

**Institute of Agro-Technology and Rural Sciences (UCIARS)  
University of Colombo**

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**Bachelor of Agro-  
Technology Degree Program**  
Revised Curriculum

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**Principal Consultant**

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**University of Colombo Institute for Agro-Technology & Rural Sciences**

The University of Colombo Institute of Agro-Technology and Rural Sciences (UCIARS) was established as an Institute with blended distance mode of teaching to provide opportunities of higher education to farming community across barriers of age, space, time and academic background, under Section 24 A and Section 18 of the Universities Act no 16 of 1978 and the University of Colombo Institute of Agro-technology and Rural Sciences Ordinance No. 02 of 20082. The Order under Section 24 A came into operation with effect from 23rd August 2008.

The establishment of this Institute heralded an era of affirmative action on the part of the Government of Sri Lanka to “uplift farming in Sri Lanka as a prestigious occupation through arming the farming community with modern knowledge and information technology”.



The Institute incorporated within its system the Magampura Agro-Technology and Community Services Center in Weligatta, Hambantota affiliated to the University of Colombo in 2000 by the UGC. The Centre’s history dates back to 1998 through which the university and researchers were able to build over the years close collaborative links with the community in order to transfer technology / knowledge and know-how directly to the end-users and improve efficiency in agriculture and agro-industry in the region.

The Institute has a mandate to “providing, promoting and developing among persons presently engaged in Agriculture and Agro-Technology, higher education in the discipline of Agro-Technology and Rural Sciences”. It will cater to the changing individual and social needs by taking education through a blended learning mode to the doorsteps of the farming community who never dreamt of entering the portals of higher education. However they have aspiration and potential to pursue higher education but could not utilize the opportunities for personal, family or economic reasons.

With the flexibility in the entry requirements and choice of courses the Institute demonstrates that it is possible to impart quality higher education using modern information communication technologies to learners of the farming communities of poor rural sectors to pursue education at a pace and place convenient to them and realize their academic, professional and social aspirations.

The will and commitment of the Institute to engage with society is evidenced by clear statements in institutional objectives, strategic planning and, teaching and learning processes.

## **Graduate Profile**

A Higher Diploma and graduates in Agro-technology should be capable of identifying and analyzing problems in agro-technology and related sectors at the local, regional, national and global needs. They should be equipped with knowledge in agro-technology and management with the developed attitudes and ethics to integrate biological and physical resources in environmentally friendly, socially acceptable and economically feasible manner for the production of food, feed, fiber, renewable energy and other agricultural products for the development of agricultural sector. They are also capable for becoming a professional in the areas of research, academia, management, entrepreneurship and a team player who is socially responsible, humane and ethical with effective communication skills.

## **Overview of Program Structure, Content and Options**

The duration of the proposed Higher Diploma in Agro-Technology, and Bachelor of Agro-Technology Honours at the UCIARS are 02, and 04 years respectively.

An ‘Academic Year’ consists of 02 Semesters of 15 weeks each and academic program is based on ‘Course Credit System’, where the students will be assessed continuously throughout the semester (i.e. formative) and end-semester evaluation (i.e. summative) will be held at the end of the semester for the designated courses. The students will be informed about the type and schedule of continuous assessment at the beginning of each course unit.

In order to qualify for the award of Higher Diploma in Agro-Technology, and Bachelor of Agro-Technology Honours, the prospective student is required to earn a total of 60, and 120 Credits respectively, which contributes to the final grade (GPA course units) and successful completion of all the courses which are not contributed to final grade (i.e. 12 Non-GPA course units).

The yearly breakdown of course units is summarized below:

(Year 1) – Thirty (30) credits of GPA course units and four (4) credits of Non-GPA course units.

(Year 2) – Thirty (30) credits of GPA course units and three (3) credits of Non-GPA course units (Cumulative Sixty (60) credits of GPA course units and seven (7) credits of Non-GPA course units)

(Year 3) – Thirty-two (32) credits of GPA course units and three (3) credits of Non-GPA course units.

(Year 4) – Twenty eight (28) credits of GPA course units and two (2) credits of Non-GPA course units.

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Table 1: Curriculum - Bachelor of Agro-Technology Honours (B.Ag.Tec.Hon)**  
**T: Theory, P: Practical, IL: Individual Learning through LMS**

- The following give the Course Codes, Course Names, GPA Credit Courses, Non GPA Credit Courses and Contact hours of each Course of the Compulsory Courses of the programme leading to the Degree of Bachelor of Agro- Technology Honours.

Subject code	Subject Name	GPA credits	NGPA credits	Total contact hours T:P:IL
<b>Level 3 (Year 1) - Semester I</b>				
AT1101	Principles of Agronomy and Horticulture	3	-	15:60:90
AT1102	Principles of crop biology	2	-	15:30:60
AT1103	Irrigation and water resource engineering	3	-	15:60:60
AT1104	Anatomy and Physiology of Farm Animals	2	-	15:30:60
AT1105	Principles of Agricultural Economics and Extension	2	-	15:30:60
AT1106	Principles of Soil Science	2	-	15:30:60
AT1107	Agricultural meteorology	1	-	00:30:60
AT1108	English	0	2	15:30:90
<b>Total Credits</b>		<b>15</b>	<b>2</b>	<b>105:300:540</b>
<b>Level 3 (Year 1) - Semester II</b>				
AT1201	Production and Management of Vegetables & Field crops	2	-	15:30:60
AT1202	Pest and disease management	2	-	15:30:90
AT1203	Management of Farm Animals	3	-	15:60:60
AT1204	Farm power and Mechanization	2	-	15:30:60
AT1205	Commercial Floriculture	2	-	15:30:60
AT1206	Soil and plant nutrient Management	2	-	15:30:90
AT1207	Introduction to Food and Nutrition	2	-	15:30:90
AT1208	Information Communication Technology	0	2	00:30:30
<b>Total Credits</b>		<b>15</b>	<b>2</b>	<b>105:270:540</b>
<b>Total Credits at Level 3</b>		<b>30</b>	<b>4</b>	<b>210:570:1080</b>
<b>Level 4 (Year 2) - Semester I</b>				
AT2101	Production and Management of Plantation crops	3	-	15:60:90
AT2102	Crop improvement and Biotechnology	2	-	15:60:90
AT2103	Production and Management of Fruit crops	2	-	15:30:60
AT2104	Post Harvest Handling and Food technology	2	-	15:30:90
AT2105	Agrostology and Grassland management	2	-	15:30:60
AT2106	Agribusiness Management	2	-	15:30:60
AT2107	Basic statistics	2	-	15:30:60
AT2108	Computer Assisted Language Learning (CALL)	0	2	15:30:90

<b>Total Credits</b>	<b>15</b>	<b>2</b>	<b>120:270:600</b>
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<b>Level 4 (Year 2) - Semester II</b>				
AT2201	Production and Management of Export Agricultural Crops	2	-	15:30:90
AT2202	Protected Agriculture	2	-	15:30:60
AT2203	Animal Breeding & Stock Management	3	-	15:60:60
AT2204	Farm planning and designing	2	-	15:45:90
AT2205	Agricultural extension and communication Technology	2	-	15:30:90
AT2206	Aquaculture production technology	2	-	15:30:60
AT2207	Plant tissue culture technology	2	-	15:30:60
AT2208	Life-Skills Development	0	1	00:30:30
<b>Total Credits</b>		<b>15</b>	<b>1</b>	<b>105:285:540</b>
<b>Total Credits at Level 4</b>		<b>30</b>	<b>3</b>	<b>225:555:1140</b>
<b>Level 5 (Year 3) - Semester I</b>				
AT3101	Landscape horticulture	3	-	30:60:90
AT3102	Agro-ecology	2	-	15:30:60
AT3103	Animal Product Processing Technology	2	-	15:30:60
AT3104	Food Processing & Value Addition	2	-	15:30:90
AT3105	Applications of crop improvements and Bio-technology	2	-	15:30:90
AT3106	Production and Management of Medicinal plants	2	-	15:30:60
AT3107	Agro forestry and silviculture	2	-	15:30:60
AT3108	Principles of Humanities and Social Sciences	0	2	15:30:60
<b>Total Credits</b>		<b>15</b>	<b>2</b>	<b>135:270:570</b>
<b>Level 5 (Year 3) - Semester II</b>				
AT3201	Crop Production Practices	4	-	00:120:90
AT3202	Livestock production practices	3	-	00:90:90
AT3203	Agriculture Engineering practices	2	-	00:60:90
AT3204	E-Commerce for Agriculture	2	-	30:30:60
AT3205	Precision Agriculture	2	-	30:30:60
AT3206	Entrepreneurship & Business Planning	2	-	30:60:90
AT3207	Case study	2	-	30:30:60
AT3208	Presentation Skills	0	1	
<b>Total Credits</b>		<b>17</b>	<b>1</b>	<b>120:420:540</b>
<b>Total Credits at Level 5</b>		<b>32</b>	<b>3</b>	<b>255:690:1110</b>

<b>Level 6 (Year 4) - Semester I</b>				
AT4101	Research Methodology & Proposal Development	2	-	15:30:90
AT4102	Agricultural experimentation and data analysis	3	-	15:60:90
AT4103	Agricultural Project Analysis & Management	2	-	15:30:90
AT4104	Agricultural Waste Management	2	-	15:30:90
AT4105	Renewable Energy Systems	2	-	15:30:60
AT4106	Crop modeling	2	-	15:30:60
AT4107	Applications of e-agriculture	2	-	30:30:60
AT4108	Bio-ethics	1	-	15:00:60
AT4109	English	0	2	15:30:60
<b>Total Credits</b>		<b>16</b>	<b>2</b>	<b>150:270:660</b>
<b>Level 6 (Year 4) - Semester II</b>				
AT4201	Agro-Technology Research Project	12	0	0
<b>Total Credits</b>		<b>12</b>	<b>0</b>	<b>0</b>
<b>Total Credits at Level 6</b>		<b>28</b>	<b>2</b>	<b>150:270:660</b>

2. The following give the Course Codes, Course Names, GPA Credit Courses, Non GPA Credit Courses and Contact hours of each Course of the Optional Courses of the programme leading to the Degree of Bachelor of Agro- Technology Honours.

### Optional courses

**T: Theory, P: Practical, IL: Individual Learning through LMS**

Subject code	Subject Name	GPA credit	NGPA credit	Total contact hours T:P:IL
AT1109	Career Guidance and Development	2	-	15:30:60
AT1209	Agro-tourism	2	-	15:30:60
AT2109	Electronics and Instrumentation	2	-	15:30:60
AT2209	Disaster Management	2	-	15:30:60
AT3109	Industrial training	2	-	00:60:60
AT3209	Animal welfare and ethics	2	-	15:30:60
AT4209	Wild life management	2	-	15:30:60

3. An alpha numeric code is used to identify a course unit. The code consists of four digits prefixed by the two letters, namely AT, to denote 'Agro-Technology'.

4. The first digit denotes the 'Year' at which the course unit is offered and the second digit denotes the 'Semester' in which the course unit is offered. The third digit denotes the 'Serial number' assigned for the course unit. (Refer curriculum outline in section 1).

**Criteria for ‘Exit’ and ‘Entry’**

A student who completes a particular Level (i.e. 3, 4 or 5), each is characterized by certain Credit Load, can be able to “exit” from the degree program with an award of a specific ‘Qualification Type’ with a ‘Designator’ as described in Table 2:

**Table 2: Criteria for Exit**

<b>Level of exit</b>	<b>Minimum credit to be completed</b>	<b>Qualification Type</b>	<b>Qualifier</b>
Level 4	60 credits form GPA courses, 07 creditsfrom NGPA courses	Higher Diploma	Higher Diploma in Agro-technology
Level 6	120 credits form GPA courses 12 credits from NGPA courses	Bachelor Honours	Bachelor of Agro-Technology Honours

A student who completes a Diploma or Higher Diploma in Agriculture from other institutes can enter to different levels of the programme mentioned as follows.

<b>Level of entry</b>	<b>NVQ level</b>	<b>Entry point</b>
Level 4 (2nd year)	5	Higher Diploma
Level 5 (3rd year)	6	Bachelors

‘Theory’ hours allocate for each course will introduce the concepts, while the ‘Practical’ sessions, including those carry out within and outside the premises and independent learning will foster in-depth understanding of the concepts. Both ‘Expert’ and ‘Regular’ Teaching Sessions will be scheduled to deliver the content of each subject systematically. Further, the teaching process is well supported by the LMS, as it has been the practice of UCIARS throughout its history.

The field work and field visits under different course units provide hands-on experience and awareness about the real-world situations. Learning will be encouraged by the use of progressive formative assessments. The ‘Agro-technology in Practice’ course will in particular ensures the graduates’ ability to apply his/her knowledge appropriately in the field to realize the real world condition pertaining to application of theory.

### Medium of Instruction

A variety of approaches such as group work involving experiential (problem) based learning, evaluating case studies, presentations, individual tutorials, and undertaking of individual research project shall be used to develop the life skills of students, including intellectual, decision making, critical thinking, communication, negotiation etc. Several NGPA course units offered in the areas of English, ICT and Career Guidance, in particular, will provide such skills.

As the degree program is unique in its nature in terms of its content and delivery and the potential learners and it is aimed to develop the capacity of those who new to, as well as already involve in various, agricultural activities including in farming and various other agribusiness as entrepreneurs and service providers, use of both ‘native’ (Sinhalese) and an ‘international’ (English) languages will help in acquiring knowledge and enhance the chances of employment (government, semi-government, private and self), gaining further competence to face challenges of the real world situation.

Medium of instruction shall be Sinhala/ Tamil/ English and the mode of instructions shall be Blended mode in LMS, class room lecture/ discussion, practical and field visits.

### Examination and Assessment Procedures

**Assessment of Course Units** will be through both continuous, i.e. throughout the semester by assignments, quizzes and other innovative assessment methods specified in the course outline) and through end-semester evaluations consisting of ‘Theory’ and ‘Practical’ components as specified in the relevant course units. The mode of evaluation for continuous assessment will be communicated to students at the beginning of the semester. The examination and evaluation shall be carried out by a Board of Examiners as approved by the Senate.

The marks allocated for courses, which include practical component, will be weighted in proportion to the **Credit**<sup>1</sup> distribution of practical and theory in that course.

**‘Research Project’** will be ‘continuous’. The monitoring and evaluation of these activities shall be conducted by a panel of evaluators/supervisors/examiners appointed by the UCIARS. The marks will be assigned as specified in the respective course unit.

### Scheme of Grading

The grade obtained for each course shall be indicated by a letter as shown below. The cut off marks for each grade and the corresponding grade points are also shown.

Marks	Grade	Grade point
≥ 90	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	E	0.00

<sup>1</sup> **Credit** – a ‘time based quantitative measure’ assigned to a course unit and indicates the rating of the unit inworking towards a degree. One credit is equivalent to 15 theory hours or 30 practical hours throughout the semester.



## Eligibility for Sitting the Examination

In order to achieve the objectives of each course unit, it is expected that the student will attend all teaching sessions, tutorial classes and practical etc. arranged by the UCIARS. Minimum of 80% of practical and field visit attendance must be required by a student in order to be eligible for sitting the relevant papers(s) of each course unit at all examinations. A student who does not record 80% attendance for practical and field works is not eligible to sit the examination and will be considered as a 'referred' candidate and he/she should sit the next immediate attempt. The highest grade given in such an attempt will be grade of **B**, regardless of the grade or marks obtained at the Examination.

If student fails to attend academic activities (i.e. lectures, tutorial classes, practical session) or examinations due to a medical reason, such absence should be reported to the respective administrator assigned by valid Medical Certificate immediately after returning to the UCIARS. All Medical Certificates should confirm to the format of a Medical Certificate issued by a Government Hospital and should only be obtained from one of the following medical officers, including: Approved Medical Officer, District Medical Officer, Consultant Specialist in the relevant field, Head of Government Base Hospital, and Ayurvedic Physician registered in the Ayurvedic Medical Council. Under exceptional circumstance Medical Certificates issued by Private Hospitals or private practitioners might be accepted by the University Medical Officer or the medical board. If a student falls ill during an examination session, such illness should immediately be reported to the supervisor of the examination or Head of the Department.

If such illness occurs at residence or elsewhere during an examination session. the student or his/her guardian should inform the Senior Assistant Registrar/Examinations within seven (7) days by a telegram followed by a letter indicating the nature of illness, doctor consulted, name of examination paper of which he is unable to appear, together with the relevant Medical Certificate. In the case of a student who, having completed the theory paper is unable to appear for the practical due to a valid medical reason, the results (including the theory paper) will not be released until the practical paper is completed on a later occasion.

**Number of Attempts for Sitting Examinations:** a student shall not be permitted more than three (03) sittings for the examination of any course unit.

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

**Provisions for Re-scrutinization Marks & Grades of Undergraduates:** will be made available for graduates to submit requests for verification of their examination marks and grades, if they wish to do so. The provision requesting re-scrutinization of marks and grade shall be limited only during the two weeks immediately following the results of an examination. An application form issued by the administration office should be duly filled and forwarded along with a receipt of non-refundable payment, of Rs. 500/= (per a course) make to the account branch. Provided the payment shall be refunded to the applicant by the UCIARS if the re- scrutiny results in a better mark and/ or grade for the course than what were released to him/her originally.

### **Award of Classes and Degree**

Classes will be awarded based on the Cumulative Grade Point Average (CGPA) as follows:

#### **First Class:**

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

- (i) Obtains a minimum CGPA of 3.70, and
- (ii) Completes the relevant requirements within stipulated time period

#### **Second Class (Upper Division):**

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

- (i) Obtains a minimum FGPA of 3.30, and
- (ii) Completes the relevant requirements within stipulated time period

#### **Second Class (Lower Division):**

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

- (i) Obtains a minimum CGPA of 3.00, and
- (ii) Completes the relevant requirements within stipulated time period

### **Award of Degree**

(1) A student shall be eligible to the award of the Degree of Bachelor of Agro-Technology Honours when he/she obtains a minimum of Grade C- at each of the GPA course making up 120 Credits and at each of the Non GPA course making up of 12 Credits, provided he/she satisfies other requirements under these By-Laws, and other relevant Regulations and Rules.

(2) No student who obtains a Grade less than C- for any of the GPA courses and/or Non GPA courses shall be eligible to be awarded the Degree of Bachelor of Agro-Technology Honours. Such a student shall be deemed to have incomplete result for the course/courses as the case may be.

(3) A student who has incomplete result having obtained a Grade less than C- in any course/s during a particular semester shall repeat the written examinations of the respective course/s at the next available occasion. Such student shall be given the option of carrying forward the continuous assessment marks earned for that course/s conducted during the particular semester.

**Grade Point Average (GPA):** is the credit-weighted arithmetic mean of the Grade Point Values. The GPA is calculated by dividing the total credit-weighted Grade Point Value by the total number of credits. GPA shall be computed to the second decimal place. For example, a student who completed four course units each of three credits and two course units each of one credits with grades A, B, C, D, E respectively would have the following GPA.

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The formula for the calculation of the GPA shall be as follows:

Eg: Consider 02 Course Units X and Y having credit values of 03 and 02 respectively. If a student earns an A Grade for X and a B Grade for Y, his/her GPA will be calculated as follows:

$$\text{GPA} = \frac{03(\text{credit value}) \times 4.00(\text{GPV}) + 02(\text{creditvalue}) \times 3(\text{GPV})}{\text{Total no. of Credits (05)}} = 3.60$$

### Course Operational Plan

*ES – Expert Seminars; TS – Teaching Sessions; PS – Practical Sessions*

Subject Code	Subject Name	Credits	ES	TS	PS	Total
<b>Level 3 (Year 1) - Semester I</b>						
AT1101	Principles of Agronomy and Horticulture	3	0	2	8	10
AT1102	Principals of Crop Biology	2	0	2	2	4
AT1103	Irrigation and water resource Engineering	3	1	3	2	6
AT1104	Anatomy and Physiology of Farm Animals	2	1	2	5	8
AT1105	Principles of Agricultural Economics and Extension	2	2	2	2	6
AT1106	Principles of Soil Science	2	0	2	6	8
AT1107	Agricultural Meteorology	1	0	1	1	2
AT 1108	English	0	0	5	3	8
<b>Total Sessions</b>			<b>4</b>	<b>19</b>	<b>29</b>	<b>52</b>
<b>Level 3 (Year 1) – Semester II</b>						
AT1201	Production and Management of Vegetables and Field Crops	2	0	2	6	8
AT1202	Pest and Disease Management	2	1	2	5	8
AT1203	Management of Farm Animals	3	1	2	3	6
AT1204	Farm power and mechanization	2	1	2	2	5
AT1205	Commercial Floriculture	2	1	1	8	10
AT1206	Soil and Plant Nutrient Management	2	0	2	6	8
AT1207	Introduction to Food and Nutrient	2	1	2	2	5
AT1208	Information Communication Technology	0	0	2	4	6
<b>Total Sessions</b>			<b>6</b>	<b>16</b>	<b>37</b>	<b>59</b>
<b>Total Sessions at Level 3</b>			<b>10</b>	<b>35</b>	<b>66</b>	<b>111</b>
<b>Level 4 (Year 2) - Semester I</b>						
AT2101	Production and Management of Plantation Crops	3	1	1	8	10
AT2102	Crop Improvement & Bio-technology	2	0	3	6	9
AT2103	Production and Management of Fruit Crops	2	0	3	7	10
AT2104	Post Harvest Handling and Food Technology	2	0	2	6	8
AT2105	Agrostronomy and Animal Nutrition	2	0	2	6	8
AT2106	Post-Harvest Technology	3	1	2	2	5
AT2107	Agribusiness Management	2	2	2	2	6
AT2108	Basic Statistics	2	2	3	1	6
<b>Total Sessions</b>			<b>6</b>	<b>18</b>	<b>38</b>	<b>62</b>

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<b>Level 4 (Year 2) - Semester II</b>						
AT2201	Production and Management of Export Agricultural Crops	2	1	1	8	10
AT2202	Protected Agriculture	2	0	2	6	8
AT2203	Animal Breeding & Stock Management	3	2	2	3	6
AT2204	Farm Planning and Designing	2	0	2	6	8
AT2205	Agricultural extension and communication Technology	2	2	2	2	6
AT2206	Aquaculture Production Technology	2	1	1	4	6
AT2207	Plant In-vitro Propagation	2	0	3	2	5
AT2208	Life-skills Development	0	1	1	4	6
<b>Total Sessions</b>			<b>7</b>	<b>14</b>	<b>35</b>	<b>55</b>
<b>Total Sessions at Level 4</b>			<b>13</b>	<b>32</b>	<b>73</b>	<b>118</b>
<b>Level 5 (Year 3) - Semester I</b>						
AT3101	Landscape Horticulture	3	1	1	10	12
AT3102	Agro-ecology	2	1	2	3	6
AT3103	Animal Product Processing Technology	2	0	2	4	6
AT3104	Food Processing & Value Addition	2	1	3	2	6
AT3105	Applications of Crop Improvement and Bio-technology	2	1	2	5	8
AT3106	Production and Management of Medicinal plants	2	1	2	3	6
AT3107	Agro-forestry and Silviculture	2	1	2	3	6
AT3108	Principles of Humanities and Social Sciences	0	2	1	1	4
<b>Total Sessions</b>			<b>8</b>	<b>15</b>	<b>31</b>	<b>54</b>
<b>Level 5 (Year 3) - Semester II</b>						
AT3201	Crop Production Practices	4	0	0	12	12
AT3202	Livestock Production Practices	3	0	0	8	8
AT3203	Agricultural Engineering Practices	2	0	0	6	6
AT3204	E-Commerce for Agriculture	2	2	1	3	6
AT3205	Precision Agriculture	2	2	2	2	6
AT3206	Entrepreneurship & Business Planning	2	2	2	2	6
AT3207	Case Study	2	0	1	5	6
AT3208	Presentation Skills	0	0	1	3	4
<b>Total Sessions</b>			<b>6</b>	<b>7</b>	<b>41</b>	<b>54</b>
<b>Total Sessions at Level 5</b>			<b>14</b>	<b>22</b>	<b>72</b>	<b>108</b>

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<b>Level 6 (Year 4) - Semester I</b>						
AT4101	Research Methodology & Proposal Development	2	1	1	4	6
AT4102	Agricultural Experimentation and Data Analysis	3	2	3	1	6
AT4103	Project analysis & Management	2	2	2	2	6
AT4104	Agricultural Waste Management	2	1	1	2	4
AT4105	Renewable Energy Systems	2	1	1	6	8
AT4106	Crop Modeling	2	1	1	6	8
AT4107	Applications of e-agriculture	2	1	2	7	10
AT4108	Bio-ethics	1	1	1	4	6
AT4109	English	0	1	4	3	8
<b>Total Sessions</b>			<b>11</b>	<b>16</b>	<b>35</b>	<b>62</b>
<b>Level 6 (Year 4) - Semester II</b>						
AT4201	Agro-Technology Research Project	12	-	-	-	-
<b>Total Sessions at Level 6</b>			<b>11</b>	<b>16</b>	<b>35</b>	<b>62</b>
<b>Total Sessions for Degree (Excluding Research)</b>			<b>48</b>	<b>105</b>	<b>246</b>	<b>399</b>

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1101			Course Title	Principles of Agronomy and Horticulture		
Year	1	Semester	1	Credits	03	Theory (hr)	15
						Practical (hr)	60
						IL (hr)	90

**Aim of the Course:**

To provide knowledge on the fundamental concepts, principles and technologies in the practices of crop production and agronomy in order to obtain sustainable development in agricultural sector.

**Intended Learning Outcomes:**

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

- Select suitable crops and regions for cropping systems based on the prevailing agro climate.
- Describe land preparation and crop establishment methods of given crops depending on the cropping systems to maximize crop production.
- Explain the role of quality planting materials in crop production and demonstrate the different sexual and asexual plant propagation methods.
- Prepare a detail crop management program for a given cropping system considering the crop management principles and practices.

**Course Capsule:**

<b>Theory (Through Expert Seminars ; Teaching Sessions; LMS)</b>
Importance and role of agriculture; Crop growth factors, Growth regulators, Land use classification, Importance and use of different methods of land preparation, Primary and secondary land preparation, Planting material production, Importance of quality planting materials, Asexual and sexual plant propagation methods, Crop establishment methods; direct seeding, nursery and seed bed preparation, nursery management, Crop management: Principles of crop management; Nutrient and soil fertility Management, Mono cropping and Multiple cropping systems, Integrated farming systems, Preparation of a crop management program.
<b>Practical (Student Centered In-Class and Field Work)</b>
Identification of cropping systems in different areas; Different crop growth factors in a selected location of the cropping field; Plant propagation techniques: Identification of different planting material types; Asexual propagation methods; Layering, Grafting, Bud-grafting techniques; cutting propagation, Sexual propagation; Seed propagation, Identify the nursery crops and direct planting crops, Establish and manage a nursery; Primary and secondary land preparation, Inorganic and organic fertilizers used in agriculture, Commonly found weeds in agricultural fields; Identification and management of pest and disease problems.

**Assessment:**

Continuous assessment:           40%  
 End semester assessment:       60%

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1102			Course Title	Principles of Crop Biology		
Year	1	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide the knowledge and skill in principles of plant protection and ecology of weed in agricultural production systems and physiological and morphological properties of plants

**Intended Learning Outcomes:**

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

- Identify the major pest groups and ecology.
- Identify common weeds grown in agricultural fields.
- Identify morphological and physiological characteristics of plants.

**Course Capsule:**

**Theory (Through Expert Seminars; Teaching Sessions; LMS)**

Physiology and morphology of plants: Plant cell biology and physiology, Photosynthesis, Respiration, transpiration, guttation, stomata activity, Water and mineral transport in plants, Plant hormones, Evolution of plants, Plant classification, Pollination, Classification of flowers, leaves and their arrangements.

Major pest groups: pathogenic microorganisms, insects, mites, nematodes and others

Principles of pest management: Development of pest problems in agro-ecosystems, Biology and ecology of pests

Principles of Disease management

Principals of weed management: Biology and ecology weeds, Common weeds of agricultural production systems

**Practical (Student Centered In-Class and Field Work)**

External morphology of insects, Insect orders included agricultural pests and collection and preservation of insects, Major pest groups associated with economically important fruits, vegetables, cereals, field crops and ornamentals. Commonly found weeds in agriculture.

Microscopic view of plant cell, stomata, cross section of stem, leaf and root sections. Arrangements of Flower, Vein and Leaf.

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1103			Course Title	Irrigation and water resource Engineering		
Year	1	Semester	1	Credits	03	Theory (hr)	15
						Practical (hr)	60
						IL (hr)	60

**Aim of the Course:**

To provide knowledge and skills required to design, install, operate and evaluate an irrigation system and handling of surface and ground water resources for sustainable use.

**Intended Learning Outcomes:**

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

- Describe the components of irrigation scheduling with special reference to crop water requirement, irrigation interval and methods of irrigation
- Design, install, operate and evaluate an irrigation system
- Explain and use the systems approach to water resource management
- Explain management of water resource for sustainable development

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to irrigation: components of irrigation scheduling, crop water requirement, irrigation interval, methods of irrigation, irrigation efficiency; Evapo-transpiration (ET): Direct method of calculation of ET (Lysimeters), Indirect method of calculation of ET, Factors affecting on an irrigation method; Conventional irrigation methods: surface and sub-surface irrigation methods; Advanced irrigation methods: Drip and Sprinkler irrigation systems, Applicability design criteria and evaluation of sprinkler and drip irrigation systems; Water resource management: Introduction to water resource management, Surface water resources, ground water resources, water resource assessment, Principles of water resource management, Regulatory issues of water resource management, Management of water resources for sustainable use.

**Practical (Student Centered In-Class and Field Work)**

Irrigation: Methods of soil moisture measurements, Design and operation of a lysimeter, calculation of crop water requirement, irrigation duration and cost of irrigation, Designing drip and sprinkler irrigation systems, Operation and evaluation of water application uniformity of drip and sprinkler irrigation systems, Determination of rates of infiltration for different soils; Water resource management: Application of GIS for water resource management, use of computer based tools in solving water management problems, Quantitative and Qualitative analysis of a water resource system

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%



**Level 3 (Year 1 – Semester I)**

Course Code	AT 1104			Course Title	Anatomy and Physiology of Farm Animals	
Year	1	Semester	1	Credits	02	
						Theory (hr) 15
						Practical (hr) 30
						IL (hr) 60

**Aim of the Course:**

To provide the knowledge and skills for students on poultry and swine production and emphasize its industrial importance for the country in fulfilling economical and nutritional aspects

**Intended Learning Outcomes:**

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

- State the present status of poultry and swine industry in Sri Lanka in terms of production, constraints and future potential for development.
- Identify and describe different species of poultry used in meat and egg production.
- Identify different breeds of swine used in the industry.
- Describe the importance of proper housing for poultry and swine, feeding and other important management practices.
- Explain the importance and methods used in prevention and control of diseases related to poultry and swine.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Present status of poultry and swine production in the world and Sri Lanka; Poultry management: raising of young stock, management of hatcheries, broilers and layers, parents, egg quality determination, incubator and brooder management; Swine management: management of sow, piglings, growers/fatteners and boars; Determination of herd composition and culling procedure for poultry and swine; Anatomy and physiology of digestive system and reproduction system of poultry; Housing systems for poultry and swine; Importance of proper feeding and feed stuffs with nutritive value; Alternative feeds; Prevention and control of poultry and swine diseases; Maintenance of farm records

**Practical (Student Centered In-Class and Field Work)**

Breeds identification; Identification and observation of poultry and swine digestive system and reproductive system; Brooder management practices (for broilers and layers); Measurement of egg quality; Egg incubation; Feed formulation for poultry and swine; Identification of alternative feeds; Handling and management tools for poultry and swine; Routine management practices for poultry and swine; Housing systems

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester I)**

<b>Course Code</b>	<b>AT 1105</b>			<b>Course Title</b>	<b>Principles of Agricultural Economics and Extension</b>	
<b>Year</b>	1	<b>Semester</b>	1	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide students with the knowledge and skills related to business management in order to establish and evaluate the performance of an agribusiness venture.

**Intended Learning Outcomes:**

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

- Assess the impact of prevailing business environment on establishing a business, in general, and agribusiness, in particular.
- Apply the principles of modern managing staff techniques in agribusiness.
- Apply the financial management tools and techniques to evaluate the performance of an agribusiness.
- Recognize the international marketing opportunities available for an agribusiness.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Nature, Definitions, Scope and importance of economics, Basic principles (Micro and Macro) of agricultural economics, Production economics, principles of supply and demand, Theories of consumption, Production and markets, Pricing of products factors of production, Profit maximization and cost minimization, resource economics, world food situation, marketing of agricultural products, and agricultural public policy, National income accounting, International trade, Agricultural development, Agricultural Marketing, General Agriculture economy in Sri Lanka.  
Agricultural Extension Introduction (Origin of extension, Definitions, Extension process, Need of extension, Agricultural Supporting Services, Extension Organization, Level of extension) , Historical development of extension system in Sri Lanka.

**Practical (Student Centered In-Class and Field Work)**

Marketing efficiency, marketing structure analysis through concentration ratios. Analysis on contract farming and supply chain management of different agricultural commodities, chain Analysis, market intelligence, technical analysis for important agricultural commodities, presentation of the survey results and wrap-up discussion

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1106			Course Title	Principles of Soil Science		
Year	1	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide students with the knowledge and skills related to principle of soil science.

**Intended Learning Outcomes:**

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

- Understand concept and importance of soil science for agriculture
- Explain how soil and plant samples are collected, processed, analyzed and interpreted
- Learn mechanisms of water and nutrient movement in soils and plants, and their relationships
- Determine the important physical properties and chemical properties of soil and their role in water and nutrient holding capacity, aeration and their significance in crop growth.
- Learn impacts on soil, water management and crop growth and soil water conservation

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to Soil Science, Definitions, *Soil Genesis and Taxonomy* -Soil forming rocks and minerals, Weathering of rocks and minerals, Soil formation, Soil profile, soil orders in Sri Lanka ; Physical and chemical properties of soil, , fundamentals of soil microbiology, Soil Water Plant Relationship, Salt-Affected Soils and Water Quality, Soil and water pollution, Soil and water conservation

**Practical (Student Centered In-Class and Field Work)**

Soil sampling and handling, Preparation of standard solutions, Preparation of saturated soil paste, Determination of soil water contents, Analysis of irrigation water, report writing and interpretation, Determination of soil physical and chemical properties, Determination of soil organic matter, Principle and instrumentation of EC meter, moisture meter, PH meter

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester I)**

<b>Course Code</b>	<b>AT 1107</b>			<b>Course Title</b>	<b>Agricultural Meteorology</b>		
<b>Year</b>	1	<b>Semester</b>	1	<b>Credits</b>	01	<b>Theory (hr)</b>	00
						<b>Practical (hr)</b>	30
						<b>IL (hr)</b>	60

**Aim of the Course:**

To provide the knowledge and operation skills of instruments used in weather station and overall aware of ecology and climatology.

**Intended Learning Outcomes:**

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

- Describe the working principle of instruments and their use and importance of agriculture.
- Record keeping on agro weather parameters.
- Identify climatic and ecological regions in Sri Lanka and crop suitability.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Introduction to Meteorology, Instruments use in agro weather station, Methods of record keeping and decision making on readings, Design a weather station.  
Introduction to Agro climatic zones and Agro ecological zones in Sri Lanka, Environmental conditions of zones and crop suitability.

**Practical (Student Centered In-Class and Field Work)**

Identification of Instruments, Methodology of use, Day today Record keeping.  
Mapping Agro climatic and Agro ecological Zones in Sri Lanka.

**Assessment:**

Continuous assessment:           40%  
End semester assessment:       60%

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1108			Course Title	English		
Year	1	Semester	1	NGPA Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

To give students a general competence in English and to encourage students to speak in English.

**Intended Learning Outcomes:**

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

- Develop their basic writing skills, improve the use of English syntax and read, skim and scan and to develop their reading comprehension skills
- At the end of the course, students will be able to review the English Tense system
- Increase their confidence in using spoken English, identify problematic areas in pronunciation and improve English pronunciation, sharpen strategic competence in face-to-face conversations and in real life situations and analyze and evaluate listening performances.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Writing Notices, Writing Instructions, Descriptions & narratives, Guided and controlled compositions , Letter Writing Skills-informal, Exercises in skimming, Scanning practice, Reading comprehension - cloze passages and comprehension questions, Reading aloud, Development of vocabulary, The use of capital letters, rules of punctuation, Sentence formation - articles, prepositions, conjunctions, English Tenses, Comparatives and Superlatives , Passive, the interrogative and reported speech forms , Continue with Tense system

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester II)**

Course Code	AT 1201			Course Title	Production and Management of vegetables and field crops		
Year	1	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide students with the understanding of the present status and agronomy of field crops mainly paddy and vegetables with special reference to cultural and production practices.

**Intended Learning Outcomes:**

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

- Explain the present status, economic importance, constraints and cultivation technologies of important field crops and vegetables.
- Describe the appropriate, sustainable and novel production techniques of field crops with special attention to paddy.
- Identify and suggest possible solutions related to the agronomic practices, planting material production and profit-oriented marketing strategies of field crops and vegetables

**Course Capsule:**

**Theory (Through Expert Seminars ; Teaching Sessions; LMS)**

Introduction of field crops and vegetables, production, extents and yields; Importance and industrial use of field crops and vegetables; Ecological requirements, National production and constraints for production of field crops and vegetables ; Morphological characters, Varieties, Crop management practices, Soil fertility improvement of lands, Yields, Physiological basis of yield of field crops and vegetables ; Traditional and modern farming systems and techniques of; Organic rice and vegetable production techniques, Seed paddy production techniques of traditional and improved rice varieties: Seed packaging and handling, Transportation and storage; Pest and disease management techniques of seed storage; Handling of field crops in the storage, Storage losses: Pest and diseases and management of field crops and vegetables.

**Practical (Student Centered In-Class and Field Work)**

Different nursery techniques of paddy and vegetables; Establishment and management of paddy nurseries; Field establishment, Crop management and pests and diseases management of field crops and vegetables using cultural, chemical and biological methods; Pest and disease management of storage;

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester II)**

Course Code	AT 1202			Course Title	Pest and Disease Management	
Year	1	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide the knowledge and skill in manage weed and pest problems in agricultural production systems to maximize their productivity.

**Intended Learning Outcomes:**

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

- Identify the major pest damages to agricultural crops in Sri Lanka.
- Identify possible methods to control weeds.
- Design a suitable crop protection program to a given agricultural crop production system after evaluating the available pest situation.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Methods of pest management: Natural and synthetic pesticides, Pesticides formulation and their mode of action, Methods of pesticide application, Effect of pesticides on environment and ecology and safe use of pesticides, Biological control of pest; Integrated Pest Management (IPM) and Integrated Crop Management(ICM). Weed management: Crop-weed interaction, Conventional and novel methods of weed management;
<b>Practical (Student Centered In-Class and Field Work)</b>
Damages caused by different insect pests, Disease diagnosis: symptoms and damages by major pathogenic micro-organisms of bacteria, fungi, viral and others, Signs of pathogenic micro-organisms, Pesticide types and their hazards levels, Pesticide application equipment and spray calibration.

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%

**Level 3 (Year 1 – Semester II)**

Course Code	AT 1203			Course Title	Management of Farm Animals		
Year	1	Semester	2	Credits	03	Theory (hr)	15
						Practical (hr)	60
						IL (hr)	60

**Aim of the Course:**

To provide the knowledge and skills for students on ruminants and non ruminants production & emphasize its industrial importance for the country in fulfilling economical and nutritional aspects

**Intended Learning Outcomes:**

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

- State the present status of ruminants and non ruminants industry in Sri Lanka in terms of production, constraints and future potential for development.
- Identify and describe different species of ruminants and non ruminants used in meat and egg production.
- Describe the importance of proper housing for ruminants and non ruminants, feeding and other important management practices.
- Explain the importance and methods used in prevention and control of diseases related to for ruminants and non ruminants.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Management of Ruminants - Introduction to ruminant species; introduction to cattle (neat cattle), buffaloes, sheep & goat, identification of breed characteristics, production and distribution in Sri Lanka, rearing systems; intensive semi intensive and extensive farming systems, comparison of different systems, management practices; housing and other equipment, identification methods, castrations of male animals, dehorning, management of new born animal, management of young stock, reproduction, feeding, health management, record keeping.

Management of Non Ruminants - Introduction; importance of pig & poultry farming, potentials and constrains of pig & poultry farming, classification of breeds of pigs & poultry, management of a breeding stock, management of kids and piglets, brooding; different brooding systems of poultry, management at brooding period, management of growers, finishers and layers; management of growers and finishers of poultry, management of layers, housing for pigs & poultry; management systems of broilers and layers, housing types and space requirements of pigs , broilers & layers, diseases of pigs & poultry; common diseases and causes, preventive methods, slaughtering of pigs & broilers; slaughtering procedure, production of broiler & pork, keeping records in pig & poultry farming; importance and use, different types of records, miscellaneous poultry production.

**Practical (Student Centered In-Class and Field Work)**

Non ruminants - Identification of breeds of swine & poultry, maintain a group of pigs, broilers & layers in the Institute farm, visit a large scale piggery & poultry farm, maintain records in a piggery & poultry shed. Ruminants - Demonstrate different restraining techniques and important knots in ruminant management, demonstrate the identification methods and breeds identification, visit different farms to identify different management systems of cattle, buffalo sheep and goat, demonstrate different hand milking methods and machine milking, identification of different instruments using in ruminant management.

**Assessment:**

Continuous assessment: 40%  
End semester assessment: 60%



**Level 3 (Year 1 – Semester II)**

Course Code	AT 1204			Course Title	Farm Power and Mechanization	
Year	1	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide the knowledge and skills required to select, operate, maintain and evaluate the machinery used in agriculture.

**Intended Learning Outcomes:**

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

- Describe the working principle of a machine and an implement used in agriculture with special reference to farm tractors and related implements.
- Select, operate and maintain farm machinery on which they have been trained.
- Evaluate the performances of farm machinery with special reference to ergonomics and safe handling.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to farm power and mechanization. Energy; Introduction of energy, Renewable energy resources, Nonrenewable energy resources. Machine and implements, Machines, Implements. Engines; Classification of engines, Two stroke and four stroke engines, Compression ignition and spark ignition, Basic components of engine, Engine systems (fuel, lubrication and cooling). Tractors; Classification of tractors, Two wheel tractor, Four wheel tractor, Maintenance of tractors. Power transmission, Mechanical transmission, Hydraulic transmission, Pneumatic transmission. Farm implements; Land preparation implements, Inter cultivation implements, Seeders and trans planters, Water pumps, Threshers and combine harvesters. Safety and ergonomics; Safety rules. Basic ergonomics.

**Practical (Student Centered In-Class and Field Work)**

Identification of external components of two-wheel and four-wheel tractors, Basic engine components, Valve mechanism, Operation and maintenance of fuel, air cleaners, lubrication, cooling, electrical and ignition, power transmission and hydraulic systems, Operation and maintenance of land preparation implements, Seeders and trans-planters, Operation of centrifugal water pumps, Calculation, selection and installation of water pumps, Sprayer calibration, Operation of harvesting and threshing machinery, Ergonomics and safe handling of farm tractors.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 1 – Semester II)**

Course Code	AT 1205			Course Title	Commercial Floriculture	
Year	2	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide the required knowledge and skills on floricultural crops and floriculture trade so that learners can use this learning experience in putting up a commercial floriculture venture

**Intended Learning Outcomes:**

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

- Identify potential floricultural crop species/varieties
- Describe procedural steps necessary during floriculture crop production from propagation to marketing.
- Define and explain the environmental factors that regulate growth and flowering of floriculture crops.
- Develop production schedules for floriculture crops.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

*Introduction to the floriculture industry in Sri Lanka and the world:* (Importance to the economy, Problems faced by farmers, Comparative advantages and disadvantages in relation to other countries, Major buyers, major producers, items in demand), *Production of cut flower crops, cut foliage and pot plants:* (Rose: Anthurium: Orchid: Gerbera: Chrysanthemum and Major foliage types: Introduction, Classes, varieties, species for exports and species for domestic trade , Factors affecting plant growth, Agronomy (Mass propagation, transplanting, Methods and systems, fertilization and irrigation), harvesting, Quality and output, Post-harvest handling practices, Pests and Diseases), *Practices in the production of fresh cut flowers:* (Overview, Pre-harvest and harvesting care, Stage of growth, Preconditioning, Temperature and water, Biocides/disinfectants, use of chemicals and non-chemical methods), *Underutilizing plants:* Introduction, Types, Potential for developing, *Value addition:* (Introduction on value added products in floriculture, Types, quality management), *Preparation of production plans :* market-oriented production, demand and supply, Process of export and import of products and planting materials

**Practical (Student Centered In-Class and Field Work)**

*Identification of commercial floricultural plants* - species for exports and species for domestic trade; species of underutilizing; *Growing and managing floricultural plants* - each student will maintain his/own plants at an identified location (at UCAIRS or at a location convenient to the learner); *Economics of floriculture crop production* - cost-benefit analysis; *Preparation of production plans* - how to target the markets, market-oriented production; Field trips (Commercial cut flower production facility; Commercial pot plant and cut foliage production facility; Retail domestic floriculture markets (pot plants and cut flowers); *Seminar/ Workshop;* preparation of value added products, Group activities; presentation

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 1 – Semester II)**

<b>Course Code</b>	<b>AT 1206</b>			<b>Course Title</b>	<b>Soil and Plant Nutrient Management</b>	
<b>Year</b>	1	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

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To provide the knowledge and skills required to manage the soil of farm lands for increasing crop production

**Intended Learning Outcomes:**

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

- Describe the role of essential plant nutrients in crop production and how these nutrients can be replenished in soil through application of organic and inorganic fertilizers.
- Explain significance of microorganisms present in soil and their role in crop productivity
- Explain how soil and plant samples are collected, processed, analyzed and interpreted

**Course Capsule:**

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**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Analytical Techniques in Soil Science ,Soil Fertility and Fertilizers – organic and inorganic fertilizers, Soil and plant nutrient management- macro and micro elements, deficiency symptoms of plants, nutrient cycles; Soil, nutrient and Water Conservation – ground water table, Environmental Pollution and Management – Types of pollution, remedial actions to be taken for preventing soil and ground water pollution, Land degradation and management

**Practical (Student Centered In-Class and Field Work)**

Introduction to specialized equipment Instrumental analyses - Principle and instrumentation of Conductivitymetry, Potentiometry, Spectrophotometry, Emission spectroscopy, Absorption pectroscopy ; Fertilizers: Identification, composition and calculation of nutrient percentage, Fertilizer analyses in organic and inorganic fertilizers, Plant analysis for N, P and K, Visit to fertilizer factories, soil fertility institutes and demonstration trials, Measurement of microbial population and activity in soil, Algal culturing and their microscopy

**Assessment:**

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Continuous assessment: 60%  
 End semester assessment: 40%

**Level 3 (Year 1 – Semester II)**

<b>Course Code</b>	<b>AT 1207</b>			<b>Course Title</b>	<b>Introduction to Food and Nutrition</b>	
<b>Year</b>	1	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide students with the understanding of the knowledge and important of nutrients in foods and food spoilage in day to day life.

**Intended Learning Outcomes:**

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

- Demonstrate knowledge and understanding of the fundamental concepts in food and nutrition
- Exhibit detailed knowledge of the nutrient content of most primary food sources
- Demonstrate the ability to estimate energy requirements, qualitatively assess dietary quality of an individual and plan a healthy diet
- Demonstrate the ability to communicate effectively in the context of nutrition
- Acquire knowledge on microorganisms in foods

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Definition and uses of Recommended Dietary Allowances (RDA), Classification of foods on the basis of major dietary components, carbohydrate metabolism, lipid metabolism, and protein metabolism, integration of metabolic cycle, evaluate the dietary sources, roles and functions of key nutrients, calculation of food and energy requirements based on recommendations, balance between food or energy intake and energy expenditure, growth curve to interpret nutritional status, food security, nutrition-related diseases that constitute health problems, various approaches to prevention, control and management of nutrition-related diseases, Definition of satiety, hunger and appetite. Role and significance of microorganisms in foods, intrinsic and extrinsic parameters of food that affect microbial growth, determination of microorganisms and/or their products in foods, fermentation and fermented foods, indicator organisms of food safety and quality.

**Practical (Student Centered In-Class and Field Work)**

Proximate composition of foods: Analysis of carbohydrates, proteins, fats, total ash, moisture content, measurement of pH, Development of a plan for nutrition education programmes in community, Preparation of communication aids for different groups

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 1 – Semester II)**

Course Code	AT 1208			Course Title	Information & Communication Technology		
Year	1	Semester	1	GPA Credits NGPA Credits	00 02	Theory (hr)	00
						Practical (hr)	30
						IL (hr)	30

**Aim of the Course:**

To provide the students with the basic knowledge and skills in Information and Communication Technology required for academic working environment that helps them to increase their efficiency and productivity during the academic and professional careers.

**Intended Learning Outcomes:**

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

- Understand the basic concepts and terminologies in Information and Communication Technology (ICT).
- Perform basic operations in the desktop environment of Windows.
- Communicate through Internet, search for information and know the various web technologies and familiar the e-learning with Learning Management System.
- Use the basic features of word processing in document preparation.
- Use the basic features of spreadsheet application for data analysis.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Basic concepts and terminologies in ICT, usage of ICT in different sectors; Computer system and its parts, Hardware, Software; Introduction to operating systems – Windows; Basic concepts of Internet communication, Facilities / benefits of Internet, Intranet and Extranet, Security and risks in Internet; Computer networks.

**Practical (Student Centered In-Class and Field Work)**

Hardware: Computer system and its parts (Input, Process, Output & Storage devices); Working with the desktop Windows: Setting the environment of a computer, Storing and managing data, Files and folder handling techniques; Connect to Internet, WWW and Web browsers, search engines, Internet services, e-mail, Information search strategies; The MS Word interface, main features of commonly used word processing applications, Adjusting environment settings, Entering text and symbols, Editing and Formatting text, Working with paragraph, Working with tables, Working with graphics and charts, Setting up pages, Printing documents; Spreadsheet management types, Excel interface, Basic file operations, Environment settings, Working with cells, Formatting cells and worksheets, Formatting/modifying charts, Setting up pages, Printing worksheets and charts

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

**Level 4 (Year 2 – Semester I)**

Course Code	AT 2101			Course Title	Production and Management of Plantation Crops		
Year	2	Semester	1	Credits	03	Theory (hr)	15
						Practical (hr)	60
						IL (hr)	90

**Aim of the Course:**

To provide the students with knowledge and skills on production and processing technology of plantation agricultural crops and different ways of value addition in order to apply them in product manufacturing and development.

**Intended Learning Outcomes:**

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

- Explain the techniques of agronomy practices following the production of plantation crops and correct harvesting methods, post harvesting practices for achieving potential yields while maintaining the quality of end product.
- Describe different processing methods and identify the ways of product development in plantation and export agricultural crops.
- Apply different strategies to improve quality of the end product/s to get maximum return on investment.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to the plantation industry in Sri Lanka; identification of importance, potential and drawbacks of the plantation industry, Plantation crops: Tea, Rubber, Coconut- Soil and climate, Clones and varieties, Land preparation, Agronomy practices, (harvesting ;plucking, tapping), replanting, pruning, shade tree management in the field, Soil conservation and rehabilitation, Integrated crop and livestock management, *Tea*: Effect of harvesting on made tea quality, Principles of black tea and green tea manufacturing, Manufacturing steps of pure orthodox tea, Orthodox-rotorvane tea, CTC tea, and green tea, Good manufacturing practices, Value added tea products, standards following for export market; *Rubber*: Harvesting, Principles of manufacturing, Natural Rubber Latex, Preservation of field latex, RSS production, Crepe rubber and Centrifuge latex production, Dry & Latex based rubber products, standards following for export market; *Coconut*: Desiccated coconut manufacturing, Copra processing, Processing of Vinegar and Wine from coconut water, Production of coconut Jam, coconut cream, coconut sap, Different products of coconut shell, Brown fiber and White fiber processing, standards following for export market, Policies and supportive services in relation to the industry

**Practical (Student Centered In-Class and Field Work)**

Identification of major plantation crops and their importance, practice their nursery establishment, crop establishment in the field, field visit to RRISL, TRI, CRI, Sugar cane research and other commercial fields for each crop cultivation, lab practical, video , *Tea*: Demonstrate Manufacturing of pure orthodox tea, Orthodox-rotorvane tea, CTC tea and green tea(Video), Arrange field visit to observe harvesting practices of tea and tea factories to show pure orthodox tea, Orthodox-rotorvane tea, CTC tea and green tea manufacturing; *Rubber*: Arrange field visit to show harvesting and manufacturing of RSS, Crepe and centrifuge latex; *Coconut*: Factory visit – Desiccated coconut factory, Fiber processing factory; Field visit – Coconut processing research division in Coconut Research Institute of Sri Lanka, Copra processing house, Laboratory practical.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 2 – Semester I)**

<b>Course Code</b>	<b>AT 2102</b>			<b>Course Title</b>	<b>Crop improvement and Biotechnology</b>	
<b>Year</b>	2	<b>Semester</b>	1	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 60
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide the knowledge and skills on different aspects of improvement in the existing crops, conservation of crop genetic resources and to provide the students with basic knowledge and exposure on different aspects and techniques of modern biotechnology

**Intended Learning Outcomes:**

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

- Select the best performing plants from the field or the hybridization program and develop them as novel varieties.
- Conserve the selected crop genetic resources for future use.
- Identify the basic concepts of crop improvement and bio-technology

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Development and scope of Plant Genetics, Fundamentals of Plant Genetics (Mendel's laws of inheritance, Gene interactions, Chromosome theory of inheritance, Chromosomal aberrations, Linkage), Principles of Plant Breeding (Historical perspective and importance of plant breeding, Evolution of cultivated crops, Objectives of plant breeding, Plant Introduction and domestication, Reproductive systems in crops, Plant breeding methods based on crop reproductive systems). Overview and scope of biotechnology; Introduction to hereditary material DNA, gene and chromosome, Relationship between DNA and the Phenotype, Organism diversity and similarly in DNA level. DNA and RNA: structure, DNA methylation and histone modification, Genetic code, Gene expression, uses of indigenous knowledge in agriculture, Genomic and DNA libraries, molecular tools in analysis of crop genetic variation, polyploids; advantages and disadvantages of polyploids in agriculture, Classifications Mutations, Molecular basis of mutations, DNA repair systems, Pedigree analysis, Southern hybridization, DNA Finger printing, Polymerase chain reaction.

**Practical (Student Centered In-Class and Field Work)**

Familiarization of flower, fruit and seed architectural biology, Identification of crops required pollination management, Creation of novel plants by hybridization, developing skills on clonal propagation techniques

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 2 – Semester I)**

Course Code	AT 2103			Course Title	Production and management of fruit crops	
Year	1	Semester	1	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide students with the knowledge of cultivation, management and novel agricultural techniques of economically important fruit crops grown in Sri Lanka . So that they should be able to propose potential solutions to enhance profits of commercial scale cultivations.

**Intended Learning Outcomes:**

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

- Explain the present status, future potentials, production systems, constraints and export potential of fruits in Sri Lanka.
- Apply the basic principles and practices of cultivation and management of economically important fruit species in Sri Lanka.
- Identify and analyze the major constraints faced by commercial scale cultivations and suggest potential solutions to maximize profits in fruits.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Present situation and future potential of economically importance fruit grown in Sri Lanka. Market demand and export potentials of fruit and fruit based cropping systems, Cultivation and management practices of economically important fruit, Pre and Post-harvest handling practices of fruits and importance of fruit quality , Importance of quality planting material production of fruits, Modern cultivation technologies and Prospects and constraints of organic fruit production
<b>Practical (Student Centered In-Class and Field Work)</b>
Production of quality planting materials; Sexual and asexual propagation of fruits ,Bud-grafting , layering techniques, and production of propagules, Establishment of nurseries,. Cultivation and management practices of fruits, Management of pest and diseases using cultural, chemical and biological methods. Rehabilitation of unproductive fruit trees.
<b>Assessment:</b>

Continuous assessment: 60%  
 End semester assessment: 40%



**Level 3 (Year 2 – Semester I)**

Course Code	AT 2104			Course Title	Post-Harvest Handling and Food Technology		
Year	2	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

To provide the knowledge on physiological processes take place in harvested agricultural produce so that students can quantify the post-harvest losses, provide the techniques to minimize such losses and introduce value added products.

**Intended Learning Outcomes:**

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

- Explain the importance of minimizing postharvest losses qualitatively and quantitatively.
- Describe the physiological processors determining the quality of agriculture produce.
- Explain how agriculture produce are harvested and handled in storage to minimize losses.
- Describe the processing techniques available for agriculture produce to preserve their quality and to minimize the losses.
- Select the correct packaging materials available for agriculture produce based on its physiology and the mode of transport and storage.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Overview of post-harvest losses in fruits, vegetables, cereals and other agriculture produce, Effect of pre-harvest factors on post-harvest quality, Fruit maturity and harvesting indices, Safe transportation, processing techniques and value addition of fruits, Harvesting, threshing and drying of cereals, Storage structures, Controlling storage environmental factors: Relative humidity, Temperature, Ventilation, Parboiling of paddy, Milling related processing techniques of paddy, Cut flowers: Handling and storage requirements, Dry preservation of ornamentals, Packaging structures.

**Practical (Student Centered In-Class and Field Work)**

Fruits: Measurements of quality parameters of harvested produce, Transportation structures, Treatments during storage, Dehydration of fruits, Value addition of fruit products; Cereals: Measurements of quality parameters of harvested produce, Storage structures( Warehouses, Bins etc.), Maintenance of environmental factors of storage structures, Parboiling technique, milling process; Cut flowers: Techniques to control post-harvest deterioration, special operations and treatments, cold storage: Packaging structures and value added products.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 2 – Semester I)**

Course Code	AT 2105			Course Title	Agrostology and Grassland Management	
Year	1	Semester	2	Credits	03	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

To assist students to get a broad understanding of forage and fodder productions techniques and how make balanced ration for farm animals to acquire optimum production.

**Intended Learning Outcomes:**

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

- State the present status of pasture and fodder production in different agro-climatic zones of Sri Lanka
- Discuss the agronomic description of pasture and fodder production
- Describe and identify the natural and improved pasture and fodder species with important morphological features.
- Explain the establishment, management and field maintenance of different pasture and fodder species in livestock farm.
- Determine of nutritive value of forages and fodder plants and formulation of balanced ration for farm animals.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to agrostology; definition of forage and its importance, limitations and improvements, agronomic description of pasture and fodder species; natural and improved pasture and fodder, types of pasture and fodder - pasture grasses, pasture legumes, fodder grasses, fodder legumes non legume tree fodder, characteristic of pasture and fodder- morphological features, climatic and environmental adaptation and nutritive composition fodder legumes and non legume tree fodder, pasture production in different agro-climatic zones of Sri Lanka; agro-climatic zones of Sri Lanka, present status of pasture production, limitations and the potentials in pasture production, strategies for improvements, establishment and management of pasture and fodder; selection of suitable species, selection of the type of cultivation - mono culture mixed culture; pasture under coconut, method of propagation and related factors, establishment of grasses, establishment of legumes, field maintenance: refilling, fertilizing, irrigation and weeding, defoliation of pasture and fodder; factors considering in defoliation, cutting interval/ frequency, cutting intensity methods of pasture and fodder conservation, hay making, silage making, evaluation of the quality of hay and silage, nutrient contents in pasture and fodder; factors affecting the nutrient contents, evaluation of the nutrient contents; estimation of yield/ha/year, fresh matter basis and dry matter basis, estimation of dry matter percentage, on wet basis and dry basis, management of grazing; define carrying capacity and stocking density, different grazing methods, introduction to principles of animal nutrition, definition and classification of nutrition, role and metabolic fate of nutrients, practical feeding of ruminants and non-ruminants; feeding standards and nutrient requirements of different animal species for maintenance growth reproduction and production, practical feeding of non-ruminants (pigs, poultry), practical feeding of ruminants (cattle and buffaloes and goats).

**Practical (Student Centered In-Class and Field Work)**

Establishment and management of pasture and fodder fields, preparation of a pasture and fodder album, harvesting and estimation of yield and skills, conservation of pasture and fodder, identification of feed ingredients, ration formulation for ruminants and non ruminants, evaluation of feed stuff for quality, estimation of gross energy contents of different feed stuffs.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 2 – Semester I)**

Course Code	AT 2106			Course Title	Agribusiness Management		
Year	1	Semester	1	Credits	02		
						Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide students with the knowledge and skills related to business management in order to establish and evaluate the performance of an agribusiness venture.

**Intended Learning Outcomes:**

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

- Assess the impact of prevailing business environment on establishing a business, in general, and agribusiness, in particular.
- Apply the principles of modern managing staff techniques in agribusiness.
- Apply the financial management tools and techniques to evaluate the performance of an agribusiness.
- Recognize the international marketing opportunities available for an agribusiness.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)** Introduction to food Managing environment in agribusiness - Internal vs. external environment; Managing people in agribusiness – Recruitment, Training, Staff motivation, Leadership, Negotiation; Managing finance in agribusiness – Record keeping, Financial statements, Analyzing financial statements; Identifying and managing international markets for agribusiness – Export options, Finding partners and making legal agreements, Pricing, Delivery terms and documentation; Quality assurance and management in agribusiness – Total Quality Management, Quality standards and assurance schemes

**Practical (Student Centered In-Class and Field Work)**  
 Managing environment in agribusiness (Case study analysis); Managing people in agribusiness (Role play); Managing finance in agribusiness (Tutorial and preparation of financial reports); Managing international markets for agribusiness (Group study and case development); Quality assurance and management in agribusiness (Group exercise and case development)

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 3 (Year 2 – Semester I)**

<b>Course Code</b>	<b>AT 2107</b>			<b>Course Title</b>	<b>Basic Statistics</b>	
<b>Year</b>	1	<b>Semester</b>	1	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide the knowledge and skills on basic mathematics, basic principles of descriptive and inferential statistics

**Intended Learning Outcomes:**

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

- Identification of basic mathematics principles regarding to statistics.
- Determination of appropriate method for data representation and identification of distributions.
- Conduct a simple statistical test and interpretation.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Terminology in agricultural statistics; Classification of data; Graphical summary, Frequency tables, Contingency tables, Bar charts, Line charts, Pie charts, Scatter plots, Histograms. Numerical summary measures; Measures in central tendency(mean mode median),Dispersion ( Range, Variance, Standard Deviation),Order statistics (maximum minimum quartiles, percentiles, box plots).Distributions ;Normal distribution, Binomial distribution, Poisson distribution .Introduction to hypothesis testing

**Practical (Student Centered In-Class and Computer Lab)**

In-class individual / small-group based practical sessions using MS-Excel Spreadsheets to carry out all statistical methods learned; Case studies to show the real world applications of statistics in analyzing, reporting and interpretation of data

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 3 (Year 2 – Semester I)**

Course Code	AT 2108			Course Title	Computer Assisted Language Learning (CALL)		
Year	1	Semester	1	GPA Credits	00	Theory (hr)	15
						02	Practical (hr)
					IL (hr)		90
				NGPA Credits			

**Aim of the Course:**

To provide the knowledge and insight to the student about the way of incorporating technology into English using environment.

**Intended Learning Outcomes:**

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

- Describe how to incorporate technology into an English using environment
- Comprehend the importance and use of on-going assessment in the computer-enhanced language classroom.
- Compile a database of CALL resources from the internet
- Devise new CALL tasks and adapt existing tasks suitable to the learner's level

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Overview of theories of language learning, Review of concepts related to lesson planning, Introduction to current CALL theories, Criteria and Conditions for CALL Use, CALL tools for independent language learning, Evaluation of websites and software as tools

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Practices of CALL Use, CALL tools for independent language learning, Evaluation of websites and software as tools

**Assessment:**

Continuous assessment: 100%

Using the criteria set by the expert trainer in consultation with the UCIARS

**Level 4 (Year 2 – Semester II)**

<b>Course Code</b>	<b>AT 2201</b>			<b>Course Title</b>	<b>Production and Management of Export Agricultural Crops</b>		
<b>Year</b>	2	<b>Semester</b>	2	<b>Credits</b>	02	<b>Theory (hr)</b>	15
						<b>Practical (hr)</b>	30
						<b>IL (hr)</b>	90

**Aim of the Course:**

To provide the students with knowledge and skills on Production and processing technology of export agricultural crops and different ways of value addition in order to apply them in product manufacturing and development.

**Intended Learning Outcomes:**

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

- Explain the techniques of production and correct harvesting methods, post harvesting practices for achieving potential yields while maintaining the quality of end product.
- Describe different processing methods and identify the ways of product development in plantation and export agricultural crops.
- Apply different strategies to improve quality of the end product/s to get maximum return on investment.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to export agricultural crops (spices, other minor export crops); identification of problems and limitations in the industry, Agronomy practices, shade tree management in the field, Soil conservation and rehabilitation, Harvesting and postharvest practices; coffee, cocoa, pepper, cinnamon, nutmeg, cardamom, clove, citronella, lemon grass, vanilla, betel, ginger and turmeric: Processing of white pepper, black pepper, cocoa, coffee (parchment coffee and cherry coffee), cinnamon: Oil extraction from citronella, lemon grass, cinnamon and clove: Processing of vanilla (Mexican and barban methods); Other value added products of export agricultural crops, standards following for export market, Policies and supportive services in relation to the industry

**Practical (Student Centered In-Class and Field Work)**

Field visits: Spice crop processing centers, Research Institutes, Central research station In-class activities: Commercial cultivation and processing firms, Video shows, Lab practical (spice crop based products)

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 4 (Year 2 – Semester II)**

Course Code	AT 2202			Course Title	Protected Agriculture		
Year	2	Semester	2	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide the knowledge and skills required to establish ‘protected agriculture models’ that provide optimum conditions for plant growth.

**Intended Learning Outcomes:**

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

- Describe different types protected agriculture models
- Evaluate the pros and cons of different types protected agriculture models suitable for various parts of the country
- Establish a protected agriculture model for a given crop in a given location.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to ‘Protected Agriculture’ - Origin, world and Sri Lankan status; Difference between ‘greenhouse agriculture’ and ‘protected agriculture’ – evolution, need for these two systems; Greenhouse structures and protected agriculture models - glasshouses, vinyl houses and polytunnels, shade structures/houses, rain shelters, insect-proof structures; Environmental manipulation under protected structures - temperature control, ventilation, exhausts, light control, humidity control; Irrigation under protected cultivation - different types of drip irrigation systems, drip tubes, nozzles; Fertilizer for protected cultivation - organic/inorganic fertilizers, fertigation, introduction to hydroponics; Pest and disease management in protected agriculture - prevention and treatments.

**Practical (Student Centered In-Class and Field Work)**

Identification of greenhouse structures and protected agriculture models - glasshouses, vinyl houses and polytunnels, shade structures/houses, rain shelters, insect-proof structures; Identification of materials used - UV treated poly-materials, shade nets, GI pipes, insect-proof netting, thermal blankets, poly-mulch materials, growth media, gutters/pots and seedling trays etc. Setting up protected agriculture models in-location - poly-house, shade house, rain shelter and record keeping; Long Task - prepare a “Guide Book: to set up a protected agriculture model for a medium-scale farmer; Field Trips - Low-cost and Modern and high-tech protected agriculture facility.

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

**Level 4 (Year 2 – Semester II)**

Course Code	AT 2203			Course Title	Animal breeding and Stock Management		
Year	2	Semester	2	Credits	03	Theory (hr)	15
						Practical (hr)	60
						IL (hr)	60

**Aim of the Course:**

To provide the students with knowledge and skills on genetics, animal breeding and stock management, so that students can use it for development and improvement of animal breeds ultimately supporting enhancement of total productivity of animal production.

**Intended Learning Outcomes:**

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

- Describe the principles of Mendelian, qualitative and quantitative genetics used in animal breeding.
- Demonstrate different artificial animal breeding methods
- Explain modern techniques used to modify and improve the reproductive performance of animals.
- Describe different management aspects of brood stock with respect to housing, feeding, replacement and health
- Identify and apply suitable animal breeding method for different animal species in order to maintain a continuous supply.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Principles of selection, Mendelian genetics, structure and function of genes, Recombinant DNA technology, Animal genetic diversity, changes of gene frequency, qualitative and quantitative traits, variance, Estimation of breeding value, Heritability and repeatability, single and multiple trait selection, inbreeding and cross breeding and heterosis, principle of Animal breeding, Breeding systems, planning of breeding programs, natural and artificial breeding (semen collection, artificial insemination, embryo transfer), Development of breeds, techniques used to modify reproduction. Management of stocks: feeding, housing, culling, health management (diseases and prevention) and record keeping (Ruminants, non ruminants).
<b>Practical (Student Centered In-Class and Field Work)</b>
Selection procedure; Structure and gene function; Recombinant DNA technology; Estimation of variance, breeding value, heterosis; Planning of breeding programs with respect to the herd composition; Dummy preparation; Semen collection; Artificial insemination (AI); Embryo transfer; Pregnancy diagnosis; Sexing; Vaccination; Feeding for brood stocks; Replacement/Culling; Development of breeds; Application of new techniques to modify reproduction

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%



**Level 4 (Year 2 – Semester II)**

<b>Course Code</b>	<b>AT 2204</b>			<b>Course Title</b>	<b>Farm Planning and Designing</b>	
<b>Year</b>	2	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 45
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide knowledge and skills on basic principles of selecting, designing and arranging farm structures and buildings used for animal housing, effective storage of crops, tools, equipment and machines.

**Intended Learning Outcomes:**

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

- Explain the basic features of different farm structures used for animal housing, effective storage of crops, tools, equipment and machines.
- Select the required farm structures/building for a given enterprise.
- Select the basic dimensions satisfying the optimum capacities of farm structures.
- Design the layouts of farm structures for a given enterprise.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Characteristics and developments in farm structures and buildings; Farm structure construction materials: wood, concrete, roofing materials; Basics of Engineering drawing; Basics on shear force and bending moment; Basics on soil shear stress; Surveying techniques for area calculations: Chain surveying, Plane tabling; Basics of leveling using an auto level; Contouring; Basic features and dimensions of farm structures: cattle units, piggery units, poultry-chicken housing, crop handling and storage structures; Pump houses, pit latrines, Greenhouses; Farm infrastructure: foot paths, roads, pipe lines, pit latrines; Applications of GIS and computer-based software on lay outting farm structure designs.

**Practical (Student Centered In-Class and Field Work)**

Familiarization of basic planes and developments of engineering drawings; Basics of Auto-Cad; Basic calculations on plotting bending movement and shear force diagrams for given beams; Basic surveying methods of area calculations; Levelling using an Auto leveler; Field visits to cattle units, piggery units, poultry-chicken housing, crop handling and storage structures, Pump houses, Greenhouses; Applications of GIS on designing farm layouts.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 4 (Year 2 – Semester II)**

<b>Course Code</b>	<b>AT 2205</b>			<b>Course Title</b>	<b>Agriculture Extension and Communication technology</b>	
<b>Year</b>	2	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide students with the practically feasible extension series by accruing latest knowledge on Agricultural extension and communication

**Intended Learning Outcomes:**

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

- Act as graduate farmers for self-employment
- Act as graduates relevant to themselves, industry and society In order to contribute effectively to the national development goals of agriculture.
- Apply the teaching-learning process
- Define the given concepts of communication
- Identify the types of communication
- Conduct interviews
- Demonstrate improved communication skills

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Principles of agricultural extension, task of agricultural extension, extension agent in rural community and role of extension agent, extension education and teaching, audio-visual aids and their role in transfer of technology. Extension approaches, formal and informal education-similarities and differences between extension education and community development. Definition and meaning of communication, elements of communication, the purpose of communication process, communication approaches, Social, psychological and mathematical communication behavior, Communication skill empathy, Fidelity, models of communication, theories of communication process, development communication, elements of diffusion, the innovation decision process, adoption, the change agent, communication channels, Change management and attitudes change, Barriers to change.
<b>Practical (Student Centered In-Class and Field Work)</b>
Visit to block and other extension institutions to study their working and staffing. Each of the students will be allotted a village near institute and will study the extension work being carried out there. They will contact farmers and then lay out new technology in agriculture and about the supporting agencies, Preparations of posters, leaflets, posters, charts, flash cards, formal groups, and circular letters, Handling of different communication media, developing communication skill, collection of data regarding number of sources used, visit to audio visual unit, TV center and press.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 4 (Year 2 – Semester II)**

Course Code	AT 2206			Course Title	Aquaculture Production Technology		
Year	2	Semester	1	GPA Credits NGPA Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

To provide knowledge and skills to the students on aquaculture and fisheries management while conserving the natural aquaculture resource base and increasing the profitability and productivity of aquaculture and fisheries production in Sri Lanka

**Intended Learning Outcomes:**

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

- State the present status of aquaculture and fisheries production, constraints and future potentials in Sri Lanka.
- Describe the nutritional requirements, energy metabolism, different feeds and formulation of fish feed.
- Acquire knowledge on fish breeding and fish breeding station management practices
- State economically viable marine and inland fish species, fish culture systems, water quality management, feeding of farmed fish, harvesting methods
- Describe important fish diseases, prevention and control measures

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to aquatic resources of the world; Classification of fish; Economically important inland and marine fish species; Selection methods of fish for farming; Present fish culture systems; Introduction to ornamental fish industry; Water quality management; Nutritional requirement of fish; Different fish feed and formulation; Introduction to live food organisms; Aquatic plants; Production of live feeds; Introduction to fish breeding; Techniques used in fish breeding; Breeding of different fish breeds; Establishment and management of fish breeding station; Introduction to shrimp and prawn culture; Fish harvesting methods and marketing; Diseases of fish; Introduction to aquaculture based farming systems; Introduction to fish legislation

**Practical (Student Centered In-Class and Field Work)**

Anatomy and physiology of fish; Water quality parameters; Fish feeds and formulation; Identification of fish live feed, propagation and management of aquatic plants; Breeding of fish species; Maintenance of ornamental fish tanks, brood stocks and back-ups; Biuret method for determination of protein content of various extracts; Determination of salt content in fish using Volhard method; Determination of rancidity in fish (Peroxide value and TBARS); Determination of total solids and chemical oxygen demand (COD); Fishing gears and crafts; Harvesting, storage and transportation techniques

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

**Level 4 (Year 2) – Semester II**

<b>Course Code</b>	<b>AT 2207</b>			<b>Course Title</b>	<b>Plant <i>In-vitro</i> Propagation</b>	
<b>Year</b>	2	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide the knowledge and skills on different aspects of improvement in the existing crops and their propagation by *in-vitro* culture techniques.

**Intended Learning Outcomes:**

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

- Identify *in-vitro* propagation technologies.
- Domestic low cost production of plants through tissue culture technology.
- Propagate selected crops in massive scale via *in-vitro* tissue culture technique.
- Identify secondary metabolites extraction technologies.

**Course Capsule:**

<b>Theory (Through Expert Seminar; Teaching Sessions; LMS)</b>
Low cost options for domestic tissue culture, Media formulation, Plant regeneration systems, Micro-propagation of important crops: Anthurium, banana, pineapple, aquatic plants, orchid, seed culturing and weaning, Medicinal production via plant tissue and cell cultures, Artificial seed production. Principals and protocols for plant chemical extraction via micro propagation technology.
<b>Practical (Student Centered In-Class and Field Work)</b>
Designing a tissue culture laboratory for <i>in-vitro</i> clonal propagation, Salts and hormone stock solution preparation, Murashige&Skoog medium preparations & formulations, Anthurium leaf culturing, Orchid seed culture; Pineapple culture procedure, Micro-tuber / micro-rhizome induction, Embryo culturing, Acclimatization methods for <i>in-vitro</i> propagated plants; <i>Fieldvisits</i> : to PGRC and a commercial tissue culture laboratory. Extraction of plant chemicals.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 4 (Year 2) – Semester II**

Course Code	AT 2208			Course Title	Life Skills Development		
Year	2	Semester	1	GPA Credits NGPA Credits	00 01	Theory (hr)	00
						Practical (hr)	30
						IL (hr)	30

**Aim of the Course:**

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To provide the knowledge and insight to the student about the importance of personal skills so that he/she can start to harness the power of his/her mind to develop, learn and achieve more in life.

**Intended Learning Outcomes:**

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

- Explain the importance of working by a professional according to certain key components specified under the ‘personal skills’ to maintain a healthy body and mind.

**Course Capsule:**

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Students are exposed to a series of interactive workshops/sessions on personal development, which will be conducted by a “Trained Career Guidance Counselor”, where a special attention would be placed on the concepts, importance and practice of: Self-preservation, Self-Motivation, Self-esteem, Self-control, Assertiveness, and Emotional intelligence to become an effective professional.

**Assessment:**

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Continuous assessment: 100%

Using the criteria set by the expert trainer in consultation with the UCIARS

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3101			Course Title	Landscape Horticulture		
Year	3	Semester	1	Credits	03	Theory (hr)	30
						Practical (hr)	60
						IL (hr)	90

**Aim of the Course:**

To provide students with the knowledge and skills required to identify, select, use and manage soft and hard landscape materials to design an outdoor area in an aesthetic and sustainable manner in order to satisfy a client.

**Intended Learning Outcomes:**

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

- Apply the principles and practices of landscape designs in residential and commercial landscapes.
- Prepare a landscape design for a client to satisfy his requirements.
- Implement and manage a design using soft and hard landscape materials in a given area.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

*Introduction to ornamental and landscape horticulture; Definitions, Goals of landscaping, Landscape categories, Background to design, Current developments, Design elements; Concepts of beauty, Contribution of plants to the landscape, , Design principles; Design principles in landscape quality, design process; Steps involved in the design process, Components of the design process, Factors influencing design quality, Plant arrangement ,Landscape installation; Hardscape landscape materials, Pre-planting site modifications, Soft landscape materials – Establishment, Bedding plants, ground covers and ornamental grasses; Definition and uses, Designing a flower garden, Types, uses and selection of ground covers, Classification and description of ornamental grass categories, Establishment of themes, Trees and shrubs; Species selection and placement, Seedling selection and planting, Establishment of themes, Ornamental species with modified stems; Role in the landscape, Classification and description of select species in major families, Turf production and management; Definitions, Purpose of turf, Lawn establishment, Planting and management practices, Pruning; Techniques and strategies, Maintenance of established trees, hedges and climbing plants, Landscape estimating and bidding; Computer aided planting designs.*

**Practical (Student Centered In-Class and Field Work)**

Identification and management of soft landscape materials – Herbaceous plants, Climbers, Ground Covers, Shrubs and Trees; Establishment and management of lawns; Landscape drawing techniques and computer aided designing; Design a project emphasizing soft and hardscaping materials and presentation of the plan; Establishment of a design in the campus premises; Field visits to expose students to witness the use of different planting design techniques, Computer aided designs

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

**Level 5 (Year 3 – Semest**

Course Code	AT 3102			Course Title	Agro-ecology		
Year	2	Semester	2	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To expose students to the recent applications and emerging trends in agro ecology that uses various methods/ technologies to enhance the sustainability of agricultural systems locally and globally.

**Intended Learning Outcomes:**

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

- Evaluate the present situation of ecological farming in Sri Lanka.
- Differentiate and demonstrate the methods of organic farming and biodynamic farming vs conventional farming.
- Demonstrate the proper maintenance of organic farm and demonstrate and describe the management of organic farm to obtain high production and revenue.

**Course Capsule:**

Theory (Through Expert Seminar; Teaching Sessions; LMS)
Introduction to agroecology, Management of ecosystem and agroecosystem, Indigenous knowledge used in ecological farming, Ecological problems of crop cultivation, pollution, leakage and erosion, land development, Effective management of soil fertility, Organic farming, Organic seed production, Bio dynamic farming, Vermiculture.

Practical (Student Centered In-Class and Field Work)
Field visit to an organic farm and biodynamic farm, Preparation of organic applications - Super compost, natural microbial culture media (“jeewamurthum”), bio char and botanical pesticide (“dasaparnakasaya”), Preparation of vermi compost and vermiwash, Application of vermi compost and vermiwash , Application of live fence for farm, Organic seed production, Application of bio dynamic farming, Use of Indigenous knowledge for farming systems.

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3103			Course Title	Animal Product Processing Technology	
Year	3	Semester	1	Credits	02	
						Theory (hr) 15
						Practical (hr) 30
						IL (hr) 60

**Aim of the Course:**

To provide the knowledge and skills for students on high quality meat, poultry, dairy products, eggs and new technological approaches in value addition and processing of animal products

**Intended Learning Outcomes:**

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

- Demonstrate the steps associated with processing of poultry and swine in order to obtain high quality meat products
- Describe different processing methods applied for meat, fish, egg and dairy products
- Explain microbiological aspects and preservation methods of meat, fish, egg and dairy products
- Develop new products by considering quality, value and health aspects using meat, fish, egg and milk
- Acquire knowledge on proper utilizing of by-products resulting from processing of meat, fish, egg and dairy products

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Meat, fish and egg industry; Live animal transportation; Animal welfare aspects; Processing of poultry (broilers) and swine: slaughtering, handling of carcass; Structure and composition of meat, fish and egg; Post-mortem glycolysis, eating quality, spoilage and pathogenic diseases associated with meat and fish; Quality aspects and properties of eggs; Processing of milk: properties and constituents of milk, spoilage, milk borne diseases, processing of liquid milk; Microbiological aspects and preservation of meat, fish, eggs and dairy products; Quality standards and health aspects; Value addition; New product development; By-product utilization; Sensory analysis.

**Practical (Student Centered In-Class and Field Work)**

Production of sausages, ham and bacon; Production of canned meat and fish; Production of salmon; Preparation of Maldives fish; Value added cuts of shrimps/prawns; Preparation of fish sauce; Production of fermented milk products; Manufacture of ghee and butter, ice-cream, sweetened condensed milk; Manufacture of cheese and panneer; New product development from meat, fish, egg and milk; Microbiological analysis for fresh produce and processed products; Functional properties evaluation of eggs; Development of quality standards (HACCP); Sensory trials for new products.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%



**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3104			Course Title	Food Processing & Value Addition		
Year	3	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

To provide the knowledge and skills required to identify, select and use relevant food processing/preservation technologies, sensory evaluation techniques, food packaging in relation to produce value added high quality nutritious processed foods, in particular.

**Intended Learning Outcomes:**

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

- Apply the appropriate food processing and preservation technologies to reduce deteriorative changes of desirable properties of raw materials/food and value-added food products.
- Demonstrate the important sensory properties of given food item and perform simple test to evaluate sensory quality of the particular food product.
- Evaluate the role and function of packaging used for a range of consumer food needs and package food in rigid and flexible containers.
- Develop a value added food product for startup business.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Food related hazardous: Microbiological, Physical and Chemical; Food borne disease; Good Hygienic Practice (GHP): Basics, Hygienic zoning, Basic concepts of cleaning and disinfection, Chemicals used for cleaning and/or disinfection; Laws and regulations related food safety; Total Quality Management, 5-S concept, New seven tools in quality management; Food Management systems: Hazard Analysis Critical Control Points (HACCP), ISO 22000; Factory design: hygienic design of equipment, factory layout, cleaning and disinfection, prevention of hazards, hygienic design of surfaces, doors and drains; hygienic design of open and closed systems, installation of equipment, and factory zoning/layout; Factory sanitation: Contamination sources, personnel hygiene; Waste disposal: treatment and storage of food plant waste, handling solid and liquid waste

**Practical (Student Centered In-Class and Field Work)**

Factors effecting food deterioration- Group assignments followed by discussion; Chemical and physical food processing and preservation techniques- Perform laboratory practical, lab reports, discussion classes, individual mini project, field visit followed by Performa; Sensory evaluation- Perform laboratory practical, lab reports and group discussion; New Product development- Video, Group assignments on product development (Lab exercise), Group presentation; Food packaging: market visit, industry visit, group report, Food related hazardous; Good Hygienic Practice - Tutorial; Basic concepts of quality- mini survey based report; Food Management systems- Group discussion; Factory design- Field visit, Case study & mini project report; Factory sanitation and personnel hygiene- Role play; Waste disposal- Field visit followed by group report

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 5 (Year 3 – Semester I)**

<b>Course Code</b>	AT3105			<b>Course Title</b>	<b>Applications of Crop Improvement and Biotechnology</b>		
<b>Year</b>	3	<b>Semester</b>	1	<b>Credits</b>	02	<b>Theory (hr)</b>	15
						<b>Practical (hr)</b>	30
						<b>IL (hr)</b>	90

**Aim of the Course:**

To provide the students with basic knowledge and exposure on different aspects and techniques of modern plant improvement techniques and biotechnology.

**Intended Learning Outcomes:**

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

- Identify the problems that can be solved by modern breeding techniques and biotechnology and direct them to be solved by suitable institution in the country.
- Critically evaluate the beneficial and adverse effects of importation of GM plants to Sri Lanka and explain the importance of risk assessment of GM plants for a country.
- Compare the present status of biotechnology between the global world and Sri Lanka and suggest suitable methods to improve agricultural biotechnology in Sri Lanka.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Issues in agricultural bio diversity, techniques in biotechnology for plant improvement, use of plant transformation, hybrid vigor, mutation breeding and molecular markers as tools in plant improvement, , What is genetic engineering?, Gene cloning principle and recombinant DNA technology, Industrial applications of recombinant DNA technology, Current global extent of genetically modified (GM) crops, Science underpinning genetically modified organisms (GMOs), Gene transformation methods into plants, Mode of action of commercially available GM plants in the world. Biosafety and risk assessment in GMOs, Gene prospecting and biopiracy, Science underpinning DNA typing technology, Basics of PCR technology, DNA typing technology in forensic identification, Application of DNA typing technology in agriculture, Bioinformatics and applications in agriculture, Present status of biotechnology in Sri Lanka

**Practical (Student Centered In-Class and Field Work)**

Students will be exposed to the latest developments of breeding and biotechnology in the context of Sri Lanka and globally through the support of Case studies, Guest speeches and Video shows etc., where the special topics of Breeding, DNA extraction, PCR, Gel electrophoresis and DNA blotting techniques etc. will be covered; Field Visit to expose students to the equipment used in biotechnology

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3106			Course Title	Production and management of Medicinal plant	
Year	2	Semester	1	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To expose students to study about the use of plants for medicinal and other purposes; poisonous plants; cross-cultural aspects; Historical development; natural products from higher plants in modern medicine.

**Intended Learning Outcomes:**

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

- Recognize both the historical and current significance of plants in medicine.
- Understand the general modes of action of some of the more important chemicals found in medicinal plants.
- Identify some of the more common native plants with medicinal properties.
- Discuss current issues and research associated with medicinal plants

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Introduction to Medicinal plants as an important Bio-resource, Historical development of the use of medicinal plants, traditional knowledge related to medicinal plants, Botanical overview of medicinal plants resources of Sri Lanka, Current conservation scenario of medicinal plants in Asia, Existing threats to medicinal plants populations, Methods for conservation (insitu gene banks, Ethno medicinal gardens, Sustainable harvest and conservation education facilities, Development of multi-disciplinary databases for medicinal plants conservation), Cultivation and management systems of important medicinal plants.
<b>Practical (Student Centered In-Class and Field Work)</b>
Preparation of a PPT presentation to elaborate the recent advancements of particular topic. Identification of valuable medicinal plants and uses, Establishment and maintain medicinal plant garden, post-harvest techniques of medicinal plants, Preparation and industry of indigenous medicine. Field visit to medicinal garden.

**Assessment:**

Continuous assessment: 60%  
 End semester assessment: 40%

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3107			Course Title	Agro forestry and Silviculture		
Year	2	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

The aim is to provide a sound understanding of the underlying principles and applied practice of agroforestry and silviculture. This will enable students to deal with the wide range of silvicultural concepts associated with management of forests.

**Intended Learning Outcomes:**

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

- Apply principles of tree species selection, including seedling physiology and physiological requirements, to develop natural and artificial forest regeneration prescriptions.
- Explain basic concepts of applied forest genetics and tree improvement and their role in agroforestry.
- Discuss applications of commonly used intermediate treatments, including commercial and pre-commercial thinning, pruning, forest fertilization, and vegetation management.
- Apply silviculture planning techniques and record keeping systems commonly used to forest estate management.

**Course Capsule:**

<b>Theory (Through Expert Seminar; Teaching Sessions; LMS)</b>
Introduction to forest (natural and manmade), Importance and role of forest on Agriculture and Environment, Reforestation, Agroforestry – Introduction to Agroforestry, Agroforestry systems, Potential roles and ancillary benefits of agroforestry systems, Forest nutrition, Choice of tree species, Urban forestry, Silviculture, Tree-crop interface, Management of tree-crop components, Harvesting forest crops, Forest health, Wildland management, Forest industry.
<b>Practical (Student Centered In-Class and Field Work)</b>
Field experience for the student in the various facets of silviculture including planning, thinning, harvesting, timber stand improvement, and site-growth relationships. Forest conservation practices, Choice of tree species, Forest measurements, Forest health and nutrition, Conservation and reforestation, Harvesting, Forestry industry.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 5 (Year 3 – Semeste**

Course Code	AT 3108			Course Title	Principles of Humanities and Social Sciences		
Year	3	Semester	1	NGPA Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To provide students with the general knowledge on humanities and social sciences to be a well organized graduate in any subject area.

**Intended Learning Outcomes:**

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

- demonstrate the importance of the humanities and social sciences as a learning area in promoting students as active and informed citizens;
- apply understandings of curriculum, inquiry learning in the humanities and social sciences and assessment frameworks in order to plan intellectually challenging and worthwhile inquiries;
- apply theoretical orientations, sources of knowledge, and pedagogical and curriculum principles to learning in the humanities and social sciences;
- employ strategies which explicitly and purposefully promote students' literacy, numeracy and critical thinking capabilities within inquiry learning contexts

**Course Capsule:**

**Theory and Practical (Through Expert Seminar; Teaching Sessions; LMS Student Centered In-Class and Field Work)**

Definition of rural sociology and its relationship to other social sciences with special reference to extension, need for studying sociological principles, concept of human society, relationship between society, culture family kin, plan, caste and religion, structure and function of social organization; various forms of culture and their importance in extension work social process, social control, social mobility, social change and the process of changes. Definitions, Social science research process, Social science research ethics, Variable and measurements, Research designs, Preparation of research proposals, Hypothesis development and testing, Types of data, Different methods of data collection, Questionnaires and schedules, Sampling techniques, Parametric and non-parametric statistical tools for social science research, Preparation of research reports, Presentation skills, Field surveys.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 5 (Year 3 – Semester II)**

Course Code	AT 3201			Course Title	Crop Production Practices	
Year	3	Semester	1	Credits	04	
						Theory (hr) 00
						Practical (hr) 120
						IL (hr) 90

**Aim of the Course:**

To provide an opportunity for students to apply the knowledge and skills that they have acquired throughout the course (i.e. Level 3 to 5) in a “real world agricultural/farming environment” individually and as a team to gain “hands-on experience” and to “develop their capacity” to use resources (physical & capital) optimally to get favorable agricultural outputs under the prevailing conditions (i.e. climate and natural environment, occupational health and safety, regulations).

**Intended Learning Outcomes:**

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

- Coordinate the limited resources available to get the optimum output from a given agricultural operation (e.g. cultivation of crop / rearing of animals) under the existing agronomic, socio-economic and regulatory conditions.
- Explain the constraints they faced as they are practically involved with agricultural farming activities.
- Recommend possible solutions to overcome the negative effects of such issues and to increase the effectiveness, efficiency and productivity of agricultural operations.

**Course Description:**

<b>Integrated Field Work Over 15 Weeks</b>
Under this course, the students are supposed to carry out designated practical work in the field, individually and collectively. They will have to plan, coordinate and implement all such activities by themselves for the most part, as it would enable them to gain knowledge and hands on experience, develop life skills and build up confidence to handle, maintain, and manage agriculture related operations in more practically and professionally. The designated activities would include, but not limited for, cultivation of various crops and rearing of livestock as well as design and implementation of support systems to manage irrigation, pest and diseases, yield and other operations in the agri-food value chain. They are supposed to attend to training sessions, meet the staff regularly, and carry on farming operations as a team with appropriate action plans, and finally present the outcome of whole exercise (i.e. lessons learned).

**Assessment:**

Continuous assessment: 60% (Field activities including record keeping)  
 End semester assessment: 40% (Case presentation)

**Level 5 (Year 3 – Semester II)**

Course Code	AT 3202			Course Title	Livestock Production Practices	
Year	3	Semester	1	Credits	03	
						Theory (hr) 00
						Practical (hr) 90
						IL (hr) 90

**Aim of the Course:**

To provide the knowledge and insight to the student about the certain leadership skills required for a professional as he/she involves dealing with people in such a way as to motivate, enthuse and build respect.

**Intended Learning Outcomes:**

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

- Explain the importance of working by a professional according to certain key components specified under the ‘leadership skills’.

**Course Capsule:**

**Practical (Student Centered In-Class and Field Work)**

Ruminant management; practice identification techniques of farm animals, restraining and handling techniques, housing, feeding, breeding and health management, grooming and hoof care, milking, record keeping, non ruminant management; management of a broiler flock from day old to slaughter, biological control of incubation, management of a breeding stock, growers and finishers of swine, layers and miscellaneous poultry

Continuous assessment: 60% (Field activities including record keeping)  
 End semester assessment: 40% (Case presentation)

**Level 5 (Year 3 – Semester II)**

Course Code	AT 3203			Course Title	Agriculture Engineering Practices	
Year	3	Semester	2	Credits	02	
						Theory (hr) 00
						Practical (hr) 60
						IL (hr) 90

**Aim of the Course:**

To provide an opportunity for students to apply the knowledge and skills that they have acquired throughout the course (i.e. Level 3 to 5) in a “real world agricultural/farming environment” individually and as a team to gain “hands-on experience” and to “develop their capacity” to use resources (physical & capital) optimally to get favorable agricultural outputs under the prevailing conditions (i.e. climate and natural environment, occupational health and safety, regulations).

**Intended Learning Outcomes:**

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

- Coordinate the limited resources available to get the optimum output from a given agricultural operation (e.g. cultivation of crop / rearing of animals) under the existing agronomic, socio-economic and regulatory conditions.
- Explain the constraints they faced as they are practically involved with agricultural farming activities.
- Recommend possible solutions to overcome the negative effects of such issues and to increase the effectiveness, efficiency and productivity of agricultural operations.

**Course Capsule:**

**Practical (Student Centered In-Class and Field Work)**

Application of agriculture engineering in field and lab

**Assessment:**

Continuous assessment: 60% (Field activities including record keeping)  
 End semester assessment: 40% (Case presentation)



**Level 5 (Year 3 – Semester II)**

Course Code	AT 3204			Course Title	E- Commerce for Agriculture	
Year	1	Semester	2	Credits	02	
						Theory (hr) 30
						Practical (hr) 30
						IL (hr) 60

**Aim of the Course:**

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To provide students with the knowledge on e-commerce so that they are familiar with the business models for e-commerce and can evaluate e-commerce businesses and explore future e-commerce opportunities.

**Intended Learning Outcomes:**

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

- Discuss electronic commerce and the stakeholders and their capabilities and limitations in the strategic convergence of technology and business.
- Appreciate the global nature and issues of electronic commerce as well as understand the rapid technological changes taking place.
- Demonstrate awareness of ethical, social, political and legal aspects of e-commerce
- Analyze features of existing e-commerce businesses, and propose future directions or innovations for specific businesses

**Course Capsule:**

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<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Introduction to e-commerce; e-Commerce infrastructure (Internet, web and mobile platform); E-commerce business models: (B2B, B2C, C2C, G2G, G2C); e-Commerce strategy: e-Commerce marketing and advertising; E-commerce security and payment systems, social, political and legal issues in e-Commerce; Social networks and communities, e-Commerce innovation: designing the future.
<b>Practical (Student Centered In-Class and Field Work)</b>
Familiarize the various web technologies and e-Commerce applications, e-Commerce business models. Sri Lankan famous e-Commerce sites; Building an e-commerce presence: (web sites, mobile sites) by customizing content management system (CMS) software; Identify the trends in e-Commerce and mobile commerce (m-commerce) applications. Compare and contrast the e-Commerce sites/applications.

**Assessment:**

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Continuous assessment:           60%  
 End semester assessment:       40%

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Level 5 (Year 3 – Semester II)**

Course Code	AT 3205			Course Code	Precision Agriculture	
Year	3	Semester	2	Credits	02	
						Theory (hr) 30
						Practical (hr) 30
						IL (hr) 60

**Aim of the Course:**

The aim of this course are to develop a fundamental understanding of precision agriculture; identify and use appropriate hardware and software tools; gain experience in developing and interpreting prescription maps; effectively use data in management decisions; and develop an understanding of precision agriculture applications in other countries.

**Intended Learning Outcomes:**

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

- To develop an understanding of using global positioning systems and their use in precision farming. Students will learn how to use GPS equipment and integrate the results with the use of appropriate software programs.
- To develop an understanding of pre-processing measured field data to create maps for display of the variability of field parameters such as soil nutrients and electrical conductivity, yield, moisture content, pH and elevation.
- To develop an understanding of using ArcVIEW GIS software to develop prescription maps. ArcCatalog, ArcMap and ArcToolbox modules will be used frequently during this course and students will become proficient using these tools.
- To interpret prescription maps and be able to develop a variable rate application management strategy. Soil maps, yield maps and profitability maps will be developed and interpreted to identify production zones in a field.
- To develop an understanding of precision agriculture technologies and their applications in other countries

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Guidelines for adopting precision Agricultural practices, Management of information relevant to Precision Agriculture: Basic, strategies and tools, Potential application of remote sensing, Collection of crop, field data and mapping, Procedure for accurate yield mapping, Yield map interpretation, Data layer smoothing and interpolation in yield mapping and interpretation, Mapping of land and crop information using GIS techniques, Variable Rate Technology (VRT) in precision Agriculture, Site specific management strategies used in precision agriculture, Adoption and economics of precision agriculture technologies, Site specific management of crop and land parameters, Techniques for conducting field scale research with precision agriculture tools. Introduction to GIS, Maps and Spatial Data Management, Spatial data, characteristics and models, Spatial data analyses in GIS, Concepts of Remote sensing, Sensors and Platforms, Interpretation of Satellite Images and Air Photos, Applications of Remote Sensing.

**Practical (Student Centered In-Class and Field Work)**

Characteristics of the GPS receivers. Performing scouting job with a GPS receiver based on pocket PC with Farm Works software. 2. Processing and interpreting the yield data. Preparing maps of the yield spatial distribution. 3. Soil sampling for precision farming purposes and preparing application maps for variable rate fertilization. 4. Work with a VRT fertilizer spreader and assessment of guidance system accuracy. 5. Processing the field data in software for a farms integrated system management

**Assessment:**

Continuous assessment: 60% (Field activities including record keeping)  
 End semester assessment: 40% (Case presentation)

**Level 5 (Year 3 – Semester II)**

Course Code	AT 3206			Course Title	Entrepreneurship & Business Planning	
Year	3	Semester	2	Credits	02	
						<b>Theory (hr)</b> 30
						<b>Practical (hr)</b> 60
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide students with the knowledge and skills required to identify, select and evaluate business opportunities to make success through efficient and effective planning.

**Intended Learning Outcomes:**

*At the completion of this course, the students should be able to:*

- Identify the business opportunities available in the market, in general, and in agricultural markets, in particular.
- Develop a competent product portfolio to a given agribusiness.
- Prepare a detailed business plan for a potential client of a specific agro-industry.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Entrepreneurship; Institutional support to business entrepreneurs; Capacity building for agribusiness entrepreneurship; Guidelines for starting an agribusiness; Entrepreneurship and innovations; Product and technology; Product portfolio, Business planning

**Practical (Student Centered In-Class and Field Work)**

Entrepreneurship (*Success stories of entrepreneurs*); Institutional support and capacity building (*Roleplay*); Guidelines for starting farm enterprises (*Development of a project proposal*); Entrepreneurship and innovations (*Case study*); Product and technology (*Power-Point Presentations*); Product portfolio (Development of a product portfolio); Business plan (*Checklist to update a business plan, Development of an agribusiness plan*).

**Assessment:**

Continuous assessment: 60%  
 End semester assessment: 40%

**Level 5 (Year 3 – Semester II)**

<b>Course Code</b>	<b>AT 3207</b>			<b>Course Title</b>	<b>Case Study</b>	
<b>Year</b>	3	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

To provide students with the knowledge and skills required to practice applying knowledge and thinking skills to a real situation.

**Intended Learning Outcomes:**

*At the completion of this course, the students should be able to:*

- Analysing, applying knowledge, reasoning and drawing conclusions" for overcome complexities, would encounter in the workplace.
- see how the complexities of real life influence decisions.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Introduction to case study, Methodologies for doing a case study
<b>Practical (Student Centered In-Class and Field Work)</b>
Doing a case study assigned by the course

**Assessment:**

Continuous assessment:            100%

## Bachelor of Agro-Technology – UCIARS – Revised Curriculum

### Level 5 (Year 3 – Semester II)

Course Code	AT 3208			Course Title	Presentation Skills		
Year	3	Semester	1	GPA Credits NGPA Credits	00 02	Theory (hr) Practical (hr) IL (hr)	00 30 30

#### Aim of the Course:

To prepare students to make and deliver an effective presentation

#### Intended Learning Outcomes:

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

- Make effective presentations
- Use communicator strategy
- Apply audience strategy and message strategy
- Prepare visual aids

#### Course Capsule:

Communication strategy  
Speaking: verbal structure  
Speaking: visual aids  
Speaking: nonverbal skills  
New media

#### Assessment:

Continuous assessment: 100%  
Based on the criteria set by the trainer in consultation with the UCIARS

**Level 6 (Year 4 – Semester I)**

Course Code	AT 4101			Course Title	Research Methodology & Proposal Development		
Year	4	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

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

**Intended Learning Outcomes:**

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

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

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction to research – the role of research, research process overview; Philosophies and the language of research theory building; Thinking like a researcher – understanding concepts, constructs, variables, and definitions: Problems and Hypotheses – defining the research problem, formulation of the research hypotheses; Research design – experimental and non-experimental research design, Field research and survey research; Selecting appropriate Qualitative and Quantitative Methods (Data collection; Questionnaire designing, Sampling techniques, Methods of Analysis); Processing and analysis of data; Determining resource requirement; Ethical issues in conducting research; Components of a standard project proposal / research paper / report; Research communication.

**Practical (Student Centered In-Class and Field Work)**

Group work on ‘mind mapping’ of the research process; Classification of research philosophies as applicable to applied research in agro-technology; Individual work supported by peer evaluation on the use of various concepts, constructs, variables and definitions: Formulation of research problem, hypotheses and appropriate design; Creating a detailed plan of practical activities; Development of an individual project proposal; Project proposal defense.

**Assessment:**

Continuous assessment:                      100%

**Level 6 (Year 4 – Semester I)**

**Semester I)**

<b>Course Code</b>	<b>AT 4102</b>			<b>Course Title</b>	Agricultural experimentation and data analysis		
<b>Year</b>	4	<b>Semester</b>	1	<b>Credits</b>	03	<b>Theory (hr)</b>	15
						<b>Practical (hr)</b>	60
						<b>IL (hr)</b>	90

**Aim of the Course:**

To provide the knowledge and skills required for collection, processing, analyzing and interpretation of agricultural data

**Intended Learning Outcomes:**

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

- Identify the most appreciate method/s available to collect and process different types of data.
- Analyze the data to get meaningful statistical outputs
- Summarize and interpret the outputs from statistical analysis.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Probability and Distributions;Populations samples and probability,Sampling techniques,Means and variances,The normal distributions,Sampling distributions. Estimation and hypothesis testing;Estimation of the population mean,Testing hypothesis about population mean,Population variance unknown;Comparison of samples,Pooled estimation of variance. A simple experiment;Randomization and replication,Analysis of a complete randomized design with two treatments,CRD with several treatments,Testing overall variance between treatments.Control of random variances;Local control of variance; RCBD ,Missing observation in RCBD,Latin square design,Replication of treatments within blocks.Particular about treatments;Treatment structure,Factorial treatment structure,Main effect and interactions,Analysis of variance of two factor experiment design.Assumptions behind the analysis;Normality, Homogeneity, Additivity. Relationships;Linear regression,Correlation,Regression in the analysis of experiments
<b>Practical (Student Centered In-Class and Field Work)</b>
In-class individual / small-group based practical sessions using MS-Excel Spreadsheets and statistical packages such as SAS, Minitab etc. to carry out all statistical methods learned; Case studies to show the real world applications of statistics in analyzing, reporting and interpretation of data.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 6 (Year 4 – Semester I)**

Course Code	AT 4103			Course Title	Agricultural Project Analysis & Management	
Year	4	Semester	1	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 90

**Aim of the Course:**

To provide the students with knowledge and skills required to identify, select, analyze, monitor and evaluate, and report with justification, a project in general, and an agriculture-based project, in particular.

**Intended Learning Outcomes:**

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

- Apply the principles of project management to design and implement a project, in general, and an agricultural technology oriented project, in particular.
- Evaluate, *an-ante* and *ex-post*, any agro-technology oriented project using appropriate methods and techniques used in project analysis.
- Prepare a detailed project report for a potential client on a specific agro-technology oriented project.

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Project: Definition and Life Cycle; Aspects of Project Preparation and Analysis; Core Project Management Processes – Scope, Schedule, Budget and Quality; Supplementary Project Management Processes – Team, Stakeholder, Information, Risk and Contract; Project Costs and Benefits; Incremental Net Benefit; Measures of Project Worth: Selection & Assessment Criteria; Discounted Measures; Present and Future Value of Money; Net Present Value & Benefit Cost Ratio; Internal Rate of Return; Sensitivity Analysis; Cost Effectiveness Analysis; Recent Trends in Project Management and Evaluation – Extended Benefit-Cost Analysis; Environmental Valuation Methods

**Practical (Student Centered In-Class and Field Work)**

Project Definition and Life Cycle – Conceptualization Group Work; Project Management Processes – Mind Mapping & Poster Preparation; Measures of Project Worth: Selection Criteria & Assessment Criteria (Undiscounted and Discounted Measures) – Tutorials & Development of Cases; Measures of Project Worth: Assessment Criteria – IRR, Sensitivity Analysis – Tutorials & Development of Cases; Compilation of Individual Project Report for an identified agro-technology project; Review of cases on environmental valuation

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%



**Level 6 (Year 4 – Semester I)**

Course Code	AT 4104			Course Title	Agricultural Waste Management		
Year	4	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

The aim of this course is to equip the students with knowledge of types and extent of agricultural waste generation and to convert into useful products.

**Intended Learning Outcomes:**

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

- To familiarize students with the nature of wastes and their impact on the environment.
- To conceptualize physical, chemical and biological bases of waste treatment
- To develop the students' abilities to analyze and design systems for the collection, handling, treatment and utilization of agricultural wastes.
- To provide familiarization with operation of waste treatment processes

**Course Capsule:**

**Theory (Through Expert Seminar ; Teaching Sessions; LMS)**

Introduction, Agricultural waste: Sources, types and composition, Nature and management of sewerage and industrial waste water, Solid waste management and role of community, Methods and technologies in solid waste management, Utilization of agricultural waste as organic fertilizer and soil conditioner, Production of energy from agricultural waste, Ethical issues of agricultural waste management, International waste management strategies

**Practical (Student Centered In-Class and Field Work)**

Waste and wastewater analysis, Physical bases for waste treatment and recycling ( Discharge of wastewater into waterways, Land application of wastes, Solids separation processes, Absorption), waste recycling – composting, Livestock and crop residual waste treatment systems, Management of dead animals ( Rendering plants, Incinerators, Disposal pits)

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 6 (Year 4 – Semester I)**

Course Code	AT 4105			Course Title	Renewable energy systems		
Year	4	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	90

**Aim of the Course:**

To provide the knowledge and skills on the principles, techniques, socio-economic aspects and policies relevant to use of renewable energy sources so that students can apply them at the level of farm to fulfill its power requirements.

**Intended Learning Outcomes:**

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

- Explain the energy principles with special reference to their use with renewable energy sources.
- Describe the technology associated with different sources of renewable energy.
- Explain the environmental impacts and safety of different sources of renewable energy.
- Evaluate the energy systems based on the economic and environmental considerations.

**Course Capsule:**

<b>Theory (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Introduction;Renewable and Nonrenewable energy sources,Farm level potential of applying renewable energy solutions,Solar thermal systems,Design efficiency system elements.Photovoltaicsystems,Designing,Efficiency and elements of system,Grid tied and off grid tied systems,Netmetering.Wind power systems;Wind power ,Wind turbine systems,Design related efficiency and system elements,Power control of wind power systems,Wind parks and off grid systems.Dendro power systems;Geo thermal energy;Biogasification;Energy mathematics and basics for each type of renewable energy;Economics and environmental factors of renewable energy
<b>Practical (Student Centered In-Class and Field Work)</b>
Solar intensity measurement using devices, Familiarization with online and GIS applications in calculating solar intensity, Designing cost effective solar heaters and dryers, Installing a simple PV system, Measuring wind direction and velocity using devices, Familiarization with online and GIS applications in calculating wind velocity and direction, Designing a simple wind turbine, Field visits to a Wind mill, Dendro power plant, Bio gas unit, Geo thermal plant, Bio gasification plant, Local power and energy authorities. Preparation of a PPT presentation to elaborate the recent advancements of a particular agro-technology (selected in consultation with the course coordinator), including its importance and relevance, current status of application globally, benefits and costs, opportunities and treats, and the applicability in the context of Sri Lankan agricultural sector; Presentation of this work to the class in a seminar.

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Level 6 (Year 4 – Semester I)**

Course Code	AT 4106			Course Title	Crop modeling		
Year	4	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

The overall goal of the course is to familiarize students with a comprehensive model for the simulation of crop growth and yield, soil and plant water, nutrient and carbon dynamics and their application to real world problems.

**Intended Learning Outcomes:**

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

- Learn the basic functions of a Cropping System Model
- Gain understanding of basic concepts of modeling crops and soils
- Learn how to make use of cropping system models to evaluate long term field experiments
- Learn how to use the models for applications in water and nutrient management and climate change issues

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Overview of cropping systems models and DSSAT software, Modeling climate effects on crop growth and potential yield, Simulating soil water dynamics and crop responses, Analysis of crop water requirements and water productivity as affected by climate, soil properties, and management, Simulating soil N and carbon dynamics and crop responses to N, Experiments and data requirements for adapting and using crop models for new regions and situations, Simulating crop rotation/sequence and conservation management for sustainable intensification under low-input agriculture

**Practical (Student Centered In-Class and Field Work)**

Describe a practical approach for simulating effects of soil, weather, management, and pest factors on crop production. Demonstrate how processes of crop growth and development, water use, uptake of water and nutrients and carbon dynamics can be simulated. Make extensive use of “hands on” sessions that apply the DSSAT-CSM model to cropping systems in various regions of the country. Describe procedures for collecting and managing crop, weather and soil data for model evaluation.

Give participants the opportunity to work with their own data and determine the accuracy of the models for application to specific problems. Concentrate on specific applications that include irrigation, fertilizer and nutrient management, climate change, soil carbon sequestration, climate variability, and precision management.

**Assessment:**

Continuous assessment:           60%  
End semester assessment:       40%

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### Level 6 (Year 4 – Semester I)

Course Code	AT 4107			Course Title	Applications of e-agriculture		
Year	4	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

#### Aim of the Course:

To practice students to exchange information, ideas, and resources related to the use of information and communication technologies (ICT) for sustainable agriculture and rural development.

#### Intended Learning Outcomes:

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

- Understand and practice the use of ICTs to empower rural communities, improve rural livelihoods, and build sustainable agriculture and food security.

#### Course Capsule:

##### Theory (Through Expert Seminar ; Teaching Sessions; LMS)

Introduction to e-agriculture, Applications of e-agriculture, Mobile agriculture, website development for agriculture, mobile apps development for agriculture, SMS, Voice messages, chat bot, call centre development for farmers.

##### Practical (Student Centered In-Class and Field Work)

Practice of e-agriculture applications and development of novel applications with e-agriculture concept

#### Assessment:

Continuous assessment: 60%  
End semester assessment: 40%

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

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**Level 6 (Year 4 – Semester I)**

Course Code	AT 4108			Course Title	Bio ethics		
Year	4	Semester	1	Credits	01	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To aware of students on how our values, desires and actions affect others, including animals and the environment

**Intended Learning Outcomes:**

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

- Able to act on philosophic integration human, animal and environmental rights

**Course Capsule:**

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**Theory and Practical (Through Expert Seminar ; Teaching Sessions; LMS)**

History and philosophy of science; Bioethics and the ethics of science and technology, Making choices, Autonomy, justice, beneficence and non-maleficence, Diversity and bioethics, Ethics in history love of life, Moral agents, Environmental ethics, Ecology and life, Biodiversity and extension, Ecological ethics, Sustainable development, Energy crisis and resources and management, The earth center initiative, Ethics of genetic engineering, Genetically modified food, Genetic privacy and information, The human genome project, Human gene therapy, Universal Declaration on Human Genome and Human Rights, International Declaration on Human Genetic Data, Ethical aspects of research involving human subjects, Ethics in animal subjects, History and evolution of animal experiments, Uses of animals in research, Arguments for and against animal experiments, three R concept, Animal pain, Welfare of animals in experiments, Research ethic issues, Authorship, Plagiarism, Peer review, Conflicts of interest, Data management, Research misconduct, IPR

**Assessment:**

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Continuous assessment:       60%  
 End semester assessment:     40%

**Level 6 (Year 4 – Semester I)**

Course Code	AT 4109			Course Title	English		
Year	4	Semester	1	GPA Credits NGPA Credits	00	Theory (hr)	30
					02	Practical (hr)	00
						IL (hr)	60

**Aim of the Course:**

To prepare students to function in an English speaking professional environment

**Intended Learning Outcomes:**

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

- speak English confidently with minimal grammar errors,
- analyze and evaluate listening/spoken performances,
- improve their English pronunciation, d
- develop basic writing skills and basic reading comprehension skills.

**Course Capsule:**

**Theory and Practical (Through Expert Seminar ; Teaching Sessions; LMS)**

CVs; Cover letters; Business Correspondence; Business reports. Extracts from different genres of business correspondence; advertisements; advertorials, Recordings of sample job interviews, news broadcasts, service phone calls; role plays; making presentations, guest lectures, short speeches, Word classes; subject-verb agreement, phrasal verbs, prepositions, simple and complex sentence structures

**Assessment:**

Continuous assessment: 100%  
Based on the criteria set by the trainer in consultation with the UCIARS

**Level 6 (Year 4 – Semester II)**

Course Code	AT 4201			Course Code	Agro-Technology Research Project							
Year	4	Semester	1	Credits	12	<table border="1"> <tr> <td>Theory (hr)</td> <td>-</td> </tr> <tr> <td>Practical (hr)</td> <td>-</td> </tr> <tr> <td>Independent Learning (hr)</td> <td>-</td> </tr> </table>	Theory (hr)	-	Practical (hr)	-	Independent Learning (hr)	-
Theory (hr)	-											
Practical (hr)	-											
Independent Learning (hr)	-											

**Aim of the Course:**

To carry out an independent research that uses ‘scientific research methods’ under the supervision of a senior academic to investigate a particular problem related to agro-technology.

**Intended Learning Outcomes:**

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

- Review the literature related to a given research topic/area systematically.
- Use appropriate scientific research methodologies to conduct an applied research in agriculture.
- Develop a ‘Working Paper’ to include the process used and outcome/s obtained in the research.
- Communicate the process used and outcome of research orally to a scientific community/and general public

**Course Capsule:**

<b>Theory and Practical (Through Expert Seminar ; Teaching Sessions; LMS)</b>
Each student is expected to carry out an independent research under the supervision of a supervisor assigned for this purpose. The research shall be completed by 15 weeks period based on a pre-approved research proposal. The outcome of research must be set to a Working Paper with specific format, and then, defended successfully.

**Assessment:**

Continuous assessment : 60% (Systematic research work)  
 End semester assessment : 40% (Working Paper 20%; Oral defense 20%)

**Optional Courses**

**T: Theory, P: Practical, IL: Individual Learning through LMS**

<b>Subject code</b>	<b>Subject Name</b>	<b>GPA credit</b>	<b>NGPA credit</b>	<b>Total contact hours T:P:IL</b>
AT1109	Career Guidance and Development	2	-	15:30:60
AT1209	Agro-tourism	2	-	15:30:60
AT2109	Electronics and Instrumentation	2	-	15:30:60
AT2209	Disaster Management	2	-	15:30:60
AT3109	Industrial training	2	-	00:60:60
AT3209	Animal welfare and ethics	2	-	15:30:60
AT4209	Wild life management	2	-	15:30:60



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**Optional Courses**

**Level 3 (Year 1 – Semester I)**

Course Code	AT 1109			Course Title	Career Guidance and Development		
Year	1	Semester	1	Credits	02	Theory (hr)	15
						Practical (hr)	30
						IL (hr)	60

**Aim of the Course:**

To help undergraduates to choose and proceed on an optimal career path, based on the students ability, desire and available opportunities.

**Intended Learning Outcomes:**

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

- Help undergraduates obtain an orientation to the employment sector
- Develop Transferable Skills such as effective communication skills, Leadership skills, Teamwork skills, and management skills
- Development of the system of career guidance and counseling
- Conceptualization, promotion and development of innovative models for career development;
- Capacity building of all participants in the process of career guidance and counseling;
- Achieve more effective employment and economic development

**Course Capsule:**

Theory (Through Expert Seminar; Teaching Sessions; LMS)
Career literature (concept, techniques, tools and processes) , Linking theoretical and empirical research with practical lifelong skill development, Self assessment, Working styles, Interest, Personality, Career pathways and communication, Identification and assessment of factors related to career decision making, Including needs values, Interests, Aptitudes, Strengths, and Goals, Changing workplace and skill needed to be successful, Participation in workshops and presentations, Use of appropriate recourses for career information research and decision- making.
Practical (Student Centered In-Class and Field Work)
Working with groups and via online media, practice the latest counseling techniques, while developing the necessary research and teamwork skills

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

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**Level 3 (Year 1 – Semester II)**

Course Code	AT 1209			Course Title	Agro-tourism	
Year	1	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

The aim of course is to introduce tourism in rural areas (and agro-tourism as a specific form of rural tourism) as one possible source of financial revenue for those areas and their subsequent development. Another aim is to show the capabilities and specifics of this business sector in the country

**Intended Learning Outcomes:**

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

- Ability to analyze the region’s internal and external environment (rural tourism point of view)
- Ability to determine potential of rural locality for tourism development
- Competences of conceptual solutions of rural development in the frame sustainable tourism development
- Competences of drawing poster as a form of promotion in rural tourism
- Knowledge of specific of business in rural tourism branch

**Course Capsule:**

<b>Theory (Through Expert Seminar; Teaching Sessions; LMS)</b>
Definition of the agro-tourism, potential of rural territory in terms of agro-tourism, development and current status in country, development and current state in foreign countries, the specifics of business in agro-tourism, position of the agro-tourism in strategic documents, funding opportunities, rural tourism
<b>Practical (Student Centered In-Class and Field Work)</b>
Designing of perfect agro-tourism models, identify the possibilities in country for promoting agro-tourism, impact on socio economic status from the agro-tourism

**Assessment:**

Continuous assessment: 60%  
 End semester assessment: 40%

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### Level 4 (Year 2 – Semester I)

Course Code	AT 2109			Course Title	Electronics & Instrumentation	
Year	2	Semester	1	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

#### Aim of the Course:

The objective of this programme is to give basic knowledge in electronics devices and systems with a focus on sensor systems. The programme provides knowledge, methods, and tools for modeling and design of components, circuits, and systems

#### Intended Learning Outcomes:

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

- Recall technical language, terms, and definitions for electronic sensors, instrumentation, and control.
- Recognize and identify the physical mechanisms of basic sensors and how they interact with the measure and for biological, biomedical, and agricultural applications. (Understanding)
- Demonstrate the ability to select instrumentation and controls components in order to design, assemble, and operate a measurement system for specific applications.
- Differentiate applications for electronic sensors and modern data-logging equipment.
- Design, develop and communicate a specific measurement system relative to area of technical interest.
- Present and defend a project with an electronic instrumentation system at a public forum.

#### Course Capsule:

#### Theory (Through Expert Seminar; Teaching Sessions; LMS)

General Principles of Instrumentation, Statistical Error Analysis, Electronic Instrumentation Amplifiers, Analog-Digital Conversion, Measurement of Physical Magnitudes. Introduction to General Electronic Instruments and Devices, Static and Dynamic Performance of Instruments, Diodes Applications and Power Supply, Potentiometer Circuit and the Whetstone Bridge, Transistors and Amplifiers, Applications of OP AMP Digital Techniques in Instrumentation, Measurement Displacement, Velocity and Acceleration, Measurement Temperature, Moisture, Humidity and Radiation, Measurement of Force and Torque, Measurement of Flow and Pressure, Measurement of Vibration and Noise, Recording Instruments, Data Acquisition and Processing

#### Practical (Student Centered In-Class and Field Work)

Identification and uses of different electronic instruments, development of project by using technique for the agriculture

#### Assessment:

Continuous assessment: 60%  
End semester assessment: 40%

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Level 4 (Year 2 – Semester II)**

Course Code	AT 2209			Course Title	Disaster management	
Year	2	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

Students will have an understanding of the principles and practices of disaster management and training in a holistic approach towards disaster management to enable them to manage all kinds of disasters by implementing proactive disaster management strategies

**Intended Learning Outcomes:**

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

- Ensure awareness on the nature and type of disasters
- Manage different types of disasters in efficient manner
- Act as a responsible person for an emergency situations
- Disseminate knowledge on disaster management

**Course Capsule:**

<b>Theory (Through Expert Seminar; Teaching Sessions; LMS)</b>
Understanding disasters, types, trends, causes, consequences and control of disasters, disaster management cycle and framework, disaster management in Sri Lanka, applications of science and technology for disaster management, suggested areas for project and assignments.

<b>Practical (Student Centered In-Class and Field Work)</b>
Designing a disaster management plan, rescue operations, evacuation drills, accident prevention, and safety measures, environmental laws rules and audits, occupational health and occupational diseases, fire fighting tutorial and demonstration, handling medical emergencies, hands on training cardio-pulmonary-resuscitation

**Assessment:**

Continuous assessment:           60%  
 End semester assessment:       40%

**Bachelor of Agro-Technology – UCIARS – Revised Curriculum**

**Level 5 (Year 3 – Semester I)**

Course Code	AT 3109			Course Title	Industrial Training	
Year	3	Semester	1	Credits	02	
						<b>Theory (hr)</b> 00
						<b>Practical (hr)</b> 60
						<b>IL (hr)</b> 60

**Aim of the Course:**

To give practical exposure to the agriculture industry.

**Intended Learning Outcomes:**

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

- Apply the technology with their hand experience
- Enhance knowledge and skills from actual working environment
- Act as a responsible person for an emergency situations
- Disseminate knowledge with their experience

**Course Capsule:**

**Practical (Student Centered In-Class and Field Work)**

All the students will be sent to selected outside public or private institutions for a 8-week Industrial Training immediately before commencement of the final year research project. This component will not contribute to the total credit requirement of the degree. However, all the students shall obtain a satisfactory “S” grade for this component. This component will be evaluated on the basis of attendance, supervisors’ report and final report submitted by the student. The Depts may opt to combine the Industrial Training and the research project and send the students to outside institutions if the case permits.

**Assessment:**

Continuous assessment: 60%  
 End semester assessment: 40%

**Level 5 (Year 3 – Semester II)**

<b>Course Code</b>	<b>AT 3209</b>			<b>Course Title</b>	<b>Animal Welfare and Ethics</b>	
<b>Year</b>	3	<b>Semester</b>	2	<b>Credits</b>	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

The aim of this course is to make scientists and other professionals (managers, policy makers) in the field of animal management aware of the ethical dimensions of their dealing with animal (welfare) issues. The course offers knowledge and tools that enables them to deal with ethical questions on both a theoretical and a practical level.

**Intended Learning Outcomes:**

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

- Outline how the study of animal behavior has developed historically.
- Understand what an ethogram consists of, and be able to perform and interpret analysis of the behaviour of any animal; and discuss social behavior and how this varies between different animal species.
- Apply learning theory to the training and management of animals.
- Describe the main philosophical frameworks used in animal ethics and compare and contrast the many factors (culture, public opinion, science, technology, regulation, economics) that influence decisions about animal use and reflect on their own ethical judgments.
- Discuss how we can feed the world sustainably while maintaining animal welfare using a logical and evidence-based approach.
- Demonstrate appropriate written and oral communication skills; and their ability to work effectively as part of a team and provide helpful feedback to other team members.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Introduction; definition-as it applies to animal ethics, philosophy of animal ethics, history of animal ethics, the basic legal system influencing animal welfare; animal welfare act, standards, food and drugs administration animal environment, animals in research; why animals are need in research, use of animals in bio medical research, ethics of animal use; philosophical issues involved in animal use, classifying animal treatment and behavior, emerging fields of animal welfare, animal environment and agri- ethics; animal’s role in food production, non animal use of animal by products, farm animal welfare, environmental factors affecting welfare.

**Practical (Student Centered In-Class and Field Work)**

Identification of euthanized methods, stunning methods and determination of comfortability of farm animals.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

**Level 6 (Year 4 – Semester II)**

Course Code	AT 4209			Course Title	Wildlife Management	
Year	4	Semester	2	Credits	02	
						<b>Theory (hr)</b> 15
						<b>Practical (hr)</b> 30
						<b>IL (hr)</b> 60

**Aim of the Course:**

The aim of this course is to make scientists and other professionals (managers, policy makers) in the field of animal management aware of the ethical dimensions of their dealing with animal (welfare) issues. The course offers knowledge and tools that enables them to deal with ethical questions on both a theoretical and a practical level.

**Intended Learning Outcomes:**

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

- Outline how the study of animal behavior has developed historically.
- Understand what an ethogram consists of, and be able to perform and interpret analysis of the behaviour of any animal; and discuss social behavior and how this varies between different animal species.
- Apply learning theory to the training and management of animals.
- Describe the main philosophical frameworks used in animal ethics and compare and contrast the many factors (culture, public opinion, science, technology, regulation, economics) that influence decisions about animal use and reflect on their own ethical judgments.
- Discuss how we can feed the world sustainably while maintaining animal welfare using a logical and evidence-based approach.
- Demonstrate appropriate written and oral communication skills; and their ability to work effectively as part of a team and provide helpful feedback to other team members.

**Course Capsule:**

**Theory (Through Expert Seminar; Teaching Sessions; LMS)**

Biodiversity(Definition, Present Situation in Sri Lanka, Importance, Threats, Conservation, Current issues), Eco-systems(Definitions, Importance, Different eco systems with special emphasis in Sri Lanka), Wildlife on Sri Lanka (Present situation, Issues, Potentials, Principles of conservation and management), Conservation of wildlife with special emphasis on elephant as a flagship species, human elephant conflicts, etc., Range management: requirements of different species; carrying capacities, stocking rate, etc., population dynamics of selected species, Research methodologies, field techniques, appropriate analysis methods, etc., Eco-tourism: Concepts, Potentials, Strategies & constraints, Government policies & legal aspects, International conventions

**Practical (Student Centered In-Class and Field Work)**

Case study on human and wild animal conflicts on desired destination, Bird watching and resources exploitation for wild animals, Stock assessment of a given wild life species in a given area, observation of the behavior of wild animals under confinement and in nature, tranquilizing techniques of wild life species.

**Assessment:**

Continuous assessment: 60%  
End semester assessment: 40%

