienced researchers and modern high- quality learning facilities, FLFN continues to serve the country through producing competent & knowledgeable and highly employable graduates. The faculty conducts academic programmes for undergraduate, post graduate and also research and outreach programmes.

The courses offered by the faculty are designed to move with the timely needs of the country thus reflecting higher employability of graduates. In ensuring excellence in teaching, FLFN adopts flexible learning as a part of its overall strategy to deliver an enhanced student-centred approach to education in a very conducive atmosphere. Apart from imparting knowledge, all courses aim at developing the personality of the students by improving leadership, interpersonal relationships, communication, analytical and critical thinking skills.

2.1 Officers of the Faculty

Dean   *Prof. B.P.A Jayaweera*
             B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL)
             SEDA (UK), C.T.H.E. (Colombo, SL), ASTHE-SEDA (UK)

Assistant Registrar   *Mrs. S.P.A.U. Senarath*
             B.Sc. (Kelaniya, SL)

2.2 Vision and Mission of the Faculty

The **vision** of the FLFN is to achieve excellence and recognition in higher education, research and developing technologies in its mandated areas. The **mission** is to produce graduates with knowledge skills and competence to meet urgent national needs in the important field of food and nutrition and to develop research and outreach activities.

2.3 Education at the Faculty

The faculty offers two B.Sc. degree programmes; B.Sc. (Honours) in Food Science & Nutrition (BScFSN), B.Sc. (Honours) in Food Production & Technology Management (BScFPTM). The faculty introduced the BScFSN degree programme in 2001. This degree programme in the combined disciplines of Food Science and Human Nutrition is the first of its kind in the Sri Lankan university system. The faculty started offering BScFPTM in academic year 2008/09. Both degree programmes are of 4-year-duration and conducted in English medium. The annual enrolment for the BScFSN programme and the BScFPTM programme are 110 and 60 students, respectively.

The two-degree programmes of the faculty have been designed to train students to meet national needs and embark on postgraduate studies. The faculty is committed to developing strong research and outreach programmes which will contribute to the development of the food and nutrition sectors in Sri Lanka. The development of skills and knowledge necessary for the graduates to be self-employed in the relevant sectors is also a major consideration.

The faculty is situated in an ideal environment with food and agribusiness, industrial and commercial activities. Apart from small and medium scale businesses, large establishments have started operations in the region in the recent past. The faculty has established links with national and regional industries, business establishments, research institutions and other government and non-governmental organizations. The faculty has several ongoing research projects in collaboration with industry.

The faculty has established its lecture theatres, laboratories in par with international standards. A media unit, animal units and aquaculture field units and student counselling centre (Youth Well Being Centre) are also there in the faculty to support the teaching and learning process. The education at the faculty is also supported by the services from the library with a vast collection of latest text books and journals, twenty-four-hour internet access and email facilities, a well-equipped Information & Communication Centre, English Language Teaching Unit and sports and recreational facilities, and a Medical Centre.

The graduates of the faculty are in strong demand by both national and international employers. The knowledge, skills attitudes and mind-set gained through the teaching-learning process at the faculty are a competitive advantage in the job market in finding placements to pursue postgraduate studies locally and internationally.

2.4 Departments of Study and Units of the Faculty

The Faculty of Livestock, Fisheries & Nutrition (FLFN) consists of four departments of study and a unit to support its academic activities.

- Department of Aquaculture & Fisheries
- Department of Livestock & Avian Sciences
- Department of Applied Nutrition
- Department of Food Science & Technology
- Biostatistics Unit
- Department of English Language Teaching

2.4.1 Department of Livestock and Avian Sciences

Head *Mr. W.A.D.V. Weerathilake*
B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL), PGDBM
Reading for Ph.D. (Wayamba, SL), R Ani Sc (UK)

Professor Emeritus *Prof. S.S.E. Ranawana*
B.V.Sc. (Peradeniya, SL), M.Phil. (Peradeniya, SL),
Ph.D. (Sydney, Australia)

Professors *Prof. B.P.A. Jayaweera*
B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL)
SEDA (UK), C.T.H.E. (Colombo, SL), ASTHE-SEDA (UK)

Senior Lecturers	Dr. Gamika A Prathapasinghe B.V.Sc. (Peradeniya, SL), M.Sc. (Canada), Ph.D. (Canada), SLVC Registered Veterinary Surgeon
	Mr. W.A.D.V. Weerathilake B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL), PGDBM Reading for Ph.D. (Wayamba, SL), R Ani Sc (UK)
	Mrs. H.N.N. Dilrukshi (on study leave) B.Sc. Food & Nutrition (Wayamba, SL), M.Sc. (Peradeniya, SL), M.Phil. (Wayamba, SL)
	Dr. (Mrs.) J.M.K.J.K. Premarathna B.V.Sc. (Peradeniya, SL), M.Phill (Peradeniya, SL), Ph.D. (Putra Malaysia), SLVC Registered Veterinary Surgeon, MSLCVS
Lecturers Probationary	Mr. K.A.H.T. Kodithuwakku (on study leave) B.Sc. Agric. (Peradeniya, SL), Reading for M.Sc. (Japan)
	Mrs. D.I. Abeygunawardana B.Sc. Food Production & Technology Mgt. (Wayamba, SL), M.Sc (Peradeniya, SL), Reading for M.Phil. (Wayamba, SL)

Animal life is part of the biological sphere of our existence as people or human beings. There can be hardly any is no meaningful ecosystem, food production, business or economy to talk about without considering the immense contribution of the animal kingdom to the survival of the human kingdom. With the improvement in the standards of living in developing countries, the demand for livestock products has been booming dramatically in recent years. This trend is expected to continue such that by the year 2020 the value of animal products will be equal to those from all crops. Sri Lanka has shown, for example, by more than 600% growth in food production through animal agriculture. Clearly, there will be an increasing demand for trained personnel to serve in the animal production sector, both locally and abroad. Such demands will be in areas such as quality assurance, post-harvest handling value addition and processing, aspects in which skills are presently lacking in Sri Lanka. These areas that require skilled intellects include production efficiency and quality enhancement, further processing of milk and meat, good manufacturing practices, quality assurance and inspection, packaging, etc. There are several animal-related technologies in which there are no properly trained personnel available at present and thus the future prospects for those who gain expertise in the sector will be flourishing.

The Department of Livestock and Avian Sciences will offer course units designed to cater to the demand for such specialized knowledge and skills in the livestock sector. Being a new degree program, it is possible to innovate and tailor the curriculum to meet the specific areas in which trained personnel are presently inadequate. The course is designed, therefore, to cover those areas in which such skills are presently not available in Sri Lanka since these are not adequately covered by degree programs in other Sri Lankan Universities. The academic and work culture of the department is very unique so that the course units offered by the Department are attractive to students and facilitate deep learning experiences. This has widened the horizons of students' capabilities, greatly enhanced the attitudes, versatility and the employability of the degree programs in food production and technology management and food and nutrition offered by this Faculty.

The Department presently comprises an Emeritus visiting professor, senior lecturers and probationary lecturers who bestow their expertise in animal-based food production, research and innovations. A modern farming facility is being developed with vital species of farm animals and some rare species of nonfarm animals for the student training and research. The Department has developed specialized laboratories with modern and high-tech facilities which are open to provide fullest support for student learning. In addition, the students will be exposed to the skills, knowledge and experience of scientists available in Research Institutes, Government departments, other universities and the livestock industry to supplement the academic resources for students' learning. A modern farming facility is being developed with vitals species of farm animals and some rare species of nonfarm animals for the student training and research. The Department has developed specialized laboratories with modern and high-tech facilities which are open to provide the fullest support for student learning. The faculty being in the centre of the North Western province, the heart of the animal production of Sri Lanka, the department has ample resources in the close vicinity for student training. The blessing of the location in an area with a high concentration of livestock farms, a strong outreach program has been developed by the Department to benefit farming industry and students. The animal husbandry sector is full of opportunities. As an energetic graduate with valuable training and work experience, graduates will be guaranteed a head-start on the job market and will have plenty of career options to choose from. Our graduate can work as an advisor to a supplier, a project manager, commercial officer, marketing officer, scientific researcher and also as a manager or entrepreneur of his/her own industry.

2.4.2 Department of Aquaculture and Fisheries

Head	*Dr. R.G.S. Wijesekara* *B.Sc. (Sp. Hons) (Peradeniya, SL), M.Sc. (Thailand), Ph.D.)*
Professor Emeritus	*Prof. J.M.P.K. Jayasinghe* *B.Sc. (SL), M.Phil. (SL), Ph.D. (UK)*
Senior Lecturers	*Dr. R.G.S. Wijesekara* *B.Sc. (Sp. Hons) (Peradeniya, SL), M.Sc. (Thailand), Ph.D. (Japan)*
	Dr. (Ms.) J.A.D.S.S. Jayakody *B.Sc. (Sp. Hons) (Kelaniya, SL)* *Post Graduate Dip (Hons) in Wildlife Mgt., Ph.D. (UK)*
	Dr. M.D.S.T. de Croos *B.Sc. (Sp. Hons) (Colombo, SL), M.Sc. (Kelaniya, SL)* *PGDBM (Colombo, SL), C.T.H.E/ SEDA (UK)* *Ph.D. (Iceland)*
	Dr. W.M.H.K. Wijenayake *B.Sc. (Sp. Hons) (Kelaniya, SL), Ph.D. (Kelaniya, SL)* *Dip in Agriculture (SL)*
	Dr. (Mrs) A.G.S.S. Darshani *B.Sc. Fisheries & Marine Science (Ruhuna, SL),* *M.Sc. (Bodo, Norway), Ph.D. (Tokyo, Japan)*
Lecturers Probationary	*Mr. G.A.H.S. Chathuranga* *B.Sc. Fisheries & Marine Science (Ruhuna, SL)* *Reading for Ph.D. (Auburn, USA)*

Lecturers Probationary	*Miss S.T. Gonapinuwala*
	B.Sc. in Food Sci. & Nutr. (Wayamba, SL),
	M.Sc. (Peradeniya, SL)

Fisheries and Aquaculture sectors play an important role in the economy of the country as they provide protein for the growing population, create employment opportunities, generate development in other related sectors of the economy and help to increase foreign exchange earnings.

Set in a fast developing area of the North Western province, Department of Aquaculture and Fisheries is breaking new ground through its innovative approach to teaching and the introduction of new degree programme which deals directly with emerging needs of the industry. Fisheries education in Sri Lanka is often considered traditional and even old-fashioned but not at the Department of Aquaculture and Fisheries of the Wayamba University of Sri Lanka. The Department is ideally located in the North Western province, with a concentration of shrimp farms, number of freshwater, marine and estuarine ecosystems such as coral reefs, mangroves, sea grass beds, sand dunes, mud flats, lagoons and estuaries.

The course modules of the degree programmes are developed to cater to the emerging needs of the Aquaculture and Fisheries sectors and are becoming extremely popular among university students. The special degree programme gives more emphasis on Applied Fisheries and Aquaculture to meet inadequacies in training current human resources within the country. Department of Aquaculture and Fisheries prides on the strength of its well-qualified teaching staff and the value that is added to students. In addition to the existing B.Sc. in Food and Nutrition degree programme, a new Degree Programme named as B.Sc. in Food Production Technology Management was started in the year 2008/2009. The department works with the mission of "Contributing to the improvement and sustainable utilization of aquatic resources of Sri Lanka and develop relevant competencies and skills in undergraduates through appropriate partnerships with the industry". The courses are designed to move with the timely needs of the country thus reflecting a 100% employability of our graduates. There is no hesitation to say that following the Fisheries Programmes at the Wayamba University of Sri Lanka is not like following any other fisheries course in Sri Lanka, because it has many crossroads to almost all sectors of the "creative" industry; exploring the aquatic environment, seaweed farming, aquatic phytology, culture-based capture fisheries, ornamental fish farming, participatory resource management, aquaculture engineering and aquaculture biotechnology.

2.4.3 Department of Food Science & Technology

Head	*Dr. (Mrs.) S. Jayathilake*
	B.Sc. Agric (Peradeniya, SL), M.Sc. (Peradeniya, SL)
	Ph.D. (Obihiro, Japan)
Professor Emeritus	*Prof. T.S.G. Fonseka*
	B.Sc. (Colombo, SL), M.Sc (Kelaniya, SL), Ph.D. (Nott.UK)
Professors	*Prof. C.V.L. Jayasinghe*
	B.Sc. (Peradeniya, SL), M.Sc. (J'pura, SL), M.Phil. (J'pura, SL)
	Ph.D. (Tokyo, Japan)

Senior Lecturers	*Dr. M.S.W. de Silva* *B.Sc. (Peradeniya, SL), Ph.D. (Ill Tech., USA)* *C.Chem (SL)*
	Dr. O.D.A.N. Perera *B.Sc. (Peradeniya, SL), M.Phil. (Peradeniya, SL)* *Ph.D (Ballarat, Australia)*
	Dr. (Mrs) B.M.K.S. Tilakaratna *B.Sc. Agric (Peradeniya, SL), M.Sc. (Ja'pura, SL),* *Ph.D. (Dr. YS Parmar University of Horticulture & Forestry, India)*
	Dr. S Jayathilake *B.Sc. Agric (Peradeniya, SL), M.Sc. (Peradeniya, SL)* *Ph.D. (Obihiro, Japan)*
	Ms. P.M.H.D. Pathiraje (on study leave) B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL), Reading for Ph.D. (Saskatchewan, Canada) Mr. D.N. Liyanage B.Sc. Agric (Wayamba, SL), MS (Ill Tech, USA), Attorney-at-Law
	Ms. A.M.M.U. Adikari *B.Sc. Agric (Peradeniya, SL), M.Sc. (Wales, UK)* *M.Phil. (Peradeniya, SL)*
	Ms. V.P.N. Prasadi (On study leave) *B.Sc. Agric (Peradeniya, SL)* *PG Dip in Applied Statistics (Peradeniya, SL)* *M.Phil. (Peradeniya, SL), Reading for Ph.D. (Gulpeh, Canada)*
	Dr. K.D.P.P. Gunathilake *B.Sc. Agric (Peradeniya, SL), M.Sc. (Peradeniya, SL)* *M.Phil. (Dalhousie University, Canada), Ph.D. (J'pura, SL)*
	Dr. (Ms.) H.P.S. Senarath *B. Sc. Food Science and Nutrition (Wayamba, SL)* *M.Phil. (Peradeniya, SL), Ph.D. (Tokyo, Japan)*
Lecturers	Ms. R.A.C.H. Seneviratne *B.Sc. Food Science & Technology (Peradeniya, SL),* *Reading for Ph.D. (Sri Lanka Institute of Nanotechnology/* *University of Cambridge, UK)*

The Department of Food Science & Technology (DFST) is one of the major contributors to the Food Science & Nutrition Degree Program. In addition, DFST also makes a considerable contribution to the B.Sc. in Food Production & Technology Management degree programme. The Department works with the mission of helping the nation through education, research and outreach programmes in the field of Food Science & Technology. DFST syllabi empower graduates with value-added skills and knowledge to competently engage in activities demanded by the academic institutions and food industry. Department activities are of global scale ensuring food quality and safety.

The undergraduate specialization program offered by the DFST has been designed to provide students with a sound theoretical knowledge in Food Science & Technology as well as practical skills / hands-on experience through highly subject-specific course units such as Food Chemistry, Food Microbiology, Food Engineering, Food Packaging and Post-Harvest Technology in Dairy, Fish, Meat,

Cereal, Fruits and Vegetables. In the first semester of the final year, students are guided to carry out a research project in departmental laboratories or in government/ private research institutions where they integrate knowledge, creation and evaluation. In the second semester of the final year, students will undergo in-plant training in food processing industries, where, in addition to technical aspects they can learn about factory management procedures and adapt to the needs of the food industry.

The students following Food Science & Technology specialization will be given good foundation to fit into professions such as academic, food scientist/ food technologist as well as key administrative positions.

2.4.4 Department of Applied Nutrition

Head	*Dr. (Mrs.) R.L.D. Kumari Malkanthi* *B.Sc. Nutrition (Wayamba, SL), M.Phil. Food & Nutrition* *(Peradeniya, SL), Ph.D. (Reading, UK)*
Professors	*Prof. Renuka Silva* *B.Sc. Agric (Peradeniya, SL), Ph.D. (Reading, UK), R.Nutr (UK)*
	Prof. (Mrs) Anoma Chandrasekara *B.Sc. Agric (Peradeniya, SL), M.Phil. Food & Nutrition* *(Peradeniya, SL), Ph.D. (Newfoundland, Canada)* *C.T.H.E. (Colombo, SL), SEDA (UK)*
Senior Lecturers	*Mrs. A.M.N.T. Adikari* *B.Sc. Human Biology (J'pura, SL), M.Sc. Nutrition & Dietetics* *(Mahidol, Thailand), Reading for Ph.D. (Peradeniya, SL)*
	Dr. Ananda Chandrasekara *BSc Agric (Peradeniya, SL), M.Sc. Food & Nutrition* *(Peradeniya, SL), Ph.D. (Sydney, Australia), Registered,* *Medical Officer (SLMC 1813), R Nutr (Australia) MTech* *(Melbourne, Australia)*
	Dr. (Mrs.) R.L.D. Kumari Malkanthi *B.Sc. Nutrition (Wayamba, SL), M.Phil. Food & Nutrition* *(Peradeniya, SL), Ph.D. (Reading, UK)*
	Mrs. R.M.T.K. Ranathunga (on study leave) *B.Sc. Nutrition (Wayamba, SL), M.Phil. Food & Nutrition* *(Peradeniya, SL), Reading for Ph.D. (Newcastle, UK)*
Lecturers	*Dr. (Mrs) G.J.M. Nanayakkara* *B.Sc. Food Sc. & Nutrition (Wayamba, SL), M.Phil. (Peradeniya, SL)* *Ph.D. (Deakin, Australia)*
	Mrs. M.S.F. Sirasa (on study leave) *B.Sc. Food Sc. & Nutrition (Wayamba, SL), M.Sc. (Peradeniya, SL)* *Reading for Ph.D. (Griffith, Australia)*
	Dr. (Mrs). H.P. Gunawardane *B.Sc. Food Sc. & Nutrition (Wayamba, SL), Ph.D. (Peradeniya, SL)*
	Mrs. J.I.K. Hettiarachchi *B.Sc. Food Science & Nutrition (Wayamba, SL)* *M.Sc. Food and Nutrition (Peradeniya, SL)*

Department of Applied Nutrition plays a major role in B.Sc. Food Science & Nutrition degree programme. The nutrition course units offered by the

Department of Applied Nutrition provide rigorous and intellectually demanding study of the science of nutrition. The department expects to contribute to the improvement of nutrition and health status of the population in Sri Lanka through the attainment of excellence in teaching, research, training and community work in the food and nutrition field. Nutritionists, dieticians and food scientists today need a thorough understanding of the scientific basis of nutrient requirements and how they are modified by disease. They also need a detailed knowledge of the toxicological, microbiological and biochemical mechanisms, by which food spoil and become unsafe. In many areas, qualified personnel are lacking and knowledge is incomplete, therefore, training and research in nutrition are necessary to develop a healthy and vibrant nation.

After the completion of a broad range of course units in the first two years in B.Sc. Food Science & Nutrition study programme those who have an interest in specializing nutrition will follow a wider range of nutrition-related specialized course units as well as some course units in food science and technology during the last two years. Medical Nutrition Therapy (dietetics) course units have been specifically designed for undergraduates with a strong interest in science and nutrition. They may apply their scientific, clinical and management background to prevent and treat diseases through modified diets. A limited number of students carry out a placement in a hospital during the final year and the course is expected to cater to the great demand for dieticians in the private and public health sectors.

In order to provide various skills to be used in the field of nutrition, a number of laboratory and field practical course units have been incorporated to the curriculum. The Analytical Laboratory of the department contains a wide range of equipment such as an indirect calorimeter, pedometer, bioelectrical impedance analyser, centrifuges, UV/Fluorescence spectrophotometers, and ELISA unit suitable for human nutrition research. The Clinical Unit of the department is equipped to measure anthropometric body composition and to conduct clinical investigations. Computer application in nutrition is also be taught during the courses. Students will undertake group or individual study projects during the programme in order to apply their classroom knowledge in community and industry. In the final year all students undertake a research project under the supervision of a member of the academic staff and each one has to present the findings and submit a printed copy of the report at the end.

The research interests of the academic staff include mechanisms by which diet influences the development of chronic diseases, functional foods, antioxidants, food security and macro and micronutrient deficiencies of community groups. Collaboration with food technologists and with the food industry in the development of foods with specific nutritional properties is a major focus for the applied aspects of research.

The course units in nutrition are career-oriented and the graduates thus produced are in great demand. Graduates with a B.Sc. degree in Nutrition are open for a wide range of careers within the food industry and health services. Graduates of nutrition specialization may gain employment in research institutes and with major food companies concerned with food production and processing or as trainee-dieticians/nutritionists in hospitals. Also, they have employment

opportunities in various international & local non-governmental organizations involved in community development.

2.4.5 Biostatistics Unit

In Charge	*Professor. C.V.L. Jayasinghe* *B.Sc. (Peradeniya, SL), M.Sc. (J'pura, SL), M.Phil.* *(J'pura, SL) Ph.D. (Tokyo, Japan)*
Senior Lecturer	*Dr. (Mrs.) T.U.S. Peiris* *B.Sc. Agric (Peradeniya, SL), M.Phil. (Peradeniya, SL)* *Ph.D. (Peradeniya, SL)*
	Dr. (Mrs.) W.A.H Champa *B.Sc. Agric (Peradeniya, SL), M.Sc. (Peradeniya, SL)* *Ph.D. (India)*
	Ms. P.U.S. Peiris (on study leave) *B.Sc. Agric. (Wayamba, SL)* *M.Sc. (Peradeniya, SL), Reading for Ph.D. (Queensland, Australia)*

Biostatistics Unit was established as a part of the Faculty of Livestock Fisheries & Nutrition in the year 2013. The unit caters to students from both B. Sc. Food Science & Nutrition and Food Production & Technology Management degree programmes offering basic as well as advanced course modules related to Statistics, Mathematics & Agronomy. These course modules provide knowledge on fundamental principles & enable students to develop their analytical skills in statistics and mathematics. Biostatistics Unit is also offering course modules to cover the basic scientific principles of agriculture & agronomical aspects with the view of increasing food production and food security.

Students from both degree programmes who wish to gain sound experience on statistical applications in food production systems, processes & technology have opportunities to conduct their research in Biostatistics & Agronomy in collaboration with other departments in the faculty as well as with recognized outside institutions. The unit also offers services/course modules/workshops on experimental design & planning to help students at the final year for successful planning, implementing & completing their undergraduate research projects.

Currently the main research and development efforts in the Biostatistics unit is in collaboration with outside institutions & the departments of the faculty on Pattern Recognition & Image Processing for complex biological processes using Artificial Neural Networks, Trend Analysis in different food production systems, investigating the potential impacts of climate change on national food security & implications of environmental pollution on human health.

2.4.6 Department of English Language Teaching (DELT)

Head	*Dr. K.M. Dissanayake* *B.A. Special (Hons) (Peradeniya), M.A. (Kelaniya),* *PGDBM (Wayamba), PhD (Malaysia)*
Instructor	*Mrs. W.M.C. Fernando* *B.A. (Peradeniya, SL), M.A. (Kelaniya, SL)*

DELT is affiliated to the Faculty of Business Studies and Finance ad located in the Kuliyapitiya premises. DELT has established "English language teaching unit" at

Makadura premises to provide English courses to both faculties at the premises. English courses are offered to enhance English Language skills and knowledge of the students. Attention is given to improve reading, writing, and listening, and speaking skills.

The teaching-learning methods are largely enhanced through technology. The ELTU DELT has an e-learning centre equipped with audio-video equipment, computers with internet access, and special language learning software. The centre is opened during office hours and the students are requested to register at the ELTU to use the e-learning centre. The mini-library of the unit has a collection of English books and other reading materials which students are expected to read to improve the language. Reading materials which are prepared with relevance to the main subjects that the students follow in the degree programme are given in English course modules.

The intensive English Language programme is conducted to improve the language skills of the new entrants to the university. During each semester in the year 1 and year 2 (Level 1), non-credit compulsory English Language course are offered.

A certificate course in Business English is offered to students in the third year.

2.5 Other Units Supporting Education at the Faculty

2.5.1 Library

Librarian   *Mr. W.Punyawardena*
                                            BLS (Kelaniya, SL), MLIS (Colombo) ALA (SL)
                                            Charted Librarian

Senior Assistant Librarian   *Mrs. D.G.A.S. Malkanthi*
                                            BA (Kelaniya, SL), ALA (SL)

The main objective of the university library is to provide access to Library and Information Service in an efficient, effective and useful manner, and to support teaching, learning and research activities of the intellectual community by making resource materials available and by accessing user to be acquainted with skills in locating information deemed necessary in the modern information age.

The library at Kuliyapitiya premises is the main library whilst the other library at Makandura premises provides services to the Faculty of Agriculture & Plantation Management and the Faculty of Livestock, Fisheries & Nutrition.

The library at Kuliyapitiya has 38,135 volumes related to the subjects of Management Studies, Electronics, Mathematical Science, Computing & Information Systems, Accountancy and Insurance & Valuation. The library collection at Makandura consists of 19,920 volumes on Agriculture, Biotechnology, Food Science and Technology, Applied Nutrition, Livestock & Avian Science, Aquaculture & Fisheries, Computer Science, English and related disciplines which are needed for teaching and research programs of the above two faculties. The collection of periodicals is in 22 titles including some key journals on Agriculture, Food Science and related subjects. Subject related CDs & large collection of In-plant Training Reports are also available in addition to the library

collection. Six online open Access Journal Database facilities are available at Makandura Library.

Borrowing facilities are available for the Undergraduate Students, Academic, Administrative, Academic Support and the Non-Academic staff. About 102 seating facilities are provided in the Library.

Bibliography materials are available for reference work and most of the reading materials are on open access to readers. Online Public Access Catalogue (OPAC) gives rapid access to the library collection. Students and Faculty Staff can use the Inter-Library Loan Service to obtain items that are not available in the Library. This library has linkages with other local libraries on the basis of Inter-Library Loan activities. The library actively participates in 2 Local Information Networks, namely SLSTINET and AGRINET. Being the member of the SLSTINET, the library is able to quip the Union Catalogue, which lists out publications of other scientific libraries in Sri Lanka. The library has been sharing its periodical collection, with the scientific community in Agricultural Instructions through the SDCP (Selective Dissemination of Current Page) service of AGRINET. The library issued the Current Content Page Service under CAS (Current Awareness Service) as well.

2.5.2 Information & Communication Technology (ICT) Centre

Director	*Dr. W.J.S.K. Weerakkody* *B.Sc. (Kelaniya, SL), Ph.D. (Kelaniya, SL)*
Lecturers	*Dr. H.A.C.K. Jayathilake* *B.Sc. Agric (Peradeniya, SL), PGDIT (SLIIT, SL), M.Sc. in IT (SLIIT, SL)* *Ph.D. (Wayamba, SL)*
	Dr. W.K.G.K.S. Weerasinghe *B.Sc. Agric (Peradeniya, SL), PGDIT (SLIIT, SL),* *M.Sc. in IS (SLIIT, SL), Ph.D (Mississippi, USA)*
Systems Engineer	*Mr. W.D. Samanwickrama* *B.Sc. (Kelaniya, SL), PGD (Colombo, SL), PGDIT (SLIIT, SL)*
Instructors	*Mr. S.B.M.C.P. Herath* *B.Sc. Agric (Wayamba, SL), M.Sc. in Agri-Econ (Peradeniya, SL)* *M.Sc. in IS (SLIIT, SL)*
	Mr. H.W.H. Premachandra *B.IT (Colombo, SL), DCSD (NIBM, SL)*

The ICT Centre at Makandura premises has been designed to impart knowledge on Information Technology for students to meet the challenges in communication and to make use of computers in their relevant fields. The ICT Centre is currently equipped with more than 125 workstations to access the internet and for course work of the two faculties at Makandura. The Campus-wide fibre network and Wi-Fi system that were added recently facilitate all the offices, departments, units, library, hostels and quarters to gain high-speed web access by a leased line (112 Mbps) and communication facility within the premises through IP telephone system which can also be used to communicate with Kuliyapitiya premises. E-mail service has been provided to all staff members. Student-centred learning environment is created through LMS, which is hosted and maintained by ICT Centre. The Centre has extended its services to out-siders by offering Certificate & Diploma Courses, namely Certificate in Computer Applications & Skills (CCAS) and Diploma in Information Technology (DIT). To enhance the internal students'

ICT skill, the Centre offers two Certificate Courses namely, Certificate in Web Designing & Development (CWDD) and Certificate in Programming & Database Systems (CPDS).

More information is provided through the university web site (www.wyb.ac.lk). Equipment including web and e- mail servers, multimedia projectors, multi-functional printers, scanners, digital cameras, video cameras and heavy-duty on-line UPS systems help the Centre to provide all necessary facilities to students. The normal opening hours of the Centre are from 7.00am to 8.00pm and it can be extended up to 10.00pm on request.

3. FOOD PRODUCTION & TECHNOLOGY MANAGEMENT DEGREE PROGRAMME

The faculty conducts two undergraduate degree programmes; B.Sc. in Food Science and Nutrition (BScFSN) and B.Sc. in Food Production and Technology Management (BScFPTM).

This chapter provides details of the BScFPTM degree programme.

3.1 Programme Description

The Wayamba University of Sri Lanka started to offer BScFPTM degree programme from academic year 2008/2009. Although there are several institutions offering food production related degrees there is still a lack of qualified professionals in food production and technology management sector. Also, changes in the environment, population pressures and degradation of farming lands have contributed to a global crisis in food security. Considering the Sri Lankan situation, it is evident that there is a vast potential to increase the food production sector, in order to meet future challenges. This degree will exclusively cater to the sciences related to primary production of food and its post-harvest management and product development. It is now being understood that food production systems should not only consider maximizing yield, but also ensure the environmental stability to maintain a sustainable system. Moreover, the efficient use of primary produce by way of applying correct post-harvest procedures and development of new food products to cater the fast-changing food habits of people are new challenges ahead, for the graduates in Food Production and Technology Management. The ideal location of the university in North Western province where fisheries, livestock and crop production determine the income of the majority of people, the university could work hand in hand with the community directly benefiting them as well as using the existing resources for the undergraduate teaching.

The proposed degree provides a strong background in the principles underlying the sciences of food production and food product technology management. The graduates of BScFPTM will have knowledge and understanding on principles and application of aquatic, livestock and crop food primary production, characteristics and composition of major food materials, biochemistry and genetic composition of major aquatic, livestock and crop resources, microbiology, nutritional quality, chemistry, physical properties and eating qualities of food, post-harvest management, the impact of food storage and processing, and relationships between food and human nutrition, sustainable food product development ensuring environmental stability and food security and downstream catering of food products. Graduates will also have the knowledge, transferable and subject-specific skills, abilities and attitudes required to work in areas spanning the primary production including aquatic, livestock and crop systems development, their management and their environmental conservation and product development in order to convert the raw material into consumer driven demands to supply nutritious and appealing food products with optimal taste, texture and functionality, food product distribution catering and sale, aquaculture, livestock and crop extension and food product related self-employment and entrepreneurship development. In addition, the graduates will be able to

contribute to the disciplines of aquaculture, fisheries, livestock sciences, avian sciences, crop sciences, food science and other pure and applied life sciences, social and management sciences through research and postgraduate studies.

The courses will be flexible and demand driven considering the employability opportunities both locally and globally. The undergraduates will be mentored and guided into careers contributing to social, environmental and economic development. The extracurricular activities will bring about the personality, confidence and social responsibility and social etiquette of students and they will be a new genre of students that will bear the hallmarks of quality and relevance of undergraduate education. Hence, while providing the opportunity to find employment in a range of different streams few very closely related employments that would be available at livestock, aquaculture and food crop farms, aquatic, diary, meat, fruit, vegetable, cereal and egg product processing units, food marketing and catering institutes, food production and post-harvest management related government, non-government and private sector institutes including research centres and environmental management and quality assurance sector. In addition, self-employability and supplementary income generating opportunities will ensure that the graduates fit in with the national and international requirements.

3.2 Specialization Options

The following areas of specialization are available for the students who follow the BScFPTM Degree Programme.

- Aquaculture and Fisheries
- Livestock and Avian Sciences

Specialization programmes are offered during the second half of the degree programme; year 3 and year 4 (section 3.6.5, 3.6.6).

3.3 Programme Learning Outcomes

The study programme provides opportunities for students to achieve and demonstrate the following:

- The underlying principles, defining concepts, theories and methods of the discipline.
- The current knowledge and developments of the food production discipline.
- The linkages of the subject with biology, environment, society, human behaviour and economic policy and markets.
- The location of resources, their management, exploitation and patterns of utilization of resources within socio-economic and legal frameworks.
- Competence in subject specific and key skills, problem-solving and a professional approach to study and life-long learning.
- An understanding of issues of sustainability and environmental impact of aquatic and livestock food production.

3.4 Graduate Profile

The graduates will have a good grounding in availability, characteristics and nutritive value of major food sources, technology of sustainable production and resources management, food safety, significance of food security, the technology of food processing, storage, modification, its bioethics and social and economic aspects of food and the related services.

They will also be equipped with generic and transferable skills and subject specific skills essential for successful performance in professional practice and day to day life.

Knowledge and understanding

1. Anatomy, physiology and biochemistry of livestock, avian and aquatic resources.
2. Distribution of livestock, avian, aquatic and plant food resources.
3. Availability, characteristics and composition of major food sources and their sustainable production and contribution to food security.
4. Management of aquatic, livestock, avian and food crop systems.
5. Chemical, physical properties and nutritional role of aquatic, livestock, avian and crop resources.
6. The impacts of food manipulation, modification, storage, processing, and its bioethics related to aquatic, livestock, avian and crop resources.
7. The use of technologies in food production systems.
8. Relationship between food, nutrition, health and environment.
9. Microbiological aspects of food quality and safety.
10. Food standards, legal framework and policies and their role in crop, livestock, avian and fisheries.
11. Marketing, economic, social and behavioural factors affecting food security.
12. Catering and mobility of food resources and standards.

Skills and other attributes of graduates

Intellectual skills

Graduates will be able to:
- recognize and use appropriate theories, concepts and principles from a range of disciplines.
- collect and integrate several lines of evidence and applying them in a balanced way in an argument.
- design an experiment, investigation, survey or other means to test a hypothesis or proposition.
- critically analyse information, synthesize and summarize the outcomes.
- apply knowledge and to understand and address both familiar and novel problems.
- demonstrate awareness of the provisional nature of the facts and principles associated with a field of study.

Practical / Professional skills

- Plan, formulate and execute field and laboratory investigations on water, soil, plant and animals in a responsible, sustainable and safe manner, paying

due attention to risk assessment, rights of access, relevant health and safety regulations, legal requirements and sensitivity to the impact of investigations on the environment and stakeholders.
- Perform quality assurance and maintain industry standards at farming and processing systems in compliance with HACCP and other safety standards.
- Identify disease outbreaks and perform preventive measures.
- Plan, conduct, and report on investigations, including the use of secondary data.
- Analyse economic, social and other management information and use it in decision making in farm construction and implementation.

Numeracy skills

- Preparing, processing, interpreting and presenting data, using appropriate qualitative and quantitative techniques and packages;
- Solving numerical problems using computer-based and non-computer based techniques.

Communication skills

- Receiving, evaluating and responding to a variety of information sources (eg. Electronic, textual, numerical, verbal, graphical);
- Contributing constructively to group discussions.
- Listening to appreciating and evaluating the views of others.

ICT skills

- Using the internet critically as a means of communication and a source of information.
- Demonstrating competence in the use of computer-based information handling and data processing tools.
- Using computer packages to create effective ways to communicate information.

Interpersonal and teamwork skills

- Organizing teamwork.
- Setting realistic targets.
- Recognizing and respecting the views and opinions of other team members.
- Having positive intentions.

Self-management and professional development skills

- Appreciating the need for professional codes of conduct where applicable.
- Recognizing the moral and ethical issues related to the subject.
- Assuming responsibility for one's actions.
- Developing and adaptable and flexible approach to study and work.
- Developing the skills necessary for self-managed and lifelong learning (eg. Working independently, time management and organization skills)

Generic / Transferable skills

Successful graduates will demonstrate;

- ability to the use library and online search facilities for accessing and searching for information in specified areas, from a range of sources and for evaluating this information to draw rational conclusions or sustainable judgments.
- ability to communicate effectively both orally and in writing, involving an ability to communicate information concerning food production and technology management formally and informally at a level appropriate to the needs of both specialist and non-specialist target audiences.
- ability to work effectively in small or large teams.
- ability to work independently.
- ability to relate to people from a wide range of backgrounds.
- skills necessary for self-managed and lifelong learning.

Values

Successful graduates will possess;
- an appreciation of the legal (moral and ethical) issues encountered in professional practice
- a commitment to ethical practice
- a commitment to research-based and evidence-based practice
- commitment to the positive advantages of ethnic, religious, cultural and social diversity

3.5 Admission Requirement

The University Grants Commission of Sri Lanka entertains applications for admission to universities from candidates who have satisfied the minimum requirements for admission at the G.C.E. (Advanced Level) Examination.

In order to be eligible for admission to BSc Food Production & Technology Management degree programme a candidate should have offered one of the following combinations of subjects and obtained at least 'S' grades in the three subjects offered.

(i)   Chemistry, Physics and Biology
(ii) Chemistry; Physics or Mathematics; Biology or Agricultural Science
(iii) Chemistry; Biology; Agricultural Science or Mathematics

3.6 Programme Structure and Levels of Study

3.6.1 Semester, Academic Year and Levels of Study

An academic year consists of two semesters of 15 weeks each. Academic programme is based on course credit system. End semester examinations will be held after a study leave period.
Year 1 and Year 2 of the degree programme are combined as Level 1, and year 3 and year 4 are named as level 2 and level 3, respectively. Level 1 course units offered in Year 1 and 2 provide a knowledge of basic science and business which will form the basis for subsequent study in food production and technology management. To achieve this, students undertake study of Aquatic Animal Biology & Principles of Aquaculture, Anatomy & Physiology, Chemistry, Human Nutrition, Microbiology, Nutritional Biochemistry, Fish Production, Crop Science

& Agronomy, Statistics and certain non-credit course units such as Mathematics & Computing and Information Technology and English.

At the end of semester 1 of the Year 1, students are attached to an organization for a period of 2 weeks to gain exposure to 'real world experience'.

At the start of Level 2 (Year 3) students can select either Aquaculture & Fisheries or Livestock & Avian Sciences specialization streams. The selection criteria for specialization are given in Section 5.4.

Level 2 builds up the knowledge on the subjects taught in Level 1. The students integrate and extend knowledge and skills gained in the earlier years of the course through undertaking advanced course units in Aquaculture & Fisheries and Livestock & Avian Science depends on their specialization.

In Level 3 Semester 1 all students should carry out an individual research project. In the second semester, students can choose to study a few taught course units worth of minimum 5 credits during the first five weeks. In Level 3 Semester 2, students are provided with an opportunity to gain experience whilst working or studying within a challenging and stimulating environment. Students undertake 10 weeks of supervised work experience in research institutes, farms, industry, or organizations involved in food production sector.

The full list of modules and status of the course unit (Compulsory or Elective) is shown in Section 3.6.4.

3.6.2 Programme Structure

The degree programme is delivered on course unit system arranged over a four year period. The length of each course unit is determined by the measure "credit hour" or "credit".

3.6.2.1 Definition of a Credit

A credit is defined as 15 contact hours of lectures or 30-45 hours of laboratory practical/field practical/field visits, 90 of training/self-study/research or any other appropriate combination of the foresaid.

3.6.2.2 Credits Available to Offer in Four Years

The degree programme offers compulsory and optional/elective course units totalling to 147 credits in a four-year-period.

3.6.2.3 Minimum Credit Requirement to Complete the Degree Programme

Students who are admitted in the BScFPTM degree programme are required to follow course units totalling to a minimum of 120 credits in fulfilling the credit requirements specified for each level of the degree programme as detailed below.

(a) Credit Requirement for Level 1

Students in BScFPTM are required to take core course units (compulsory) of 60 credits offered at Level 1 (year 1 and year 2)

(b) Credit Requirement for Level 2

Students in BScFPTM are required to take a minimum of 40 credits from the course units offered at Level 2 (year 3), including compulsory course units and electives as specified by the specialization stream.

(c) Credit Requirement for Level 3

Students in BScFPTM are required to take a minimum of 20 credits from the course units offered at Level 3 (year 4), including compulsory course units of "Research Project" and "In-plant training" or "Internship training" as specified by the specialization stream and electives.

3.6.2.4 Maximum Credits a Student Can Take

A student may take a maximum of 147 credits (depending on the course units available). All credits accumulated over the entire period shall be taken into account for the award of the degree. The students are strongly advised to seek advice from Heads of Departments and academic staff of the Departments before deciding on elective course units.

3.6.2.5 Length of the Degree Programme

The degree programme should be completed in maximum of 7 years. The duration of a student in the degree programme is determined without considering the medical or any other reasons including deferments and intermissions. However, in special circumstances, Academic Concessions can be granted (Section 5.15).

3.6.3 Abbreviations and Notations

An alpha numeric code is used to identify a course unit. The code consists of four digits prefixed by a set of three letters which refer to the subject area or the Department or the Unit offering the course unit. The **first digit** denotes the level at which the unit is offered, the **second digit** the semester during which it is offered (if a course unit is offered in both semesters, then X is assigned to the second digit), the **third digit denotes** a serial number assigned to the course unit by the department or an academic unit. The **last digit** stands for the credit rating of the course unit (when the credit number exceeds 9, a sign X is assigned).

Prefix	Subject area/ Department/ Unit/Faculty
AQF	Aquaculture and Fisheries
FST	Food Science and Technology
LAS	Livestock and Avian Sciences
NTN	Applied Nutrition
LFN	Faculty of Livestock, Fisheries & Nutrition
ELT	English Language Teaching
CGU	Career Guidance Unit

Example: LAS 1224 is the Livestock & Avian Science Level 1 course unit conducted during the second semester having serial number 2 and credit weight of 4.

3.6.4 Core-Programme of the Degree Offered at Level 1 (Year 1 and 2)

All core-course units at the Level 1 of the study programme are compulsory.

Intended Learning Outcomes of the Level 1

At the end of Level 1 the students should be able to;

- relate basic concepts of physical and general chemistry to production, processing and nutritional aspects of foods.
- describe properties and characteristics of living systems; structures and biological functions of proteins, carbohydrates and lipids, enzymes and their regulation in the human body.
- describe the basic functional organization of the major physiological systems and their physiological regulation and anatomy of humans, animals and food crops.
- discuss the contribution of agriculture, livestock and fisheries food production systems to food security in the country, household and individuals.
- perform poultry production and describe all the process related to sustainable poultry production.
- perform all major procedures involved with fresh and brackish water fin-fish production for selected species.
- produce vegetable and leaf vegetables and describe their post-harvest management.
- analyse food composition (including major chemical interactions and nutritional factors) in the context of food quality and safety.
- explain scientific principles of technology related to food composition, safety, toxicology, processing, preservation and distribution.
- name and characterize major groups of microorganisms of importance to the food industry and explain their ecological, physiological, and public health aspects.
- explain how food processing and preservation systems are used to produce safe, nutritious and palatable foods.
- analyse the chemical and physical properties of a food sample and interpret values; evaluate adoption, interpretation and enforcement of laws and regulations governing food processing and food service systems.
- perform statistical analysis and statistical interpretations of articles in their own discipline.
- perform mathematical calculations and interpret values in their own discipline.
- retrieve information using a variety of media, including web-based resources
- select the appropriate experimental design to test hypotheses in their own discipline.
- recognize professional activities of working places; identify a range of careers available in their discipline.

Course Units Offered at Level 1

Course unit code	Course unit Title	Credits	Remarks
Level 1 Semester 1 (Year 1)			
FST 1113	Chemistry I	3	Core course unit
FST 1121	Laboratory Course in Chemistry	1	Core course unit
LAS 1114	Anatomy & Physiology	4	Core course unit
AQF 1114	Aquatic Animal Biology & Aquaculture Principles	4	Core course unit
LFN 1120	Mathematics & Computing	0	Core course unit
LFN 1130	Introduction to Information Technology	0	Core course unit
ELT 1110	English for Science I	0	Partial fulfilment
Level 1 Semester 2 (Year 1)			
LFN 1210	Special Assignment	0	Core course unit; 2 week attachment to stakeholder organization during vacation
LFN 1232	Concepts & Practice of Statistics	2	Core course unit
LFN 1244	Crop Science & Agronomy	4	Core course unit
NTN 1232	Fundamentals of Human Nutrition	2	Core course unit
LAS 1214	Nutritional Biochemistry & Principles of animal nutrition	4	Core course unit
AQF 1214	Marine & Brackish Water Fish Production	4	Core course unit
LFN 1X10	Social Harmony & Conflict Resolution	0	Partial fulfilment; continues to Level 1 Semester 3
ELT 1210	English for Science II	0	Partial fulfilment
Level 1 Semester 3 (Year 2)			
FST 1314	Microbiology	4	Core course unit
FST 1324	Principles of Food Science	4	Core course unit
LAS 1314	Poultry, Meat & Egg production	4	Core course unit
LFN 1X10	Social Harmony & Conflict Resolution	0	Partial fulfilment; continued from Level 1 Semester 2
LFN 1324	Principles of Food Crop Production I	4	Core course unit
ELT 1310	Academic English I	0	Partial fulfilment
Level 1 Semester 4 (Year 2)			
AQF 1414	Farming & Environment	4	Core course unit
FST 1414	Food Analysis & Quality Assurance	4	Core course unit
FST 1424	Food Processing & Preservation Technology	4	Core course unit
LFN 1414	Information Systems & Data Handling	4	Core course unit
ELT 1410	Academic English II	0	Partial fulfilment

3.6.5 Livestock & Avian Sciences Specialization Programme

The specialization programme in Livestock & Avian Sciences which is offered over Level 2 and Level 3 is comprised of the following course units. Students have to follow a combination of compulsory and elective course units as recommended by the Department of Livestock & Avian Sciences.

Course Units Offered under Livestock & Avian Sciences Specialization at Level 2 (Year 3)

Course unit code	Course unit Title	Credits	Remarks
Level 2 Semester 1 [Minimum of 20 credits; maximum 25]			
LAS 2113	Animal Breeding & Selection	3	Compulsory
LAS 2122	Animal Feed Technology	2	Compulsory
LAS 2133	Practicum I	3	Compulsory
LAS 2144	Principles of Animal Disease Control & Diagnostic Technology	4	Compulsory
LAS 2151	Poultry Breeding & Parent stock Management	1	Compulsory
LAS 2162	Egg Science & Technology	2	Elective
LAS 2172	Farm Mechanization & Engineering	2	Elective
LAS 2182	Farm Planning & Economics	2	Elective
LAS 2192	Forage Science & Range Management	2	Elective
LAS 21a2	Micro Livestock Production & Management	2	Elective
LAS 21b2	Pet Animal Nutrition & Feed Formulation	2	Elective
LAS 21c2	Goat & Sheep Production & Management	2	Elective
LAS 21d1	Special Topics in Animal Science	1	Elective
AQF 2123	Crustacean & Molluscs Farming Systems	3	Elective
LFN 2113	Principles of Food Crop Production II	3	Elective
Level 2 Semester 2 [Minimum of 20 credits; maximum 25]			
LAS 2213	Dairy & Beef Production & Management	3	Compulsory
LAS 2222	Animal Experimentation	2	Compulsory
LAS 2231	Practicum II	1	Compulsory
LAS 2242	Swine Production & Management	2	Compulsory
LAS 2252	Food Inspections & Evaluation	2	Compulsory
LAS 2262	Waste Management & Utilization	2	Compulsory
LAS 2272	Animal By-product Technology	2	Elective
LAS 2282	Meat Science	2	Elective *(LAS 21a2)
LAS 2292	Animal Biotechnology	2	Elective
LAS 22a2	Dairy Product Quality Control & Processing	2	Elective *(LAS 2213)
LAS 22b2	Wildlife & Recreational Animal Management	2	Elective
LFN 2212	Community Link (LinkCom)	2	Compulsory
LFN 2223	Post-harvest Technology of Major Food Crops	3	Compulsory

Course unit code	Course unit Title	Credits	Remarks
LFN 2233	Fruit & Vegetable Production	3	Elective
FST 2222	Food Packaging	2	Elective
FST 2242	Food Safety & Quality Management	2	Elective
FST 2253	Fish, Meat & Egg Product Technology	3	Elective
FST 2281	Indigenous Food Technology	1	Elective
AQF 2232	Aquatic Pathobiology & Health Management	2	Elective
AQF 2243	Post-harvest Management of Bio-aquatic Resources	3	Elective
AQF 2282	Remote Sensing & GIS	2	Elective

Course units Offered under Livestock & Avian Sciences specialization at Level 3 (Year 4)

Course unit code	Course unit Title	Credits	Comments
Level 3 Semester 1			
LFN 3112	Scientific Communication	2	Compulsory
LAS 3118	Research Project in Livestock & Avian Sciences	8	Compulsory
Level 3 Semester 2 [Minimum of 10 credits]			
LAS 3214	In-plant training	4	Compulsory
LAS 3222	Commercial Food Preparation & Service Management	2	Compulsory
LAS 3232	Extension Methodology	2	Elective
LFN 3212	Human Resource Management	2	Elective
LFN 3222	Organizational Management	2	Elective
CGU 3211	Mass Communication	1	Elective
CGU 3221	Entrepreneurship Development	1	Elective

3.6.6 Aquaculture & Fisheries Specialization Programme

The specialization programme in Aquaculture & Fisheries which is offered over Level 2 and Level 3 is comprised of the following course units. Students have to follow a combination of compulsory and elective course units as recommended by the Department of Aquaculture & Fisheries.

Course units Offered under Aquaculture & Fisheries Specialization at Level 2 (Year 3)

Course unit code	Course Unit Title	Credits	Remarks
Level 2 Semester 1 [Minimum of 20 credits; maximum 25]			
AQF 2113	Freshwater Food Resources Management & Limnology	3	Compulsory
AQF 2123	Crustacean & Molluscs Farming Systems	3	Compulsory

Course unit code	Course Unit Title	Credits	Remarks
AQF 2132	Seed Production & Seed Quality Management in Aquaculture	2	Compulsory
AQF 2143	Culture of Ornamental Aquatic Fauna & Flora	3	Elective
AQF 2152	Oceanography & Marine Ecology	2	Elective
AQF 2162	Sea Weed & Edible Fresh Water Plant Culture	2	Elective
LAS 2122	Animal Feed Technology	2	Elective
LAS 2144	Principles of Animal Disease Control & Diagnostic Technology	4	Compulsory
LAS 21b2	Pet Animal Nutrition & Feed Formulation	2	Elective
LFN 2113	Principles of Food Crop Production II	3	Elective
Level 2 Semester 2 [Minimum of 20 credits; maximum 25]			
AQF 2214	Natural Aquatic Resource Management & Fishing Gear Technology	4	Compulsory
AQF 2223	Aquaculture Engineering	3	Compulsory
AQF 2232	Aquatic Pathobiology & Health Management	2	Compulsory
AQF 2243	Post-Harvest Management of Bio-Aquatic Resources	3	Compulsory
AQF 2252	Current Topics in Fisheries & Aquaculture	2	Elective
AQF 2262	Ecotoxicology	2	Elective
AQF 2272	Fish Biotechnology	2	Elective
AQF 2282	Remote Sensing & GIS	2	Elective
FST 2222	Food Packaging	2	Elective
LAS 2213	Dairy and Beef Production & Management	3	Elective
LAS 22a2	Dairy Product Quality Control & Processing	2	Elective .(LAS 2213)
LAS 2252	Food Inspections & Evaluation	2	Compulsory
LAS 2262	Waste Management & Utilization	2	Elective
LAS 22b2	Wildlife & Recreational Animal Management	2	Elective
LFN 2212	Community Link (LinkCom)	2	Compulsory
LFN 2223	Post-Harvest Technology of Major Food Crops	3	Compulsory
LFN 2233	Fruit & Vegetable Production	3	Elective
FST 2242	Food Safety & Quality Management	2	Elective
FST 2253	Fish, Meat & Egg Products Technology	2	Elective

Course units offered under* Aquaculture & Fisheries *specialization at Level 3 (Year 4)

Course unit code	Course Unit Title	Credits	Remarks
Level 3 Semester 1			
LFN 3112	Scientific Communication	2	Compulsory
AQF 3118	Research Project in Aquaculture & Fisheries	8	Compulsory
Level 3 Semester 2 [Minimum of 10 credits]			
AQF 3214	In-plant Training	4	Compulsory
LAS 3222	Commercial Food Preparation & Service Management	2	Elective
LAS 3232	Extension Methodology	2	Elective
LFN 3212	Human Resource Management	2	Elective
LFN 3222	Organizational Management	2	Elective
CGU 3211	Mass Communication	1	Elective
CGU 3221	Entrepreneurship Development	1	Elective

* Pre-requisite

- The status of a particular course unit (i.e., compulsory or optional) depends on the specialization stream.
- The availability of elective course units will be announced by the department of study at the beginning of each semester.

3.6.7 Selection for Specialization

All students who are eligible to proceed to Level 2 can apply for either Livestock & Avian Sciences or Aquaculture & Fisheries specializations. Depending on the number of placements available in each discipline, students will be selected for specialization. If there are more applicants than the number of placements in a particular specialization, students will be selected according to following criteria:

1. Students applied for a particular specialization will be ranked according to CGPA and placements will be filled
2. Those who are not qualified for their preferred specialization will be allowed to follow another specialization stream.

4. TEACHING & LEARNING METHODS AND COURSE UNIT ENROLMENT

4.1 Teaching and Learning Methods

The mode of delivery of the programme is based on lectures, practical sessions, demonstrations, assignments, tutorial discussions, field visits, research and industrial training etc.

Lectures will introduce concepts, and practical sessions including group work will foster in-depth understanding of the concepts. Field visits and industrial visits are conducted to provide hands-on experience and awareness about the practical situations. Learning will be encouraged by the use of progressive formative assessments. Placements in industry and institutions will ensure graduates can apply their knowledge appropriately in commercial enterprises, research or educational institutions, or in advisory and regulatory agencies. A variety of approaches such as group work involving problem based learning, case studies, class presentations, individual tutorials, and the undertaking of individual research projects will be used to develop intellectual skills. Structured classes in science and computer laboratories, and lectures supported by group work and seminars are expected to develop professional and practical skills. Opportunities to enhance transferable skills are incorporated into lectures, seminars and practical sessions involving group and individual work, project preparation and implementation.

At the beginning of the delivery of each course unit, students are provided with a course outline/Course specification which includes, objectives, intended learning outcomes, the content of theory and practical components, and assessment/evaluation procedures.

4.2 Medium of Instruction

All course units are taught in the English medium. All examinations (formative and summative) are set in English and answers must be given in only English.

4.3 Course Unit Enrolment

Students should register for the course units prior to the commencement of each semester using prescribed forms at the Faculty Office.

4.4 Limitation in Enrolment for Course Units

The faculty reserves the right to limit placements and the registration in any of the course units listed in Section 3.6.4. Information concerning limitations on course units will be notified to students in advance.

4.5 Minimum Enrolment of Students to Offer a Course Unit

Enrolment of 5 or more students in a course unit is required to consider offering that course unit in the scheduled semester. If less than 5 students registered, the course unit would not be offered.

4.6 Changes or Dropping of Course Units

Students are not permitted to change or drop course units for which they have registered for a semester after the laps of two weeks from the commencement of the semester.

4.7 Offering Optional and Elective Course Unit

The faculty will decide on offering optional course units in any semester after considering time table arrangements and other relevant factors.

4.8 Revising Course Units

The faculty reserves the right to cancel or revise any of the course units listed in Section 3.6.4. Any revision to course units and cancellation of course units will be notified to students prior to the beginning of the respective semester.

4.9 Sitting Examinations

Only the students who are enrolled for a course shall be permitted to sit for the assessments or examinations on that course unit provided satisfying the attendance requirement and any other course unit requirements specified by the departments at the beginning of each semester.

5. ASSESSMENT OF LEARNING

Assessment of learning and evaluation of outcomes are done through assessment of ILOs of course units.

5.1 Assessment Methods

In general, a course unit may be assessed by both formative and summative methods. Assessment methods are close examinations, assignments, reports, presentations, quizzes, viva-voce examinations, coursework, etc. as appropriate to the course unit. They reflect differences from normal practice depending on the course unit. Both summative assessments (End semester examination) and formative or continuous assessments (throughout course units) are planned to test the achievement of different learning outcomes and demonstration of learning. Continuous assessment marks are taken into account when calculating final grade/course grade. Coursework includes practical reports, problem-solving, case studies, literature-based assignments, log book and a research project report.

5.2 Assessment in Course Units

All the components (Theory, practical) of a course unit are assessed by way of both continuous (formative) assessment and end-semester examination (summative). The contribution from the marks of the two components to the **final marks/ course grade** of the course unit is decided by the relevant Department. The exact methods of assessment will be notified to students by the relevant Department prior to the commencement of the semester or academic year.

5.3 Continuous Assessment

Continuous assessment is comprised of mid-semester tests, quizzes, coursework and other components as defined by the relevant department. If a student is absent at any of the components of continuous assessment, the student will not receive marks for that component. Continues assessments are not repeated and highest marks achieved by a student in previous attempt of a particular continuous assessment of the course unit will be carried forward and considered I finalising marks.

5.4 End Semester Examination

The end semester examination of a course unit is comprised of theory examination or practical examination or both as specified by the relevant department. Thus, for a course unit which is comprised of both theory and practical papers at the end semester examination, the total mark (%) is calculated using an equation which is set according to credit ratio between the theory and practical components of the course unit. Based on the credit value, the duration of practical examination of a course unit varies from one to two hours and, for theory examination, it varies from one hour to three hours.

The theory examination is comprised of two/three sections; Section I, Section II/Section A, and Section III/Section B. Marks distribution among the sections, length & duration of the examination are based on the credit value of the course unit as detailed below.

Section I is comprised of multiple choice questions

Section II /Section A is comprised of structure essay questions

Section III /Section B is comprised of essay questions

Credit Value-Based Structure of Theory Examination Papers

The credit value of the course unit	Section I*			Section II/Section A*			Section III/ Section B*		
	No. of questions	Marks allocation	Duration (h)	No. of questions	Marks allocation	Duration (h)	No. of questions	Marks allocation	Duration (h)
1	N/A	N/A	N/A	0	N/A	N/A	2	100	1
	N/A	N/A	N/A	2	60	½	1	40	½
2	20	30	½	3	30	1	2	40	1
≥ 3	20	30	½	5	40	1 ½	2	30	1

*No multiple choice questions are given under one-credit-course units; therefore, the relevant theory examination paper is comprised of only Section A and Section B.

5.5 Status of Incompletion of Course Units

Students should complete the theory and practical components of summative assessment of a course unit all in one sitting. The final grade obtained for the course units would be released as 'Incomplete' (Grade "I") in situations where the candidate was;

    (a) absent at the end semester practical or theory examination even though he/she has marks for some components of continuous assessment.

    (b) not eligible to sit any component of the end semester examination.

Students with "I" grade are allowed to complete those course units by sitting the examination at the next immediate attempt (end semester examination). Students may request to sit for missed components/ failed components of continuous assessment at the immediately available occasion and such requests are granted on the recommendation of the course unit coordinators and the relevant department. The final grade will be calculated taking the marks of the component completed later and the marks of the previously completed components. Students should make a formal request form the course coordinator for resetting any component of a continuous assessment which is counted for final marks.

5.6 Eligibility to sit the End Semester Examination

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, field visits, seminars, etc.). At least an 80% attendance must be secured by a student for each course unit in order to be eligible to sit for the relevant end-semester examinations. A student who does not record 80% real attendance for any course unit will be considered as a referred candidate and

he/she should sit for the course unit at the **next immediately available** examination. The highest grade obtainable in such an attempt will be a grade of C.

If a student is not eligible to sit any end semester examination (theory or practical) due to not having required attendance, it is considered as one attempt.

5.7 Grades and Grade Point Values (GPV)

The grade obtained for a course unit is designated by a letter. The cut-off marks for each grade and the corresponding grade point values (GPV) are shown below.

(a) Cut-off Marks, Grades and GPV for Credited Course Units

Marks	Grade	GPV
90 – 100	A+	4.00
85 – 89	A	4.00
80 – 84	A-	3.70
75 – 79	B+	3.30
70 – 74	B	3.00
65 – 69	B-	2.70
60 – 64	C+	2.30
55 – 59	C	2.00
50 – 54	C-	1.70
45 – 49	D+	1.30
40 – 44	D	1.00
<40	F	0.00
Not sitting for one or more components of the course unit assessment as required by the course unit	I (Incomplete)	0.00

(b) Cut-off Marks, Grades and GPV for Non-Credited Course Units

Marks	Grade	GPV
≥ 55	P (Pass)	-
Not sitting for one or more components of the course unit assessment as required by the course unit	I (Incomplete)	-

5.8 Pass Mark for a Course Unit

The pass mark for a course unit is 55 from the final mark which is calculated as described in see sections 5.2, 5.3 and 5.4.

5.9 Re-sitting the Examinations for Improving Grades

A student who obtains a grade below "C" for a course unit only may re-sit the unit at the **next immediately available examination** to improve the grade, and in

such situations, the maximum grade obtainable is "C". No provision is available for attempts to upgrade the other grades. In an event where the re-sitting results in a lower grade, the student will be entitled to the previous grade. However, only three attempts including the first are allowed. Candidates should apply for re-sitting the examination **before the 10th week of the semester.**

The marks already recorded for completed components of continuous assessment may be carried forward.

5.10 Absence at the First Attempt in Examination

A student who fails to sit for a course unit at the end semester examination at the first attempt due to medical reasons but submits an acceptable medical certificate (Section 5.14, 5.15) must sit the course unit at the next immediately available end semester examination. This sitting is considered as the first attempt and the student is awarded the grade linked to the marks.

The marks already recorded for completed components would be carried forward.

5.11 Number of Attempts for Sitting Examinations

A student who fail to satisfy the Examiners in an examination, and who has yet to satisfy the conditions to be considered for the relevant award, may be permitted to re-sit the examination up to **a maximum of three (3) number of attempts (**as specified in **5.9)**. A student shall not be permitted more than three (03) sittings for the examination of any course unit. A course unit which student has been failed must be retaken at the next immediate occasion of the relevant semester. If a student does not take the examination at the next immediate examination, or if a student is not eligible for an examination (due to inadequate attendance, etc), unless a valid medical certificate is submitted, those are considered as attempts. Students are not permitted to sit an examination if he/she has completed **seven academic years** from the date of admission to the University. However, grace chance can be considered by the university under special circumstances and if the candidates make a formal request to the Dean for grace chance **at first two weeks** of the particular semester.

5.12 Appeal for Re-scrutinization of Marks and Grades

With the release of the Semester Examination results, the Assistant Registrar of the Faculty will notify the students to request for result verification. Requests for result verification should be made to the Assistant Registrar of the Faculty within 14 days after the release of results. Applications can be obtained from the Students Affairs Unit of the faculty upon the submission of a receipt issued by the Shroff for paying Rs 500.00 per subject.

5.13 Grade Point Average (GPA), Cumulative Grade Point Average (CGPA) and Final Grade Point Average

GPA and CGPA are the measures of the progress of students in their studies in the faculty. The grading scale for course units is "A+" to "F" with the corresponding grade point value range of "4.00" - "0.00".

5.13.1 Grade Point Average (GPA)

GPA is calculated for every semester. The GPA of a semester is the credit-weighted arithmetic mean of the Grade Point Values (GPV) of the course units taken in the semester. GPA is computed to the second decimal place by using the following equation;

GPA of a semester = $\sum$ (GPV of course unit x Credit value of course unit)
                          Total number of credits taken in the semester

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Example:

Suppose a student has completed five course units as detailed below,

Course Unit	Credits	Grade	GPV	Credits x GPV
I	4	A	4.0	16
II	3	B+	3.3	9.9
III	2	C	2.0	4
IV	4	D	1.0	4
V	1	F	0.0	0
Summation of (Credits x GPV)				33.9

GPA = 33.9 / Total no. of credits
     = 33.9 / 14
     = **2.42**

5.13.2 Cumulative Grade Point Average (CGPA)

CGPA is calculated for a given Level. CGPA is the credit-weighted arithmetic mean of the GPV of the course units taken in that Level. The CGPA for a given level is computed to the second decimal place by using the following equation;

$$\textbf{CGPA} = \frac{\sum_{i=1}^{n} \sum_{\text{Semester i}} (\text{GPV of Course Unit} \times \text{Credit value of the course unit})}{\text{Total number of credits taken in the level}}$$

Where, "n" is the number of semesters in the level considered

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Example: Calculation of Level CGPA

Semester 1					Semester 2				
Course Unit	Credits	Grade	GPV	Credits x GPV	Course Unit	Credits	Grade	GPV	Credits x GPV
I	4	A	4.00	16.00	I	1	A+	4.00	4.00
II	3	B+	3.30	09.90	II	2	B-	2.70	5.40
III	2	C	2.00	04.00	III	3	C+	2.30	6.90
IV	4	D	1.00	04.00	IV	4	I	0.00	0.00
V	1	F	0.00	0.00	-	10	-		16.30
-	14	-		33.90					

CGPA = (33.90+16.30)
          (14+10)
       = 50.20/24= 2.091
       = **2.09**

5.13.3 Final Grade Point Average (FGPA)

FGPA of those who completed the degree programme is calculated by taking CGPA values of the three levels as follows:
The contribution of Level 1 CGPA to the final GPA is 30%.
The contribution of Level 2 CGPA to the final GPA is 40%.
The contribution of Level 3 CGPA to the final GPA is 30%.

FGPA = 0.3 (CGPA of Level 1) + 0.4 (CGPA of Level 2) + 0.3 (CGPA of Level 3)

GPA values appear in the academic transcript.

5.14 Absence from Academic Activities and Examinations

If a student fails to attend academic activities (i.e., lectures, tutorials, practical sessions, etc.) or formative or summative assessments (examinations) due to prolonged medical reasons, such absence should be reported to the Senior Assistant Registrar (SAR) of the Examination Branch or, to another person appointed by him with a valid medical certificate immediately after returning to the faculty. All medical certificates should conform to the format of a medical certificate issued by a government hospital and should necessarily be obtained from one of the following persons:

- University Medical Officer (UMO)
- District Medical Officer
- Consultant Specialist in the relevant field
- Head of Government Hospital
- Government Medical Practitioner Registered in the Sri Lanka Medical Council
- Medical Superintendent of a Provincial Ayurvedic Government Hospital
- Ayurvedic Physician registered in the Ayurvedic Medical Council

Under exceptional circumstances medical certificates issued by private hospitals or registered private practitioners might be accepted by the UMO or Medical Board.

Should a student fall ill during an examination, such illness should immediately be reported to the UMO at the University Health Centre. If such illness occurs at residence or elsewhere during an examination session, the student or his/her guardian should inform SAR/Examinations within seven (7) days by a telegram/fax followed by a letter indicating the nature of illness, doctor consulted, examination paper affected, etc. together with the relevant medical certificate.

5.15 Academic Concession

The faculty is committed to supporting students in their academic pursuits. Students may request academic concession in circumstances that may adversely affect their attendance or performance in a course unit or programme. Generally, such circumstances fall into one of the two categories; **conflicting responsibilities and unforeseen events**.

Students who intend to, or who as a result of circumstance must, request academic concession must notify through their Head of Department to the Dean as specified below. Before responding to a student's request, the Dean may require supporting documentation and may also ask the student to formulate and follow an academic plan which could include: a reduction in course load; a commitment to an on-going programme of medical care, counselling services; or other appropriate actions. The student's personal circumstances will be taken into account in the development of such a plan. On-going support from the Departments and Units may require periodic updates from the student on their academic plan and/or the submission of documentation from a treating health professional or other source of personal support. This documentation might be a "Statement of Illness" form obtained from the University Medical Officer or an informative letter from the attending physician, from Counselling Services or from another recognized counsellor.

The academic concessions that may be granted include the following: permission to drop a course after the normal deadlines and/or deferment from the course. When student is ready to continue the academic work, documentation from a medical or counselling professional sufficient to satisfy the University that the student is ready to continue studies may be required before the student will be re-enrolled.

Conflicting responsibilities

Conflicting responsibilities include, but may not be limited to, representing the university (province or the country) in a competition or performance, working to support oneself or one's family, and having responsibility for the care of a family member and or any other situation accepted by the Faculty Board and the Senate.

Students with conflicting responsibilities have a duty to arrange their course schedules so as to avoid as much as possible any conflicts with course requirements. Students with such responsibilities are also required to discuss with their course instructor(s) and mentors at the start of each semester, or as soon as a conflicting responsibility arises, any accommodation that may be requested. Instructors may not be able to comply with all such requests especially because the academic standards and integrity of the course or programme could not be compromised.

Unforeseen events

Unforeseen events include, but may not be limited to, ill health or other personal challenges that arise during a semester.

Students who, because of unforeseen events, are absent during the semester and are unable to complete tests or other graded work (continuous assessment only), should formally discuss with their course coordinator how they can make up for missed work, according to written guidelines given to them at the start of the course. Instructors are not required to make allowance for any missed test or incomplete work that is not satisfactorily accounted for. If ill-health is an issue, students are encouraged to seek attention from a health professional. The University Health Service and Counselling Services will normally provide documentation only for students who have been seen previously at these offices

for treatment or counselling specific to conditions associated with their academic difficulties. Students who feel that requests for consideration have not been dealt with fairly by their instructors may take their concerns to the office of the Dean.

Students who, because of an unforeseen event, experience a prolonged absence during a semester or who miss a final or end semester examination must report to the Dean to request academic concession as close as possible to the time that attendance is adversely affected. The faculty will not consider late appeals on academic concessions, therefore such students are advised to make appeals immediately. The occurrence of adverse personal circumstances that cannot be anticipated may necessitate that a student seeks academic concession more than once. Each request for academic concession will be considered on its merits. Repeated requests based on the same or similar reasons may require a different response than *de novo* requests.

5.16 Facilitation of Differently-abled Students

The Faculty is ready to facilitate differently-abled students who are enrolled in the academic programme or become differently-abled during the period of enrolment. Faculty would provide facilities for them to progress smoothly through the teaching and learning assessment programme. Students who need special assistance in academic and assessments should make a formal request to the dean highlighting the type of support they require for the successful completion of academic work.

6 PROGRESSION THROUGH THE ACADEMIC PROGRAMME

The academic programme is delivered over a four-year period and years are designated as levels of the programme as defined below.

Level 1 comprises the programme delivered over year 1 and year 2.
Level 2 comprises the programme delivered over year 3.
Level 3 comprises the programme delivered over year 4.

The progression of students from one level to the next higher level is determined by the following criteria. In situation where students do not meet the criteria, appropriate measures will be taken in respect of those students as specified under each progression below.

6.1 Minimum Requirements for Progression to Level 2

A student must fulfil the following requirements at the end of Level 1 of the degree programme:

1. Should pass (obtain 55 marks or greater) a minimum of 80% of the compulsory course units in Level 1 in which the results have been released and;
2. Should sit/complete (by attending all assessment components) 90% of the course units (i.e., 54 credits out of 60) and;
3. Should obtain CGPA of 2.00 and;
4. Should pass non-credit compulsory course units and all English Competency tests in which the final results are released.

If above minimum requirements are not fulfilled from the available Level 1 examination results, a student will not be admitted in Level 2. Even if a student is allowed to proceed to Level 2 without passing some of the course units (but achieving a GPA of 2.00), he/she shall not be able to enrol in certain Level 2 course units if he/she has not completed the pre-requisite course units from Level 1. In such a situation, the student will be placed in Level 2 as a 'provisional student' and he/she has to complete pre-requisites while following Level 2/3 course units.

The Faculty Board has the final discretion to decide on the progression of a student to Level 2.

6.2 Minimum Requirements for Progression to Level 3

A student must fulfil the following requirements at the end of Level 2 of the degree programme:

1. Should pass (obtain 55 marks or greater) a minimum of 80% of the required total number of course units including compulsory course units in Level 1 and 2 in which the results have been released and;
2. Should sit/complete (by attending all assessment components) 90% of the course units and;
3. Should obtain CGPA of 2.00

If above minimum requirements are not fulfilled from the available Level 1 and 2 examination results, a student will not be allowed to go to Level 3. Even if a

student is allowed to proceed to Level 3 without passing some of the course units (after achieving above requirements), he/she shall not be able to enrol in certain Level 3 course units if he/she has not completed the pre-requisite course units from Level 1 and 2.

The Faculty Board has the final discretion to decide on the progression of a student to Level 3.

7 MONITORING AND EVALUATION OF STUDENTS' PERFORMANCE

The faculty continuously monitors and evaluates students' performance in studies at the faculty throughout the degree programme and accordingly advises and takes measure to help them. The mechanism which is in place for this purpose includes Dean's list recognition of students with outstanding performance, Portfolio-based Students Advisory System, and Deficit-point-based-feedback system.

7.1 Dean's List and Faculty Awards

With the intension of motivating students to achieve the highest possible academic standard, the faculty has introduced the "Dean's List" and "Faculty Award" concept. The students, who possess outstanding academic performance, engage actively in extra-curricular activities and who are with good conduct are eligible for a standing in the Dean's List and Faculty Awards. The Dean's List concept is applied to all levels of fulltime undergraduate degree programmes of the faculty. A student can secure a standing in the Dean's List of the respective level of study, if he/she has;

- obtained a minimum GPA of 3.55 at Level 1, 3.60 at Level 2 and 3.70 at Level 3.
- obtained a "C" or higher grade from the first attempt for all credited course units taken by the student in the relevant level.
- passed all non-credited compulsory course units.
- not received academic warning letters while in the university.
- not faced any disciplinary action while in the university.
- evidence for the involvement in extra-curricular activities and achievements.

7.2 Deficit Point-Based Feedback and fall-back Option

Deficit point-based (DP) feedback system is specially to assist the students who perform poorly in studies. Students are categorized according to the level of DP. The students with unsatisfactory performance will be referred to the Student Advisory Service of the faculty, where they will receive guidance and advice to improve and upgrade academic performance.

Computation of Deficit Point (DP) and Student's Performance

Deficit point is calculated for each semester after the release of the results of the semester examination using the following formula.

DP = 2 (credits of the total course units offered–total credits successfully completed)

Note: To successfully complete a credit, a student must obtain a minimum of "C" grade for the course unit.

Student's Performance and DP

DP range	Performance	Remark
DP = zero	Satisfactory	Student's performance is at or above the minimum requirement.
$2 \leq$ DP < 12	Unsatisfactory-*Poor*[a]	Student's performance is just below the minimum requirement.
$12 \leq$ DP < 24	Unsatisfactory-*Very Poor*[a]	Student's performance falls considerably below the minimum requirement.
DP $\geq$ 24	Unsatisfactory-*Extremely Poor*[a]	Student's performance is well below the minimum requirement.

a: These students will be referred to the Student Advisory Service of the faculty.

Example

If the number of credits offered by the student is 24 and number of credits successfully completed is 18, then;

DP = 2 (24-18)

   = 12

Performance = Very Poor

7.3 Student Portfolio

Students have to maintain records of their academic performance, co-curricular and extra-curricular activities carried out during the study programme in the 'Student Portfolio' provided by the faculty at the beginning of the academic programme. Students are advised to follow the instructions given in the Portfolio. With the duly filled portfolio, students are required to meet their mentors at least twice a semester. Mentor makes his observation and signs the portfolio which the faculty refers to in responding to student's request on academic concessions, progression to the next higher level, grace chances for examinations, character certificates/ recommendation letters, etc.

The faculty has initiated the implementation of the electronic version of the student portfolio: **e-portfolio**, which will replace the present paper-based student portfolio.

8 AWARD OF THE DEGREE AND HONOURS

8.1 Eligibility for Degree

To be eligible for the award of B.Sc. in Food Production and Technology Management Degree, a student must have accumulated a minimum aggregate of **120 credits** with a minimum prescribed number of credits from each semester including the credits arising out of the compulsory course units belonging to the core-programme and to the relevant specialization. In cases where a student has accumulated more than **120 credits**, all course units will be considered.

Furthermore, a student should;
  (i)   obtain grades of C or better in core course units and compulsory course units and at least grades of D in the remaining course units taken into consideration,
  (ii) obtain a 'Pass' grade for non-credit compulsory course units,
  (iii) have a minimum Final Grade Point Average of **2.00,**
             and
  (iv) complete the relevant requirements within a period of <u>seven</u> academic years.

A student should apply for the award of a degree on satisfying the requirements. Students are entitled to obtain a detailed certificate/transcript and the degree certificate.

8.2 Requirement of English Language Proficiency

All the students are required to obtain a 'Pass' grade at all English Language course units conducted by the Department of English Language Teaching (DELT) in Level 1 to fulfil the requirements of the B.Sc. in Food Production and Technology Management Degree.

8.3 Award of Honours

8.3.1 First Class Honours

A student may be awarded First Class Honours provided that he/she;
  (i) obtains a minimum Final Grade Point Average of **3.70,**
             and
  (ii) completes the relevant requirements within <u>four</u> academic years.

8.3.2 Second Class (Upper Division) Honours

A student may be awarded Second Class (Upper Division) Honours provided that he/she;
  (i) obtains a minimum Final Grade Point Average of **3.30,**
             and
  (ii) completes the relevant requirements within <u>four</u> academic years.

8.3.3 Second Class (Lower Division) Honours

A student may be awarded Second Class (Lower Division) Honours provided that he/she;
  (i)   obtains a minimum Final Grade Point Average of **3.00,**
             and
  (ii) completes the relevant requirements within <u>five</u> academic years.

Final GPA cut-off	Class/ Pass	Maximum duration for the completion*
3.70	First Class	4 years
3.30	Second Class Upper Division	4 years
3.00	Second Class Lower Division	5 years
2.00	Pass	7 years

* Maximum duration for the completion of the degree will be determined subject to Academic Concessions.

8.4 Awards & Medals at the Convocation

Convocation annually presents medals and awards to students who have made an outstanding performance in the degree programme subject to the criteria specified under each award and medal.

1. Prof. and Mrs. T.S.G. Fonseka Gold Medal for the Best Performance in the Faculty of Livestock, Fisheries and Nutrition.

2. Dr. Paul Perera Gold Medal for the best performance in the Aquaculture & Fisheries Specialization in B.Sc. Food Production & Technology Management Degree Programme.

3. Prof. A.S.B. Rajaguru Memorial Gold Medal for the best overall performance in the Livestock & Avian Science Specialization in B.Sc. in Food Production & Technology Management Degree Programme.

4. Prof. V.Y. Kuruvita Memorial Gold Medal for the best performance in Principles of Animal Disease Control & Diagnostic Technology in B.Sc. in Food Production & Technology Management Degree Programme.

5. Prof. J.M.P.K Jayasinghe Gold Medal for the student with the best academic performance in the B.Sc. Degree Programme in the Food Production & Technology Management, Faculty of Livestock, Fisheries & Nutrition.

 (as decided at the time of the General Convocation)

9 CONTENTS OF THE COURSE UNITS

Details of the course units are given below. Please note that the contents are given below and the assessment methods are only guidelines and there can be some changes done by the Departments or Units with prior notice. Theory and practical hours may also be changed when necessary. The course unit overview (approved by the Faculty Board) given at the beginning of the course unit provides exact details and regulations applicable to each course unit.

9.1 Course Units Offered under Livestock and Avian Sciences (LAS)

LAS 1114 Anatomy and Physiology

Aims
1. To give a basic understanding on morphological and anatomical features of the animal body.
2. To study characteristic features of animals and to relate these to management decision making.
3. To compare physiology of different farm animals.

Learning outcomes
Students should be able to;
1. classify farm animal species
2. describe basic anatomical features of farm animals.
3. summarize physiological norms of farm animals.
4. identify animal organs and their anatomical position in cadavers
5. identify and analyse similarities and differences in the anatomy and physiology of farm animals.
6. carryout animal dissections

Contents
Introduction, Taxonomy of farm animals, Morphology and Organization of the animal body, The digestive system, Digestive physiology of ruminants, Swine, rabbit and poultry, Anatomy of the: Reproductive system, Respiratory system, Cardiovascular system, Nervous system, The endocrine system and hormones, The udder of the ruminants, Physiological parameters of farm animals and measurements, Examination of slides of tissues under the microscope, Multimedia show on types of tissues. Farm Animal Ethology, Animal behavioural norms, Animal's environment and environmental physiology. Animal Dissection, Examination of specimen of organs and systems of domestic animals. Fish anatomy: Sense organs of fish and their functional mechanisms, Digestive system of fish and digestive physiology, Blood circulation, Endocrine system and control of reproduction, Excretion and osmoregulation, Bioluminescence,

Allocation of time
45 hrs of lectures, 30 hrs of practical and 3 hrs of assessment

Assessment
Mid-semester examination   25 %
Practical paper (spot test)   25 %
End-semester theory paper 50 %

LAS 1214 Nutritional Biochemistry and Principles of Animal Nutrition

Aims
1. To provide an understanding of biochemical processes of animal body related to the different physiological and nutritional status
2. To study the principles of animal nutrition and their applications.
3. To give hands-on training in proximate analysis of feed.
4. To give opportunities to evaluate feed quality
5. To investigate into indigenous knowledge of animal feeding

Learning outcomes
Students should be able to;
1. relate the regulation of biochemical processes to farm animal physiology
2. evaluate the dietary requirements of major biomolecules depending on the animal species, breed and physiological state
3. identify common feed ingredients, classify, and describe their physical & nutritional characteristics
4. identify antinutritive factors and toxins present in ingredients and suggest methods to eliminate them
5. describe the role of nutrients in animals and identify signs of deficiency
6. evaluate and comment on quality: dryness, adulteration and purity
7. evaluate nonconventional feed stuff, describe their characteristics and analyze sample of feed for proximate composition

Contents
Nutrition in animal production, History and definition, Carbohydrates, fats and proteins, Digestion in ruminants, hind gut fermenters, birds and fish, Utilization of nutrients, Intermediary metabolism, Energy metabolism – energetics of glucose and fat oxidation, glycolysis, tricarboxylic acid cycle, oxidative phosphorylation, ketone bodies, glycogen metabolism, lipid metabolism, Special aspects of metabolism – pentose phosphate pathway, cholesterol metabolism, urea cycle, metabolism of sulfur-containing amino acids, alcohol metabolism, NPN and fate of N in rumen, use of metabolites in synthesis of milk, meat and eggs, Micronutrients: characteristics and metabolism of Minerals, Vitamins, Feed evaluation, Digestibility and biological value of protein, Energy evaluation Classification and evaluation of feed stuffs, Concentrate ingredients: origins, characteristics, nutritive value, Micronutrient supplements and feed additives, Roughages and their nutritive value, Crop residues, Silage and hay, Classes of animals and their feed requirements, Feeding standards, Feeding of domestic animals and fish, Nutritional disorders, Feed Analytical Laboratory – Basics, Proximate analysis, Specialized instruments in animal nutrition, Bomb Calorimetry, Photometry, Enzymes and metabolic regulation – enzyme classification, cofactors, effect of temperature, pH, substrate and product on the enzyme activity, allosteric, hormonal and dietary regulation of enzyme activity, feedback activation and inhibition.

Allocation of time
45 hrs of lectures, 30 hrs of practical and 3 hrs of assessment

Assessments
Mid-semester examination   25 %
Practical examination   25 %

End-semester theory paper   50 %

LAS 1314 Poultry, Meat & Egg Production

Aims
1. To give a basic understanding of the Poultry Industry in Sri Lanka.
2. To provide students with the basic management tools to gain an entry level position in the Poultry Industry.
3. To discuss management strategies of poultry at large scale farming in relation to breeding, feeding, product handling and healthcare.

Learning outcomes
Students should be able to;
1. explain the management procedures of the poultry as layers and broilers at commercial level.
2. describe the principles of feeding and nutrition of poultry
3. describe the principles of product handling and marketing of poultry
4. interpret performance and financial data in a poultry farm
5. explain the techniques used in the management diseases of poultry.
6. plan a commercial poultry farm and suggest management strategies for a profitable poultry business.
7. evaluate and analyse performance of commercial poultry project and suggest improvements
8. predict the trends of the future of the industry

Contents
Poultry industry, potentials and constrains for Poultry production, Classification of poultry, Breeds, Indigenous poultry breeds, Selection of breeds and breeding, Production systems, housing systems, Housing requirements, Poultry equipment-Chick management, brooder management, Grower managements de-beaking, restricted feeding, lighting, stress and welfare. Layer management, judging and culling for egg production. Nutrition of poultry, feeds and water, Feeding requirements, management during hot weather, Diseases and field problems of poultry, prophylactic programs, and vaccination for poultry, Broiler management Poultry processing, slaughtering, carcass quality, marketing of eggs, poultry waste management, Farm Economics and evaluation, Farm records, broiler and layer performances analysis, labour norms, resource handling, financial management and costing. Planning of commercial poultry projects, planning of continuous egg production, continuous broiler production, and local government regulations.

Allocation of time
50 hrs of lectures, 20 hrs of practical and 3 hrs of assessment

Assessments
Mid-semester examination   30 %
Practical paper (spot test)   15 %
End-semester theory paper 55 %

LAS 2113 Animal Breeding and Selection

Aims
1. To explain genetic influence on the characteristics exhibited by animals.
2. Explain the commercial methods used to breed farm animals.
3. To discuss procedures to select animals for a breeding program.
4. To discuss breeding policy and strategy in Sri Lanka.
5. To discuss qualitative and quantitative genetics and their application to the breeding and improvement of domestic animals.

Learning outcomes
Students should be able to;
1. outline the principles of Mendelian genetics using examples from livestock.
2. discuss their application to breeding of livestock for specific traits.
3. explain Mendelian inheritance and the basis of parentage testing.
4. demonstrate awareness of the basic concepts of quantitative genetics.
5. describe national breeding policy and techniques of reproduction for domestic livestock
6. evaluate aspects of breeding policy and their designs that influence the rate of genetic improvement for traits and breeding goal.
7. describe steps of progeny testing, performance testing and pedigree selection.
9. students envision possible future effects of the manipulation of reproductive processes and genetic inheritance.

Contents
Fundamentals of Heredity, Genetic Relationship and their Measurement, Genetic structure and Population, Estimation of Breeding Value, Variation and Selection Breeding value, Population genetics, Heritability, Heterosis, Different selection methods, Inbreeding and Cross Breeding Inbreeding co-efficient, Inbreeding depression, Inbred lines, Practical Breeding Plans, Methods of Crossbreeding, selection, selection index, grading up, National breeding policy, Revision of reproduction in the male and female, Normal sexual apparatus (Anatomy), Male sexual physiology, Spermatogenesis, Sperm maturation, and Epididymal function, Mating behaviour, Normal semen, Collection of semen, Examination and evaluation of semen, Reproductive abnormalities of the male animals, Artificial insemination Reproduction in the female General concepts of mammalian endocrinology, Neuro-endocrinology of reproduction, Revision of Physiology and endocrinology of female reproductive cycle, Comparative reproduction of farm animals Mating, Fertilization and Pregnancy Mating behaviour, Pregnancy maintenance, Pregnancy diagnosis, Disorders during pregnancy Parturition, Mechanism of parturition, abnormal parturition

Time allocation
Lectures- 30 hrs, Laboratory- 30 hrs

Assessment

Mid semester examination	30 %
Practical (spot test)	20 %
End semester theory paper	50 %

LAS 2122 Animal Feed Technology

Aims
1. To teach the principles and the technology of animal feed formulation.
2. To introduce the quality control system and regulations in animal feed processing and marketing
3. To expose learners to practical aspects of commercial animal feeds processing.

Learning outcomes
Students should be able to;
1. assess and comment on the quality of feed ingredient.
2. calculate feed formulas manually and using software.
4. produce simple software for feed formulation calculation.
5. formulate cost effective ration for identified farm animals selecting appropriate ingredients.
6. identify necessary equipment for feed processing unit.
7. propose and design suitable methods for processing of feeds for species of livestock and fish.
8. evaluate commercial feed mill for operational efficiency and running capacity.

Contents
Animal Feed Industry, Trade in feed ingredients, Bulk feed ingredients: their characteristics and handling, nutritional and physical properties, drying and thermal properties of grains and grain products, sampling and quality testing, product handling: conveyors & elevators, bins, dust collectors, feed additives and micronutrient premixes: Feed formulation for ruminants and monogastrics, Requirements, feed specifications and calculation, Feed manufacture and Quality Control of Raw materials, feed processing, total mixed rations, pelleting and extruding: wafers, pellets, crumbles and feed blocks, packaging and storage, equipment and their maintenance, Pest Management, Specialty feeds, fish feeds, Pet feeds, liquid feeds, blocks and licks, Safety and Health, Computer operations in feed formulation, Planning and design of feed plants, Legislation governing manufacture and sale of animal feeds.

Time allocation
Lectures-20hrs, Laboratory-20hrs

Assessments
Continuous evaluation   30 %
Practical examination (paper) 20 %
End-semester theory paper   50 %

LAS 2133 Practicum I

Aims

1. To provide opportunities to put theory into practice.
2. To expose learners to management practices of farm animals.
3. To create interest and give opportunity to get hands on experience and skills of animal handling in the real environment.
4. To use laboratory and field equipment correctly to generate data.
5. To give opportunities to work for a common goal and share responsibilities.

Learning outcomes

Students should be able to;

1. carryout daily routine of a farm.
2. demonstrate skill related to special management practices like breeding, disease prevention and restraining of animals.
3. maintain farm records and summarize them for evaluation of performance and budgeting.
4. propose appropriate practices for the welfare of animals.
5. Provide a comprehensive report of the group activities.
6. demonstrate general knowledge related to livestock farming in Sri Lanka.

Contents

Farm practice and on farm training in relation to, small ruminant production, poultry production, and Animal breeding: Restraining and handling of animals, AI and Pregnancy Diagnosis, De-worming and pest control, conducting Vaccination and treatments, herd management practices in small ruminants; identification, castration, dehorning, hoof trimming, grooming, restraining and handling, training and exercise, breeding and selection, judging and culling, feeding management in farm, feed milling and feeding, resource and product handling, Farm record keeping, costing and farm evaluation

Time allocation

Farm training- 90 hrs, assessments- 2.5 hrs

Assessments

Continuous evaluation   60 %
End semester Comprehensive examination   40 %

LAS 2144 Principles of Animal Disease Control & Diagnostic Technology

Aims:

1. To discuss farm animal diseases specific to the country along with diseases controlled by governmental regulations.
2. To demonstrate post mortems, surgery, physical examination of animals.
3. To discuss other health problems of farm animals.
4. To take learners on field trips both on farms and at the veterinary investigation centres to demonstrate practices of animal healthcare.
5. To provide an understanding of principles of veterinary diagnostic technologies and veterinary nursing

Learning outcomes

Students should be able to;

1. carryout a farm level investigation on dead animals.
2. demonstrate basic skills of handling sick animals and nonsurgical practices of treatments and control.
3. investigate on pattern of disease outbreak in a farm and propose biosecurity measures.
4. describe disease control programmes for specific diseases.
5. suggest herd health programmes for given condition/area.
6. demonstrate awareness on national disease control and eradication programmes.
7. recognize and advise on the consequences of animals for human health of and contribute to the improvement of human well-being.
8. apply the principles of veterinary diagnostic technologies in animal health care.
9. perform the basics of responsible animal care.
10. handle animal specimens correctly and process them accurately.
11. operate and maintain veterinary diagnostic equipment.
12. work in veterinary clinics and hospitals as technicians.

Contents

Principles of epidemiology, Host-agent environment relationship, modes of transmission, general animal sanitation and disease prevention, Immunity and vaccination, types and production of vaccine, Microbiology of domestic animal pathogens and other disease causing agents, OIE classification, Common diseases of cattle, Common diseases of swine, Common diseases of poultry, Parasitic infections, Disease caused by haemoparasites, Economic importance of diseases, Methods of disease diagnosis, reasons for maintaining animal health, losses due to animal health, Zoonotic diseases and regulatory aspects of animal diseases, public heath importance, animal act, quarantine measures. Principles of radiography, ultrasound scanning and electrocardiography Use and maintenance of veterinary diagnostic equipment.

Time allocation

Lectures-45h, Laboratory-30h

Assessment

End semester examination   60 %
Assignments   20 %
Field visits   20 %

LAS 2151 Poultry Breeding & Parent Stock Management

Aims

1. To provide students with the management tools to gain an entry level position in the poultry hatchery industry.
2. To discuss management strategies of layer and broiler parent stocks in relation to breeding, feeding, hatchery practices and healthcare.

Learning outcomes

Student should be able to;

1. explain the techniques used in the management of parent stocks
2. identify commercial lines and their management standards
3. describe steps of successful management of poultry incubation
4. identify special requirements in parent stock management
5. evaluate hygiene and bio-security measures in hatchery
6. practice selection of egg and chicks

Contents

Principles of Parent stock management and breeding, hygiene and biosecurity, special care in commercial parent stock. Egg Incubation, Selection of eggs, storage and handling of eggs, Hatchery practices- management of incubators, types of incubators, requirements for successful incubation, disinfecting, setting of eggs and turning, candling and hatching, Assessing chick quality, chick selection, sexing and handling of chicks in the hatchery, vaccination, transport and marketing. Hatchery waste handling, Requirements and Factors affecting Incubation of eggs of the other species of poultry

Time allocation

Lectures -10hrs, Laboratory- 10hrs

Assessment

Continuous evaluation   30 %
Oral examination   10 %
End-semester theory paper 60 %

LAS 2162 Egg Science & Technology

Aims

1. To expose learners to the entire process of egg inspection,
2. To expose learners to handling of the product and quality assurance of egg.
3. To expose learners to processing techniques and quality control tests for animal products.

Learning outcomes

Student should be able to;

1. describe routine test and inspection for egg and egg products
2. inspect sample and comment on quality
3. describe factors affecting product quality and ways of their manipulation
4. interpret results of quality inspection and draw logical conclusion
5. provide overview and improvement to egg marketing

Contents

Formation of the egg, structure of the hen's egg, chemical composition and factors affecting composition, functional modification of egg and egg products, Nutritional modification of egg, Egg quality, factors affecting quality and shelf life, measurement of egg quality, inspection of the egg, food value of eggs, handling, grading and storage of eggs, Egg products, Egg preservation and egg

powder, other uses of eggs including non-food use, Contamination problems associated with poultry products. Egg marketing and trends

Time allocation
Lectures- 15 hrs, Laboratory-30 hrs

Assessment
Continuous evaluation   20 %
Practical   30 %
End semester theory paper   50 %

LAS 2172 Farm Mechanization & Engineering

Aims
1. To discuss appropriate technologies that may benefit food production.
2. To give basic principles of machinery and mechanics
3. To introduce basics of electric wiring, maintenance and troubleshooting of electrical equipment

Learning outcomes
Student should be able to;
1. use laboratory and field equipment correctly to generate data
2. calculate basic machinery and power requirement for a production line/farm
3. improve, manage, design and innovate of appropriate tools and implement method
4. identify, describe and analyse matters related to the handling and proper management of equipment in production systems and processing plants.
5. evaluate machinery and energy efficiency in a production process and propose improvements
6. drawing of plans and models of farm structures and implements
7. preparation of BOQ for farm structures

Contents
Basic farm machinery and mechanics in animal production and fisheries, electrical systems, estimation of machinery requirement and work norm, calculation of optimum power requirements, costing, maintenance and safety on operation, engineering drawing, innovative farm machinery and design, inventions.
Time allocation: Lectures 15 hrs, Laboratory 30 hrs

Assessment
Continuous evaluation   30 %
Practical examination   20 %
End semester theory paper   50 %

LAS 2182 Farm Planning and Economics

Aims
1. To discuss sustainable food production system, food safety, marketing and economics of crop and animal production.
2. To discuss various factors to be considered in design of food production project
3. To educate learners about different regulations related to livestock production

Learning outcomes
Student should be able to;
1. analyse primary data to determine cost and benefit in a project
2. prepare technical reports on commercial viability of a project
3. design "target food production" from a farm
4. use IT to support to record keeping, handle data and present information for management.
5. design and evaluate feasibility of food production systems,
6. give suggestions and use novel thinking and predictions for food production
7. provide innovative solutions for food production problems of the country

Contents
Decision making principles in livestock production. Livestock systems. Role of budgeting in livestock industry. Management of livestock projects, Management of livestock marketing. Livestock agricultural business. Importance and types of livestock farms. National properties, policies and subsidy programs, Market survey, Survey of resources. Site selection, resource planning, Farm establishment, choice of resources. Management procedure of the farm operations. Marketing strategies. Farm records, accounting and budgeting; farm evaluation.

Time Allocation
Lectures 25hrs, Laboratory 10 hrs

Assessment
Mid semester Examination   30 %
End semester theory paper   70 %

LAS 2192 Forage Science and Range Management

Aims
1. To discuss aspects of food security for livestock
2. To provide training in establishment and management of forage lands
3. To discuss ways of optimizing forage resource utilization in the country.

Learning outcomes
Student should be able to;
1. identify requirements for sustainable forage production in farm and prepare cropping calendar and forage estimates
2. identify potential non-traditional forage varieties in Sri Lanka.
3. describe commercial value of forage as an input for production

4. planning commercial production oil seeds and maize for forage
5. describe methods of forage conservation
6. evaluate indigenous and exotic forage varieties for their composition, productivity and utility under local condition.
7. suggest forage production programme for the identified conditions.

Contents

Role of forages in productive Agriculture; Natural grasslands in Sri Lanka, Forage production in Sri Lanka, Technology of forage production, commercial forage production, Maize and forage cereals production, oil seeds, pasture and fodder, legumes, grass and non legume fodder, Evaluation; Forage – Animal – soil relationships; Importance of trees & shrubs in animal feeding; Nutritional limit to animal production from tropical forages; Identification and mitigation; Importance of forage conservation in topics; Advance in forage conservation as silage and hay; Feed conservation; Biological residues; Measurement of forage intake by grazing ruminants.

Time Allocation
Lectures-25 hrs, Laboratory-10 hrs

Assessments
Continuous evaluation	30 %
Oral examination	20 %
End semester theory paper	50 %

LAS 21a2 Micro Livestock Production and Management

Aims
1. To discuss the potential role of non-traditional farm animals in the economy and food security.
2. To give the basics of management of non-traditional farm animals.
3. To discuss management strategies of those animals in commercial level relation to breeding, feeding, management and product handling

Learning outcomes
Student should be able to;
1. manage micro livestock in model units in the university.
2. identify diseases and field problems of micro livestock and find solutions
3. design farm structures for micro livestock
4. propose methods to promote uses of non-conventional animal products and survey consumer preference and market demand for such products.
5. discuss the factors affecting quality of micro livestock products and suggest improvements
6. propose solutions to management problems in micro livestock farms

Contents
Miscellaneous poultry production; Ducks, Geese, Turkeys, Guinea Fowls, Pigeons, Quails and Ostrich, Cage Birds, Rabbit farming, Guinea Pigs, Fur bearing Animals: Minks, Sables, Deer Farming, Crocodile farming, Equine farming, Breeds, feeding and feeds, housing, breeding and other management practices, field problems, micro livestock product quality and their utilities

Time Allocation
Lectures-25 hrs, Laboratory-10hrs

Assessments

Continuous evaluation	30 %
Oral examination	10 %
End semester theory paper	60 %

LAS 21b2 Pet Animal Nutrition and Feed Formulation

Aims
1. To study the principles of pet animal nutrition and their applications.
2. To give hands-on training in proximate analysis of feed.
3. To give opportunities to evaluate commercial pet feed
4. To investigate into indigenous knowledge of animal feeding

Learning outcomes
Students should be able to;
1. identify common feed ingredients in pet food and classify
2. describe their physical & nutritional characteristics.
3. identify ANF and toxins present in ingredient and suggest methods to eliminate them.
4. list nutritional requirements of pet animals depending on their life cycles
5. describe role of nutrients in animal and identify signs of deficiency
6. evaluate and comment on quality: dryness, adulteration and purity.
7. evaluate non-conventional feed stuff and describe their characteristics.
8. analyse sample of feed for proximate composition
9. provide nutritional counselling to pet animals

Contents
Nutrition in pet animals, Digestion in dogs, cats, birds and fish, Utilization of nutrients, Intermediary metabolism, Micronutrients: characteristics and metabolism of Minerals, Vitamins, Feed evaluation, Digestibility and biological value of macronutrients, Energy evaluation Classification and evaluation of feed stuffs for pet food, Concentrate ingredients: origins, characteristics, nutritive value, Micronutrient supplements and feed additives for pets, Feeding standards, Feeding of domestic animals and fish, Nutritional disorders, Feed Analytical Laboratory – Basics, Proximate analysis, Specialized instruments in animal nutrition, Bomb Calorimetry, Photometry,

Time Allocation
Lectures-15hrs, Laboratory-30 hrs

Assessment

Mid-semester examination	25 %
Practical paper (spot test)	25 %
End-semester theory paper	50 %

LAS 21c2 Goat and Sheep production and Management

Aims
1. To discuss economic importance of small ruminant industry in Sri Lanka.
2. To discuss management strategies of goat and sheep in relation to breeding, feeding, product handling and healthcare.
3. To provide opportunities to get training in the commercial goat and sheep farms.

Learning outcomes
Students should be able to;
1. explain the procedures the management practices with sheep and goat at commercial level dairy and mutton production.
2. explain the techniques used in the breeding and herd management of small ruminants
3. plan a goat/sheep farm and suggest management strategies for improvement of business.
4. plan feeding programme and estimate feeding requirements.
5. identify important diseases in a farm and suggest methods of prevention and control.
6. evaluate and analyse performance of commercial dairy farm and suggest improvements.

Contents
Sheep and goat farming in Sri Lanka, Population and distribution, system and purpose of rearing, breeds and breeding, feedstuff and nutrition, meat production and marketing, Ecology and distribution, Reproduction and pregnancy, growth, lactation, digestion, wool production, Biological and economical efficiencies of management systems, Breeds and breeding, Modern breeds and their origin, objectives of selection, recording production, selection plans for improvement, Health Infectious diseases, external parasites, internal parasites, carcass quality, wool and sheep skins.

Time Allocation
Lectures-25 hrs, Laboratory-10hrs

Assessment

Continuous Evaluation	30 %
Practical (Oral examination)	10 %
End semester theory paper	60 %

LAS 21d1 Special Topics in Animal Science

Aims
1. To provide opportunities for Individual study in specialized areas of animal production and related topics.
2. To discuss current topics of global and regional interest.
3. To induce culminating learning experience in interdisciplinary in nature.
4. To impart problem solving skill to the learner
5. To promote presentation skills of the learner,

Learning outcomes

Student should be able to;

1. demonstrate awareness of current trends of animal production through short critics and presentations
2. take part in open days mobile sessions and farm visits
3. demonstrate interpersonal skill in outreach activities
4. critically evaluate problems of food security/current trends and propose solutions/overview in teams.
5. retrieve, sift and select information from a variety of sources
6. demonstrate effective presentation skills

Contents

Search of information and sifting information on current topics related to animal production, food security, global trends of production, survey and data collection, analysis of trends, predictions and extrapolation, culminating learning and group projects,

Time allocation

Lectures-10 hrs, Laboratory-20 hrs

Assessment

Continuous evaluation	50 %
End semester report	50 %

LAS 2213 Dairy and Beef Production & Management

Aims

1. To give a basic understanding of the dairy cattle and buffalo industry in Sri Lanka.
2. To provide students with the basic management tools to gain an entry level position in the dairy industry.
3. To discuss management strategies of cattle and buffalo at large scale farming in relation to breeding, feeding, product handling and healthcare.
4. To provide opportunities to get training in the commercial dairies.
5. To discuss managerial and policy implication for dairy development in Sri Lanka.

Learning outcomes

Students should be able to;

1. explain the procedures for the different management practices with dairy cattle and buffalo at commercial level.
2. explain the techniques used in the breeding and herd management of dairy animals.
3. identify important diseases in a farm and suggest methods of prevention and control
4. summarise various factors affecting dairy production and product quality and quantity.
5. plan a dairy farm and suggest management strategies for improvement of business.
6. plan feeding programme and estimate feeding requirements.
7. evaluate and analyse performance of commercial dairy farm and suggest improvements.

Contents

State of dairy and beef cattle industry in Sri Lanka, Taxonomy of cattle, selection of breeds and crosses, Systems of management, housing requirements, Breeding policy, judging for production, breeder management, AI, embryo transfer, Dairy cattle management, Dry cow management, pregnant heifer management, calf rearing, management of bull calves and replacement stocks, restraining and handling, Herd management practices and tools, Milking of cattle and buffalo, Milking methods, composition and quality of milk, Feeding and feeds of cattle, Feeding requirements, ration formulation, nutritional disorders, Planning of commercial dairy farm, herd composition and costing, farm records, Beef production, management of beef cattle, bull calf management, processing carcass, beef marketing, Buffalo production in Sri Lanka, breeding and management problems, reproduction, management in pregnancy and lactation, Housing and special requirements, calf rearing, management of buffalo as a draught animal, Integrated Ruminant Management, Field problems in livestock management in Sri Lanka, Health management, common diseases, vaccination and disease prevention.

Time Allocation

35 hrs of lectures, 20 hrs of practical and 2.5 hrs of assessment

Assessment

Continuous evaluation	30 %
Practical examination (spot test)	20 %
End semester theory paper	50 %

LAS 2222 Animal Experimentation

Aims

1. To provide opportunities to design experiments or surveys
2. carryout research interpretation
3. To facilitate preparation and presentation of oral and written reports on timely topics involving commercial animal production and/or advancements in biotechnology as they may apply to animal science

Learning outcomes

Students should be able to;

1. analyse primary data to determine its validity and reliability.
2. prepare technical reports.
3. design a scientific research to study problems and evaluate animal production strategies of the country and provide innovative solutions.
4. use scientific methodology, employ critical thinking skills and apply. appropriate tools/methods/theories to address problems.
5. select suitable animals for scientific research.
6. conduct research with animals for precise and accurate results.
7. follow ethics of animal welfare in animal research.
8. give technical presentations and transfer knowledge.

Contents:

Research proposal formulation, planning animal experiments, safety, ethics and animal welfare in research, selection of animals, Digestibility and metabolism

experiment, performance testing, statistical design and analysis, reporting and interpretation, writing manuscripts

Time Allocation

20 hours of lectures; 20 hrs of practical and tutorial; 2 hrs of assessment

Assessment

Continuous Evaluation	30 %
Practical (Oral)	10 %
End semester theory paper	60 %

LAS 2231 Practicum II

Aims
1. To provide opportunities to get managerial experience at a farm.
2. To expose learners to practical decision making at the farm level.
3. To give opportunity to get hands on experience and skills of animal healthcare practices.
4. To give practical experience of product handling at farm level.

Learning outcomes
Students should be able to;
1. apply scientific principles and concepts in the context of animal management and food production.
2. identify and make use of the practical expertise of others when following production procedures.
3. demonstrate skills of costing and marketing of products at the farm gate.
4. evaluate performance of a farm and carryout cost benefit analysis.
5. Perform a roster of duties in model animals units in the university.

Contents
Farm practice and on farm training in relation to Cattle, buffalo, swine, goat sheep, conducting experiment at farm level in large ruminants; Slaughterhouse management and by product handling, forage establishment, grassland management, forage estimation, forage conservation, resource and product handling, Farm recordkeeping, costing and farm evaluation

Time Allocation
Farm training and visits; 30 h, Assessment 15 h

Assessment

Continuous assessment	60 %
End semester Comprehensive examination	40 %

LAS 2242 Swine Production & Management

Aims
1. To give a basic understanding about the swine industry in Sri Lanka.
2. To expose the learner to basic management tools to gain an entry level position in the swine industry.
3. To discuss management strategies of swine at large scale farming in relation to breeding, feeding, product handling and management.

Learning outcomes

Students should be able to;

1. summarize management practices of a swine farm with different animal categories.
2. describe management problem arise in farms and suggest remedies.
3. calculate herd composition for given market demands.
4. design piggery according to given conditions.
5. evaluate the quality of given carcass or pork sample and interpret findings.
6. describe the organizational structure, economic realities and production trends in the swine industry.

Contents

Swine Production in Sri Lanka, Morphology & body conformation, breeds of pig and crosses, Highlights of pig behaviour, Farm planning and housing, Feeding and nutrition: Basic Nutrients, Special Nutritional Considerations in Each Production Phase, management of pigs, Reproduction and breeding, Sow and litter care, fattening, replacement stock management, performance testing, Growth, carcass composition & pork quality, technologies to improve swine growth and composition, Measurements of carcass composition, Pork Quality: The effect of climate and temperature, Stress, Systems of swine production, Health and hygiene, Market demand and herd composition , Considerations in designing a piggery, Swine farm records and evaluation

Time Allocation

25 hours of lectures; 10 hrs. of practical and visits 2 hrs. of assessment

Assessment

Continuous assessment   30 %
Oral examination   10 %
End semester theory paper 60 %

LAS 2252 Food Inspection & Evaluation

Aims

1. To introduce the principles of food evaluation and inspection.
2. To develop the skills of using different techniques to determine the quality of different food products.

Learning outcomes

Students should be able to;

1. demonstrate basic food evaluation skills
2. implement HACCP and other quality assurance skills
3. describe main regulatory agencies and their role in terms of food inspection
4. food inspection skills, food purchasing skills

Contents

Basic Food Safety: food microbiology, temperature control (bacteria, viruses, parasites - how they grow), other types of food contamination such as chemical or physical hazards, Plant and animal toxins, cross-contamination. Requirements for Food handling - Personnel: Personal hygiene, Hand washing, Food handler illness

or injury, Basic HACCP: Describe main principles of HACCP, assess food safety hazards, identify critical control points (CCPs), set up procedures and standards of CCPs, monitor CCPs, take corrective actions, set up record keeping system, verify system is working, manage a HACCP system, train employees to follow HACCP procedures. Purchasing and Receiving Food: Purchasing and receiving standards, reliable suppliers, providing receiving facilities and/or equipment, use of food thermometers, purchase and inspection of food, reject shipments. Food Storage: general storage guidelines - i.e., stock rotation, dating, dry food storage, etc. frozen and refrigerated food storage. Facilities and Equipment: food service building design - e.g. floor, walls, ceiling construction, toilet facilities etc. proper equipment selection (i.e., dish machines, refrigeration, stoves etc.), NSF standards, lighting and ventilation, handling of garbage and solid waste, plumbing (i.e., cross connections, air gaps, backflow), sewage disposal. Cleaning and Sanitizing: cleaning and sanitizing throughout the food service operation (types and strengths of sanitizers, test kits, etc.), machine and manual ware washing, storage of clean and sanitized items, safe handling of cleaning and hazardous chemicals. Pest Management Program: methods of detecting pests, control of pests, pest exterminating companies. Regulatory Agencies and Inspections: role of regulatory agencies (state and local), various types of inspections, working with environmental health specialists during an inspection, making use of inspections, legislation.

Time Allocation
Lecture contact hours- 25 hrs; Practical-10 hrs

Assessments
End semester examination	60 %
Project report	15 %
Practical	15 %

LAS 2262 Waste Management & Utilization

Aims
To give a basic understanding of the principles and the practices associated with the safe disposal or utilization of waste arising from livestock and fish farms, abattoir and food processing plants.

Learning outcomes
Students should be able to;
1. design a waste disposal system for given conditions.
2. identify appropriate method for recycling and utilization of waste
3. propose alternative ways of waste handling.
4. propose a design of a bio gas unit suitable for farming/domestic needs.

Contents
Principles of waste utilization and disposal, equipment and machinery, urban waste, design of farms and processing plants for efficient waste collection, waste auditing, principles of recycling waste, inspection and regulation, Animal farm wastes, Manure; collection, transportation, treatment and storage, Farm livestock feed from farm waste, methane production, Waste from food processing plants;

cannery waste and vegetable processing waste, waste from sugar production, brewery waste, utilization of waste for animal feeds

Time Allocation

Total 20 hours of lectures; 20 hrs of practical and field visits; 2 hrs of assessment

Assessment

Continuous Evaluation	20 %
Practical	30 %
End semester theory paper	60 %

LAS 2272 Animal By-product Technology

Aims

1. To give basic understanding of the principles and the practices associated with the utilization of by-products arising from livestock and fish farms, abattoir and food processing plants.
2. To discuss further processing and value adding to livestock by products

Learning outcomes

Students should be able to;

1. identify appropriate method for utilization of by-products.
2. identify steps of leather processing and importance of the procedure for product quality
3. practice design a disposal system for given condition
4. propose methods of rendering of by products

Contents

By-products from dairy plants, from abattoirs and meat processing plants, offal, processing of bones, feather and hatchery by-products, hides and skins, curing, preservation and grading of hides and skins, leather and leather products, by-products from Aquatic species processing plants, Cannery by-products, chitin and chitosan, fish meal and fish protein concentrates, fish silage, gelatine and glue, use of shells.

Time Allocation

 20 hours of lecture   20 hrs of practical and visits; 2 hrs of assessment

Assessment

Continuous assessment	20 %
Practical	30 %
End semester theory paper	50 %

LAS 2282 Meat Science

Pre-requisite: (LAS-21a2) Micro-livestock Production & Management

Aims

1. To give basic knowledge on structure and composition of skeletal muscles and connective tissue.
2. To discuss post mortem changes affecting meat quality and processing characteristics.

3. To discuss strategies of improving product quality through management practices of the farm level.

Learning outcomes

Students should be able to;
1. evaluate market animals of beef, dairy-beef, sheep and swine for carcass merit.
2. evaluate of merits and selection of meat animals for breeding utilizing performance records.
3. describe factors affecting quality of meat
4. carryout meat inspection and interpret results
5. demonstrate awareness of indigenous knowledge related to meat

Contents

Introduction, Growth and body composition, carcass yield and composition, describing and predicting composition, slaughtering of farm animals, cuts of meat, composition & structure of muscle, colour & flavour of meat, Textural properties of meat, carcass quality and meat inspections, carcass grading, preservation of quality, processing and preparation of meat & meat products, Food regulations related to meat

Time Allocation

20 hrs of lectures, 20 hrs of practical and 2 hrs of assessment

Assessments

Continuous assessment	30 %
Practical examination (spot test)	20 %
End semester theory paper	50 %

LAS 2292 Animal Biotechnology

Aims
1. To give a understanding of principles of current methodologies utilized in biotechnology
2. To expose learners to the application of biotechnological skills
3. To give specific application to areas of animal science
4. To review and critique published scientific articles as well as statistically analyse data and write interpretive papers based on results gained from experiments.

Learning outcomes

Students should be able to;
1. demonstrate basics hands on skill of biotechnology
2. describe application of biotechnology in breeding of livestock, in animal nutrition, and applied feed technology.
3. use biotechnology and biometric statistical analysis for data interpretation.
4. demonstrate the skill of biotechnical application in farm level

Contents

Principles and techniques used in animal reproduction: Semen technology, Artificial insemination; Super-ovulation; Surgical and ultrasound guided oocyte

retrieval; In vitro maturation of oocytes; In vitro fertilization Intra-cytoplasmic spermatozoa injection; In vitro embryo culture; Embryo transfer; Transgenic animal technology. Principles and Techniques used in animal nutrition : Use of molecular techniques to study and manipulate rumen function; Reduction of Methanogenesis; Use of nuclear and colorimetric techniques for the estimation of rumen microbial supply; Use of nuclear and related techniques for predicting and improving the efficiency of feeding ruminants on tanniniferous tree foliage; Biodegradation of lignocellulosic materials, probiotics and prebiotics.

Time Allocation
20 hrs of lectures; 20 hrs of practical and tutorials; 2 hrs of assessment

Assessments
Mid semester examination	30 %
Practical	20 %
End semester theory paper	50 %

LAS 22a2 Dairy Product Quality Control & Processing

Pre-requisite: LAS 2213 Dairy and Beef Production & Management

Aims
1. To expose the learner to the testing of milk and dairy products
2. To give elements of the manufacture of various dairy products
3. To discuss various factors affecting milk and production quality
4. To expose learners to milk and product handling in dairy producers

Learning outcomes
Students should be able to;
1. carryout standard testing of milk and dairy products
2. discuss elements of the manufacture of various dairy products in relation to quality milk production on the farm
3. evaluate dairy products and propose improvements of quality.
4. carryout field survey, analyse data and propose ways to improve row milk
5. critically evaluate policy needs for dairy development

Contents
Anatomy of the mammary gland, Secretion of milk in ruminants, formation of milk components, significance of composition of milk of cattle buffalo and goat, factors affecting physical properties of milk including appearance, taste and flavour, manipulation of milk quality, microbes in raw milk, clean milk production strategies, adulteration testing, Reception of raw milk and pre-treatments (platform tests and storage, pre-treatment), cooling and keeping quality, Milk products; Principles and characteristics, Characteristics of milk and milk products, Heat treatments and processed liquid milk, Fermented milks, Cheese; Definition, principles and procedures, Butter and Ghee; traditional and industrial, Concentrated milk products, Cream, ice cream and flavoured milks, Milk and human health, Comparison of human and other milk, nutritive value of milk and milk products

Time Allocation

20 hrs of lectures; 20 hrs of practical and tutorials; 2 hrs of assessment

Assessment

Continuous assessment	20 %
Practical	30 %
End semester theory paper	50 %

LAS 22b2 Wildlife & Recreational Animal Management

Aims

1. To create interest in studies of other non-domestic animals
2. To discuss recreational uses and care of non-farm animals
3. To discuss conservational practices for different wild animals
4. To promote participation in conservational activities of environment

Learning outcomes

Students should be able to;

1. carryout investigations on non-food systems, and meet the challenges of recreational opportunities of animals.
2. describe methodology of conservation of important wild animals in Sri Lanka.
3. assess impact, engage in conservation of environment and take care of biodiversity and sustainability
4. evaluate conservational practices and assess their impact on animal conservation.
5. evaluate human-elephant conflict in the north-western province and suggest solutions.

Contents

Animal Biodiversity in Sri Lanka, Wildlife ordinance, farming for Agrotourism, ecotourism, Habitat conservation, backyard wildlife, biosphere and ecosystem endangered and threatened species, Invasive fauna, care of captive and pet animals, Management of Zoo animals, African and Asian Elephant, Body characteristics, Evolution, Varieties, Diet, Social behaviour, Reproduction, Motherhood and calf rearing, Usefulness to the environment, Humanity and Elephants, Domestication and use, Elephants in Culture, Man elephant conflict, Threat of extinction, National Parks and elephant reserves, Population dynamics and conservation.

Time Allocation:

25 hrs of lectures;   10 hrs of practical and visits; 2 hrs of assessment

Assessment

Continuous Evaluation	30 %
Practical (Oral examination)	10 %
End semester theory paper	60 %

LAS 3118 Research Project in Livestock & Avian Sciences

Aims

To apply research techniques and integrate knowledge in the identification, description, analysis and solving of problems within their specialization

Learning outcomes

Students should be able to,

1. identify and understand the problems in related fields.
2. state the hypothesis that needs to be tested.
3. write the objectives of the study.
4. select the appropriate methods to carryout the research project considering the available resources and to suggest alternative research approaches when facilities are limited.
5. design the experiment or study.
6. collect data in an accurate, methodological and honest manner.
7. present the results in a logical sequence and use figures, tables, etc. for clarity of the results.
8. select and apply correct statistical analytical tools.
9. interpret the findings scientifically.
10. cite references to build on the existing knowledge.
11. make logical suggestions, recommendations and conclusions in relation to observed results.
12. write an abstract to highlight major findings of the research.
13. prepare a dissertation based on the findings of the research/ research survey on the project which meets acceptable standards for scientific writing.
14. communicate to scientific audience the summery of the whole project during specified time duration in an easy and comprehensive manner.
15. defend research findings and the interpretations with confidence.

Contents

Students will select a project and develop and perform it under the supervision of a member of academic staff of the Department. Students are first required to search the literature relevant to their project and to plan their project work, including identifying the hypothesis to be tested. Students are expected to submit & present abstracts at the Undergraduate Research Symposium of the Faculty in conjunction with their academic supervisor.

Time Allocation

Throughout the semester

Assessment

Research Project Report	50 %
Oral presentation	20 %
Viva-voce examination	10 %
Student's profile	20 %

LAS 3214 In-plant Training

Aims

1. To give students an insight into the operation of a company/ organization/institute and the opportunity to relate their academic discipline to the workplace.
2. To make the student aware of the nature and purpose of the organization and how the department to which they are attached relates to the rest of the organization.

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3. To contribute to the development of the student by providing responsibility appropriately matching with their level of knowledge, experience, potential and degree of maturity.
4. To develop the students' personal skills as well as their scientific knowledge and technical competence.

Learning outcomes

Students should be able to;

1. recognize scientific and technical issues relevant to the company /organization and their products/service
2. build up the awareness about economic and commercial considerations within an organization, consumer food choice and approaches to consumer and market research, human resource management, finance and marketing management and business management.
3. demonstrate intellectual skills enabling to solve problems.
4. demonstrate practical skills.
5. identify quality assurance procedures in food processing.
6. perform economic analyses of food production systems, assist the management of food business and marketing of their products.
7. build own profile to the required standards of the Food industry
8. consider and manage career choices.

Contents

Students will be placed in an industrial or other relevant work environment for 10 weeks, and will be expected to make a significant contribution to a relevant project under the supervision of industrial and Departmental personnel. Students will be placed in a private sector industry, non-government organization or government institute. Students are obliged to actively participate in the work placement programme and to attend scheduled interviews. Students are required to prepare a final report on their placement, and make a presentation on their work.

Time Allocation

Ten weeks

Assessment

Training plan	05 %
General performance	10 %
Report on in-plant training	40 %
In-plant training Diary	20 %
Presentation	10 %
Viva-voce Examination	15 %

LAS 3222 Commercial Food Preparation & Service Management

Aims

1. To provide a basic understanding of the hospitality industry in relation to catering
2. To understand concepts of kitchen and menu planning, basic cookery and food service

Learning outcomes

Students should be able to;

1. explain the nature of the hospitality industry and catering
2. evaluate the trends and the influence of the food service
3. describe fundamentals and types of cooking
4. perform basic cooking procedures ensuring health and safety
5. planning of the kitchen and the menu
6. food purchasing skills
7. product development skills

Contents

Hospitality industry, products and services, types of catering, trends and influence, food and society, influence on ethnic cultures, kitchen planning, menu planning, production systems, food purchasing, storage and control, chemistry in the kitchen, cookery, cooking of foods, different food items, larder work, principals of frying, poaching, stewing, roasting, backing, grilling, barbecuing, different pastries and different bake products, microwave technology, microwave tips and tricks.

Time Allocation

Lecture hours-20hrs, Practical-20hrs

Assessment

Practical examination	75 %
Assignment	15 %
Simulations	10 %

LAS 3232 Extension Methodology

Aims

1. To expose the learner to basic concepts of extension
2. To provide opportunities for extension activities in the field level

Learning outcomes

Students should be able to;

1. give technical presentations, transfer knowledge, train and teach on a selected topic.
2. participate (80%) in outreach activities and open days of the faculty.

Contents

Extension methods and service, structure and the approaches of livestock extension, social groups and organization, leadership and social power, communication components and effectiveness, information technology needs for extension, effective communication for extension, publication of material for extension, conducting case study, survey and participatory appraisals, organization of outreach activities, activities of outreach centre.

Time allocation

10 hours of contact sessions and 10 hours self-study; 1.5 hrs of assessment

Assessment

Continuous evaluation	60 %
Presentation	40 %

9.2 Course Units Offered under Aquaculture and Fisheries (AQF)

AQF 1114 Aquatic Animal Biology & Aquaculture Principles

Aims

1. To provide a basic understanding of the biology of culturable organisms with respect to aquaculture.
2. To provide the basic principles in identification of main aquaculture production systems, site and species selection for aquaculture.
3. Interpretation of soil and water quality for aquaculture
4. To develop a basic understanding in culture based capture fisheries, sociological contribution of aquaculture.

Learning outcomes

Students should be able to;

1. re-state the global/regional/local status of aquaculture and future predictions.
2. describe the desirable characteristics of culturable aquatic faunal species.
3. distinguish biological characteristics of molluscs, crustaceans, and fish in relation to aquaculture.
   distinguish and describe aquaculture systems.

Contents

Global and regional trends, Biology of aquaculture organisms (crustaceans, molluscs and fish), Aquatic animal production systems, Site selection and assessment for aquaculture; Role of aquaculture in sustaining food security and livelihood; Properties and characteristics of aquatic food resources; Integrated farming systems; Sociological contributions; Aquaculture and environment, Resources enhancement and aquaculture, Ranching and fattening, Legal frame work.

Allocation of time

Lectures (45 hrs) /Self-studies/field visits (30 hrs)

Assessment

End semester structured essay examination   60 %
Quiz/assignments /presentations/Reports etc.   20 %
Continues assignments & Practical   20 %

AQF 1214 Marine & Brackish Water Fish Production

Aims

To describe different culture practices for selected marine and brackish water fish species.

Learning outcomes

Students should be able to;

1. identify suitable fish species for marine water, brackish water and marine environment.
2. describe good husbandry practices for selected marine and brackish water species.
3. Plan, design and manage an aquaculture farming system for selected species.
4. monitor and manage water quality for different culturable species

5. manage quality of products and ensure environmental sustainability.

Contents

Selection of suitable candidates for marine and brackish water aquaculture, Detailed site and environment assessment for selected marine and brackish water species, Development of culture technologies for *Chanos chanos*, *Etroplus suratensis*, *Mugil cephalus*, Mullets, *Lates calcarifer*, Siganids, crabs and lobsters and eel, Pond preparation and stocking, Water and soil quality requirements and evaluation for brackish and marine species, Feed management, Monitoring Growth and health, Product quality enhancement, Harvesting and marketing.

Allocation of time

Lectures 45 hrs; Field & practical work: 30 hrs

Assessment

Continuous assessments of practicals	20 %
Assessments, presentations	20 %
End semester exams	60 %

AQF 1414 Farming & Environment

Aims

1. To describe the major environmental systems in Sri Lanka, their value, current status and to highlight the impacts of farming systems on terrestrial, aquatic and arial habitats.
2. To provide a rationale for sustainable and efficient environmental practice based on an understanding of important scientific and ecological principles; the social, economic and political framework.
3. To provide an integrated framework for assessing environmental issues and a capacity to identify and respond to a range of critical environmental management and rehabilitation issues associated with farming.
4. To provide an understanding of the complex nature of most environmental issues.
5. To involve an interdisciplinary approach to environmental management and restoration issues and to provide an understanding that most environmental management and restoration issues involve a large number of stakeholders who are likely to have different values and needs.

Learning outcomes

Students should be able to;

1. identify major environmental systems of Sri Lanka and describe the biotic and abiotic factors that define their identity.
2. design appropriate methods to value environmental systems.
3. critically evaluate the current status of terrestrial, aquatic and arial environments and assess the impacts of different anthropogenic factors that lead to environmental degradation, specially farming and allied industries.
4. measure major pollutants and their indicators in soil, water and air
5. describe the current local and international regulations that are in place for environment impact mitigation, evaluation and monitoring and identify the relevant authorities.

6. appreciate the importance of sustainable and environmentally friendly farming systems and propose practical solutions to a given environmental problem based on an understanding of important scientific and ecological principles; the social, economic and political framework.

Contents

Natural and manmade components of the environment; Different environmental systems of Sri Lanka, Their biotic and abiotic characteristics, Current status and future concerns; Principles and importance of environmental valuation, Its uses and techniques; Major sources of pollution with special reference to food and agricultural sector, Major pollutants, methods of measure, their impacts, control and prevention of entry to terrestrial, aquatic and atmosphere; Effluent management techniques; Human health hazards and contaminants, Toxic substances and sediments, Acidification, Toxicological aspects of heavy metals, POPS and pesticide and weedicide residuals; Water eutrophication and its impacts; Invasive flora and fauna management; GM products; IEE, EIA, EPL procedures; Major national and international environmental legislatures, Treaties and implementation agencies; Catchments management concepts; Global warming and impacts of farming systems on global warming (PBL); Impacts of different farming systems on environment; Over exploitation of resources and its impacts, Methods and gear used to avoid capture of threatened species in fisheries; Social and economical concerns in environmental issues and appreciation of protecting the rights of all stake holders through viable environmental management.

Allocation of time

Lecture hours-35, Self-learning: 10hrs practical and field work: 30 hrs

Assessment

End semester structured essay exam	55 %
Practical reports	10 %
Problem based learning reports (01)	10 %
Case study poster and viva	25 %

AQF 2113 Freshwater Food Resources Management & Limnology

Aims

1. To provide knowledge on physico-chemical processes that affect the biological productivity of freshwater systems.
2. To provide knowledge on different freshwater aquaculture systems, culture organisms and culture techniques to enhance the productivity.
3. To provide knowledge on enhancing fish production in freshwater systems for sustainable utilization and management.
4. To provide knowledge on biotic components and biological productivity of freshwater systems.

Learning outcomes

Students should be able to;

1. describe physico-chemical factors that affect the food production in aquatic habitats.
2. identify species suitable for freshwater aquaculture and describe culture techniques.

3. design and evaluate methodologies to enhance the productivity of culture-based activities.
4. propose suitable management strategies to enhance food production in common property resources.

Contents

Classification of the fresh water environment; physical, chemical and biological parameters affecting biological productivity in freshwater environment; Different methods and techniques used to measure water quality parameters; Water quality management in freshwater aquaculture facilities; Different freshwater fish species used in fresh water aquaculture in Sri Lanka; *Oreochromis* spp., Major Chinese carps, Major Indian carps, Common carp and Indigenous food fish species and their culture techniques, Environmental management of different freshwater aquaculture facilities; Recreation and aquaculture based eco-tourism; Ponds, Cages, Pen culture, etc., Inland fisheries enhancement; Culture-based fisheries, Enhance capture fisheries, Identification of new inland fisheries resources, Management strategies for inland fishery resources; Enforcement, Co-management, Community based management and Participatory management strategies.

Allocation of time

30 hrs of lectures and 30 hours practicals

Assessment

Practical examination (end semester)	40 %
End semester examination.	60 %

AQF 2123 Crustacean & Molluscs Farming Systems

Aims

1. To provide knowledge on commercial production of selected crustacean and molluscs species.
2. To give hands on experience in analysis of water and soil quality in crustacean and molluscs culture environment.
3. To provide a sound understanding of feed management, water quality management, best management practices, and code of practices in crustacean and mollusc culture/post-harvest handling.
4. To contribute to the improvement of knowledge and technical competence in developing environmentally sound and socially responsible crustacean and molluscs culture systems.

Learning outcomes

Students should be able to;

1. describe and design different commercial crustacean and molluscs culture systems.
2. analyse and interpret physical, chemical and microbiological parameters.
3. apply procedures in feed management, water quality and sediment management in culture systems.
4. describe good management practices and code of practices in crustacean aquaculture.
5. assess environmental impacts & describe mitigatory measures.

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6. assess site suitability and prepare EIA reports for aquaculture projects.
7. develop environmental sound of sociality responsible crustacean and molluscs culture systems.

Contents

Culturable species of shrimps/prawns, molluscs and different culture systems, Soil quality management, Water quality management, Feed management, Recent advances in shrimps/prawns and molluscs culture, Aquaculture economics, Feed management , Code of practices and Environmental regulations, Traceability and eco-labelling in crustacean farming systems and Recent advances, Aquaculture business management, Post-harvest considerations and Marketing.

Allocation of time

30 hrs of lectures and 30 hours practicals

Assessment

End semester exams   60 %
Assignments, presentations   20 %
Continuous assessments of practical 20 %

AQF 2132 Seed Production & Seed Quality Management in Aquaculture

Aims

1. To provide an understanding of the basic principles of brood stock management, domestication, natural and artificial spawning in aquaculture.
2. To explain basic concepts in cryo-preservation, eye ablation and environmental manipulation in seed production.
3. To provide opportunities to familiarise hatchery & nursery operations.
4. To enable students to evaluate/manage seed quality.

Learning outcomes

Students should be able to;
1. use practical skills gained in hatchery and nursery operations.
2. evaluate principles in brood stock management & domestication, cryo-preservation and environmental manipulation.
3. demonstrate eye ablation hormonal induction and artificial fertilization.
4. evaluate seed quality of given samples.
5. demonstrate larval raring techniques.
6. describe technologies used in packing seeds & brood stock for transport.

Contents

Reproductive biology of selected fish, Crustaceans and Molluscs species, Brood stock selection and management, Domestication of brood stock, Maintenance of plankton cultures and live food organisms, Cryo-preservation, Hormone induction, Spawning, Artificial fertilization, Larval rearing techniques, Larval quality assessment, Fry and fingerling culture, Identification and prevention of common diseases in hatcheries.

Allocation of time

20 hrs of lectures and 20 hours practicals

Assessment

End semester exams	70 %
Mid semester exam	10 %
Continuous assessment	10 %
Assignments/Quizzes	10 %

AQF 2143 Culture of Ornamental Aquatic Fauna & Flora

Aims

1. To provide an understanding of the biology, breeding techniques, fry rearing, nursery management and culture techniques of exotic & native ornamental aquatic organisms.
2. Provide opportunities to familiarize ornamental fauna & flora farming practices.
3. Familiarize with aquatic plant propagation.

Learning outcomes

Students should be able to,

1. identify commercially important ornamental fishes and aquatic plants.
2. execute culture techniques of ornamental fish and aquatic plants.
3. demonstrate brood stock management and breeding techniques for common aquatic fish and other commercially important aquatic plants.
4. recognize the methods of propagation of aquatic plant species.
5. design and assess culture facilities for different ornamental fish and aquatic plants.

Contents

An overview of history, Present status of world ornamental fish industry and Present status of ornamental fish industry in Sri Lanka, Identification of exotic, indigenous and endemic fish species; Natural habitats, Environmental parameters and Conservation status, Culture techniques of different ornamental fish species; Water quality management, Feeding regimes and Behavioural changes, Brood stock management, Breeding techniques of ornamental fish species; Breeding of live bearers, Breeding of gold fish and carp species, Breeding of cichlids, Breeding of anabantids, Hatchery management, Management of nursery ponds and Marketing aspects, Designing ornamental fish farm, Calculating required facilities for ornamental fish farm, Calculation of required rearing facilities according to the groups of fishes; Live bearers, Egg layers, etc., Present status of the aquatic plant industry; Global and Local, Identification of exotic, indigenous and endemic ornamental plant species; Natural habitats, Environmental parameters and Conservation status, Marine aquatic organisms used for ornamental fish industry, Different propagation methods used in aquatic plant industry, Seeds and vegetative propagation techniques; Cuttings, Daughter plants, Uprooted plants and Tissue culture, Preparation of culture beds, Culture techniques, Sterilization of culture media, Fertilization and disease controlling, Different methods of marketing; Branches, Potted plants, Uprooted plants, etc., Packing materials and

Methods of packing, Preparation for exporting, Legislation in ornamental fish industry and aquatic plant industry in Sri Lanka.

Allocation of time
30 hrs of lectures and 30 hours practical

Assessment
End semester exam   70 %
Practical   30 %

AQF 2152 Oceanography & Marine Ecology

Aims
1. To describe the physical laws relevant to oceans and their dynamics.
2. To explain the chemical composition of oceans and its variations.
3. To introduce main ocean environments and examine the life-forms that inhabit them.

Learning outcomes
Students should be able to;
1. restate the main physical oceanographic features of and their variability.
2. evaluate the significance of main chemical features of the oceanic environments in relation to their biotic components and production.
3. critically analyse the impacts of oceanic environmental changes in relation to survival of humans and other living things.

Contents
Ocean geology , The origin of oceans and continents, Tectonics and The ocean floor, Ocean water; The properties of water, Chemistry of sea water, Temperature and Salinity, Light and Sound, Circulation and Climate, Ocean winds, Surface currents, Underwater circulation, Global water cycle, Oceans and climate; El – Niño and La Niño, ENSO, Hurricanes and Typhoons, Tsunami, Ocean waves and Tides, Ocean environments, Coasts and Seashore , Coasts and Sea level change, Coastal landscape, Beaches and Dunes, Salt marshes and Tidal flats, Integrated coastal management , Shallow seas, Continental shelves, Rocky bottoms, Sandy bottoms, Sea grass beds and Kelp forests, Coral reefs, Pelagic zones , The open ocean and Ocean floor zones of the open ocean, Thermoclines, The polar oceans, Ocean life, Life cycles and Energy flow , Planktons, Zonations , Sea mammals and Conservation

Allocation of time
20 hrs of lectures and 20 hours practical

Assessment
End semester examination (Theory)   50 %
End semester examination (Practical)   20 %
Field visits and reports   15 %
Tutorial   15 %

AQF 2162 Sea Weed & Edible Fresh Water Plant Culture

Aims
1. To provide the basic principles in identification of suitable site and assessing available markets for sea weeds.

2. To develop basic skills in site selection, site evaluation, culture propagation techniques for select sp. see weed species.

Learning Outcomes
Students should be able to;
1. assess the suitability sites for culture of different seaweed species in Sri Lanka.
2. describe different techniques for propagation of culture materials.
3. identify problems as metigatory measures in seaweed farming industry.
4. suggest appropriate techniques for production of suitable sp. see weed in Sri Lanka.

Contents
What are seaweeds, Characteristics of Sea weeds (Algae); Classification, Economic seaweeds; Species, Characteristics, Uses, Seaweed production in the world and Sri Lanka, importance of seaweeds, Seaweed culture, Selection of culture sites; Criteria for selecting inside bay sites, Criteria for selecting offshore sites, Criteria for selecting ponds as farm sites, Spore collection and Sporeling culture; Collecting spores and Culturing sporelings in the sea, Preparation of mature fronds of *Gracilaria*, Management of the mature fronds and collection of spores, Spraying of spore-filled water, The culture of sporelings, Seaweed cultivation methods; Scattering sporeling culture, Net culture in tidal zone, Raft culture in tidal region, Raft culture in shallow sea, Pond scattering culture, Pond construction, Planting in the ponds, Water management, The approach for increasing the seaweed yield; Cutting method, Increase the yield by fertilizing, Increasing the yield with growth hormone, Removing harmful organisms, Polyculture with shrimp and/or crab, Harvest and simple processing methods (Post harvest methods), Other edible flora culture, Utilization and conservation of the natural resources, Measures to conserve the natural resources.

Allocation of time
20 hrs of lectures and 20 hours practical

Assessment
Group presentation	15 %
Practical reports	15 %
Mid semester examination	10 %
Final practical examination	20 %
Final theory examination	40 %

AQF2214 Natural Aquatic Resources Management & Fishing Gear Technology

Aims
1. To explain basic ecological, economical, social and technical factors that influence on world fishery production.
2. To provide knowledge, skills and scientific technology for the assessment and evaluation of any given fish stock.
3. Provide opportunities to compare different managerial strategies used by different fisheries of the world.

Learning outcomes
Students should be able to;

1. identify the past, present and future status and the trends in world fishery production.
2. contrast the social, ecological and economical factors that influence on world fishery productions.
3. analyse the status of any given stock by proposing suitable managerial recommendations.
4. assess the effect of fisheries on fish stocks.
5. appropriate use of data sources, data collection and storage and critical data analysis.
6. problem solving/thinking skills in management of fisheries.
7. effective use of field study techniques and methods.
8. use of computer technology and modelling.
9. cooperatively working with different ethical and social groups specially during data gathering process.

Contents

Marine fisheries ecology; Introduction to fisheries of the world, Pattern of exploitation, Management of fisheries, Marine ecology and production process; Primary production, Fishery production, Effect of population structures on production processes, Fishing and fishers; Fishing methods and techniques, Effects of fishing, Fishing gear construction and operations, Single species stock assessment; Multi-species assessment and ecosystem modelling, Stock identification and dynamics; Management and conservation options; Bio-socio economic factors in fisheries.

Time Allocation

45 hours of contact hours, 06 hours of self-study & 06 hours of tutorials

Assessment

Group presentations	15 %
Practical reports	15 %
Mid semester examinations	10 %
Final practical examination	20 %
Final theory examination	40 %

AQF 2223 Aquaculture Engineering

Aims
1. To provide an understanding on site suitability water resources and soil properties for aquaculture.
2. To provide knowledge on selection of equipment material and facilities for aquaculture systems.
3. To provide basic principles in design and construction of hatcheries & farms.

Learning outcomes

Students should be able to,
1. identify sites for construction of hatcheries ponds, pens and cages.
2. evaluate soils for aquaculture.
3. design ponds, pens, cages for grow out & nurseries.

4. develop treatment/tilter systems for aquaculture facilities.
5. identify/ select equipment and materials for aquaculture systems.

Contents

Introduction to different aquaculture systems; Land based and water based system, Site selection criteria for construction of aquaculture system; Soil properties, Water properties, Climatic properties and Social factors , Soil sampling method; Open pit method, Auger bouring, Thin wall tube; Soil colour and its properties, Test methods to evaluate soil texture at field; Chemical properties of soil and avoiding adverse soil types; Soil pH, Measuring soil pH, Soil density; Dry density and Saturated density; Permeability; Site evaluation giving special preference to tidal fluctuations; Designing of aquaculture systems, Hatcheries, Dike preparation based on tidal levels, Sluice gate designing; Elementary hydraulics; Pumps and pumping systems; Oxygenation; Water based culture methods and site selection; Construction of water based culture systems (cage culture and pen culture); Environmental impact of water based culture methods.

Time Allocation

10 hours of contact hours; 03 hours of self-study & 02 hours tutorials

Assessment

Group presentation	15 %
Practical reports	15 %
Mid semester examination	10 %
Final practical examination	20 %
Final theory examination	40 %

AQF 2232 Aquatic Pathobiology & Health Management

Aims

1. To provide knowledge on good husbandry, control and prevention of disease in aquaculture.
2. To provide an understanding of concepts in histology, pathology, microbiology and parasitology in relation to diseases of Aquatic organisms.
3. To provide scientific knowledge on quarantine techniques, spread of disease infections and non-infections diseases.
4. Diagnosis, control & prevention, sampling for disease diagnosis.

Learning outcomes

Students should be able to;
1. identify common pathogens in aquaculture systems.
2. describe symptoms of various diseases and identification.
3. discuss the importance of good husbandry practices in preventing and control of diseases.
4. describe the concepts of histology, pathology, microbiology & parasitology in relation to disease out breaks.
5. treat common diseases in fish, molluscs and crustacean culture systems.
6. identify diseases agents and evaluate their effects to the host.
7. apply methods on disease diagnosis, prevention & control

Contents

Occurrence and spread of disease in aquatic systems; Infections and non - infectious disease, Their characteristics and Identification in molluscs, crustaceans, fish culture systems and among ornamental fishes; Common pathogens and diseases in molluscs, crustaceans, fish culture systems and ornamental fishes; Disease prevention and control; Quarantine procedures, Legislation, Legal frame work; Histology, Histopathology in relation to disease diagnosis; Sampling and sample preparation for disease diagnosis; GMP's in disease control.

Time Allocation

Direct contact hours 25h, Self-learning: 5h Practical and field work: 30 h

Assessment

End semester structured essay exam	60 %
Practical reports	20 %
Problem based learning reports (01)	10 %
Case study poster and viva	10 %

AQF 2243 Postharvest Management of Bio aquatic Resources

Aims
1. To provide knowledge on environmental considerations in sustainable production of aquatic resources to minimize post-harvest losses.
2. To provide knowledge on the scientific background, principles, technologies and applications involved in different bio aquatic resources handling, processing, extraction and preservation methods.
3. To provide knowledge on a farm and handling practices to increase the environmental sustainability.

Learning outcomes

Students should be able to;
1. process some selected fisheries/aquaculture products and evaluate their quality.
2. identify appropriate technologies for on board handling and preservation of fishery products.
3. identify appropriate technologies for preservation, quality management, packaging and transport of raw fishery and aquaculture products.
4. describe and practice appropriate technologies for managing discharged effluents from processing factories and monitoring of effluents.
5. identify causes of spoilage and quality deterioration of fishery products.
6. describe production procedures to minimize adverse environmental impacts on post-harvest losses and to ensure the product quality.
7. describe production procedures to minimize adverse environmental impacts on post-harvest losses and to ensure the product quality.

Contents

Influence of fishing practices on post mortem changes, Fish quality and fishery products, Handling of fish in landing sites and management of fishery harbours, Onboard handling of fish and management of fish along the handling chain, Extraction of animal aquatic resources, Effluents from farms, hatcheries and

fishery harbors, Effluent management, HACCP in farms and hatcheries, Traceability, Ecolabelling, LCA, Environmental Code of practices in fisheries and aquaculture, Post-harvest losses and reduction of post-harvest losses.

Time Allocation
Contact hours: 25h, Self-learning: 10h, Practical and field work: 30h

Assessment
End semester exam	65 %
Mid semester exam	10 %
Product development	15 %
Viva	10 %

AQF 2252 Current Topics in Fisheries & Aquaculture

Aims
1. To develop the interest in investigating current scientific topics in food production field.
2. To develop the ability of accessing and extracting the required information from any given source in an effective manner.

Learning outcomes
Students should be able to,
1. identify suitable information sources with respect to the different disciplines.
2. extract the main core content from an article, journal paper, etc.
3. integrate different information

Contents
Current issues related to the discipline will be discussed.

Time Allocation
Contact hours 20h, Self-study 7h, Tutorials 2h

Assessment
Individual reports	25 %
Group presentation	15 %
Poster presentations	15 %
Debates	45 %

AQF 2262 Ecotoxicology

Aims
1. To define the relationships and connections between ecotoxicology and other biological and environmental sciences; terminology of toxicology and ecology; retrospective and prospective ecotoxicology.
2. To provide an overview of environmentally-relevant properties of chemical compounds (basic and specific descriptors - partition coefficients, sorption constants, lipophilicity); introduction to principles of study of the fate of chemicals in the environment.

3. To explain the biochemical and molecular modes of toxic action; mutagenicity, genotoxicity and their parameterization; derivation and interpretation of ECx, LCx, LO (A) EL, NO (A) EL values.
4. To enable the student to describe the effects of individual chemicals, mixtures and complex samples; industrial and urban pollution; basic characteristics of major classes of dominant pollutants, their sources, fate and effects.
5. To provide an overview of mathematical models for the transport and fate of chemicals in the environment and in food chains; risk assessment - basic concepts and management.

Learning outcomes
Students should be able to;
1. describe the relationship of ecotoxicology to the life sciences.
2. analyse the fate of chemicals in the environment; biotic transformations, biodegradation and metabolism of xenobiotics; the specificities of aquatic and terrestrial ecosystems.
3. describe the biochemical and molecular modes of toxic action of selected compounds; lethal and sub lethal ecotoxicological endpoints.
4. select appropriate testing systems according to the sample type and derive the ECx, LCx, LO(A)EL, NO(A)EL values in order to interpret results of ecotoxicological bioassays, chemical analyses and ecological data from biomonitoring.

Contents
History and current structure of ecotoxicology, Toxicology; Nutritional and Xenobiotic chemicals, Biochemistry of toxic chemicals, Physiology and toxicology, Ecotoxicological genetics, Most important groups of toxic chemicals, Chemical compounds in ecosystems, Effects of chemical stressors on ecosystems and on organisms, Acute and chronic toxicity vs. genotoxicity vs. carcinogenicity**,** Biomarkers , Hierarchy of the biological systems, Effects at subcellular and cellular levels ; Biochemical and molecular modes of toxic action**,** Properties, structure and functions of ecosystems ; Stress in communities and ecosystems ; Spatial and temporal changes ; Experimental approaches : laboratory testing vs. *in situ* studies; Biomonitoring **,** Methods and experiments of different complexities in ecotoxicology; **L**aboratory biotests and ecological studies ; *In situ* study methods**,** Major classes of important contaminants; Individual chemicals vs. mixtures and complex samples, Toxicological development of new antifouling agents, Marine Paint**,** Applications of predictive ecotoxicology; Principles and characteristics of structure-activity relationship modelling (QSAR) ; Mathematical models for fate and transport of chemicals in the environment and in food chains, Risk assessment : basic concepts and realization ; Hazard vs. risk**;** Statistics for ecotoxicologists (specificity of toxicological and ecotoxicological data analysis), Specialized statistical methods; Life tables and survival analysis, Logistic and Probit analysis.

Time Allocation
Theory 20 hrs, Practical 20 hrs

Assessments
End semester structured essay test   55 %

Mid semester MCQ test	15 %
Tutorials	10 %
Practical reports	10 %
Poster	10 %

AQF 2272 Fish Biotechnology

Aims

1. To give understanding of principles of current methodologies utilized in biotechnology
2. To expose learners to application of biotechnological skills
3. To give the specific application to areas of fish science
4. To review and critique published scientific articles as well as statistically analyze data and write interpretive papers based on results gained from experiments.

Learning outcomes

Students should be able to;

1. demonstrate basic hands on skill of fish biotechnology
2. describe application of biotechnology in breeding of fish, in fish nutrition, and applied feed technology
3. use biotechnology and biometric statistical analysis for data interpretation.
4. demonstrate the skill of biotechnical application in farm level

Content

Principles and techniques used in animal reproduction; Cryopreservation, Principle of gene transfer; Methods used in gene transfer, Microinjection, Electroporation, Sperm mediated gene transfer, Lipofection, Retroviral infection, Generation and identification of transgenic fish; Trans gene construction, Egg collection and embryoculture, Screening, Identification of gene expression, Superovulation, In vitro fertilization, Intra-cytoplasmic spermatozoa injection, In vitro embryo culture, Embryo transfer, Transgenic animal technology, PCR technology and other biochemical tests.

Time Allocation

20 hrs of lectures; 20 hrs of practical and tutorial; 2 hrs of assessment

Assessment

Mid semester examination	30 %
Practical	20 %
End semester theory paper	50 %

AQF 2282 Remote Sensing & Geographical Information System

Aims

1. To give knowledge about Geographical information system (GIS) and satellite remote sensing (RS) as a tool for manipulating geographically distributed data in enhancing food production.
2. To provide opportunities to familiarize application of GIS and RS in decision making at planning and managing the food production systems.

3. To introduce common software and instruments used in GIS and RS.

Learning outcomes
Students should be able to,
1. describe the principal concepts in GIS and RS.
2. demonstrate the use of given software and equipment to collect and manipulate data under given conditions.
3. prepare maps to visualize geographically distributed information.
4. asses / plan a given food production system using GIS and RS as a tool.

Contents
Introduction to geographic information systems, Maps and GIS (map scale, classes of maps, Coordinate systems and transformation, Map projection, georeferencing), Use of Global Positioning System (GPS) to collect data/information. (Use of GPS to collect data in a particular location, mapping area and gather geographically distributed information such as altitude, etc.), Data manipulation using GIS (vector and raster based data processing, visualization of geographic information and generation of information), Introduction to remote sensing. (Introduction to digital image processing of remotely sensed data, remote sensing data acquisition), Image enhancement, Image classification, Extraction of information from images, Use of common software in GIS and RS (Arc GIS).

Time Allocation
20 hours of lectures; 20 hrs of practical and tutorials

Assessments
Poster	20 %
Case studies	20 %
End semester examination	60 %

AQF 3118 Research Project in Aquaculture & Fisheries

Aims
To apply research techniques and integrate knowledge in the identification, description, analysis and solving of problems within their specialization.

Learning outcomes
Students should be able to,
1. identify and understand the problems in related fields.
2. state the hypothesis that needs to be tested.
3. write the objectives of the study.
4. select the appropriate methods to carryout the research project considering the available resources and to suggest alternative research approaches when facilities are limited.
5. design the experiment or study.
6. collect data in an accurate, methodological and honest manner.
7. present the results in a logical sequence and use figures, tables, etc. for clarity of the results.
8. select and apply correct statistical analytical tools.
9. interpret the findings scientifically.
10. cite references to build on the existing knowledge.

11. make logical suggestions, recommendations and conclusions in relation to observed results.
12. write an abstract to highlight major findings of the research.
13. prepare a dissertation based on the findings of the research/ research survey on the project which meets acceptable standards for scientific writing.
14. communicate to scientific audience the summery of the whole project during a specified time duration in an easy and comprehensive manner.
15. defend research findings and the interpretations with confidence.

Contents
Students will select a project and develop and perform it under the supervision of a member of academic staff of the Department. Students are first required to search the literature relevant to their project and to plan their project work, including identifying the hypothesis to be tested. Students are expected to submit & present abstracts at the Undergraduate Research Symposium of the Faculty in conjunction with their academic supervisor.

Time Allocation
Throughout the semester

Assessment
Research Project Report	50 %
Oral presentation	20 %
Viva-voce examination	10 %
Student's profile	20 %

AQF 3214 In-plant Training

Aims
1. To give students an insight into the operation of a company/ organization/institute and the opportunity to relate their academic discipline to the workplace.
2. To make the student aware of the nature and purpose of the organization and how the department to which they are attached relates to the rest of the organization.
3. To contribute to the development of students by providing responsibility appropriately matching with their level of knowledge, experience, potential and degree of maturity.
4. To develop the student's personal skills as well as their scientific knowledge and technical competence.

Learning outcomes
Students should be able to;
1. recognize scientific and technical issues relevant to the company/organization and their products/ service
2. build up the awareness about economic and commercial considerations within an organization, consumer food choice and approaches to consumer and market research, human resource management, finance and marketing management and business management.
3. demonstrate intellectual skills enabling to solve problems.

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4. demonstrate practical skills.
5. identify quality assurance procedures in food processing.
6. perform economic analyses of food production systems, assist the management of food business and marketing of their products.
7. build own profile to the required standards of the Food industry
8. consider and manage career choices.

Contents

Students will be placed in an industrial or other relevant work environment for 10 weeks, and will be expected to make a significant contribution to a relevant project under the supervision of industrial and Departmental personnel. Students will be placed in a private sector industry, non-government organization or government institute. Students are obliged to actively participate in the work placement programme and to attend scheduled interviews. Students are required to prepare a final report on their placement, and make a presentation on their work.

Time Allocation

Ten weeks

Assessment

Training plan	05 %
General performance	10 %
Report on in-plant training	40 %
In-plant training Diary	20 %
Presentation	10 %
Viva-voce Examination	15 %

9.3 Course Units Offered under Food Science and Technology (FST)

FST 1113 Chemistry I

Aims

1. To provide the knowledge of basic principles and concepts of chemistry as required for understanding, interpreting and explaining chemistry related to food science & technology and nutrition.
2. To improve the ability to carry out chemistry related calculations.

Learning outcomes

Students should be able to;

1. describe the basic principles and concepts in physical and analytical chemistry.
2. apply the acquired knowledge of chemistry (underlying topics) and analyse, interpret and explain problems, observations and phenomena occur in the context.
3. record data of measurements with correct units and uncertainties, and present final calculated numerical answers in a correct manner.

Contents

Introduction to matter; uncertainties in measurement & significant figures; yield of chemical reactions; acids, bases & buffers; theory of titrations; basics in coordination chemistry; ions in solutions; basics in electrochemistry; molecular interactions; theory of colligative properties; interaction of matter with electromagnetic radiation; basics in gravimetry & precipitation gravimetry.

Contact hours

Lectures (37 h), Tutorials (8 h)

Assessment

Tutorials/Quizzes	10 %
Mid semester Examination - Theory	20 %
End Semester Examination - Theory	70 %

FST 1121 Laboratory Course in Chemistry

Aims

1. To provide opportunity to apply theories taught in the class room and to text their validity.
2. To enhance the skills in applications of chemistry required for understanding processes in Food Science & Technology.
3. To provide methods of carrying out basic laboratory and analytical chemistry procedures related.
4. To give hands-on experience and make familiarize with basic laboratory apparatus, equipment & chemicals and with safety practices in chemistry laboratories.
5. To improve recording or writing of laboratory reports.

Learning outcomes

Students should be able to;

1. perform experiments and carryout calculations with confidence by applying the theoretical knowledge.
2. construct the conclusions based on observations.
3. propose mechanisms to explain observations/changes occur in chemical experiments.
4. recognize appropriate method of analysis upon a given sample.
5. write lab reports and present data in proper manner.

Contents

This course unit consists of a series of laboratory practical related to the course contents of FST 1113.

Contact hours

Laboratory practical 30 h

Assessment

Continuous assessment of lab work   25 %
End Semester Examination – Practical   75 %

FST 1314 Microbiology

Aim

To provide basic knowledge on microbiology in order to understand its importance to the food industry and to familiarize with microorganisms of different sources, classification, techniques of culturing, control and growth requirements of microorganisms.

Learning outcomes

Students should be able to;

1. distinguish between different microorganisms using classification and growth requirements
2. recognize the methods of identification and means of control of microorganisms to ensure quality of food.
3. design appropriate approaches to develop the usage of microorganisms at industrial level and improve the existing methods in order to enhance the quality of outputs.
4. carry out the basic microbiological techniques ensuring safety and confidence

Contents

Theory: Introduction to microbiology- Scope and history of microbiology; characterization and classification of microorganisms; microscopic examination of microorganisms- eukaryotes and prokaryotes, morphology and fine structure of bacteria; cultivation of bacteria, pure culture techniques; theory and practice of sterilization, physical and chemical agents for control of bacteria; principles of microbial nutrition, construction of culture media, selective media; microbial metabolism, energy production- utilization of energy and biosynthesis; isolation and identification of bacteria; microbial growth; microbiology of domestic and waste water; spoilage of food; methods of identification and control of microorganisms; importance of microorganisms at industrial level.

Practical: Examination of living microorganisms in natural environment; microscopic examination of bacteria; simple staining; Gram staining; sterilization techniques; effectiveness of the sterilization techniques; isolation of bacteria; effect of antimicrobial agents on microorganism; quantitative estimation of number of viable cells in a milk sample – Serial dilution; quantitative estimation of cell number using haemocytometer.

Contact hours
Lectures 40 h, Tutorial 5 h, Laboratory 30 h

Assessment
Theory: Quizzes, assignments   25 %
End Semester Examination – Theory   75 %
Practical: Examination   85 %
Lab reports   15 %
Students have to pass both theory and practical components

FST 1324 Principles of Food Science

Aim
To provide the knowledge on fundamental concepts on the behaviour of food constituents and food preservation technologies to enable the student to understand the advanced theories and applications in respective subject areas.

Learning outcomes
Students should be able to;
1. describe the role of food constituents in food systems.
2. discus the importance of the physical, chemical, biochemical reactions of food constituents to the quality of food.
3. differentiate between the principles of food preservation methods.
4. explain the importance of food safety and quality control in food industry.
5. apply the qualitative and quantitative tests for analysis of food constituents.

Contents
Theory: Physical, chemical and functional properties of food constituents: water, carbohydrates, proteins, lipids, enzymes, vitamins, minerals, flavours, colorants and additives; theory behind the analysis of food constituents; moisture, ash, carbohydrates, proteins, lipids, enzymes, vitamins and minerals; food deterioration, and principles of food preservation: Types and causes of food deterioration, unit operations of food processing, high temperature, low temperature, drying and dehydration, evaporation, fermentation, enzyme technologies and irradiation; fundamentals of food safety and quality control in food industry.

Practical: Review on identification methods of major food constituents; determination of moisture and ash content in food; estimation of glucose in a sugar solution; determination of crude protein, crude fat and crude fiber content in food; determination of titratable acidity in fruit juice/milk; determination of saponification value and acid value of fat; determination of alanine content in

food; determination of salt content in dried fish; determination of vitamin C content in fruits; measurement of specific gravity of milk; measurement of brix value in fruit juice concentrates; study on enzymatic browning reaction in fruits and vegetables; evaluation of freshness of milk using methylene blue dye reduction test.

Contact hours
Lectures 45 h, Laboratory 30 h

Assessment
Continuous assessment (Theory)	15 %
End semester examination (Theory)	60 %
Continuous assessment (Practical)	05 %
End semester examination (Practical)	20 %

FST 1414 Food Analysis & Quality Assurance

Aims
1. To offer the knowledge of analysis and quality assurance required to meet the standards as applied to maintain the quality of food.
2. To offer the opportunity to enhance the skills of designing analytical approach to solve problems related to food quality.
3. To provide hands-on experience to apply the procedures of food analysis in real context.

Learning outcomes
Students should be able to;
1. describe quality assurance procedures applied in food industry.
2. use the practical skills gained in respect of food analysis.
3. apply food standards and regulations to assure the quality of food.
4. select an appropriate method to analyse a food sample for a given quality control parameter.
5. design an analytical approach to solve a given problem related to food quality.

Contents

Theory: Analytical approach to solving problems; evaluating analytical data; selecting methods; developing procedures; quality assurance; standards and regulations; molecular and atomic absorption spectroscopic methods; molecular and atomic emission spectroscopic methods; chromatography and electrophoresis; microbial hazards; food additives, adulterants, contaminants.

Practical: determination of phosphorous content of a fish sample by UV/Visible spectrophotometry; determination of sodium ion content of a fish sample by flame photometry; determination of potassium ion content of a sample by flame photometry; determination of iodine content of a sample by titrametric analysis; determination of sodium metabisulphite content in a food Sample; determination of nitrite content of a sausage sample by spectrophotometry; determination of reducing sugar content of coconut water sample by UV/Visible spectrophotometry; identification of adulterants in food by microscopy; chromatographic separation of food colorants; determination of ethanol percentage in a mixture

Contact hours
Lectures 50 h, Laboratory work 20 h

Assessment

Continuous assessment (practical)	05 %
End semester examination (practical)	15 %
Tutorials /quizzes	10 %
Mid semester examination (Theory)	10 %
End semester examination (Theory)	60 %

FST 1424 Food Processing & Preservation Technology

Aims
To provide the knowledge on principles, technologies, and applications involved in different food processing and preservation methods in order to develop high quality processed foods.

Learning outcomes
Students should be able to;

1. describe preservation in terms of the retardation or prevention of deteriorative changes in the desirable properties of the food
2. recognize the principles & technologies applied in the industrial scale food preservation operations
3. identify the appropriate technology to preserve different types of raw products under the existing facilities.
4. process some selected food products and evaluate their quality and efficiency of the preservation treatment/s applied.

Contents
Theory: Types of food deterioration and losses; introduction to food preservation; different method of food preservation with respect to their principle, unit operation, machinery and equipment, impact on nutritional & sensory qualities of food and their applicability in different groups of foods: chemical preservation, fermentation, thermal processing, low and high temperature preservation, dehydration, osmotic dehydration, membrane concentration, evaporation, smoking, food irradiation, microwave heating.

Practical: Identification of different food ingredients, their chemical properties and use in the food industry; food preservation through fermentation; use of dehydration as a preservation method; measuring the effectiveness of dehydration process; osmotic dehydration of fruits and vegetables; production of osmotically preserved fruit and vegetable chunks; production of different processed products.

Contact hours
Lectures 45 h, Laboratory 30 h

Assessment

End Semester Examination - Theory	60 %
End Semester Examination – Practical	15 %
Continuous Assessment - Theory	15 %
Continuous assessment – Practical	10 %

FST 2222 Food Packaging

Aims
1. To provide knowledge on use and evaluation of food packaging materials
2. To provide knowledge on methods to design an appropriate packaging system for particular food product.

Learning outcomes
Students should be able to;
1. explain physical and chemical properties of packaging materials.
2. evaluate packaging materials and methods in relation to their applicability in foods.
3. compare the usability of traditional vs synthetic packaging materials /methods.
4. propose novel packaging systems to selected food items.

Contents
Introduction to packaging; importance of packaging in food industry; packaging materials: flexible, metal, paper, glass; properties of packaging material; methods of packaging in food industry; modern packaging systems; packaging of fresh, processed and preserved products; traditional packaging materials and development of traditional packaging materials.

Contact hours
Lectures and Tutorial   25 h, Presentations/Assignments /Field Visits 10 h

Assessment
End semester examination   75 %
Practical examination, Assignment/learning activity, Presentation   25 %

FST 2242 Food Safety & Quality Management

Aim
To provide necessary knowledge on concept and regulations on food quality management required to produce wholesome food

Learning outcomes
Students should be able to;
1. aware of the food laws, regulations & food standards used in food industry.
2. elucidate the quality tools and management techniques used in food industry.
3. propose suitable layout of a factory with due consideration to the factory sanitation, waste disposal and utilization.

Contents
Food safety: safe foods vs. hazardous foods, public health, food borne illnesses, laws & regulations related to food safety; Food regulatory systems (ISO 22000, HACCP), food labelling regulations, food inspection, good safety practices; basic concepts of quality: Total Quality Management (TQM), Japanese tools in productivity improvement (5-S concept), Sri Lanka National Quality policy;

Organization for Quality: Quality organization, Leadership for Quality, vendor relations, customer relations; management techniques in quality: new seven tools in quality management; System approach for Quality: ISO 9000:2000, EMS, Six sigma; Factory design: lay out of factory, design and construction of food facilities, regulatory requirements; Factory sanitation: contamination sources, personnel hygiene and sanitary handling, cleaning compounds and equipments, plant sanitation; waste disposal & utilization: treatment and storage of food waste, principles of disposal and handling of waste.

Contact hours
Lectures and tutorials 25 h, Assignments / field visits 10 h

Assessment
End semester examination   75 %
Quizzes, assignment, student activities   25 %

FST 2253 Fish, Meat & Egg Products Technology

Aims
1. To provide knowledge on technologies of processing, and quality control of meat, fish & egg required to produce variety of products.
2. To provide practical experience in processing of selected meat and fish products.

Learning outcomes
Students will be able to;
1. describe the chemical and functional properties of eggs.
2. record the common types of microorganisms associated with eggs, meat, fish and their products.
3. discuss the quality of meat and fish with respect to ante-mortem and post-mortem handling practices.
4. demonstrate the processing of selected meat and fish products.
5. compare the effectiveness of processing and preservation techniques applied in selected products.

Contents
Post-mortem changes and quality deterioration; chemical, Microbiological and physical methods of quality evaluation, Wet fish handling and preparation; chilling and freezing of fish, traditional preservation techniques, fermented fish products, minced fish products and value addition, fish by-products, processing of some commercially important aquatic products, toxins and contaminants in fish and shellfish; composition and nutritional value of meat, slaughtering of animals, muscle structure and composition, post mortem changes, quality of meat, processing of meat products: smoking, curing, fermentation, dehydration, packaging and storage, microbiology of meat, safety of meat and meat products; composition and functional properties of eggs, quality of eggs, storage of eggs, processing of eggs.

Contact hours
Lectures 35 hrs; Practical - laboratory 10 h, field visits: 15 h

Assessment

Assignments/Quizzes/Presentations   15 %
End semester examination (Theory)   65 %
End semester examination (Practical)   10 %

FST 2281 Indigenous Food Technology

Aims
1. To provide knowledge on principles and technologies applied in preparation of selected indigenous foods in Sri Lanka
2. To provide hands on experience related to processing of selected indigenous food products

Learning outcomes
Students should be able to;
1. find out traditional foods inherent to different areas in Sri Lanka.
2. explain the functionality of different ingredients used in selected indigenous food.
3. describe the significance of the processing steps.
4. design technologies to commercialize the traditional foods.

Contents
Introduction to indigenous foods; processing techniques behind indigenous food production and conservation of technology for future; nutritional aspects and health benefits associated with indigenous foods; develop technologies for commercialization of indigenous foods in the local/international market.

Contact hours
Lectures 10 h, Laboratory practical and field visits 10 h

Assessment

Assignment   20 %
Student report   60 %
Presentation   20 %

9.4 Course Units Offered under Applied Nutrition (NTN)

NTN 1232 Fundamentals of Human Nutrition

Aims

The general principles of nutrition will be described with particular emphasis on digestion, absorption, metabolism and function of nutrients.

Learning outcomes

Students should be able to;

1. describe the role of nutrients in the body.
2. be aware of the importance of the provision of optimal energy and nutrient intake to ensure good health and excellence in quality of life.
3. list compositional differences between and within food groups.
4. summarise how nutritional requirements vary throughout the lifecycle;
5. outline the scope of the main dietary recommendations and dietary guidelines and provide examples

Contents

Energy metabolism; measurement of energy expenditure; energy balance. Composition, requirements and metabolic aspects of carbohydrates and lipids; amino acids and protein requirements of humans; biological value of protein. Digestion and absorption of carbohydrates, lipids and proteins. Nutritional properties of vitamins. Recommended dietary allowances and dietary guidelines.

Allocation of time

Lectures: 25 hours; Tutorials 10 hrs

Assessments

Continuous assessment   20 %
End Semester Examination   80 %

9.5 Course Units Offered under Faculty of Livestock, Fisheries and Nutrition (LFN)

LFN 1120 Mathematics & Computing

Aims

To familiarise the students with the basic concepts, theories and principles in mathematics and apply them successfully in their discipline.

Learning outcomes

Students should be able to;
1. plot a graph and extract relevant information.
2. define a set and perform relevant operations.
3. use matrices as a convenient structure for linear equations and inequalities.
4. demonstrate the knowledge of calculus.
5. derive derivatives of basic algebraic and trigonometric functions.
6. find integral of algebraic and trigonometric functions.
7. apply the mathematical skills in real situations.

Contents

Analytical geometry - distance between two points in a plane, slope of a straight line, equation of a straight line, point intersection of two lines; Sets, relations and functions - basic concepts, sub sets, operations on sets and applications, Cartesian product of a two sets, Relations properties of relations, functions and graphs; Differential calculus - idea of limit and continuity, differential coefficient, average concept and marginal concept, the techniques of differentiation, rules of differentiation, higher order derivatives, geometric meaning of "dy/dx", increase and decreasing functions, criteria for maxima and minima, applications of derivatives; Integration - rules of integration, definite integral, meaning of a definite integral, applications; Matrices - basic concepts, addition of a matrices, scalar multiplication, multiplication of matrix, inverse of a matrix, solutions for a system of linear equations.

Contact hours

Lectures 20 h, Tutorials 20 h

Assessment

Mid semester test   20 %
End semester examination   80 %

LFN 1130 Introduction to Information Technology

Course Overview

Computer technology is becoming more and more pervasive in our lives as computers become cheaper and more powerful. Hence the knowledge of computer applications is an essential skill for anybody in any discipline and further it will help to ensure their job security. This course facilitates the IT necessary for undergraduates to meet the challenges in rapidly developing IT and communication system in their relevant field of study.

Aims
1. To enhance basic computer skills
2. To provide the proficiency in computer office applications

3. To improve the knowledge of on line communication and information searching through the web.
4. To encourage self-learning through Learning Management System (LMS) and online resources
5. Enhance the career prospects and employability of the undergraduates.

Learning outcomes

On successful completion of this course students should be able to:

1. identify the structure of a computer and computer related items
2. handle the basic operations in a computer
3. do word processing and produce documents for course work submission
4. prepare tables, manipulate data and produce graphs using spreadsheets
5. prepare visuals/slides for graphical presentations using PowerPoint
6. prepare a simple database and manage records
7. use internet & email for communication
8. use internet based databases to search scientific information
9. use LMS for self-learning & assignments
10. use e-resources (CD/DVD ROMs, Flash Drives, LMS) to retrieve information
11. show ability to select the appropriate computer program from the job in hand

Contents

Module 1 – Understand basic concepts of Information Technology: Define IT/ICT, General Concepts, Hardware, Software, Information Network, IT in society, Health, Safety & Environment and Livestock, Fisheries & Nutrition areas, copyright & Laws

Module 2 - Use the Computer & Manage file: computer Environment, The Desktop, Operating System, File & folder handling, Print Management, Computer maintenance and Management.

Module 3 – Word Processing using MS Word: Getting started with Word; formatting a document: page setup, margins, layout, tab settings, paragraph setting, bullets & numbering, borders & shading, change case; Styles & formatting, Reveal formatting; Insert symbols, pictures and Clip Art's Create Tables and Lists; Edit Headers and Footers; Check spelling, Grammar & Word Count, Auto text, Drop caps, Speech; Create tables and table formatting; Insert Page break and Section breaks, Footnote, Table of content; Print documents, Mail merge; Comments, Track Changes; Use templates & add-ins

Module 4 – Spreadsheet applications using MS Excel: Getting started with Excel; Create, open and save workbooks; Manipulating data & contents; Auto format & Conditional format; Creating Formulas; Use functions; Worksheet Layout and Management: Working with multiple worksheets; Formatting Rows, Columns & Cells; Creating & Formatting a Chart; Print Management; Use Auto Filter; Sorting Lists.

Module 5 – Understand & Use a database with MS Access: Database System, Database Management System, Database Design Techniques; Data types, Create table using Design view, primary Key, Relationships; Create forms, Reports, Relational Database Model, Object Oriented Database Model, Normalization, SQL, Retrieve Data, Format Output, Use Switchboard Manager

Module 6 – Graphical presentation using MS PowerPoint: Creating a Blank Presentation; Applying a slide layouts, Design Template, Colour scheme, Background; Creating a slide Master; Adding Charts, Diagrams, Tables, Clip Art and Pictures;

Animating Slides, Adding Transition; Customizing Slide Design, Colour Scheme; Ordering Objects on a Slide; Setting the timing and Rehearse Timing Features; Inserting Movies & Sounds, Adding Background Music; PowerPoint Packaging a Presentation for CD.

Module 7 – Internet, e-mail & Information search techniques: Internet; Web, Uniform Resource Locator, Internet Service Provider, Protocol, Web browser, Web credibility, Search engines, Subject directories, Meta search; email: web mail, POP3, SMTP, email software.

Module 8 – Introduction to Computer Networking: Data communication, Data com methods, classification of network, network equipments & their functions, software use in networking, network management.

Method of teaching/learning
Lectures Practical Tutorials & self-learning
Self-learning contents will be delivered through LMS

Contact hours
Lectures 20 h, Tutorials 20 h

Assessment
Continuous Assignments (through LMS)   30 %
End semester examination   70 %

LFN 1210 Special Assignment

Aims
1. To expose students to an environment where they will be able to observe operations of organizations and role of professionals working in them.
2. To give an opportunity to students to relate their academic discipline to the workplace.
3. To make the student aware of the nature and purpose of the organization and how their discipline of study relates to the organization.
4. To provide an understanding of the problems and issues of the relevant organization.

Learning outcomes
Students should be able to;
1. describe operations in an establishment in their discipline.
2. explain the setup of an establishment in their discipline.
3. describe scientific and technical issues relevant to their placement.

Content
Students will be placed at an organization/industry/institution for a period of 2 weeks (10 working days) at the end of the Year 1 Semester 1 examination. During this period they will mainly observe the functions of the establishment and its employees.

a. Students to visit a Factory/Company/Laboratory/Research Institute etc. Daily visits for 2 weeks
b. Study the vision & mission of the respective institute/organization.

c. Study the institutional arrangements – Cadre positions/Institutional flow chart etc.
d. Observe the activities of the institute/organization
e. Meet key people and discuss various relevant issues pertaining to the institute.
f. Understand how the particular organization functions to meet the needs of the industry/country.

Contact hours
Introductory lecture 3 hrs, Industry visits and working 80 h

Assessment
Group presentation	50 %
Case study report / short viva	50 %

LFN 1232 Concepts & Practice of Statistics

Aims
1. To provide an understanding on the links between science and statistics, especially science as a discipline of probability
2. To explain basic concepts of types of data and data exploration
3. To introduce different types of distributions of data.
4. To illustrate the graphical representation of data

Learning outcomes
Students should be able to;
1. identify different types of data
2. describe main character of qualitative and quantitative data
3. calculate and compare values of central tendency and variability
4. judge the correct graphical presentation for different data types and use R and excel software in illustrating basic graph.
5. define probability and recognize main features of normal poison and bimodal distribution
6. test a given set of data to compare the means using test and explore the associations using simple linear regression.

Contents
Data types of data and variability in observations; frequency distributions, scatterplots, stem and leaf box plots, histograms; measure of central tendency in data, mean, median; dispersion of data; populations and samples and sampling theory; probability theory, normal curve and calculation of areas; variance of data and introduction to analysis of variance - T-tests, one-way ANOVA; correlations and linear regression.

Contact hours
Lectures 20 h, Group work 6 h, Practical (Computer based) 10 h, individual mini project work 4 h

Assessment
End semester examination (theory)	55 %
End semester practical examination	20 %
Group based data collection report	10 %
Poster (Individual)	10 %

Practical reports   5   %

LFN 1244 Crop Science & Agronomy

Aims
1. To discuss the importance of crop resources in maintenance of food security.
2. To discuss the physic-chemical restrictions and requirements of different crop for sustainable food production.

Learning outcomes
Students should be able to;
1. classify and identify the major food crops in Sri Lanka
2. describe the farming systems of Sri Lanka.
3. evaluate the current status of major food crops in relation to demand, land availability and human needs.
4. highlight the current needs and issues for sustainable crop production.
5. describe principle and application of different agronomic practices
6. propose methods to optimize food production through sustainable crop management.

Contents
Introduction to agricultural sector in Sri Lanka. Status of food production and recent trends, GDP, future prospects, Importance of food security, Production potential and distribution of food crops in relation to agro climate, introduction to Agroclimatology; rainfall pattern, temperature, elevation, Agroclimatic zones,, land classification, soil types, soil characteristics, soil conservation methods Adoption of basic agronomic practices and importance towards increasing productivity and sustainability; principles of land preparation, nursery management, principles of plant nutrition and fertilizer, Principles of pest management, pest control methods, water management; farming systems, chena cultivation, dry farming techniques, organic farming concepts.

Contact hours
Lectures 45, Practical 30 h

Assessments
End semester examination   60 %
Quiz   10 %
Practical reports   30 %

LFN 1X10 Social Harmony & Conflict Resolution

Aims
This short-course unit is designed;
1. to provide simple analytical and practical knowledge on social and intercultural harmony, gender and human rights for the university students.
2. to provide an understanding on the consequences of social disharmony and alternative strategies to solve such problems within the university system.
3. to promote wider participation of students in aesthetic and interactive socio-cultural activities

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Learning outcomes

Students should be able to;

1. identify causes of social disharmony in the society.
2. describe the role of university students and future graduates in the national development.
3. demonstrate skills of negotiation, mediation and conflict management strategies in activities.
4. appreciate human rights.
5. evaluate cases related to social disharmony and propose mitigation methods.
6. perform individual or group events in social and intercultural aesthetic activities.

Contents

Self-realization and vision building, Human Principles and philosophy of life, Social disharmony and aggressive behaviour, Cross cultural understanding & understanding of human differences, Responsibilities (duties) and rights of a University Student as a civil person and basic human rights human dignity, Conflict management, negotiation and mediation skill, Techniques for building social harmony and Communication - Concept at SH, Aesthetic and interactive activities

Students organize and take part in outreach activities to serve diverse cultural groups in the country. Students organize group learning exercises to introduce norms and values in their culture to other ethnic groups in the faculty. Few participatory research tools, that would be useful for understanding these concepts will be adopted. Practical work will be carried out to assess the self and the level of harmony and integration. Students would be taken to culturally important sites in the country (both in north and south). As a part of the course unit students of different social groups will have to produce cultural item as a group that will be staged or performed at the end of the semester. Participation in the cultural events and aesthetic performance should be open to every student. Academic and non-academic staff may also perform in intercultural events

Assessment

Students' participation will be monitored through student portfolio. Mentors should endorse the students' role in activities and attendance of student in the special page of the student portfolio. Students should obtain 'Satisfactory' Grade for this course unit as prescribed by the Faculty.

LFN 1324 Principles of Food Crop Production I

Aims

1. To introduce the major concepts and skills in managing some selected food crop production systems.
2. To discuss the current techniques used in food crop production systems to enhance production and product quality.

Learning outcomes

Students should be able to;

1. describe the agronomic practices in relation to cereal, legume and tuber crops

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2. identify pest and diseases of food crops and propose remedies.
3. suggest suitable food crops for different food production systems.
4. describe the factors affecting nutritional quality of crop harvest and suggest methods to improve.
5. discuss the national policy on food crop production
6. suggest ways to meet the future needs of food crops.

Contents

Classification of food crop and production systems; Salient features of production systems; Sustainability of production systems, classifications and production of food crops; Cereals (Rice), Roots and tubers (Potato, cassava, S. potato) Grams legumes (green grams, black grams). Constraints to production, Pest and diseases of food crops. Nutritional quality of cereals, roots, rubbers, legumes. National policy on cereals and legume production, Subsistence Vs commercial production systems; Food Crop Production statistics in Sri Lanka, imports and export, Future requirements and strategies for increased production. Home gardening and amateur cropping, concepts of organic farm, crop rotation and integrated farming.

Contact hours

Lectures-45 h, Practical-30 h, field visits and tutorials.

Assessment

End semester examination   70 %
Practical   30 %

LFN 1414 Information Systems & Data Handling

Aims

1. To familiarise the world wide web (WWW) as a key source for retrieving, storing and manipulating scientific data
2. To introduce software such as Endnote and Ref man for data storage.
3. To introduce the key parametric and non-parametric data analysis techniques using software Minitab, R and Genstat.

Learning outcomes

Students should be able to;

1. design appropriate experimental designs, implement, analyse and interpret data collected for analysis of variance (parametric data).
2. design, pre-test and collect data for biological and socio-economical research using questionnaires.
3. design appropriate experimental designs, implement, analyse and interpret data for non-parametric data.

Contents

Data, data storage, retrieval and handling; search engines and their use; reference management using Endnote and Ref man; conversion of data and reports to PDF; Analysis of parametric data with statistical software; Principles of experimental design, randomization, blocking, replication, completely randomized designs (CRD), randomized complete block design (RCBD), Latin square designs, blocking techniques in animal experiments, convenience analysis, factorial experiments, designs for special situations in animal experiments, incomplete

block design (IBD), balance incomplete block design, nested factor design, confounding factorial design, split plot design, exercises in analysis using statistical packages (SAS and Minitab).

Analysis of nonparametric data with R and Minitab: Scale of measurements - nominal or classificatory scale, ordinal or ranking, interval scale, ratio scale.

Categorical data analysis: two-way contingency tables, test of association and goodness of fit.

Introduction to non-parametric statistics: Wilcoxon Rank Sum Test , Sign Test, Mann-Whitney Test; Kolmonogorov-Smirnov Test, rank correlation;

Questionnaire construction; sampling techniques: random, stratified, systematic, cluster and multistage sampling.

Introduction to multivariate methods: multiple linear regression, linearization of model, cluster analysis, discriminate analysis; multivariate data analysis – Principle component analysis, Hierarchical analysis, Bipot, Canonical Variate Analysis.

Contact hours
Lectures 40 h, Practical 30 h, Project work 10 h

Assessment

End semester examination	40 %
Practical examination	20 %
Project reports	20 %
Mid-semester examination	20 %

LFN 2113 Principles of Food Crop   Production II

Aims
1. To provide principles of the management aspects of major oil crops and perennial food crops important for food security in Sri Lanka.
2. To provide fundamental of the environmental and physio-chemical requirements for successful perennial crop resources management.

Learning outcomes
Students should be able to;
1. identify suitable oil and forage crops in Sri Lanka and describe their agro climatic requirement.
2. describe the cultural practices of major perennial food crops in relation to establishment, agronomic practices and crop security.
3. discuss the potentials and constrains for production and yield optimization of perennial food crops.
4. evaluate the current status of oil crops, beverage crops and export agricultural crops in relation to demand, land availability, human needs and food security.
5. suggest suitable food production systems for major oil crops and export agricultural crops.
6. suggest ways to meet the future needs of oil crops, beverage and spice crop.

Contents
Oil crop production (soya, groundnut, sunflower, sesame, oil palm and other oil crops, plantation crop production (coconut, tea, sugar cane, cashew), export

agricultural production (pepper, cardamom, clove, coffee and others), nonconventional field crops and newly introduced crops, production status and importance for economy and food security, potential for improvement of production, outline of different cropping needs in relation to nursery management land preparation, planting, spacing, plant nutrition, fertilizer, pest management, water management, harvesting, factors affecting quality of products and nutritional aspect. National policy for food security.

Contact hours

Lectures 30 h, Practical 30 h

Assessment

End semester examination   60 %
Quiz   10 %
Practical reports   30 %

LFN 2212 Community Link (LinkCom)

Aims
1. To obtain required skills and knowledge to observe and comprehend the actual situation of food production, security and nutrition at community level.
2. To improve sense of risk, risk assessment and health and safety at field level.
3. To create awareness regarding legal requirements in day to day operations and   sensitivity to the impact of food production on the environment and stakeholders.
4. To bring a sense of belonging among the community and students themselves and to bring out improved idea of the relevance of modules that they follow under study programme

Learning outcomes
 Students should be able to;
1. plan, conduct, and report on investigations, including the use of secondary information such as existing knowledge.
2. evaluate and analyse economic, social and other management information and use it in decision making.
3. respect socio-economic and cultural background of the relevant communities.
4. contribute constructively to group discussion.
5. show willingness to involve in community work

This course will also improve a number of values and soft skills such as;
1. Act according to professional codes of conduct where applicable.
2. Assume responsibility for one's actions.
3. Develop an adaptable and flexible approach to study and work.
4. Develop the skills necessary for self-managed and lifelong learning (eg. Working independently, time management and organization skills)
5. Contribute constructively to group discussions.

Contents

The two degree programs produce graduates that would have direct and indirect relationships with the grass root level food producers, processor and distributors, etc. However, none of the study modules have activities that enable students to understand the actual behaviour and the characteristics at the grass root level. Each student will be placed with a household that engages in food production, processing and marketing or a community set up. In addition students will also be placed in households selected considering their food and nutritional security. The locations of placements will be determined for each year by the faculty and would be informed to students. Students will be given a certain level of freedom in selecting placements; however, the final decision of placement will be taken by the faculty.

Contact hours: A total of 60 hrs from the allocated time slot plus extra 60 hours from weekends of student choice must be spent

Assessment

Diary and e–portfolio	30 %
Oral Presentation	20 %
House hold assessment survey outcome	10 %
Material/ resources developed by student	40 %

LFN 2223 Postharvest Technology of Major Food Crops

Aim

To introduce the principles and applications in post-harvest management of food crop produce

Learning outcomes

Students should be able to;

1. apply basic principles of post-harvest management to a given food crop produce
2. evaluate the quality of a food crop produce

Content

Post-harvest management of Food crops, Introduction to Post harvest handling of major food crops. (cereals, roots & tubers, legumes, fruits, vegetable, etc., Post-harvest handling and transport, Post-harvest physiology of food crops, Management of pH tests and diseases, Quality management, Constraints in pH handling, Value addition and nutritional quality of new products, Future directions and exports potential.

Allocation of time

30 hours of student contact, 30 hours of practical and field visits

Assessment

End semester examination	75 %
Technical report	25 %

LFN 2233 Fruit & Vegetable Production

Aims

1. to provide knowledge on the management aspects of fruits, vegetables and perennial food crops.
2. to provide knowledge and understanding of the environmental and physio-chemical requirements for successful fruit and vegetable cultivation.

Learning outcomes

Students should be able to;

1. identify the cultural requirements for perennial food crops in Sri Lanka
2. describe the farming practices of fruits and vegetable crops in relation to establishment, agronomy and crop security.
3. discuss the potentials and constrains for production and yield optimization of important food crops
4. evaluate the current status of food crops in relation to demand, land availability and human needs.

Contents

Fruit crops and orchards in Sri Lanka, distribution of fruit crops, banana, mango, pineapple, papaw and citrus cultivation, agroclimatic requirements, propagation and establishment, inter-cropping with coconut and monoculture, irrigation, crop physiology, pest and disease management, harvesting, packing and handling the products. Potential of nonconventional fruits in Sri Lanka; Principles of Olericulture, cultivation extents, current production, marketing and potential of major vegetable crops; Important legumes, cucurbits and crucifers. Increasing productivity of vegetable crops, Different cropping needs in relation to nursery management, land preparation planting, spacing, plant nutrition, fertilizer, Pest management, water management, cropping systems of vegetable crops, organic vegetable farming, harvesting, factors affecting quality of products, nutritional aspects of fruit and vegetables.

Contact hours

Lectures 30 h, Practical 30 h

Assessments

End semester examination	60 %
Quiz	10 %
Practical reports	30 %

LFN 3112 Scientific Communication

Aims

1. To develop a set of knowledge, skills and attitudes to practice scientific communication by avoiding common errors.
2. To develop fundamental knowledge and convention relating to scientific communication and their most important methodologies.
3. To improve skills of writing reports, dissertations, manuscripts and other scientific communications.
4. To enhance the oral presentation skills.
5. To develop the ability to construct and evaluate technical and scientific papers.

Learning outcomes

Students should be able to;

1. describe the scientific writing process and its key stages.

2. reflect on what extent a research problem is to be addressed in a scientific paper.
3. analyse and review scientific papers in terms of key message and consistency.
4. reflect on the benefits of working in teams in scientific writing and describe the rules of co-authorship.
5. demonstrate effective, concise oral presentation.
6. reflect on the ethics of scientific writing.

Contents

It is expected to deliver the following contents in workshops to facilitate ongoing final year research work.

Importance in writing in Science: Scientific writing principles; special ESL grammar problems; Ethics of scientific publications; References and plagiarism: Selecting and managing reference; Text citation; reference styles; foot notes and endnotes; Plagiarism; paraphrasing; referencing software; Write research grant proposals: good attributes in a proposal, essential parts of a proposal; Introduction: for research papers/ review articles; common problems of introduction; Materials and methods section: Common problems of materials and methods; How to create effective illustrative materials: Select the proper illustrative material for different scientific publications; Results: important writing principles for results; common problems of results section; Discussion and conclusions: results and discussions; Abstracts: Organization; Applying basic scientific principles; Key words; Concept of 2 min drill; Titles for different scientific publications; Authorship; Acknowledgements; Posters and presentations: organization; sections; Oral presentation: voice and delivery; vocabulary and style; action and motion; body language; How to handle questions from the audience; Ethic in speaking to media (2 hrs)

Contact hours

Lectures 25 hrs, Class room exercises/activities 10 hrs

Assessments

Class room exercises/activities	35 %
Two minutes drill on the final year research outcome	20 %

   -Participants must be able to summarize their entire research
   blend into the abstract and present by reading within two-minutes.

Poster presentation   (Not to be evaluated by the respective supervisors) 45 %
   -Research proposal will be presented in a poster

LFN 3212 Human Resource Management

Aim

To provide knowledge on utilization and management of human resources required to deal with related issues in real working place.

Learning outcomes

Students should be able to;

1. identify the human resource management trends, key terms used and their relevance to successful operation and sustainable development of work organizations.

2. apply human resource management theories to the successful management of people within organizations.
3. identify the legal and ethical issues in human resources management.
4. analyse the human resource management practices used in a business organization.

Contents
Introduction to human resource management; team working/culture; HRM planning, recruitment, selection and retention; career development and training; leadership; appraising and improving performance; human resource management in small firms; collective bargaining and labor relations; legal and ethical issues in human resource management.

Contact hours
Lectures 30 h

Assessment
Report   40 %
End semester examination - Theory 60 %

LFN 3222 Organizational Management

Aim
To provide knowledge on concepts and principles of management of an organization required to resolve managerial problems to create an environment conducive for improvement of the organizations.

Learning outcomes
Students should be able to;
1. identify the key management principles that motivate employees in an organization to achieve organizational goals.
2. apply organizational management principles and concepts to create effective organizations
3. analyse information systematically, taking a holistic approach to addressing issues facing an organization (Based on case studies).
4. listen to and respect the ideas of others and present own ideas & recommendations in a group setting while effectively defending own positions (Based on the case studies)

Contents
Development and history of management science and profession; definition of management and its applications; development of organizations; human resource development in organizations; motivation of employees and application of motivation theories; team working culture; supervision and control; office management; effectiveness in management; public relations.

Contact hours
Lectures 30 h

Assessment
Case study   40 %
End semester examination   60 %

9.6. Course Units Offered under Career Guidance (CGU)

CGU 3211 Mass Communication

Aims
1. To train learner for composing scientific communication for media.
2. To induce creativity of generating/compiling of information for the interest of general public/selected ordains.

Learning outcomes
Students should be able to;
1. communicate effectively using a variety of means address to a range of audiences.
2. prepare documents/short communications for awareness, training and outreach.
3. write articles to mass media and journals.

Contents
This course unit will comprise a series of workshops, seminars and lectures about communicating through electronic and print media to masses.

Contact hours
Workshops, lectures, student activities 30 h

Assessment
Writing newspaper articles, essays, assignments,
Group work, presentations   100 %

CGU 3221 Entrepreneurship Development

Aim
To promote confidence of graduates for self-employability and to develop qualities of entrepreneurship.

Learning outcomes
Students should be able to;
1. prepare project proposal for banks/other financing agent.
2. identify opportunities, critically evaluate potentials and constrains for proposed projects.
3. demonstrate qualities of being self-critical, seeking and responding to feedback.
4. identify goals and marketing of own competencies.

Contents
This course unit will comprise a series of workshops, seminars and lectures about entrepreneurship and self-employment.

Contact hours
Workshops, lectures, student activities 30 h

Assessment
Project report   80 %
Presentations   20 %

9.7 Course Units Offered under English Language Teaching (ELT)

ELT 1110 English for Science I

Aims

This course unit aims to provide the following English language skills:
1. Recognizing meaning through lexical and grammatical understanding
2. Reading scientific and academic texts more efficiently.
3. Writing concise and meaningful write ups in the appropriate style
4. Understanding, and contributing appropriately to group discussions

Learning outcomes

Students should be able to;
1. apply linguistic features in conversations.
2. utilize a range of general vocabulary and range of grammatical structures when speaking
3. listen and take notes with an acceptable accuracy from academic lectures.
4. use correct pronunciation, stress and intonation in speaking.
5. communicate ideas with colleagues and lecturers.
6. read and comprehend academic texts, through skimming, and scanning
7. organize and present ideas within a framework provided.

Contents

Basic grammar structures, pronouncing key words (related to the academic subjects) clearly, using word stress, rhythm and intonation satisfactorily in speech, clarifying meaning when involved in spoken dialogue, taking turns appropriately (linguistically and functionally), when involved in spoken dialogue, summarizing in both speaking and writing; reading academic texts; writing descriptions and essays in English.

This course unit will be conducted as repeated cycles involving a vocabulary session, reading and listening tasks, and a related writing task.

Contact hours

Classroom contact hours 20 hrs, language centre activities 20 h

Assessment

Continuous assessment   40 %
End-semester examination   60 %

ELT 1210 English for Science II

Aims

This course unit aims to further improve English language skills developed in ELT 1110 English for Science I and to develop skills in:
1. participating actively in seminars on subject-related topics.
2. selecting what to read/research in an appropriate way.
3. incorporating information from sources into writing.
4. developing awareness of the value of re-drafting and editing.

Learning outcomes

Students should be able to;
1. actively participate in seminars by asking and answering questions.
2. do presentations related to general issues and subject-related topics.
3. find out information and incorporate them in writing essays and assignments.
4. summarise texts and write explanatory notes on a given topic.

Contents

This course unit consists of classroom activities involved in reading, writing, speaking and listening. The texts and situations related to science will be used to familiarize the vocabulary and the tasks will be given to them to use appropriate language in communicating ideas with others.

Contact hours

Classroom contact hours 20 hrs, language centre activities 20 h

Assessment

Continuous assessment   40 %
End-semester examination   60 %

ELT 1310 Academic English I

Aim

This course unit aims at developing English language skills and techniques, enabling students to demonstrate them in full potential in their academic work including examinations.

Learning outcomes

Students should be able to;
1. comprehend technical texts relevant to their chosen subjects in English for the purpose of completing assignments.
2. write coherent and meaningful essays or reports relevant to their chosen subjects in English.
3. do effective oral presentations.
4. ask and answer questions posed in an oral presentation.

Contents

Structure and cohesion, process description, describing physical features, definitions, narrations, exemplification, cause and effect, classifications, writing assignments and essays (this task will require students to investigate the topic independently or within a small group, produce an independently written summary, report or analysis-approx. 500-800 words); oral presentations.

Contact hours

Classroom contact hours 20 hrs, language centre activities 20 h

Assessment:

Continuous assessment   40 %
End semester examination   60 %

ELT 1410 Academic English II

Aim

This course unit aims at developing English language skills required for sharpening both oral and written communicative skills.

Learning outcomes

Students should be able to;

1. paraphrase and summarise technical texts (in English) relevant to the subjects
2. compose essays and reports in English using appropriate and formal language
3. do effective oral presentations

Contents

Comparisons and contrasts, survey and data collections, generalizing and interpretation of data, discussion, drawing conclusions, writing assignment and essays – this task will require students to investigate the topic independently or within a small group, produce an independently written summary, essay, report or analysis-approx. 500-800 words, oral presentation.

Contact hours

Classroom contact hours 20 hrs, language centre activities 20 h

Assessment

Continuous assessment   40 %
End semester examination   60 %

Inquiries & Contacts

Please forward any Inquiries arising from this handbook to:

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Student Handbook