This handbook provides general information about The Open University of Sri Lanka and in particular about the Faculty of Natural Sciences. You can also use it as a guide for the undergraduate Programmes/Courses offered by the Faculty of Natural Sciences.

From this handbook, you will find out about:

- the study system adopted by The Open University
- the undergraduate study Programmes/Courses offered by the Faculty
- how you can register for Courses/Programmes
- the support you will receive to follow Courses/Programmes
- administrative divisions you may have to frequently contact
- the teaching and administrative staff of the Faculty
- how you can obtain exemptions based on prior qualifications
- course fees applicable for your Courses/Programmes
- scholarships/ bursaries and other awards available
- awards criteria for degrees offered by the Faculty
- your responsibilities as a student of The Open University
Your responsibilities as a student of The OUSL

The Open University of Sri Lanka is committed to a working and learning environment which is friendly, peaceful and safe for all staff and students. Such an environment can only be created by a collective effort of all concerned parties. Students being the largest category in the University, their conduct and behaviour have a considerable impact on the environment of the University.

The Faculty of Natural sciences wishes to emphasise the following regarding responsibilities of students.

- Always carry the Record Book with you while in the University, as a proof of identity.
- Comply with the rules and regulations of the University. The General By Law for student discipline, No 02 of 2008, OUSL and Prohibition of Ragging and Other Forms of Violence in Educational Institutions Act, No.20 of 1998 (Parliament of the Democratic Socialist Republic of Sri Lanka) require the University to prevent or effectively deal with any disturbances to the working and learning environment. Copies of these documents are available in the main library and the regional libraries (Reference section).
- Engage in your studies in a serious manner, taking advantage of the educational opportunities provided.
- Maintain the highest standards of academic integrity.
- Treat the university community (students and staff) with dignity and respect.
- Safeguard the good name of the Faculty and the University.
- Protect and refrain from damaging University property.
The Open University of Sri Lanka

Faculty of Natural Sciences

Undergraduate HandBook
2016 - 2017

Phone: 011-2822738, 011-2881258 (Dean/Natural Sciences)
011-2881592 (Dept. of Botany)
011-2881450 (Dept. of Chemistry)
011-2881309 (Dept. of Math & Comp.Sc)
011-2881588 (Dept. of Physics)
011-2881488 (Dept. of Zoology)
011-2881000 (University-hunting line)

Fax: 011-2436858 (University)
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E mail: deannsc@ou.ac.lk
Web: www.ou.ac.lk/science
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Desktop Publishing and Cover page - Janaka Nayanalochana
Programmes / Courses of Study Offered By the Faculty of Natural Sciences, OUSL

Programmes/Courses described in this Handbook

Bachelor of Science Degree
Bachelor of Science Special Degree
Diploma in Science

Other Programmes/Courses

M.Sc. in Environmental Sciences - Inter - Faculty programme
M.Sc. in Medical Entomology and Applied Parasitology
Bachelor of Education (Natural Sciences) - contributes to the Faculty of Education
Diploma in Microbiology - blended online programme
Diploma in Natural Resources and Ecotourism
Advanced Certificate in Laboratory Technology
Certificate in Laboratory Technology
Certificate in Wildlife Conservation & Management
Certificate in Computer Networks and Security
Certificate in Professional Computer Applications
Certificate in Food Science
Stand Alone Courses in Science
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Faculty of Natural Sciences

Mission

To be innovative in teaching-learning and research
demonstrating leadership in open & distance learning in the fields of Science,
with a commitment to achieve national goals

Objectives

To develop motivated personnel successful in their academic, career & life-long learning goals

To offer quality programmes informed by current needs and demands

To support the community and the nation through partnerships and public service

To promote research, scholarship and enterprise activities

To increase the outreach of the sciences via open access & distance education
Selecting a university and programme of study to suit your requirements is an important decision you make in life. This message intends to help you take the right decision for a bright future in the field of science.

The Faculty of Natural Science has over 30 years of experience delivering a wide range of quality distance learning programmes in a variety of disciplines in the sciences, as part of a qualification or on a stand-alone basis. Whether you want to develop your career path or study for your own personal fulfilment, you can choose from an assortment of programmes at both undergraduate and postgraduate levels, ranging from certificates to diplomas to degrees.

The degrees awarded by the OUSL are given the same recognition as those awarded to students studying face-to-face at other Sri Lankan national universities. The courses on offer are suited to all those who wish to obtain up-to-date knowledge, skills and insight into the various disciplines of science to meet the challenges of today’s dynamic, complex and competitive environment.

Our programmes are specially designed to suit those with other commitments such as full-time employment, financial obligations and family commitments. Our unique system of open distance learning, developed over the years, gives you the flexibility to engage in your studies at your own place and at your own pace, at an affordable price.

To date, our Faculty has very successfully educated thousands of individuals throughout the country, using multimedia study material packages of print, audio and visual aids, CD ROMs and online material. Our learner support system will guide you and assist you at every stage of your academic career from your very first day of registration up to completion of the programme.

Going to university is a challenge. Being a distance learner can be even more challenging. Do take note that you will need to be self-motivated and learn to work independently to successfully meet the challenges of studying in the distance mode.

Thank you for your interest in our Faculty. Please go through the information to find out more about us.

We are proud to say that many of our past students hold responsible positions today and are making a valuable contribution to the nation through their work in different fields such as research, teaching and administration both in the state and private sector.

Hope you too will find our courses interesting, motivating and useful, and your learning experience rewarding and enjoyable.

On behalf of our Faculty I wish you good luck in all your future endeavors.

Prof. Lilani K. Senaratna
Dean/Faculty of Natural Sciences.
The Open University of Sri Lanka (OUSL) is the premier Open and Distance learning institution in Sri Lanka where students can pursue their studies through Open and Distance Learning (ODL) methodologies. Established in 1980, under the Universities Act No. 16 of 1978 and OUSL Ordinance No. 1 of 1990, as amended, the OUSL has the same legal and academic status as any other national University in Sri Lanka. According to the Public Administration Circular No. 16/92, dated 13.03.92, issued by the Ministry of Public Administration, Provincial Councils & Home Affairs, the degrees awarded by The Open University of Sri Lanka are equivalent to degrees awarded by any other University under the purview of the University Grants Commission.

Due to the nature of its teaching methodology and infrastructure, The OUSL is able to serve a large student population spread throughout the country. Currently, there are over 30,000 students studying at the OUSL, who are being served by eight Regional Centres and eighteen Study Centres located around the country (Fig. 1). The Central Campus and the Colombo Regional Centre are situated at Nawala. The other seven Regional Centres are situated at Kandy, Matara, Jaffna, Anuradhapura Batticaloa, Kurunegala and Badulla.

The academic and the administrative Head of the University is the Vice-Chancellor. The Senate of the University, which is chaired by the Vice-Chancellor, is the highest body that makes decisions regarding academic matters. The University has five Faculties: Natural Sciences, Engineering Technology, Humanities and Social Sciences, Education and Health Sciences.

The Faculty of Natural Sciences consists of five Departments; Botany, Chemistry, Mathematics & Computer Science, Physics and Zoology. The Department of Health Science which was under the Faculty of Natural Sciences was upgraded to a new Faculty of Health Science in 2015. The Faculty is administered under the leadership of the Dean of the Faculty; each Department is under a Head and all Departments are collectively responsible for all academic activities of the Faculty. The Faculty Board of Natural Sciences regulates all academic activities in the Faculty, under the guidance of the Senate of the University.

Studying at OUSL

The distance learning methodology adopted by the OUSL may initially appear as a challenging task for you. However, very soon you will learn that it is a rewarding and enjoyable experience. In addition to gaining subject knowledge and skills, you will be developing many other life skills, including self-organization and time management.

Regular lectures, a feature of face-to-face teaching at a conventional university, is minimal at the OUSL. Instead, students learn through carefully prepared study material together with other forms of support that facilitate learning.

The Study Package

The Open University adopts a multimedia system for teaching with a strong emphasis on distance study. The study system supports the students through printed course material, audio-visual aids, discussions, day schools, laboratory/field work, industry visits and web-based learning. Continuous assessments and final examinations are also integral parts of the study system.

Printed course material is the central element in the study package. Improving reading skills is therefore essential to be successful as an OUSL student. Where applicable, you will also be provided with other supportive material applicable to a course, such as study guides, practical guides and audio-visual material, etc.

Printed course material are carefully prepared to suit self-study and independent learning. The printed course material provide the student the subject knowledge of the course. They clearly outline the objectives of the course and what the student will be able to achieve by studying the course. Self-assessment questions and activities included in the course material will enable the learners to continuously assess themselves as they proceed. Printed course material are usually provided at the time of registration for a programme/course.
<table>
<thead>
<tr>
<th>Centre</th>
<th>Code</th>
<th>Address (Telephone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colombo</td>
<td>WP10</td>
<td>OURC, Nawala, Nugegoda (011-2853930)</td>
</tr>
<tr>
<td>Jaffna</td>
<td>NP40</td>
<td>OURC, Browns Road, Kokuvil, Jaffna (021-2223374)</td>
</tr>
<tr>
<td>Kandy</td>
<td>CP20</td>
<td>OURC, Polgolla, Kandy (081-2494083 - 081-2494084)</td>
</tr>
<tr>
<td>Matara</td>
<td>SP30</td>
<td>OURC, Nupe, Matara (041-2222943)</td>
</tr>
<tr>
<td>Anuradhapura</td>
<td>NC50</td>
<td>OURC, Jayanthi Mawatha (Depot Area), Anuradhapura (025-2222871)</td>
</tr>
<tr>
<td>Batticaloa</td>
<td>EP60</td>
<td>OURC, 23, New Road, Batticaloa (065-2222264)</td>
</tr>
<tr>
<td>Badulla</td>
<td>UP80</td>
<td>OURC, 08, Bandaranayaka Mw, Badulla, (055-2228842)</td>
</tr>
<tr>
<td>Kurunegala</td>
<td>NW70</td>
<td>OURC, Negombo Rd, (Nissanka Mw Junction), Malkaduwawa, Kurunegala (037-2223473)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Centre</th>
<th>Code</th>
<th>Address (Telephone)</th>
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<tr>
<td>Ambalangoda</td>
<td>SP31</td>
<td>80/1, Polwatte Road, Halwatura Ambalangoda (091-2258585)</td>
</tr>
<tr>
<td>Ambalanthota</td>
<td>SP33</td>
<td>Rajasaranagama Road, Lunama South, Ambalanthota (047-2225533)</td>
</tr>
<tr>
<td>Ampara</td>
<td>EP61</td>
<td>Inginiyagala Road, , Samapura, Ampara, (063-2222052)</td>
</tr>
<tr>
<td>Bandarawela</td>
<td>UP81</td>
<td>St. Thomas Road, Wewatenna, Bandarawela (057-2222820)</td>
</tr>
<tr>
<td>Galle</td>
<td>SP32</td>
<td>Labuduwa, Galle (091-2223784)</td>
</tr>
<tr>
<td>Gampaha</td>
<td>WP11</td>
<td>Gampaha Road, Miriswatte, Mudungoda.( 033-2234571/033-2234572)</td>
</tr>
<tr>
<td>Hatton</td>
<td>CP21</td>
<td>Thondaman Vocational Training Centre, Hatton (051-2225139)</td>
</tr>
<tr>
<td>Kalutara</td>
<td>WP12</td>
<td>66/2, Nagoda Road, Kalutara (034-2223399)</td>
</tr>
<tr>
<td>Kegalle</td>
<td>SG91</td>
<td>Kumaratunge Munidasa Mawatha, Kegalle (035-2225201)</td>
</tr>
<tr>
<td>Moneragala</td>
<td>UP82</td>
<td>Technical college Junction, Sirigala, Potuvil Road, Moneragala (055-227395)</td>
</tr>
<tr>
<td>Polonnaruwa</td>
<td>NC51</td>
<td>24th Mile Ppost Bendiwewa Jayanthipura, Polonnaruwa (027-2225776)</td>
</tr>
<tr>
<td>Puttalam</td>
<td>NW71</td>
<td>1/137, Colombo Road, Puttalam (032-2266822)</td>
</tr>
<tr>
<td>Ratnapura</td>
<td>SG90</td>
<td>Hiddellana, Ratnapura (045-2228660)</td>
</tr>
<tr>
<td>Vavuniya</td>
<td>NP41</td>
<td>366, Kandy Road, Thekkawaththai, Vavuniya (024-2222995)</td>
</tr>
<tr>
<td>Killinochchi</td>
<td>NP42</td>
<td>155th Mile Post, Kandy Road, Killinochchi (021-2283970)</td>
</tr>
<tr>
<td>Trincomalee</td>
<td>EP62</td>
<td>26/A, Post Office Rd, Trincomalee (026-222088)</td>
</tr>
<tr>
<td>Kuliyapitiya</td>
<td>NW72</td>
<td>Technical College, Kuliyapitiya, (037-2281181, 037-2281271)</td>
</tr>
<tr>
<td>Mullaitiv</td>
<td>NP43</td>
<td>Aathiparasakthi Ariviyal College, Ward No. 04, Irranaippalai Veethy, Pulukudiyiruppu, Mullaitiv.</td>
</tr>
</tbody>
</table>
OUSL Vocabulary

Once you become a student of the OUSL, you need to be familiar with the OUSL terminology. It is important that you understand these terms clearly and be vigilant of these, since most are related to your performance in studies.

A Programme of Study consists of a combination of compulsory and optional courses, which leads to a Certificate, Advanced Certificate, Diploma, Degree or a Postgraduate Degree. For example, the Bachelor of Science Degree Programme is a programme of study which leads to the B.Sc Degree.

A Stand Alone Course is a course which can be considered as a separate entity. These courses can be offered by any person who wishes to upgrade the knowledge in a particular subject area, without registering for a regular programme of study, such as a Degree/Certificate Programme. For example, a person who is interested in learning Natural Products Chemistry can register only for that course, as a stand alone course. Many courses of the Degree Programmes are offered as stand alone courses.

Continuing Education Courses are offered for students registered for regular programmes of study who wish to widen their knowledge in areas of their choice. These include support courses, such as Mathematics, English, Computer literacy and Motivation and study habits. A student can offer a limited number of continuing education courses, over and above the maximum workload allowed during an academic year.

Foundation Courses in OUSL

are offered to those who lack academic qualifications equivalent to that of G.C.E (A/Levels). Thus, these are particularly suited for students who lack direct entry requirements for the Degree Programme.

Credit Rating

Programmes as well as courses carry a credit rating. The ‘credit rating’ is the expression used in the OUSL to denote the "academic value" of a course/programme. Please note that the word ‘credit’ does NOT imply any measure of academic performance at an examination such as a Credit pass at GCE Ordinary/Advanced Level Examination. The credit rating gives a measure of the time expected to be spent on studying the course. At the OUSL, one credit is about 50 notional hours of study time. The time specified for a course takes into account all aspects of work involved, including reading and understanding course material, face-to-face- sessions, continuous assessments, final examinations, consultation of reference material and practical classes.

The credit rating of a programme increases progressively, with Certificates usually being 18 credits, a Diploma 36 credits and undergraduate Degrees comprising 108 or 144 credits, depending on whether degree is a three or four year programme.

Based on the SLQF recommendation, from 2017/2018 the credit rating of a certificate will be 3 credits, a Diploma 30 credits and undergraduate degrees 90 credits and 120 credits depending on three or four year programme.

The credit rating of courses also vary (Table 1). The minimum credit rating of courses presently offered by the Faculty of Natural Sciences is 3. Average total time expected to be spent on a 3 credit course is around 150 hours. In actual study time, this would mean a student is expected to spend 6 hrs per week on average, for a 3 credit course that is offered during one semester (24 weeks).

Table 1: Credit rating

<table>
<thead>
<tr>
<th>Credit rating</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>18</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average study hours</td>
<td>150</td>
<td>300</td>
<td>450</td>
<td>900</td>
<td>1800</td>
</tr>
</tbody>
</table>

The maximum workload a student may undertake in an academic year is 36 credits. A student may register for a maximum of two programmes in the Open University (one credit is considered equivalent to 50 notional Learning hours). However, the maximum workload undertaken between both programmes should be 36 credits. This corresponds approximately to the workload undertaken in an academic year by a full-time student in a conventional University. Many students, who are either employed or with other commitments find it difficult to spend this much of time for their studies and handle this full workload. Students are therefore strongly advised not to register for more than 27 credits especially in their first year of study.
Course Code

Each course offered by the Faculty is assigned a course code. This code includes certain components of identification that uniquely identifies the course. The particular subject area/discipline is one component of identification used when assigning course codes. The specific letters assigned to the different areas/disciplines of study are shown in Figure 2.

The course code also informs the programme of study for which the course is offered and the level of study at which it is offered. Courses for undergraduate degrees are offered at Levels 3 to 6, whilst Courses in Foundation are offered at Level 1 & 2. In assigning course codes, the Programme of study is identified by a letter and the level of study is identified by a digit. For instance, undergraduate courses are identified by the letter U and Foundation courses are identified by the letter F (Table 2).

Incorporating all of the above components, each course is assigned a course code consisting of 7 alphanumeric characters. The first three letters indicate the area of discipline and the programme of study. The first digit reflects the level of study, the second digit multiplied by 3 will give the credit rating. The last two digits give a unique serial number for the course. An example of a course code is shown in Figure 3.

Table 2: Programmes/Levels of study

<table>
<thead>
<tr>
<th>Level</th>
<th>Programme of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Foundation</td>
</tr>
<tr>
<td>1</td>
<td>Certificate</td>
</tr>
<tr>
<td>2</td>
<td>Diploma</td>
</tr>
<tr>
<td>3</td>
<td>Undergraduate</td>
</tr>
<tr>
<td>4</td>
<td>Postgraduate</td>
</tr>
<tr>
<td>5</td>
<td>Stand Alone/Continuing Education</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Foundation</th>
<th>Certificate</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>E0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>C0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F2 C1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C2 D1 U1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>D2 U2 E4</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>U3 E5</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>U4 E6</td>
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<td>7</td>
<td>P1 E7</td>
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<tr>
<td>8</td>
<td>P2 E8</td>
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</tbody>
</table>

Figure 2. Area/Discipline of study

Table 3: Programmes/Levels of study

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
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<tbody>
<tr>
<td>0</td>
<td>E0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>C0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F2 C1</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>C2 D1 U1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>4</td>
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<td>P2 E8</td>
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</tr>
</tbody>
</table>

Figure 3. An example of a course code
Deciding on the Workload

In an academic year, students of a regular programme of study may register for courses with a total credit value within a minimum of 9 credits and a maximum of 36 credits.

Students may register simultaneously for up to 2 programmes of study, except for Foundation courses subject to the permitted maximum of 36 credits in total per academic year.

In addition, students may register for continuing education courses up to 9 credits. Students registering for stand alone courses may register for up to 18 credits of courses per academic year.

Students registering for courses with an academic value adding up to 36 credits are reminded that they will have to devote on the average a minimum of 30 hours of study per week for 30 weeks in an academic year. Most students, even if they are unemployed, are unable to devote this amount of time. Registering for a workload that is difficult to cope, will adversely affect the academic performance. Therefore, students are very strongly advised to initially register for courses with a total academic value not exceeding 27 credits. Those registering for courses adding up to less than 36 credits may devote a pro rata minimum number of hours of study.

Planning and Allocating Time for Studies

The Faculty of Natural Sciences offers courses according to a semester system. Each academic year is divided into two semesters. Activities for many courses are scheduled to fit one semester. However, activities for a few courses are spread through both semesters. Students are expected to carefully plan the studies paying special attention to the workload and the semester in which the courses are offered.

At registration, students are provided with the activity schedules relevant to the courses they register. These indicate the dates and times of activities such as day schools, assessment tests, tutorial classes, workshops and practical classes, that the University has planned for each course. It is the responsibility of the student to draw up a suitable time plan to prepare for these activities.

The students are also advised to pay attention to the medium of instruction of the course. Many courses are offered in the English medium only. Thus, it is very important that you pay a keen interest on improving your English knowledge. To prepare the student for this challenge the University offers supportive English courses for which the students are strongly advised to register at the first instance.

Selection of Courses

Subject to the specified prerequisites being fulfilled, a student could simultaneously register for courses at different levels. In the Faculty of Natural Sciences, a student cannot however register for courses in the degree programme (at Levels 3, 4, 5 & 6) simultaneously with courses offered in Foundation.

In most of the programmes offered by the Faculty, there are courses, such as English and Mathematics, of which a certain level of competency is required before proceeding to a higher level. Students are strongly advised to offer such prerequisite courses in the first instance.

Support for Learning

Realising the necessity to give a helping hand to students who have entered a new learning environment, the Faculty provides support to the students in a variety of ways.

Personal Tutors

Each student is assigned a personal tutor/counsellor during the pre-registration orientation sessions of some programmes. The Personal Tutor will guide the students and provide greater awareness about the University, the study system and other particulars regarding the programme of study. This facility is available throughout the study period of the student and all students are advised to make best use of this service. Students are also reminded that it is mandatory to get the registration form certified by the Personal Tutor before coming for registration.

The common induction programme START@OUSL (Student Academic Readiness Training @ OUSL) has been offered since the academic year 2014/2015 for OUSL students. It consists of two compulsory courses; English for Academic Purposes (EGAP), Empowering for Independent Learning (EfIL), and optional courses to be selected from ICT skills, Soft Skills & Social Harmony second National Language. However, Faculty also recommends the course ICT skills for BSc Students.

EfIL gives an opportunity for the students to become familiar with the practices of OUSL and network among them. The activities in induction are designed to bring out the inner potential of students and motivate them for study.
Motivation and Study Habits courses (PASS)

Over the past years, the Faculty has identified that a large number of students need additional support to study in the distance mode. Motivation and study habits courses are offered with the intention of bridging this gap. In each of these courses there is a series of interactive student help sessions in course material of an associated Level 3 discipline-based course.

Interactive help sessions are conducted approximately every two weeks throughout the 1st and 2nd semesters using peer-assisted learning techniques. These sessions provide an opportunity for the students in developing sound study habits, which are essential to succeed at the OUSL. Also they help sustain the motivation of students throughout the academic year and promote life long learning.

Sufficient induction workshops and student help sessions are conducted in most of the regional centres in parallel so that all students get a chance to attend them. More information will be made available to you at the orientation session.

Students are strongly advised to follow the PASS session carefully.

Day Schools

Day schools are interactive sessions where the student will get the opportunity to meet the respective course teachers to clarify any difficulty they come across in their study material. Attendance at day schools is not compulsory. However, attending a day school well-prepared will immensely help students perform well in the course. Day schools are held at almost all Regional Centres and the students have the option of attending a day school held at a centre of their choice.

Laboratory work/Field work/Projects

Practical work is an integral part of many courses and attendance is compulsory. These sessions are designed to transfer practical skills, experimental methodology, planning, interpretation of data as well as other generic skills. They may take the form of laboratory sessions, mini projects, or industrial/field based experiences.

Laboratory facilities are available at Colombo, Kandy and Matara Regional centres. Several practical groups are conducted for courses with practical components and students can select the group they want to attend. Practical guides and tutor support are provided at practical sessions. These sessions reinforce and extend theoretical knowledge, give students hands on experience, and expose them to natural and field situations.

Online Support

In order to give the students additional help and also to familiarise them with modern learning trends and tools, some courses are supplemented with an online component. The online activities could be accessed from home or from the National Online Distance Education Service Access Centres (NAC centres) located at centers specified in Appendix iv (page 80). Once you register for a course with an online component, you will be further advised on how to access and use it.

MyOUSL

Through the MyOUSL web portal students may access online moodle courses, personal details, timetables, payment details, submit final examination applications etc. To access MyOUSL, use the link from the OUSL homepage at: http://www.ou.ac.lk/ OR type: http://myousl.ou.ac.lk/

User name: [Student ID Number]; Password: [National Identity Number]

Student ID number is given on the Personal Information page of the Record Book. Note this is different from the Registration number).

Library

The OUSL operates a network of libraries comprising the main library at Central Campus and Regional Centre libraries located at other Regional Centres. In addition, there are small libraries in each of the Study Centres. The main library is open for students from 8.30 am to 6.30 pm every day including week-ends except on Poya days and University holidays. The Regional Centre libraries are open during working hours everyday, except on Sundays and Mondays.
Students are also advised to use the libraries carefully.

Regional Educational Services

The University has a network of Regional centres/study centres distributed throughout Sri Lanka (Fig.1). These centres provide facilities for distribution of course material, limited reference facilities at libraries, counselling, day schools, tutor clinics and laboratory classes in the science disciplines and face to face teaching.

Computer facilities through elementary computer laboratories are also provided at the regional and study centres at Colombo, Kandy, Matara, Ambalangoda, Anuradhapura, Bandarawela, Batticaloa, Kegalle, Kurunegala, Polonnaruwa, Badulla and Ratnapura centres. Limited internet facilities are available at all libraries for more details on the facilities provided and how to make use of them.

The main library is well equipped with a substantial collection of books in a wide variety of subjects and many foreign and local journals. The main library also operates a fully equipped Audio Visual Resource Centre (AVRC) with a substantial collection of videos/audios/CDs to supplement print material. The AVRC provides internet facilities for study purposes of students.

In-house photocopying facilities are also available at very nominal rates for the convenience of all library users. The facility of getting inter-library loans of books, journals and video films is also available. The library has copies of past examination papers, which are also available on the University web site. Students are advised to read the library information sheets available at all libraries for more details on the facilities provided and how to make use of them.

Financial Assistance - Scholarships and Bursaries

The OUSL provides a limited number of bursaries administered by the University and Mahapola Scholarships administered under the Mahapola Trust.

Both the Bursaries and Scholarships are offered under two schemes – merit and need. The main criterion for a merit scholarship is the overall student performance at Final Examinations. Guidelines for the Bursaries and Mahapola Scholarships and further information are available with the Assistant Registrar of the Faculty. Application forms will be available at the Re-registration counters at all Regional Centres or can also be downloaded from www.ou.ac.lk/science. The closing date of applications will be announced in due course.

In addition, University Enhancement Bursaries will be awarded to students who complete the course in the same year of registration.

Selection Criteria University Enhancement Bursary Proposed

(Effective from Academic Year 2014/2015)

University Enhancement Bursaries is awarded by The Open University of Sri Lanka to motivate the degree level students to complete the courses they have offered in a particular year and complete their degrees at a reasonably shorter period of time. The value of the scholarship varies based on the number of times the students is successful in meeting he bursary criteria. A student may be awarded a University Enhancement Bursary for a maximum of three times in his/her entire academic career. A student who has been awarded either a Mahapola Scholarship or the University Bursary maybe also entitled for the University Enhancement Bursary.

Eligibility Criteria for Award of University Enhancement Bursary

a) A student is eligible for the award of the University Enhancement Bursary s/he has registered for a minimum of 27 credits of courses in the first year of registration at the OUSL and successfully complete all the credits s/he registered for in the same academic year. However, if a student chooses to register for courses more than 27 credits, s/he shall be required to complete even the additional credits they have registered for to become eligible for the bursary.

b) In the subsequent year/s student shall be required to register for a minimum of 36 credits of courses at the OUSL and successfully complete all the credits s/he registered for in the same academic year. However, if a student chooses to register for credits more than 36 credits, s/he shall be required to complete even the additional credits they have registered for to become eligible for the bursary.

c) A student who fulfils the requirements given in (a) or (b) for the first time will be eligible for an award of a bursary equivalent to 10% of the tuition fee in the next academic year.

d) Similarly a student who fulfils the requirements given in (a) or (b) for the second time will be eligible for an award of a bursary equivalent to 20% of the tuition fee in the next academic year.

e) Likewise a student who fulfils the requirements given (a) or (b) for the third time will be eligible for an award of a bursary equivalent to 30% of the tuition fee in the next academic year.

f) The bursary amounts awarded to the students as per (c), (d) and (e) above, would be set aside from the tuition fee for the next academic year.
Duty Leave for Government School Teachers

School teachers following the BSc programme are entitled for 20 days of duty leave per year. Please refer to the Circular No 26/2013 issued by the Ministry of Education (www.moe.gov.lk)

Administrative Divisions Providing Support

Student Affairs Division

The Student Affairs Division located in the administrative building of the Nawala Central Campus is responsible for maintaining all personal and academic records of The Open University students. In case of loss of record books and change of addresses, students should immediately inform the Student Affairs Division. To drop courses in the permitted drop period or obtain studentship, students should contact the Student Affairs Division.

Students should also contact the Student Affairs Division for other matters pertaining to registration of students, such as changes to the medium of study, study centre and civil status. The contact details are: Senior Assistant Registrar (SAR), Student Affairs Division, The Open University of Sri Lanka, P.O. Box 21, Nawala, Nugegoda. Telephone: 011-2823920/011-2881205.

Examinations Division

Any query regarding examinations should be forwarded to the SAR/Examinations. When applying for examinations, you have to submit the duly completed application form to the SAR/Examinations. After processing your applications, the Examination Division will send you relevant online admission forms for sitting examinations prior to the commencement of the final examinations. Students may also request for results sheets and certificates from the Examination Division by paying a nominal fee. The contact number of the Examinations Division is 011-2881203 or 011-2881350.

Finance Division

The Finance Division is the administrative branch dealing with student fees. Any queries related to course fees should be forwarded to the Finance Division. The Colombo Regional Centre has a Shroff Counter that is open from 9.00 a.m to 3.00 p.m on week days with a half hour break from 12.00 noon to 12.30 p.m. Payments for certificates and results sheets can be made at the Shroff counter.

Other Forms of Student Support and Welfare

Student Counselling

General counselling on non academic student matters is available to all students through the Chief Student Counsellor and five Faculty Student Counsellors. All Students are advised to approach the Faculty Student Counsellors in the first instance.

Faculty Student Counsellors:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. D. Weerahewa</td>
<td>Senior Lecturer</td>
<td>Dept. of Botany</td>
<td>Tel: 2881634</td>
</tr>
<tr>
<td>Dr. J. V. P. Fernando</td>
<td>Senior Lecturer</td>
<td>Dept. of Physics</td>
<td>Telephone: 2881367</td>
</tr>
<tr>
<td>Dr. S. R. Hettiarachchi</td>
<td>Senior Lecturer</td>
<td>Matara Regional Centres</td>
<td>Tel: 041 2222943</td>
</tr>
<tr>
<td>Dr. R.M.R.R. Ratnayake</td>
<td>Senior Lecturer</td>
<td>Kandy Regional Centres</td>
<td>Tel: 081 2499370</td>
</tr>
<tr>
<td>Dr. C. Ranasinghe</td>
<td>Senior Lecturer</td>
<td>Dept. of Chemistry</td>
<td>Tel: 2881444</td>
</tr>
<tr>
<td>Dr. W.C.W. Navaratna</td>
<td>Senior Lecturer</td>
<td>Dept. Maths &amp; Com. Sci</td>
<td>Tel: 2881019</td>
</tr>
<tr>
<td>Dr. N.N. Punchihewa</td>
<td>Senior Lecturer</td>
<td>Dept. of Zoology</td>
<td>Tel: 2881446/090</td>
</tr>
</tbody>
</table>

Temporary Residential Facilities (TRF)

The University provides temporary residential facilities for a limited number of students for a limited period at Colombo, Kandy and Matara Regional Centres for attending academic activities. The application form to request for this facility needs to be collected from the Senior Assistant Registrar/General Administration or from the reception desk at the residential facility. The duly completed application form certified by the relevant academic staff member should be submitted and approved prior to using this facility.

Medical Centre

A medical centre is available at the Colombo Regional Centre for the benefit of all staff and students. This centre is located close to the Pre School and is normally open on weekdays except on University holidays and public holidays.

Canteens

Meals and other refreshments can be purchased from the University canteens at reasonable prices. Canteens are available at Nawala both in the Central Campus (near the Administration Block) and the Colombo Regional Centre (next to Block 15). Canteens are also available at the Kandy and Matara Regional Centres. The canteens provide service on all weekdays and weekends except on University holidays.
Facilities for Payment of Vouchers

Payment facilities are available to students at the Shroff Counter in the new CRC Building (adjoining the registration area). You may also make the payments at any Peoples’ Bank (the closest branch is at the Nawala Narahenpita Junction).

World University Service (WUS) Book Shop

The OUSL Branch of the WUS runs a small bookshop at Block 9. Students can purchase stationery and other consumable items at reasonable prices from the book shop. Safety Goggles, which is a requirement to work in the Chemistry Laboratory, can also be purchased from the book shop.

Photocopying Facilities

Photocopying facilities are available at the library, Student Union Room and at Natural Sciences Alumni Association photocopy centre at reasonable rates.

Career Guidance Unit

This Unit is located in the new CRC Building at Nawala and conducts activities to help OUSL students and graduates to enhance their career development skills and to optimize employment opportunities available to them.

Co-curricular Activities

Societies/Associations in the Faculty organize many social, cultural, religious and educational activities/functions that students can take part in. Societies such as the Buckyball Society, Bot-Soc, Spectrum and Zoonet regularly organize guest lectures and other co-curricular activities, to broaden the knowledge and skills of the students.

Faculty Alumni Association

All students of the Faculty are eligible to become members of the Alumni Association after they graduate. It organises activities to promote fellowship among members whilst supporting past and present students and encouraging general interest and well-being of the Faculty/University.

Student Welfare Division

The Student Welfare Division is responsible for coordination and facilitation of activities coming under different units such as student counseling, career guidance, health care, maintenance division and security allowing better networking and efficiency. Some of the specific functions coming under the Student Welfare Division are as follows.

- Selection and approval of students for University, Mahapola and other bursaries
- Review monitor and evaluate progress of activities carried out by support service units
- Initiate activities to enhance student welfare and cultural renaissance
- Initiate activities to enhance students’ social, ethnic cohesion and harmony.
- Create awareness about university student charter and promote students to comply with norms
- Entertain complaints and grievances from students
- Facilitate the management of temporary residential facility

- Coordinate student counseling services
- Facilitate management of common amenities

The Student Welfare Division of The Open University is dedicated to foster an environment where all students feel welcome and respected.

Admission and Registration

Students selected for admission to the different programmes of study offered by the Faculty are notified and will be required to register themselves on a specified date. The first time you register for a programme at the OUSL, you are referred to as a new registrant. When you register for courses in the subsequent years, you are called a re-registrant.

If a student does not renew his/her registration for 5 consecutive years, the registration to the programme will lapse.

Open Days and Orientation Sessions

To help familiarise new and potential students with the OUSL and its programmes, the Faculty organizes open days, pre-registration and post-registration orientation sessions for some programmes. Prior to registration, students are also sent a package that contains useful information regarding registration for courses. You are strongly advised to carefully read all the information given in this package.
Registering for Courses

Registration and re-registration of students for the BSc degree programme are conducted at all Regional Centres except at Badulla and Kurunegala. Registration of students for other programmes is conducted only at the Colombo Regional Centre. Counsellors are available to advise and help students during the registration process.

Studentship Only

A re-registering student can decide not to offer any courses in a given year. However, in this case it is mandatory that you register under the category of studentship only. Studentship should be obtained within 5 months of the end of the registration period. Beyond this, renewal of registration is permitted only during a registration period, with a financial penalty. It is also important to note that if a student does not renew the studentship for five consecutive years, registration to the programme will lapse.

A student who has obtained studentship will be called for registration for the subsequent academic year. He will also be able to sit examinations in courses he has obtained eligibility, if any, in previous years.

New students cannot register in the “studentship only” category. If they are not offering any courses in their first year, they are required to apply again as new students in the following year.

Making Changes to Registered Courses

Students who registered for the BSc Degree programme, and wish to change courses are permitted to do so within a specified period known as the ‘add/drop period’ and the ‘drop only period’.

Changes during Add/Drop Period

You are permitted to add or drop courses on the dates assigned for this purpose by completing a form that can be collected from the Assistant Registrar of the Faculty. If you drop courses you had registered for, the relevant course fee will be credited to your account. In making changes to registered courses, the total 36 credit maximum or the 9 credit minimum limit per academic year need to be maintained.

When dropping courses during add/drop period, the course material issued to you should be returned to the Book Centre.

Changes during drop period

After the add/drop period, you are not permitted to add courses. However, during the drop period, which runs beyond the add/drop period, you are permitted to drop courses. In this case, the course fee will not be refunded or carried over to the next academic year. It is very important to note that students who do not sit for continuous assessments/participate in other compulsory academic activities after the drop period will be considered as repeat students for that course.

Getting Exemptions for Courses

Students may request for specific exemptions from a course based on relevant qualifications they already possess. Applications for claiming such exemptions can be collected from the Assistant Registrar of the Faculty. Duly completed application forms together with proof for such qualifications and relevant course descriptions should be forwarded to the Dean of the Faculty. The Faculty Exemption Committee will assess the qualifications and inform the student if exemptions that could be granted. It is the responsibility of the student to claim such exemptions granted at a subsequent registration.

It is important to note that the marks assigned for a course with an exemption is equivalent to that of a minimum pass grade and a GPV of 2.00. An exemption processing fee will be charged for each exemption claimed.
Assessment and Evaluation

Evaluation in the Motivation and Study Habits courses is based on the attendance for its activities. The final evaluation is reported as pass or fail. What appears below applies to all the other courses.

Continuous Assessments and Eligibility

A student’s progress in each course is assessed continuously by means of assignments and/or assessment tests and/or practical tests. The assessment tests could be conventional No Book Tests (NBT) or Open Book Tests (OBT). An overall mark for continuous assessments, termed as CAM, is computed based on marks of assignments/assessment tests/practical tests.

Only those students who obtain a specified minimum CAM (termed as obtaining eligibility to sit the final exam) are permitted to sit the end of semester final examination for that course. The minimum CAM needed to obtain eligibility differs from programme to programme. Refer the relevant sections that describe individual programmes for more information in this regard.

Eligibility obtained is valid only for a limited period. After the lapse of an eligibility obtained, you will not have the opportunity to sit the final examination to upgrade RE/RF/RX/C-/D+/D/E grades. If you need to upgrade such grades, you will be required to re-register for the course and obtain eligibility once again.

For all students newly enrolling for programmes in and after academic year 2010/11 and for students who enrolled for the BSc programme in and after 2009/10, eligibilities obtained for courses will be valid for three consecutive years (including the year in which eligibility is obtained).

Final Examinations

The Faculty operates a two semester system for its courses in most programmes. The final examination of each course is held at the end of the relevant semester.

Sitting for Final Examination

Students are strongly advised to take into notice that the eligibility for a course can be carried forward only up to a limited period of time from the year of obtaining eligibility. Students are therefore strongly advised not to postpone sitting final examinations unless due to unavoidable reasons.

Students may postpone sitting final examinations under unavoidable circumstances. Medical or other letters/certificates are not requested from students who postpone examinations in this manner. However, the Faculty has observed over the years that the students who postpone sitting the final examinations do not perform well.

Application to sit for the final examinations
(or through My.OUSL)

Each semester, students are required to inform the SAR/Exams about the courses they intend to sit final examinations by submitting the duly completed application form for final examinations (online through My.OUSL). prior to the commencing date of the examination period. It is your responsibility to inquire from the Asst. Registrar/N.Sc. www.ou.ac.lk/science if you do not receive in time.

Repeat Students

Any student failing to obtain eligibility to sit the final examination for any particular course will have to re-register for that course in a subsequent year by re-paying the tuition fee. Such a student will be considered as a repeat student for that course. Repeat students will not be eligible for a grade higher than a minimum pass grade and a GPV of 2.00 for the repeat course.

Students are strongly advised not to register for too many courses which they cannot cope up with and thereby run the risk of becoming repeat students in a subsequent year.

Resit Candidates

Students who are eligible but fail to obtain at least a minimum pass mark at the final examination will be considered as resit candidates. Resit candidates need not re-register for that particular course at a subsequent registration, provided the student is writing the examination before the end of the eligibility valid period. However, like repeat students, resit students are not eligible for a grade higher than a minimum pass grade at subsequent attempts of the final examination. Resit candidates are not required to repay any course fee but will have to pay the resit examination fee.
Finance

The fees indicated below are applicable to any student registering for a programme in the Faculty of Natural Sciences.

Registration Fee: Rs. 400.00
Sports Club Fee: Rs. 25.00
Facilities Fees: Rs. 1500.00
Library facilities Fee: Rs. 100.00
Refundable Lab deposit Rs. 1100.00
Tuition Fee Rs. 1430.00 per credit
StART@OUSL Fee Rs. 7500.00

Vouchers for Payment of Fees

Fees are payable in two installments. Each student will initially receive a voucher for the first installment that includes 60% of the Tuition fees. After payment, the University copy of the voucher should be handed over at registration/re-registration. The voucher for the second installment that corresponds to the balance of the fees payable after making adjustments for the fees already paid will be sent to you about four months after the registration. After you make this payment, the university copy should be forwarded to the SAR/ Student Affairs without delay. You will need to pay the voucher for the second installment to receive the second semester course material.

The student copies of the vouchers are for your records. Students should not make any changes to the printed vouchers. Contact the Bursar (011-2881208), if you have any queries.

Awards, Prizes and Scholarships

Outstanding academic achievements of students are well recognized by the Faculty by offering them a number of Awards, Prizes and Scholarships. Some of these are funded by trust funds established by individuals whereas the others are donated either by the Faculty or the various societies in different Departments.

Awards Presented at the Annual Convocation

D. B. Ellepola Gold Medal for Science
This is awarded to the student having the best performance based on all courses considered for the award of the BSc Degree. It is funded by a trust fund with an original donation from Mr. Chandana Ellepola in memory of his father.

To qualify for the Medal, a student should have:
- satisfied the criteria for the award of the BSc degree and
- obtained at least a First Class and
- obtained the highest GPA

A student who has been found guilty of any offence related to examination/disciplinary matter shall not be eligible to receive the Gold Medal.

If more than one student qualifies for the Medal, the number of A grades or higher will be considered to select the winner.

Nalini Ratnasiri Gold Medal for Excellence in Zoology

A Gold Medal and cash award is presented to the student having the best performance in Zoology in the BSc Degree programme. It is funded by an original donation from the ZooNet of OUSL. To qualify for the Gold Medal, a student should have:
- satisfied the criteria for the award of the BSc degree and,
- registered and obtained at least B+ grades for a total of 42 credits of Zoology courses, including 9 credits at Level 3, 15 credits at Level 4 and 18 credits at level 5/6, and
- minimum A grade for the Zoology Project ZLU3288, and,
- obtained at least 3.70 GPA for the Zoology courses mentioned in (b) above, and
- obtained the highest GPA in the courses mentioned in (b) above.

J.N.Oleap Fernando Gold Medal for Excellence in Chemistry

The Buckyball Society established this prize in recognition of the services of Prof. J. N. Oleap Fernando, former Professor of Chemistry.

It is awarded to the student having the best performance in all Chemistry courses including Physical Chemistry courses at Levels 4 and 5. The award will carry a Gold Medal, a certificate and a cash prize.
Faculty of Natural Sciences Prizes

The Faculty of Natural Sciences prizes funded by the Faculty Prize Fund (established from donations of teaching staff in the Faculty) are awarded in each of the disciplines in Applied Mathematics, Botany, Chemistry, Physics, Computer Science, Pure Mathematics and Zoology at the BSc final examination to a student who has attained the following:

- satisfied the criteria for the award of the BSc degree, and,
- registered and obtained at least C grades in the relevant discipline at Levels 3, 4 and 5/6 as defined in the schedule below, and,
- obtained at least 3.30 GPA (for NS structure) in the defined courses of the relevant discipline and,
- obtained the highest GPA in the defined courses of the relevant discipline.

A student who has been found guilty of any offence related to examination/disciplinary matter shall not be eligible for a prize.

If more than one student qualifies for a particular prize based on above criteria, the winner will be selected considering the number of A grades or higher amongst defined courses.

Schedule:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>No. of credits at each Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 3</td>
</tr>
<tr>
<td>Botany</td>
<td>09</td>
</tr>
<tr>
<td>Chemistry</td>
<td>09</td>
</tr>
<tr>
<td>Computer Sc.</td>
<td>09</td>
</tr>
<tr>
<td>Pure maths</td>
<td>09</td>
</tr>
<tr>
<td>Applied maths</td>
<td>09</td>
</tr>
<tr>
<td>Physics</td>
<td>09</td>
</tr>
<tr>
<td>Zoology</td>
<td>09</td>
</tr>
</tbody>
</table>

** including at least a grade B+ in CSU3274 or CPU3250

Notes:

- For students who have offered more than the required course units as specified above, the courses in which the performance is best will be considered.
- Highest mark to be considered for any repeat course/resit examination will be 40% or GPV of 2.00 irrespective of the actual marks obtained by student.

Awards Presented at Faculty Awards Ceremony

Nalini Ratnasiri Scholarship for BSc Degree Students

The scholarship is funded by a donation initially made by Prof. Nalini B. Ratnasiri, Professor Emeritus of Zoology. An annual scholarship to the value of Rs. 5000/- is awarded to the student who obtains the highest GPA from among those who satisfy the following criteria:

a) Sat for final examinations of courses adding up to the required 36 credits at Level 3 within a max/minimum of 03 academic years from first registration, and, have registered up to at least 09 credits in the academic year of computation,

b) No E grades within course units considered in (a)

c) Have obtained at least B– grades in courses adding up to 30 credits (excluding LSE1303 and PSE3117) at Level 3, and,

d) A GPA of at least 3.30 with at least B+ grades for a minimum of 15 credits in the courses mentioned in (c)

If two or more students qualify based on the above criteria, the student who has the highest number of better grades will be awarded the scholarship.

A recipient of the scholarship in a previous academic year will not be considered again.
Kandiah Memorial Scholarship Award

Funds for this scholarship are donated by Prof. Umarany Coomaraswamy, Professor Emeritus/Botany, in memory of her parents Mr. & Mrs. K. Kandiah. This scholarship will award cash Rs. 8000/-.

A student will qualify to be considered for the scholarship for a particular academic year* if he/she has the following requirements at the time of selection:

a) Registration for all courses at Level 3 adding up to a total of 36 credits inclusive of Botany as one of the main disciplines.

b) Completion of registration for the 15 credits of Botany courses at Level 4.

c) Minimum of C grades and a GPA of 2.70 for courses adding up to 27 credits at Level 3 (inclusive of a minimum of B-grade for the Botany courses at Level 3 BOU1101+BOU1200 and exclusive of LSE3201 and PSE3117).

d) A low annual income**.

* Those qualifying for the requirements at an earlier registration will not be eligible for the scholarship.

** The level of income should be less than Rs.200,000.00 per year.

The student who has obtained the highest GPA for (27) credits at Level 3 with less than the stipulated income level will be awarded the scholarship.

If more than one student qualifies in any one academic year, it will be shared equally by all.

Buckyball Award for Excellence in Chemistry

The Buckyball Society of the Department of Chemistry makes an annual award to each of the Chemistry courses in Levels 3 - 5 except for CMU1121, CMU3134 and CMU3235. In each course, it is awarded to the student who has secured the highest GPA overall mark and an minimum A grade. Each award will carry a certificate and a cash prize.

C-60 Scholarship for the Best Performance in Chemistry at Level 3 and Level 4

Three scholarships will be awarded by The Buckyball Society of the Department of Chemistry be based on the performance in all Chemistry courses available at Levels 3 and 4. And the above requirements should be fulfilled in the year of first registration of the courses. Candidate should have a GPA of 3.70 or more in the above courses. The winner of the Professor JN Oleep Fernando Scholarship will not be eligible for the C-60 scholarship.

Buckyball Science Award for the best Level 3 student

This award, presented by The Buckyball Society is offered to the student with the best performance in three science based disciplines at Level 3 including Chemistry. A student would be eligible for consideration for the award only at the first instance of completing the courses.

Professor GMKB Gunaherath Award for Organic Chemistry

This is awarded to the student with the best performance in all Chemistry courses, including Organic Chemistry courses at Levels 4 and 5. The award will carry a certificate and a cash prize.

Professor JN Oleep Fernando Scholarship

The Buckyball Society of the Department of Chemistry is awarded to the student based on the performance in all Chemistry courses available at Levels 3 and 4. And the above requirements should be fulfilled in the year of first registration of the courses. Candidate should have a GPA of 3.70 or more in the above courses. The winner of the Professor JN Oleep Fernando Scholarship will not be eligible for the C-60 scholarship.

Zoonet Awards for Best Performance in Zoology Courses

The Zoonet of OUSL presents annual awards for courses offered by the Department of Zoology. In each course, it is awarded to the student who sits the final examination of the course in the same academic year of obtaining eligibility and secures the highest Overall Mark with an Overall A Grade. The award will carry a certificate and a cash prize.

Spectrum Awards for Best Performance in Physics Courses

The Spectrum of OUSL presents annual awards for courses offered by the Department of Physics. In each course, it is awarded to the student who sits the final examination of the course in the same academic year of obtaining eligibility and secures the highest Overall Mark with an Overall A Grade. The award will carry a certificate and a cash prize.
BotSoc-OUSL Awards for Botany

The Botanical Society of the OUSL awards certificate of best performance together with a cash award to the students who secure highest overall marks with at least an 'A grade' in the following subjects offered by the Department of Botany. To qualify for this award, student should sit for the final examination in the same academic year in which eligibility is obtained.

BOU1101, BOU1200, BOU2101, BOU2102, BOU2103, BOU2200, BOU3101, BOU3104

Dean’s List Awards

Criteria are as follows:

1. Completed the final examinations with a minimum of 27 credits (out of the total registered), with a Grade Point Average* of 3.70 or better,

2. Completed the final examinations of the 27 credits considered in (a) above, in the year of obtaining eligibility to sit final examination,

3. Obtained C grades or above for any credits completed at the final examinations of the relevant academic year (including final examinations of courses sat over and above the minimum 27 credits considered), with no resits or repeats among the completed credits,

4. No F Grades permitted among the total registered courses in the relevant academic year; RX grades are permitted, and,

5. No disciplinary action should have been taken against the candidate.

* Grade Point Average will be the weighted mean of the best Grade Point Values a student earns by completing final examinations of 27 credits in the relevant academic year (one/two semesters).

When considering the performance, only the regular courses of the programme will be considered (Continuing education courses are excluded).

Special Benefits to students

- The Dean’s List Placement will be noted on the Student’s Transcript.

- Each student placed on the Dean’s List will receive a Letter of Commendation from the Dean of the Faculty of Natural Sciences

- A scholarship to the value of 18 credits (tuition fees as relevant to the programme) will be awarded by the University to students placed high on the Dean’s List.

The Dean’s List of the relevant academic year will be computed for each undergraduate Programme of Study after all final examination results of the particular academic year are released.
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Department of Botany

Welcome to the Department of Botany!

Botany is the scientific study of plants. Plants include a wide range of living organisms from the smallest bacteria to the largest living things - the giant sequoia trees. The discipline of Botany covers a range of fields - diversity of plants, their taxonomy, genetics, physiology and many more, and also the interaction among plants and their well being.

Studying Botany will not only enhance your knowledge about plants, but will also open up many employment opportunities once you acquire theory and practical knowledge on fields of Botany that have applications in many industries.

The Department offers opportunities in research on many fields of Botany for those students who are interested in strengthening their analytical and interpreting skills, by conducting a research study under the supervision of a senior academic. In addition, the staff is also engaged in Open and Distance Learning research in order to improve the quality of its products.

The Department is very enthusiastic in sharing its knowledge with you to achieve your targets in your future endeavours. To further facilitate this task, the department offers many other Programmes such as Diploma in Microbiology, Certificate in Environmental Science and short course in Tissue Culture Techniques providing on the job training.

The Department would like to have student interactions through Bot-Soc - OUSL; a society initiated by the Botany staff to enhance interactions and appreciate the outstanding students through scholarships.

Hope you will have a useful and enjoyable experience studying Botany!

Further information is available at www.ou.ac.lk/science/botany

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Chemistry is generally referred to as the central science because, diverse fields of study such as Biology, Agriculture, Engineering and Geology share an essential tie to it. It is an extremely practical science and has been very influential in its impact on our daily life.

The Department of Chemistry offers basic courses in Chemistry as well as those in advanced topics covering both fundamental and applied areas of the discipline. It is hoped that the knowledge and skills gained through these courses will prepare students well for the competitive world of work.

In addition to the undergraduate courses, the Department is interested in offering Short courses and Certificate courses in specialized fields such as Food Science.

The Department provides opportunities for the students to engage in research, both at the undergraduate and postgraduate levels in theoretical and applied areas of Chemistry. In order to improve the quality of its services to students, the Department is also engaged in Open and Distance Learning research.

The Department encourages students to enrich their knowledge outside the curriculum through the activities of the Buckyball Society; a society formed with the initiative of the Chemistry staff. The Buckyball Society also recognizes outstanding academic achievements of students through a scheme of awards and scholarships.

Further information is available at www.ou.ac.lk/science/chemistry

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Department of Mathematics and Computer Science

The Department of Mathematics and Computer Science welcomes students who wish to follow courses in any of the areas of Pure Mathematics, Applied Mathematics and Computer Science. The computer science discipline is open for any student who satisfies the qualification to enter the BSc. Degree Programme, regardless of whether they have offered courses from the Bio Science or the Physical Science streams of the Advanced/Foundation Level.

To cater those who require the knowledgeable and skilled personnel in the areas of Computer Networks and Computer Applications, the department also offers certificate programmes in these areas.

In addition, the department offers stand-alone courses in the areas of Applied Mathematics and Pure Mathematics, to cater to those who wish to enhance knowledge in the areas of their choice without registering for a regular degree programme.

Research opportunities are also available in the areas of Pure Mathematics, Applied Mathematics and Computer Science leading to higher degrees.

Further information is available at
www.ou.ac.lk/science/maths

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Physics is perhaps the most basic of all sciences. Understanding the principles of Physics and the laws of nature gives you an enhanced insight into the world around you. All modern science and technology is underpinned by Physics. The goal of Physics is to discover the unrevealed secrets in nature that extends from minute elementary particles to the massive galaxies with the knowledge of physical laws and mathematics for sustainable development.

Physics courses are prepared not only for a career in Physics, but also for many other fields as well. In fact, the Physics Department has made a concerted effort to make its core requirements more flexible, offering a variety of courses for different programs of study that satisfy the major requirements. Department also offers some interdisciplinary courses that attracts even biological science students. Essentials of geology and Fundamentals of geophysics are also taught by the Department of Physics. Study of rocks, minerals and its geological and geophysical applications is its main focus. Department has been active in undergraduate and postgraduate researches in the fields of electronics, novel semiconductor materials, exploration geophysics and applications in geology. The Department also conducts a Certificate in Applied Electronics. Further, plans are underway to conduct a Certificate in Applied Earth Sciences. Students are encouraged to explore multidisciplinary programs in Physics.

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Department of Zoology

Zoology is the study of animal life. It is central to our understanding of the world and encompasses a fascinating body of knowledge ranging from molecules to populations and to their interactions with the environment.

Our Department strives to disseminate knowledge in the discipline by contributing to a variety of academic programmes, including the BSc Degree, the Advanced Certificate in Laboratory Technology, the PG Dip/MSc in Environmental Science. We also offer a Certificate in Wildlife Conservation & Management, Diploma in Natural Resources and Ecotourism and a Short course in GIS. Courses offered for these programmes aim to provide understanding in the core areas of Zoology and in its applications. Students are also provided with a range of transferable skills through activities such as laboratory and fieldwork, teamwork, oral presentations, information retrieval and report writing.

Research within our Department presently focuses on wildlife conservation, animal diversity and abundance studies, control of pests, molecular phylogenetics and aquatic pollution. Students get opportunities to engage in research studies at undergraduate and postgraduate levels.

We encourage co-curricular activities through the ZooNet of OUSL, a student-staff society, which organises regular guest lectures, educational trips, mini projects, etc. ZooNet also gives awards annually, in recognition of academic excellence and other achievements of students.

The overall training provided by our Department prepares students for postgraduate studies and for diverse careers in academic & research institutions, biomedical, aquatic, wildlife or environment related sectors.

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<td>Senior lecturer</td>
<td>BSc (Jaffna) M.Phil (Jaffna) 0112881446</td>
</tr>
<tr>
<td>Dr. N.N. Punchihewa</td>
<td>Senior Lecturer</td>
<td>BSc (Sri Jayewardenapura) M.Phil (OUSL); Ph.D. (Auckland &amp; OUSL) PG Dip. Education (OUSL) PG Dip. Envi Health (Massey NZ) M.I. Biol (SL); C.Biol (SL) F Biol (SL) 0112881446/090 <a href="mailto:nnpun@ou.ac.lk">nnpun@ou.ac.lk</a></td>
</tr>
<tr>
<td>Ms. C.D. Jayasinghe</td>
<td>Lecturer</td>
<td>BSc (Colombo) M.Sc. (Osaka) 0112881446/090 <a href="mailto:cdjay@ou.ac.lk">cdjay@ou.ac.lk</a></td>
</tr>
<tr>
<td>Mr. T.S.P Fernando</td>
<td>Lecturer (Probationary)</td>
<td>BSc : M.Phil. (Colombo) M.I. Biol (SL) <a href="mailto:saminda@ou.ac.lk">saminda@ou.ac.lk</a> (On leave)</td>
</tr>
<tr>
<td>Ms. W.A.Y. Chandrani</td>
<td>Senior Lecturer</td>
<td>BSc (Sri Jayewardenapura) M.Sc. (Colombo); M.Phil. (OUSL) PG Dip. Education (OUSL) M.I. Biol (SL) 0112881446/090 <a href="mailto:wacha@ou.ac.lk">wacha@ou.ac.lk</a></td>
</tr>
<tr>
<td>Mr. D.R.G.W.B. Ellepola</td>
<td>Lecturer (Probationary)(MRC)</td>
<td>BSc (Peradeniya)</td>
</tr>
</tbody>
</table>
PROGRAMMES OF STUDY

Bachelor of Science Degree Programme

Aims and Objectives
The BSc Degree programme is designed to contribute towards raising the general educational standards of the public by providing an opportunity for higher education in Science. The specific objectives are to:

• provide an opportunity for persons to obtain a Science Degree and thereby improve their promotional/career prospects

• enable, particularly those in employment, late developers and those who could not avail themselves of higher education at the end of their secondary school career, to obtain a degree

• enable any person to pursue a degree course in Science in their own time at an affordable cost

• combine courses within and outside the Faculty to suit his/her interest or job requirements

Academic Admission requirements
Minimum of 3 passes at the GCE (A/L) examination from among the Science subjects, Applied Mathematics, Biology, Botany, Chemistry, Combined Mathematics, Higher Mathematics, Mathematics, Physics, Pure Mathematics, Information technology and Zoology in any number of sittings. Appendix 1 records equivalent qualifications that will enable exemptions for entry into Level 3 of the programme.

Duration
Requires a minimum period of three academic years to complete the programme.

Learning Outcomes
Upon successful completion of the BSc Degree programme, a graduate is expected to have:

• acquired an understanding of the theoretical and applied knowledge of the respective disciplines in Science

• acquired relevant practical skills to complement and support subject-based theoretical knowledge

• developed the ability to conduct scientific investigations and proceed to undertake research studies at higher levels

• gained a range of critical, analytical, transferable and personal skills

• obtained broader knowledge on areas outside the subject combinations in Science through open electives

• changed from a dependent learner to an independent learner and developed an interest in life-long learning

Programme Structure
The BSc programme offers courses at Levels (L) 3, 4 and 5/6, equivalent to the 1st, 2nd, and 3rd/4th years of the BSc Degree Programme of a conventional University.

Medium of Instruction
Instruction, including course material at Level 3 are available in English, Sinhala and Tamil, except for those course material in the disciplines of Computer Science, Pure & Applied Maths and a few others offered by other Departments. Instruction at Levels 4 and 5 is available only in the English medium.

Workload
For the BSc Degree, a student requires to take discipline-based courses and open electives adding up to a total of 108 credits. Those without exempting qualifications are also require to register for English and Mathematics. A student can register only for a maximum total of 36 credits per academic year. However, students are strongly advised not to register for the maximum number of credits, particularly at Level 3.

Award of the BSc Degree
The BSc degree is conferred according to the OUSL Rules and Regulations. Those who wish to be considered for the award of the degree need to apply to the SAR/Examinations before the stipulated deadline (see page 103) using the prescribed application form available with the Asst. Registrar/ Natural Science or download from the website: www.ou.ac.lk/science. to be considered for the award.
BSc Degree Programme - NS Structure

The BSc Degree programme is of 108 credits and offers a combination of discipline-based courses, open electives and continuing education courses at Levels (L) 3, 4 and 5/6.

Level 3 - Register within the maximum of 36 credits

Admission requirements

At least 3 passes or exemption in approved Science subjects in GCE A/L or Foundation Level, in any number of sittings, including the specified prerequisites in the relevant disciplines of choice.

Compulsory requirements

Choose a minimum of 36 credits with at least 9 credits from the compulsory open electives and 9 credits each from the three chosen disciplines. If not exempted, offer LSE3202, EDE3001, PSE3117.

Level 3 courses

| Discipline | Course Code | Course Title | Pre-Requisites                   
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>BOU1200</td>
<td>Diversity of Plants</td>
<td>Pass in Botany/Biology*</td>
</tr>
<tr>
<td></td>
<td>BOU1101</td>
<td>Organization of Cells &amp; Plant Biochemistry</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>CMU1220</td>
<td>Basic Principles of Chemistry</td>
<td>Pass in Chemistry *</td>
</tr>
<tr>
<td></td>
<td>CMU1121</td>
<td>Practical Chemistry</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>PYU1160</td>
<td>General and Thermal Physics</td>
<td>Pass in Physics *</td>
</tr>
<tr>
<td></td>
<td>PYU1161</td>
<td>Basic Electromagnetism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PYU1162</td>
<td>Waves in Physics</td>
<td></td>
</tr>
<tr>
<td>Zoology</td>
<td>ZLU1280</td>
<td>Animal Life and Diversity</td>
<td>Pass in Zoology/Biology*</td>
</tr>
<tr>
<td></td>
<td>ZLU1181</td>
<td>Biogeography</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>CPU1140</td>
<td>Fundamentals of Computers</td>
<td>3 Passes in GCE A/L or pass in Foundation</td>
</tr>
<tr>
<td></td>
<td>CPU1141</td>
<td>Introduction to Computer Programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPU1142</td>
<td>Data Structures and Algorithms</td>
<td>CPU1140+CPU1141 EL/CR</td>
</tr>
<tr>
<td>Applied Maths</td>
<td>APU1140</td>
<td>Vector Algebra</td>
<td>Pass in Applied/Combined Math/Higher Maths *</td>
</tr>
<tr>
<td></td>
<td>APU1141</td>
<td>Basic Statistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>APU1142</td>
<td>Differential Equations</td>
<td></td>
</tr>
<tr>
<td>Pure Maths</td>
<td>PUU1140</td>
<td>Logic and Mathematical Proofs</td>
<td>Pass in Pure/Combined Math/Higher Maths *</td>
</tr>
<tr>
<td></td>
<td>PUU1141</td>
<td>Foundation of Mathematics</td>
<td>PUU1140 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>PUU1142</td>
<td>Vector Spaces</td>
<td>(PUU1140 + PUU1141) (EL/CR)</td>
</tr>
</tbody>
</table>

Open Elective Courses

| Course Code | Course Title                      | Pre-Requisites                   
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compulsory Selections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LWU1161</td>
<td>Understanding Law</td>
</tr>
<tr>
<td></td>
<td>MCU1108</td>
<td>Managing Your Work &amp; People</td>
</tr>
<tr>
<td></td>
<td>SSU1198</td>
<td>Introduction to Sri Lankan Society</td>
</tr>
<tr>
<td></td>
<td>PCU1102</td>
<td>Ethics in Science &amp; Technology</td>
</tr>
<tr>
<td></td>
<td>PCU1163</td>
<td>Communication skills</td>
</tr>
<tr>
<td></td>
<td>PCU1141/</td>
<td>Basic Statistics</td>
</tr>
<tr>
<td></td>
<td>APU1141</td>
<td>For Maths students not offering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Applied Maths</td>
</tr>
<tr>
<td></td>
<td>PSE3117</td>
<td>Mathematics for Chemistry and Biology</td>
</tr>
<tr>
<td></td>
<td>EDE3001</td>
<td>Empowering for Independent Learning (EfIL)</td>
</tr>
<tr>
<td></td>
<td>LSE3202</td>
<td>English for General Academic Purposes</td>
</tr>
</tbody>
</table>

* Pass in GCE A/L or OUSL Foundation certificate / Foundation courses in Science
EL – Eligibility; CR – Concurrent registration
A student can offer up to a total of 45 credits from Level 3 courses. However, this is subject to the maximum 36 credits allowed per academic year and other conditions.
Level 4 – Register within the maximum of 36 credits

Admission requirements
Pass/exemption/eligibility/concurrent registration in the 36 credits of specified compulsory course requirement at L3 and Pass/exemption/concurrent registration in LSE3210 and exemption/eligibility in PSE3117 (for students offering Chemistry, Botany or Zoology). Pass in EDE3010

Compulsory Requirements
Select a minimum of 36 credits comprising 15 credits each from the major disciplines and 6 credits from the 3rd discipline offered at L3.

Level 4 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
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<tbody>
<tr>
<td>Botany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOU2100</td>
<td>Plant Physiology</td>
<td>BOU1200 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>BOU2101</td>
<td>Genetics and Evolution</td>
<td></td>
</tr>
<tr>
<td>BOU2102</td>
<td>Systematics of Higher Plants and Animals</td>
<td></td>
</tr>
<tr>
<td>BOU2103</td>
<td>Principles of Microbiology</td>
<td>BOU1200 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMU2220</td>
<td>Concepts of Chemistry</td>
<td></td>
</tr>
<tr>
<td>CMU2221</td>
<td>Organic Chemistry I</td>
<td>CMU1220 (EL) + CMU 1 12 1 (EL) and pass in EDE3 00 1</td>
</tr>
<tr>
<td>CMU2222</td>
<td>Inorganic Chemistry</td>
<td>CMU1220 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PYU2160</td>
<td>Modern Physics</td>
<td>PYU1160 (EL or CR) + PYU1 161 (EL or CR) + PYU1162 (EL or CR) + PYU1 165 (EL or CR) + PYU1 167 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>PYU2262</td>
<td>Electronics</td>
<td>PYU1160 (EL or CR) + PYU1 161 (EL or CR) + PYU1 162 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>PYU2164</td>
<td>Optics</td>
<td>PYU1160 (EL or CR) + PYU1 161 (EL or CR) + PYU1 162 (EL or CR) + PYU 216 5 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>PYU2165</td>
<td>Mathematical Methods for Physics</td>
<td>PYU1160 (EL or CR) + PYU1 161 (EL or CR) + PYU1 162 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>Zoology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZLU2280</td>
<td>Animal Form and Function</td>
<td></td>
</tr>
<tr>
<td>ZLU2281</td>
<td>Fundamentals of Ecology</td>
<td>ZLU1280 (EL or CR) and pass in EDE3 00 1</td>
</tr>
<tr>
<td>ZLU2182</td>
<td>Animal Development</td>
<td>ZLU1280 (EL or CR) and pass in EDE3 00 1</td>
</tr>
<tr>
<td>Computer Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU2140*</td>
<td>System Analysis and Software Engineering</td>
<td>(CPU 1140 + CPU 1141 + CPU 1142)(EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>CPU2241</td>
<td>Database Management Systems</td>
<td></td>
</tr>
<tr>
<td>CPU2242</td>
<td>Object Oriented Programming using C++ and Java</td>
<td>(CPU 1140 + CPU 1141 + CPU 1142)(EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APU2140</td>
<td>Statistical Distribution Theory</td>
<td>APU1141 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>APU2141</td>
<td>Regression Analysis I</td>
<td>APU1141 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>APU2142</td>
<td>Newtonian Mechanics I</td>
<td>(APU1140(EL or CR) + APU 1142(EL)) and pass in EDE3001</td>
</tr>
<tr>
<td>APU2143</td>
<td>Vector Calculus</td>
<td>APU1140 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>APU2144</td>
<td>Applied Linear Algebra and Differential Equations</td>
<td>APU1142 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>Pure Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPU2140</td>
<td>Sequences and Series</td>
<td>(PPU1140 + PPU1141)(EL) and pass in EDE3001</td>
</tr>
<tr>
<td>PPU2141</td>
<td>Continuous Functions</td>
<td>(PPU1140 + PPU 1141)(EL) and pass in EDE3001</td>
</tr>
<tr>
<td>PPU2142</td>
<td>Linear Algebra</td>
<td>PPU1142 (EL) and pass in EDE3001</td>
</tr>
<tr>
<td>PPU2143</td>
<td>Differentiable Functions</td>
<td>PPU2141 (EL or CR) and pass in EDE3001</td>
</tr>
<tr>
<td>PPU2144</td>
<td>Group Theory I</td>
<td>(PPU1140 + PPU 1141)(EL or CR and pass in EDE3001</td>
</tr>
</tbody>
</table>
Level 5 – Register within the maximum of 36 credits

**Admission requirements**
Pass/exemption/eligibility/concurrent registration in the 36 credits each of specified compulsory course requirement at L3 & L4 and pass in LSE 3210

**Level 5 courses**

<table>
<thead>
<tr>
<th>Discipline-based Courses</th>
<th>Discipline</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>BOU3100</td>
<td>Environmental and Applied Microbiology</td>
<td>BOU2103 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3101</td>
<td>Plant Pathology</td>
<td>BOU2103 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3102</td>
<td>Plant Growth and Development</td>
<td>BOU2200 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3103</td>
<td>Plants and Man</td>
<td>BOU1200 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3104</td>
<td>Soils and Plant Growth</td>
<td>BOU1200 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3105</td>
<td>Literature Review in Botany</td>
<td>Limited Registration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3106</td>
<td>Plant Breeding</td>
<td>BOU2101(EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3107</td>
<td>Forest Resources and their Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3108</td>
<td>Post- harvest Technology of Fresh Produce</td>
<td>BOU2200 (EL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOU3209</td>
<td>Horticulture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Zoology                   | ZLU3180    | Aquatic Biology |
|                          | ZLU3181    | Fish Biology and Fishery Management |
|                          | ZLU3182    | Conservation and Management of Biodiversity |
|                          | ZLU3183    | Animal Behaviour |
|                          | ZLU3184    | Parasitology |
|                          | ZLU3185    | Human Biology |
|                          | ZLU3186    | Insect Biology |
|                          | ZLU3187    | Mammalian Biology |
|                          | ZLU3288    | Zoology Project | PCU3141 (EL or CR) only for General Degree |
|                          | ZLU3189    | Paleobiology |
|                          | ZLU3190    | Evolutionary Biology |
|                          | ZLU3191    | Literature review in Zoology | only for Special Degree |
|                          | ZLU3192    | Zoology Essay | only for General Degree |
|                          | ZLU3193    | Research Methodology and Scientific Writing |

| Compulsory Requirements | | |
|-------------------------| | |
| Select a maximum of 36 credits from L5 or higher level. |

**Discipline-based Courses**

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>CMU3120</td>
<td>Organic Chemistry II</td>
<td>CMU2221 (EL)</td>
</tr>
<tr>
<td></td>
<td>CMU3122</td>
<td>Organometallic Chemistry</td>
<td>CMU2122 (EL)</td>
</tr>
<tr>
<td></td>
<td>CMU3123</td>
<td>Analytical Chemistry</td>
<td>(CMU1220 + CMU1121) (C grades)</td>
</tr>
<tr>
<td></td>
<td>CMU3124</td>
<td>Chemistry of Biomolecules</td>
<td>CMU2221 (EL)</td>
</tr>
<tr>
<td></td>
<td>CMU3125</td>
<td>Natural products Chemistry</td>
<td>CMU3124 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>CMU3126</td>
<td>Biochemistry</td>
<td>CMU3124 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>CMU3127</td>
<td>Chemical aspects of food Industry</td>
<td>CMU3124 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>CMU3128</td>
<td>Instrumental Methods of Chemical Analysis</td>
<td>CMU3123 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>CMU3129</td>
<td>Environmental Chemistry</td>
<td>CMU1220 (C grade)</td>
</tr>
<tr>
<td></td>
<td>CMU3130</td>
<td>Selected Topics in Inorganic Chemistry</td>
<td>CMU1220 (C grade)</td>
</tr>
<tr>
<td></td>
<td>CMU3131</td>
<td>Concepts in Spectroscopy</td>
<td>CMU2220 (EL)</td>
</tr>
<tr>
<td></td>
<td>CMU3232</td>
<td>Industrial Chemistry</td>
<td>CMU1220 (C grade)</td>
</tr>
<tr>
<td></td>
<td>CMU3233</td>
<td>Polymer Chemistry</td>
<td>CMU1220 (C grade)</td>
</tr>
<tr>
<td></td>
<td>CMU3134</td>
<td>Literature Project in Chemistry</td>
<td>15 credits in L4 Chemistry (EL) + limited registration</td>
</tr>
<tr>
<td></td>
<td>CMU3235</td>
<td>Research Project in Chemistry</td>
<td>15 credits in L4 Chemistry (EL) + limited registration</td>
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</tbody>
</table>

**Open Elective Courses**

<table>
<thead>
<tr>
<th>Course Codes</th>
<th>Credit Rating</th>
<th>Course Title</th>
<th>Pre-Requisites/ Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCU3141</td>
<td>3</td>
<td>Bio Statistics (Non-Mathematics Students)</td>
<td>PSE3117 (EL)</td>
</tr>
<tr>
<td>PCU3142</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>APU1141/PCU1142/PCU1141/PCU3141 (EL or CR) or equivalent</td>
</tr>
<tr>
<td>PCU3104</td>
<td>3</td>
<td>Environmental Studies</td>
<td></td>
</tr>
<tr>
<td>PCU3170</td>
<td>3</td>
<td>Electronics for Biology Students</td>
<td>For Non Physics Students</td>
</tr>
<tr>
<td>PCU3271</td>
<td>6</td>
<td>Physics for Biology Students</td>
<td>For Non Physics Students</td>
</tr>
</tbody>
</table>

Contd.
### Level 5 Courses, contd.

<table>
<thead>
<tr>
<th>Discipline-based Courses</th>
<th>Discipline-based Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discipline</strong></td>
<td><strong>Course Code</strong></td>
</tr>
<tr>
<td><strong>Physics</strong></td>
<td>PYU3160</td>
</tr>
<tr>
<td></td>
<td>PYU3161</td>
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<tr>
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<td>PYU3162</td>
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<td>PYU3164</td>
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<td>PYU3168</td>
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<td>PYU3270</td>
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<tr>
<td></td>
<td>PYU3171</td>
</tr>
<tr>
<td></td>
<td>PYU3172</td>
</tr>
<tr>
<td></td>
<td>PYU3173</td>
</tr>
<tr>
<td><strong>Computer Science</strong></td>
<td>CPU3140*</td>
</tr>
<tr>
<td></td>
<td>CPU3141</td>
</tr>
<tr>
<td></td>
<td>CPU3242</td>
</tr>
<tr>
<td></td>
<td>CPU3243*</td>
</tr>
<tr>
<td></td>
<td>CPU3144*</td>
</tr>
<tr>
<td></td>
<td>CPU3245*#</td>
</tr>
<tr>
<td></td>
<td>CPU3146#</td>
</tr>
<tr>
<td></td>
<td>CPU3147#</td>
</tr>
<tr>
<td></td>
<td>CPU3148#</td>
</tr>
<tr>
<td></td>
<td>CPU3149#</td>
</tr>
<tr>
<td></td>
<td>CPU3151</td>
</tr>
<tr>
<td></td>
<td>CPU3152</td>
</tr>
<tr>
<td></td>
<td>CPU3250</td>
</tr>
</tbody>
</table>

* Compulsory for relevant discipline specialization.
# Compulsory for specialization in Information Technology

Some of the above courses will not be offered every year.

---

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Maths</td>
<td>APU3240</td>
<td>Numerical Methods</td>
<td>APU1142 (EL/CR) or AMU1181 (EL)</td>
</tr>
<tr>
<td></td>
<td>APU3141</td>
<td>Linear Programming</td>
<td>for Maths Students only</td>
</tr>
<tr>
<td></td>
<td>APU3143</td>
<td>Mathematical Methods</td>
<td>APU1142 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>APU3244</td>
<td>Graph Theory</td>
<td>for Maths Students only</td>
</tr>
<tr>
<td></td>
<td>APU3145</td>
<td>Newtonian Mechanics II</td>
<td>APU2142 (EL)</td>
</tr>
<tr>
<td>Pure Maths</td>
<td>APU3146</td>
<td>Operational Research</td>
<td>{APU2144 (EL) + APU3141 (EL/CR)}</td>
</tr>
<tr>
<td></td>
<td>APU3147</td>
<td>Statistical Inference</td>
<td>APU2140 (EL/CR)</td>
</tr>
<tr>
<td></td>
<td>APU3150</td>
<td>Fluid Mechanics</td>
<td>APU2143 (EL)</td>
</tr>
<tr>
<td></td>
<td>APU3251</td>
<td>Project on Self Study</td>
<td>Limited Registration</td>
</tr>
<tr>
<td></td>
<td>PUU3240</td>
<td>Ring Theory and Field Theory</td>
<td>PUU2144 (EL)</td>
</tr>
<tr>
<td></td>
<td>PUU3141</td>
<td>Algebra of Complex Numbers</td>
<td>for Maths Students only</td>
</tr>
<tr>
<td></td>
<td>PUU3242</td>
<td>Combinatorics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PUU3143</td>
<td>Riemann Integration</td>
<td>{PUU2141 (EL/CR) + PUU2143 (EL)}</td>
</tr>
<tr>
<td></td>
<td>PUU3244</td>
<td>Number Theory and Polynomials</td>
<td>PUU1141 (EL)</td>
</tr>
<tr>
<td></td>
<td>PUU3245</td>
<td>Complex Analysis I</td>
<td>PUU3141 (EL/CR)</td>
</tr>
</tbody>
</table>
## Level 6 Courses

Level six courses may be offered subject to prerequisites.

### Discipline-based Courses

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOU4102</td>
<td>Biotechnology</td>
<td>BOU1101(EL)</td>
<td></td>
</tr>
<tr>
<td>BOU4103</td>
<td>Experimental Design and Biological Data Analysis</td>
<td>PCU1140 (EL) PSU2182 (EL)</td>
<td></td>
</tr>
<tr>
<td>BOU4108</td>
<td>Advanced Ecology</td>
<td>ZLU2281(EL)</td>
<td></td>
</tr>
<tr>
<td>BOU4311</td>
<td>Research Project in Botany</td>
<td>Limited registration</td>
<td></td>
</tr>
<tr>
<td>APU4240</td>
<td>Stochastic Processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APU4242</td>
<td>Statistical Quality Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APU4243</td>
<td>Actuarial Mathematics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EL – Eligibility; CR – Concurrent Registration

Only a few of the above courses will be available in 2016/2017. Others will only be available in the future.
Evaluation

Evaluation in Motivation and Study Habits courses (BOE3000, CME3000, PYE3000, PUE3000 AND ZLE3000) is based on attendance. The final evaluation is reported as pass or fail.

For all the other courses evaluation procedure involves both continuous assessments and final examinations. To be eligible to sit the final examination of a course, a student should score a **minimum of 40% for its continuous assessments**, which will be valid for three years. Students are required to answer Level 4 and higher level examinations in English

i) **Overall Mark**: For each course the overall mark, “Z%” will be computed by a combination of the Continuous Assessment Mark (CAM), “X%” and the Final Examination Mark (FEM), “Y%” as follows.

   a) **For courses offered by the Faculty of Natural Sciences and Faculty of Humanities and Social Sciences except LSE3202**
      
      If $Y \geq 40$, then $Z = 0.4 X + 0.6 Y$
      
      If $30 \leq Y < 40$, then $Z = 0.4 X + 0.6 Y$, subject to a maximum of 40
      
      If $Y < 30$, then $Z = Y$

   b) **For LSE3202 : English for General Academic Purposes**
      
      If $Y \geq 40$, then $Z = 0.3 X + 0.7 Y$
      
      If $Y < 40$, then $Z = Y$
      
      If $Y \geq 35$ and $Y < 39$ then $Z= 0.3X+0.7y$ subject to a maximum of 40
      
      If $Y < 34$, then $Z = Y$.

ii) **Overall Grade and Grade Point Value**: For each course, an overall Grade and a Grade Point Value will be awarded based on Z% as shown below.

<table>
<thead>
<tr>
<th>Range of marks</th>
<th>Overall Grade</th>
<th>85-100</th>
<th>70-84</th>
<th>65-69</th>
<th>60-64</th>
<th>55-59</th>
<th>50-54</th>
<th>45-49</th>
<th>40-44</th>
<th>35-39</th>
<th>30-34</th>
<th>20-29</th>
<th>0-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Grade</td>
<td>A+</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D+</td>
<td>D</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Grade Point Value</td>
<td>4.00</td>
<td>4.00</td>
<td>3.70</td>
<td>3.30</td>
<td>3.00</td>
<td>2.70</td>
<td>2.30</td>
<td>2.00</td>
<td>1.70</td>
<td>1.30</td>
<td>1.00</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

A+, A-, B+, B, B+, C+, and C are Pass grades. Not eligible students will be assigned a F Grade and Absentees for a final examination will be assigned a RX Grade

i) **Grade Point Average (GPA)**: GPA is the credit-weighted arithmetic mean of the Grade Point Values obtained by a student for the total of 108 credits. GPA will be calculated to the second decimal point, subject to a maximum of 4.00, as shown in the example below. GPA will determine the Passes and Classes of the BSc degree.

Example: Calculation of the GPA for a student with the following Grades

<table>
<thead>
<tr>
<th>Overall Grade</th>
<th>No of credits</th>
<th>Credit weighted Grade Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>6</td>
<td>$6 \times 4.00 = 24.00$</td>
</tr>
<tr>
<td>A</td>
<td>15</td>
<td>$15 \times 4.00 = 60.00$</td>
</tr>
<tr>
<td>B</td>
<td>30</td>
<td>$30 \times 3.00 = 90.00$</td>
</tr>
<tr>
<td>C</td>
<td>51</td>
<td>$51 \times 2.00 = 102.00$</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>$6 \times 1.00 = 6.00$</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>282.00</td>
</tr>
</tbody>
</table>

GPA = $\frac{\sum c_i g_i}{\sum c_i}$

$c_i$: Credit rating of the $i^{th}$ course

$g_i$: GP value obtained for $i^{th}$ course

GPA = 282.00/108 = 2.61
BSc Degree (NS Structure) Award Criteria (108 credits)

The BSc degree will be awarded in accordance with the provisions of the OUSL Regulation and Rule 1.1.1.1(e). An extract of the award criteria is given below. Those who wish to be considered for the award of the degree, should apply on the prescribed form to the SAR/Examinations, before the date stipulated by the Faculty (see page 103).

<table>
<thead>
<tr>
<th>Minimum credit requirements</th>
<th>Exemption and/or eligibility in courses adding up to a total of 108 credits comprising:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 36 credits at L3 with 9 credits in each of the three chosen disciplines and 9 credits of open electives,</td>
</tr>
<tr>
<td></td>
<td>• 36 credits at L4 with 15 credits in each of the two main disciplines and 6 credits from the remaining discipline chosen at L3,</td>
</tr>
<tr>
<td></td>
<td>• 27 credits at L5 and/or higher level with at least 6 credits each from the two main disciplines chosen at L4,</td>
</tr>
<tr>
<td></td>
<td>• 9 credits comprising discipline-based courses remaining at L4, 5 or higher, and/or, open electives at L 3, 4 and 5 (subject to a maximum total of 15 credits open electives),</td>
</tr>
<tr>
<td></td>
<td>And</td>
</tr>
<tr>
<td></td>
<td>• Minimum C grade or exemption in PSE3117 for Chemistry and Biology students,</td>
</tr>
<tr>
<td></td>
<td>• Minimum C grade or exemption in LSE3202/LSE3201.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pass</th>
<th>C grades or better in 81 credits (from among the 108 credits above) with at least 27 credits at L3, 21 credits at L4 and 18 credit at L5,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Minimum D grades in the remaining 27 credits,</td>
</tr>
<tr>
<td></td>
<td>• Minimum GPA of 2.00.</td>
</tr>
<tr>
<td></td>
<td>• Complete the relevant requirements within a period of 10 academic years.</td>
</tr>
</tbody>
</table>

To be awarded a First or Second Class Honours, a student needs to fulfil the Pass criteria specified above with criteria specified below:

| Second Class (Lower Division) Honours | C grades or better in 90 credits and at least D grades for the remaining courses, |
|                                     | B grades or better in at least 54 credits,                                             |
|                                     | Minimum GPA of 3.00.                                                                     |

| Second Class (Upper Division) Honours | C grades or better in 99 credits and at least D grades for the remaining courses, |
|                                     | B+ grades or better in at least 54 credits,                                              |
|                                     | Minimum GPA of 3.30.                                                                     |

| First Class Honours                 | C grades or better in 102 credits and at least D grades in the remaining courses, |
|                                     | A grades or better in 54 credits,                                                       |
|                                     | Minimum GPA of 3.70                                                                      |
BSc Degree Programme - Course Fees

The Registration fee and other fees relevant for 2016/2017, are given below.

Registration Fee - Rs. 400.00
Sports Club Fee - Rs. 25.00
Facilities Fee - Rs. 1500.00
Refundable Lab Deposit - Rs. 1100.00
Library Facilities Fee - Rs. 100.00
Tuition Fees - Rs. 1430.00 per credit

Tuition & Practical fees payable are given in the Tables below. Foreign students will be charged four (4) times tuition fees of local students.

**Table 8 Tuition Fees**

<table>
<thead>
<tr>
<th>Credit rating</th>
<th>3</th>
<th>9</th>
<th>18</th>
<th>27</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fees</td>
<td>Rs.4,290.00</td>
<td>Rs.12,870.00</td>
<td>Rs.25,740.00</td>
<td>Rs.38,610.00</td>
<td>Rs.51,480.00</td>
</tr>
</tbody>
</table>

**Table 9 Practical Fees - to be paid only by those students offering the relevant courses.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Fee</th>
<th>Course</th>
<th>Fee</th>
<th>Course</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOU1200</td>
<td>Rs.500.00</td>
<td>CMU2221</td>
<td>Rs.1200.00</td>
<td>CPU3141</td>
<td>Rs.200.00</td>
</tr>
<tr>
<td>CMU1121</td>
<td>Rs.1500.00</td>
<td>ZLU2280</td>
<td>Rs.500.00</td>
<td>CPU3245</td>
<td>Rs.200.00</td>
</tr>
<tr>
<td>ZLU1280</td>
<td>Rs.500.00</td>
<td>ZLU2281</td>
<td>Rs.500.00</td>
<td>CPU3147</td>
<td>Rs.200.00</td>
</tr>
<tr>
<td>PCU1159</td>
<td>Rs.200.00</td>
<td>CPU2140</td>
<td>Rs.200.00</td>
<td>CPU3149</td>
<td>Rs.200.00</td>
</tr>
<tr>
<td>CPU1141</td>
<td>Rs.200.00</td>
<td>CPU2241</td>
<td>Rs.200.00</td>
<td>BOU4110</td>
<td>Rs.500.00</td>
</tr>
<tr>
<td>CPU1142</td>
<td>Rs.200.00</td>
<td>CPU2242</td>
<td>Rs.200.00</td>
<td>ZLU4183</td>
<td>1000.00</td>
</tr>
<tr>
<td>BOU2103</td>
<td>Rs.600.00</td>
<td>BOU3100</td>
<td>Rs.600.00</td>
<td>ZLU4184</td>
<td>750.00 - 2000.00</td>
</tr>
<tr>
<td>BOU2200</td>
<td>Rs.600.00</td>
<td>BOU3102</td>
<td>Rs.600.00</td>
<td>ZLU4285</td>
<td>750.00</td>
</tr>
<tr>
<td>CMU2220</td>
<td>Rs.1200.00</td>
<td>BOU3108</td>
<td>Rs.600.00</td>
<td>ZLU4186</td>
<td>750.00 - 2000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CMU3120</td>
<td>Rs.1200.00</td>
<td>ZLU4289</td>
<td>750.00 - 2000.00</td>
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<tr>
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<td></td>
<td>CMU3123</td>
<td>Rs.1200.00</td>
<td>ZLU4191</td>
<td>750.00 - 2000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CMU3128</td>
<td>Rs.1200.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BSc Special Degree Programme

The BSc Special Degree Programme is of 144 credits and offers a combination of discipline-based courses, open electives and continuing education courses as in the BSc (General) Degree programme up to Level 4 and focus more on courses based on a single discipline at Levels 5 and 6.

Admission requirements for Level 5

Eligibility in 72 credits at Levels 3 and 4, completed within 3 years from initial registration; with minimum C grades for the 36 credits at Level 3 and 15 credits of the subject of specialization at Level 4 with minimum GPA of 3.00 for the 51 credits at Levels 3 and 4 in the subject of specialization; minimum of B grades adding up to 18 credits out of a total of 24 credits in the subject of specialization at Levels 3 and 4 taken together and minimum C grade or exemption for the course PSE3117 for students offering courses in one or more of the disciplines of Botany, Chemistry and Zoology at Level 4 and above.

Compulsory Requirements

Select a maximum of 36 credits from L5 or higher level.

Level 5 Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Rating</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOU3100</td>
<td>3</td>
<td>Environmental and Applied Microbiology</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3101</td>
<td>3</td>
<td>Plant Pathology</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3102</td>
<td>3</td>
<td>Plant Growth and Development</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3103</td>
<td>3</td>
<td>Plants and Man</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3104</td>
<td>3</td>
<td>Soils and Plant Growth</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3105</td>
<td>3</td>
<td>Literature Review in Botany</td>
<td>Limited Registration</td>
</tr>
<tr>
<td>BOU3106</td>
<td>3</td>
<td>Plant Breeding</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU3107</td>
<td>3</td>
<td>Forest Resources and their Management</td>
<td></td>
</tr>
<tr>
<td>BOU3108</td>
<td>3</td>
<td>Postharvest Technology</td>
<td></td>
</tr>
<tr>
<td>BOU3109</td>
<td>6</td>
<td>Horticulture</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMU3120*</td>
<td>3</td>
<td>Organic Chemistry II</td>
<td>CMU2221 (EL)</td>
</tr>
<tr>
<td>CMU3221*</td>
<td>6</td>
<td>Physical Chemistry I</td>
<td>CMU2220 (minimum C grade)</td>
</tr>
<tr>
<td>CMU3122*</td>
<td>3</td>
<td>Organometallic Chemistry</td>
<td>CMU2122 (EL)</td>
</tr>
<tr>
<td>CMU3123*</td>
<td>3</td>
<td>Analytical Chemistry</td>
<td>CMU2120 (minimum C grade) + CMU1121 (minimum C grade)</td>
</tr>
<tr>
<td>CMU3124*</td>
<td>3</td>
<td>Chemistry of Biomolecules</td>
<td>CMU2221 (EL)</td>
</tr>
<tr>
<td>CMU3125*</td>
<td>3</td>
<td>Natural Product Chemistry</td>
<td>CMU1214 (EL or CR)</td>
</tr>
<tr>
<td>CMU3126*</td>
<td>3</td>
<td>Biochemistry</td>
<td>CMU2221 (minimum C grade)</td>
</tr>
<tr>
<td>CMU3127*</td>
<td>3</td>
<td>Chemical Aspects of Food Industry</td>
<td>CMU1214 (EL or CR)</td>
</tr>
<tr>
<td>CMU3128*</td>
<td>3</td>
<td>Instrumental Methods of Chemical Analysis</td>
<td>CMU1215 (EL or CR)</td>
</tr>
<tr>
<td>CMU3129</td>
<td>3</td>
<td>Environmental Chemistry</td>
<td>CMU1220 (minimum C grade)</td>
</tr>
<tr>
<td>CMU3131*</td>
<td>3</td>
<td>Concepts in Spectroscopy</td>
<td>CMU2220 (EL)</td>
</tr>
<tr>
<td>CMU3136</td>
<td>6</td>
<td>Advanced Organic Chemistry</td>
<td>CMU1214 (minimum C grade)</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PYU3160*</td>
<td>3</td>
<td>Nuclear &amp; Particle Physics</td>
<td>PYU2160 (EL or CR) + PYU2165 (CR or EL)</td>
</tr>
<tr>
<td>PYU3161*</td>
<td>3</td>
<td>Practical Physics</td>
<td>PYU2160 (EL or CR) + PYU2165 (EL or CR)</td>
</tr>
<tr>
<td>PYU3162*</td>
<td>3</td>
<td>Atmospheric Physics</td>
<td></td>
</tr>
<tr>
<td>PYU3164*</td>
<td>3</td>
<td>Data Acquisition and Signal Processing</td>
<td>PYU2262 (EL or CR)</td>
</tr>
<tr>
<td>PYU3165</td>
<td>3</td>
<td>Biophysics</td>
<td></td>
</tr>
<tr>
<td>PYU3168</td>
<td>3</td>
<td>Fundamentals of Geophysics</td>
<td>PYU3166 (CR or EL)</td>
</tr>
<tr>
<td>PYU3169</td>
<td>3</td>
<td>Literature Survey project in Physics</td>
<td>Only for General Degree Students</td>
</tr>
<tr>
<td>PYU3170</td>
<td>3</td>
<td>Research Project in Physics</td>
<td>PYU2163 (CR or EL)</td>
</tr>
<tr>
<td>PYU3173*</td>
<td>3</td>
<td>Solid State Physics</td>
<td>PYU2160 (EL or CR) + PYU2165 (CR or EL)</td>
</tr>
<tr>
<td>PYU3174*</td>
<td>3</td>
<td>Advanced Electromagnetism</td>
<td>PYU2165 (CR or EL)</td>
</tr>
<tr>
<td>PYU3175*</td>
<td>3</td>
<td>Thermodynamics</td>
<td>PYU2165 (EL or CR)</td>
</tr>
<tr>
<td>Zoology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZLU3180</td>
<td>3</td>
<td>Aquatic Biology</td>
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<tr>
<td>ZLU3181</td>
<td>3</td>
<td>Fish Biology and Fishery Management</td>
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<tr>
<td>ZLU3182</td>
<td>3</td>
<td>Conservation and Management of Biodiversity</td>
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<tr>
<td>ZLU3183</td>
<td>3</td>
<td>Animal Behaviour</td>
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<td>ZLU3184</td>
<td>3</td>
<td>Parasitology</td>
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<td>ZLU3185</td>
<td>3</td>
<td>Human Biology</td>
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<td>ZLU3186</td>
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<td>ZLU3187</td>
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<tr>
<td>ZLU3188</td>
<td>6</td>
<td>Zoology Project</td>
<td>PYU3141 (EL or CR), only for General Degree</td>
</tr>
<tr>
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<td>6</td>
<td>Conservation and Management of Zoology</td>
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<td>ZLU3191*</td>
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<td>Only for Special Degree</td>
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<td>ZLU3192*</td>
<td>3</td>
<td>Zoology Essay</td>
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<tr>
<td>Computer Science</td>
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<tr>
<td>CPU1140*</td>
<td>3</td>
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<tr>
<td>CPU1141</td>
<td>3</td>
<td>Digital Computer Fundamentals</td>
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<tr>
<td>CPU3242*</td>
<td>6</td>
<td>Operating Systems</td>
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<tr>
<td>CPU3243*</td>
<td>6</td>
<td>Principles and Techniques of Artificial Intelligence</td>
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<tr>
<td>CPU3144*</td>
<td>3</td>
<td>Theory of Computing</td>
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<tr>
<td>CPU3245*</td>
<td>6</td>
<td>Computer Networks &amp; Security</td>
<td>(CPU1140 + CPU1141 + CPU1142) (EL or CR) + (CPU2140 + CPU2241 + CPU2242)(EL or CR)</td>
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<tr>
<td>CPU3146*</td>
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<tr>
<td>CPU3147*</td>
<td>3</td>
<td>Software Quality Assurance</td>
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<tr>
<td>CPU3148</td>
<td>3</td>
<td>Management Information systems</td>
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<tr>
<td>CPU3149</td>
<td>3</td>
<td>Web Technologies</td>
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<tr>
<td>CPU3151</td>
<td>3</td>
<td>Information security and Cryptography</td>
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</tr>
<tr>
<td>CPU3152</td>
<td>3</td>
<td>Data Communication</td>
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<tr>
<td>Mathematics</td>
<td></td>
<td></td>
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<tr>
<td>APU3240*</td>
<td>6</td>
<td>Numerical Methods</td>
<td></td>
</tr>
<tr>
<td>APU3241</td>
<td>3</td>
<td>Advanced Statistical Designs and Analysis</td>
<td>PPU2142 (EL)</td>
</tr>
<tr>
<td>APU3242*</td>
<td>3</td>
<td>Mathematical Methods</td>
<td></td>
</tr>
<tr>
<td>APU3243</td>
<td>3</td>
<td>Graph Theory</td>
<td></td>
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<tr>
<td>APU3244</td>
<td>6</td>
<td>Newtonian Mechanics II</td>
<td>APU3242 (EL)</td>
</tr>
<tr>
<td>APU3245</td>
<td>3</td>
<td>Recreational Research</td>
<td>(CPU2141 (EL or CR)) + APU3141 (EL or CR)</td>
</tr>
<tr>
<td>APU3246*</td>
<td>3</td>
<td>Statistical Inference</td>
<td>APU2140 (EL or CR)</td>
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<td>APU3247</td>
<td>6</td>
<td>Time Series Analysis</td>
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<tr>
<td>APU3248</td>
<td>3</td>
<td>Regression Analysis II</td>
<td>APU2141 (EL or CR)</td>
</tr>
<tr>
<td>APU3249</td>
<td>3</td>
<td>Fluid Mechanics</td>
<td>APU2143 (EL)</td>
</tr>
<tr>
<td>APU3240*</td>
<td>6</td>
<td>Logic and Field Theory</td>
<td>PPU2143 (EL)</td>
</tr>
<tr>
<td>APU3241*</td>
<td>3</td>
<td>Algebra of Complex Numbers</td>
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<tr>
<td>APU3242*</td>
<td>6</td>
<td>Combinatorics</td>
<td></td>
</tr>
<tr>
<td>APU3243*</td>
<td>3</td>
<td>Riemann Integration</td>
<td>(CPU2141 (EL or CR) + PPU2143 (EL))</td>
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<tr>
<td>APU3244*</td>
<td>6</td>
<td>Number Theory and Polynomials</td>
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</tr>
<tr>
<td>APU3245*</td>
<td>6</td>
<td>Complex Analysis I</td>
<td>PPU3141 (EL or CR)</td>
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</table>
Open Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Rating</th>
<th>Course Title</th>
<th>Pre-Requisites/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCU3141</td>
<td>3</td>
<td>Bio Statistics (Non-Mathematics Students)</td>
<td>PSE3117 (EL)</td>
</tr>
<tr>
<td>PCU3142</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>APU1141/PCU1142/PCU1141 (EL or CR) or equivalent</td>
</tr>
<tr>
<td>PCU3104</td>
<td>3</td>
<td>Environment Studies</td>
<td></td>
</tr>
<tr>
<td>PCU3170</td>
<td>3</td>
<td>Electronics for Biology Students</td>
<td>For Non Physics students</td>
</tr>
<tr>
<td>PCU3271</td>
<td>6</td>
<td>Physics for Biology Students</td>
<td>For Non Physics Students</td>
</tr>
</tbody>
</table>

Admission requirements for Level 6
Pass/eligibility/concurrent registration in the 36 credits each of specified compulsory course requirements at L5.

Compulsory Requirements
Select a maximum of 36 credits.

Level 6 Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Rating</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td></td>
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</tr>
<tr>
<td>BOU4100</td>
<td>3</td>
<td>Plant Molecular Biology</td>
<td>BOU1101 (EL)</td>
</tr>
<tr>
<td>BOU4101</td>
<td>3</td>
<td>Bioinformatics</td>
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</tr>
<tr>
<td>BOU4102</td>
<td>3</td>
<td>Biotechnology</td>
<td>BOU1101(EL)</td>
</tr>
<tr>
<td>BOU4103*</td>
<td>3</td>
<td>Experimental Design and Biological Data Analysis</td>
<td>PCU1140 (EL), PSU 2182(EL)</td>
</tr>
<tr>
<td>BOU4104</td>
<td>3</td>
<td>Integrated Crop Protection</td>
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</tr>
<tr>
<td>BOU4105</td>
<td>3</td>
<td>Industrial Microbiology</td>
<td>BOU2103 (EL)</td>
</tr>
<tr>
<td>BOU4106</td>
<td>3</td>
<td>Molecular Systematics</td>
<td>BOU2102(EL)</td>
</tr>
<tr>
<td>BOU4107*</td>
<td>3</td>
<td>Advanced Plant Physiology and Biochemistry</td>
<td>BOU2200(EL)</td>
</tr>
<tr>
<td>BOU4108*</td>
<td>3</td>
<td>Advanced Ecology</td>
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</tr>
<tr>
<td>BOU4109</td>
<td>3</td>
<td>Soil Biology</td>
<td>BOU2103(EL)</td>
</tr>
<tr>
<td>BOU4110</td>
<td>3</td>
<td>Advanced Plant Pathology</td>
<td>BOU3101(EL)</td>
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<tr>
<td>BOU4111*</td>
<td>9</td>
<td>Research Project in Botany</td>
<td>PCU1142 (EL or CR)</td>
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<tr>
<td>BOU4112</td>
<td>3</td>
<td>Plant Virology</td>
<td>BOU3101(EL)</td>
</tr>
<tr>
<td>BOU4113*</td>
<td>3</td>
<td>Special Topics in Botany</td>
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</tr>
<tr>
<td>Chemistry</td>
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</tr>
<tr>
<td>CMU4120*</td>
<td>3</td>
<td>Selected Topics in Inorganic Chemistry</td>
<td>CMU2122(EL)</td>
</tr>
<tr>
<td>CMU4121*</td>
<td>3</td>
<td>Advanced Concepts in Chemistry</td>
<td>CMU3121(EL)+CMU2220(EL)</td>
</tr>
<tr>
<td>CMU4122</td>
<td>3</td>
<td>Medicinal Chemistry</td>
<td>CMU3126(EL)</td>
</tr>
<tr>
<td>CMU4123</td>
<td>3</td>
<td>Clinical Chemistry</td>
<td>CMU3126(EL)</td>
</tr>
<tr>
<td>CMU4124</td>
<td>3</td>
<td>Boron Chemistry</td>
<td>CMU2122(EL)</td>
</tr>
<tr>
<td>CMU4125</td>
<td>3</td>
<td>Chemical Aspect of Food Industry</td>
<td>CMU3124(EL or CR)</td>
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<tr>
<td>CMU4128</td>
<td>3</td>
<td>Physical organic chemistry</td>
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<tr>
<td>CMU4129</td>
<td>3</td>
<td>Application of Advanced Spectroscopy</td>
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<tr>
<td>CMU4130*</td>
<td>6</td>
<td>Advanced Experimental Chemistry</td>
<td>(CMU220EL)+ (CMU2221(EL)+CMU2122(EL)+CMU3123(EL)+CMU3128(EL))</td>
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<tr>
<td>CMU4134*</td>
<td>3</td>
<td>Literature Project in Chemistry</td>
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<tr>
<td>CMU4135*</td>
<td>9</td>
<td>Research Project in Chemistry</td>
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<tr>
<td>Pure Maths</td>
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</tr>
<tr>
<td>BUU3204*</td>
<td>6</td>
<td>Point Set Topology</td>
<td>BUU2140+BUU2141(EL)</td>
</tr>
<tr>
<td>BUU3205</td>
<td>6</td>
<td>Measure Theory</td>
<td>BUU2131(EL)</td>
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<tr>
<td>BUU4122</td>
<td>3</td>
<td>Group Theory II</td>
<td>BUU2143(EL)</td>
</tr>
<tr>
<td>BUU4144</td>
<td>3</td>
<td>Introduction to Galois Theory</td>
<td>BUU2420</td>
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<tr>
<td>BUU4226</td>
<td>6</td>
<td>Complex Analysis II</td>
<td>BUU3132(EL)</td>
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<td>BUU4226</td>
<td>6</td>
<td>Functional Analysis</td>
<td>BUU2423(EL)</td>
</tr>
<tr>
<td>PCU4141</td>
<td>3</td>
<td>Advanced Topics in Real Analysis</td>
<td>BUU3140+BUU2143(EL)</td>
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<tr>
<td>APU4351</td>
<td>9</td>
<td>Research Project in Mathematics</td>
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Physics

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Course Title</th>
<th>Pre-Requisites</th>
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<tbody>
<tr>
<td>PYU4160*</td>
<td>3</td>
<td>Advanced Practicals in Physics</td>
<td>PYU2160 (CR or EL) PYU3174 (CR or EL)</td>
</tr>
<tr>
<td>PYU4161*</td>
<td>3</td>
<td>Advanced Solid State Physics</td>
<td>PYU3173 (CR or EL) PYU2160CR (CR or EL)</td>
</tr>
<tr>
<td>PYU4162*</td>
<td>3</td>
<td>Advanced Quantum Mechanics</td>
<td>PYU2160 (CR or EL)</td>
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<tr>
<td>PYU4363*</td>
<td>9</td>
<td>Advanced Research Project in Physics</td>
<td>PCU2163 (CR or EL)</td>
</tr>
<tr>
<td>PYU4164*</td>
<td>3</td>
<td>Advanced Electronics</td>
<td>PYU2262 (CR or EL) Only for Special Degree Students</td>
</tr>
<tr>
<td>PYU4265</td>
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<td>Nanophysics and its Applications</td>
<td>PYU3173 (CR or EL)</td>
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<tr>
<td>PYU4166*</td>
<td>3</td>
<td>Statistical Physics</td>
<td>PYU2165 (CR or EL)</td>
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<tr>
<td>PYU4167</td>
<td>3</td>
<td>Modern Optics</td>
<td>PYU2164 (CR or EL)</td>
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<tr>
<td>PYU4168</td>
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<td>Renewable Energy Sources</td>
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Zoology

<table>
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<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZLU4180</td>
<td>3</td>
<td>Management of Insect pests and vector</td>
<td>ZLU3186(EL)</td>
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<tr>
<td>ZLU4181</td>
<td>3</td>
<td>Aquaculture</td>
<td>ZLU3180 (EL)</td>
</tr>
<tr>
<td>ZLU4182</td>
<td>3</td>
<td>Immunology</td>
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<tr>
<td>ZLU4183*</td>
<td>3</td>
<td>Molecular Biology</td>
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<tr>
<td>ZLU4285*</td>
<td>6</td>
<td>Advanced Laboratory Techniques in Zoology</td>
<td>Only for Special Degree</td>
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<tr>
<td>ZLU4286</td>
<td>6</td>
<td>Ornithology</td>
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<tr>
<td>ZLU4388*</td>
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<td>Research Project in Zoology</td>
<td>PCU3141 (EL or CR)</td>
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<tr>
<td>ZLU4189</td>
<td>3</td>
<td>Oceanography and ocean resources</td>
<td>Only for Special Degree</td>
</tr>
<tr>
<td>ZLU4190</td>
<td>3</td>
<td>Wild life management and conservation</td>
<td>ZLU3182 (EL)</td>
</tr>
<tr>
<td>ZLU4191*</td>
<td>3</td>
<td>Special topics in Zoology</td>
<td>Only for Special Degree</td>
</tr>
<tr>
<td>PCU4180</td>
<td>3</td>
<td>GIS in Natural Resource Management</td>
<td>Only for Special Degree in any discipline</td>
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<tr>
<td>PCU4281</td>
<td>6</td>
<td>Environmental Degradation Management</td>
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</tr>
<tr>
<td>PCU4182</td>
<td>3</td>
<td>Fundamentals of Environmental Impact Assessment</td>
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## Open Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Rating</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCU4180</td>
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<td>GIS in Natural Resource Management</td>
<td>-</td>
</tr>
<tr>
<td>PCU4281</td>
<td>6</td>
<td>Environmental Degradation Management</td>
<td>-</td>
</tr>
<tr>
<td>PCU4182</td>
<td>3</td>
<td>Fundamentals of Environmental Impact Assessment</td>
<td>-</td>
</tr>
</tbody>
</table>

EL; Eligibility; CR: Concurrent registration

* Compulsory for the relevant discipline of specialization
Evaluation

Evaluation procedure involves both continuous assessments and final examinations. To be eligible to sit the final examination of a course, a student should score a minimum of 40% for its continuous assessments, which will be valid for three years.

i) Overall Mark: For each course the overall mark, "Z%" will be computed by a combination of the Continuous Assessment Mark (CAM), "X%" and the Final Examination Mark (FEM), "Y%" as follows.

If \( Y \geq 40 \), then \( Z = 0.4X + 0.6Y \)

If \( 30 < Y < 40 \), then \( Z = 0.4X + 0.6Y \), subject to a maximum of 40.

If \( Y < 30 \), then \( Z = Y \)

ii) Overall Grade and Grade Point Value: For each course, an overall Grade and a Grade Point Value will be awarded based on Z% as shown below.

<table>
<thead>
<tr>
<th>Range of Marks</th>
<th>85-100</th>
<th>70-84</th>
<th>65-69</th>
<th>60-64</th>
<th>55-59</th>
<th>50-54</th>
<th>45-49</th>
<th>40-44</th>
<th>35-39</th>
<th>30-34</th>
<th>20-29</th>
<th>0-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Grade</td>
<td>A+</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D+</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>Grade Point Value</td>
<td>4.00</td>
<td>4.00</td>
<td>3.70</td>
<td>3.30</td>
<td>3.00</td>
<td>2.70</td>
<td>2.30</td>
<td>2.00</td>
<td>1.70</td>
<td>1.30</td>
<td>1.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

A+, A, A-, B+, B, B-, C+, and C are Pass grades. Not eligible students will be assigned a F Grade and Absentees for a final examination will be assigned a RX Grade.

Range of marks

Grade Point Average (GPA): GPA is the credit-weighted arithmetic mean of the Grade Point Values obtained by a student for the total of 144 credits. GPA will be calculated to the second decimal point, subject to a maximum of 4.00, as shown in below. GPA will determine the Passes and Classes of the BSc degree.

\[
GPA = \frac{\sum c_i g_i l_i}{\sum c_i l_i}
\]

where \( c_i \) is the credit rating of the ith course, \( g_i \) is the GP value the student has obtained for the ith course, \( l_i \) is 2 if the ith course is in either Level 3 or 4, and \( l_i \) is 3 if the ith course is in either Level 5 or 6.

BSc Special Degree Award Criteria (144 credits) Point

For the award of the Bachelor of Science Special degree, a student may be required to complete 144 credits within 06 academic years from his/her initial registration to the BSc Degree Programme. Those who do not complete within the stipulated period, may opt for the Bachelor of Science General Degree, on completing 108 credits and satisfying the requirements for the award.

The BSc Special Degree will be awarded in accordance with the provisions of the OUSL Regulation and Rule 1.1.1.1(e). An extract of the award criteria is given below.
<table>
<thead>
<tr>
<th>Minimum credit requirements</th>
<th>Exemption and/or eligibility in courses adding up to a total of 144 credits comprising:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 36 credits at L3 with 9 credits in each of the three chosen disciplines and 9 credits of open electives,</td>
</tr>
<tr>
<td></td>
<td>• 36 credits at L4 with 15 credits in each of the two main disciplines and 6 credits from the remaining discipline chosen at L3,</td>
</tr>
<tr>
<td></td>
<td>• 36 credits at Level 5 comprising minimum 24 credits from the subject of specialization, and,</td>
</tr>
<tr>
<td></td>
<td>• 36 credits at Level 6 comprising minimum 30 credits from the subject of specialization (or specified by the department) which shall include a 9-credit research component (compulsory).</td>
</tr>
<tr>
<td>And</td>
<td>Minimum C grade or exemption in PSE3117 for Chemistry and Biology students,</td>
</tr>
<tr>
<td></td>
<td>Minimum C grade or exemption in LSE3202/LSE3201.</td>
</tr>
</tbody>
</table>

| Pass                        | C grades or above for courses adding up to 144 credits, and, |
|                             | • a minimum of C grade or exemption for the course PSE3117 for students offering courses in one or more of the disciplines of Botany, Chemistry and Zoology at Level 4 and above, and, |
|                             | • a minimum of C grade or exemption for the course LSE3202, and, |
|                             | • a minimum Grade Point Average of 2.00 in courses adding up to 144 credits as specified |

To be awarded a First or Second Class Honours, a student needs to fulfill the Pass criteria specified above with criteria specified below:

| Second Class (Lower Division) Honours | B grades or above in courses adding up to at least 72 credits comprising 45 credits at Levels 5 and 6 (out of a total of 54 credits of the subject of specialization at Levels 5 and 6) taken together, and, |
|                                        | • a minimum Grade Point Average of 3.00 in courses adding up to 144 credits as specified. |

| Second Class (Upper Division) Honours | B+ grades or above in courses adding up to at least 72 credits comprising 45 credits at Levels 5 and 6 (out of a total of 54 credits of the subject of specialization at Levels 5 and 6) taken together, and, |
|                                       | • a minimum Grade Point Average of 3.30 in courses adding up to 144 credits as specified. |

| First Class Honours | A grades or above in courses adding up to at least 72 credits comprising 45 credits at Levels 5 and 6 (out of a total of 54 credits of the subject of specialization at Levels 5 and 6) taken together, and, |
|                     | • a minimum Grade Point Average of 3.70 in courses adding up to 144 credits as specified. |

**Course Fees**

Level 5- Rs. 1430.00
Level 6- Rs. 1800.00
Diploma in Science

Students who originally registered for the BSc Degree Programme may exit the programme and opt for a Diploma in Science after the acquisition of 72 credits by applying on the prescribed form to SAR/Examinations, before the stipulated date (see page 103).

Award Criteria

i) For students admitted to the BSc programme NS Structure: The Diploma in Science will be awarded in accordance with Regulation & Rule 1.1.1.1 (e). An extract of the award criteria is given below.

<table>
<thead>
<tr>
<th>Minimum credit requirements</th>
<th>Exemption and/or eligibility in courses adding up to a total of 72 credits comprising:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>• 36 credits at L3 with 9 credit in each of the three chosen disciplines and 9 credits of specified open electives,</td>
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<tr>
<td></td>
<td>• 36 credits comprising 15 credits at L4 in each of the two main disciplines and 6 credits comprising discipline-based courses remaining at L4, L5 or higher, and/or, open electives at L 3, 4 and 5</td>
</tr>
</tbody>
</table>

| Pass                        | • C grades or better in 54 credits (from among the 72 credits above) with at least 27 credits at L3, 21 credits at L4, L5, or higher |
|                            | • Minimum D grades in the remaining 18 credits, |
|                            | • Minimum GPA of 2.00, |
|                            | • Complete the relevant requirements within a period of 10 academic years. |

Re-admission to the BSc programme: Diplomates may seek re-admission to the BSc Degree programme with exemptions/credit transfers and shall be required to register for courses to fulfil the requirements for the award of the Degree as specified in the Regulation and Rule 1.1.1.1 (e)
COURSE DETAILS

Bachelor of Science Degree Programme

LWU1161 - Understanding Law
Introduction to the legal system of Sri Lanka; sources of Sri Lankan law. Formation of contracts, Delictual liability, contract of service, Types of Employment, Industrial Disputes, workmen’s compensation ordinance.

MCU1108 - Managing Your Work and People
The job of a manager; types of managers; recent developments in management; the organizational environment; globalization and its impact on management; the concept of planning; ethics of downsizing and minimizing its adverse effects; authority and power; authority delegation and job design; communication and its fundamentals; leadership and its approaches, styles and effectiveness; motivation at work place; effective control; operations management in organization.

SSU1198 –Introduction to Sri Lankan Society

PCU1102 - Ethics in Science & Technology
Definitions of terms; Philosophy of life; Values, Beliefs, Attitudes, Moral problems and dilemmas, and changing values; Principles of ethics: Basic principles of ethics, Ethical theories; History of Ethics in Science and Technology including theories, International and National (Sri Lanka); Ethics in practice: Medical ethics, Ethical conduct in other subjects, Informed consent, Ethics in dissemination of knowledge; Ethics in intellectual property rights (IPR); Ethical decision making, Ethical problems, Ethical dilemmas, Ethical reasoning; Session; Related issues: Research in Ecology, Research in Biotechnology, Technological researches, Medical researches; Present status of ethics in Science and Technology in Sri Lanka.

PCU3271 - Physics for Biology Students
General physics and thermal physics; waves and vibrations; fields; nuclear and atomic physics; electronics; environmental physics; practicals upto 80 laboratory hours.

PCU3141 - Bio Statistics (For non-Mathematics students)
Sampling Techniques; Probability and Non Probability Sampling; Simple random Sampling; Stratified Random Sampling; Cluster Sampling; Systematic Sampling; Multi Stage Sampling; Classification of Data; Qualitative vs Quantitative Data; Nominal Data; Ordinal Data; Interval and Ratio Data; Design of Experiments; Completely Randomized Design; Randomized Complete Block Design; Factorial Design; 2k experiments; Tabular Data Summaries; Graphical Data Summaries; Numerical Data Summaries; Measures of Location; Measures of Dispersion; Measures of Skewness; Statistical Hypotheses; Introduction to the Statistical Hypotheses; Formulating a Hypothesis; Null and Alternative Hypotheses; One sided and Two sided Hypotheses; Testing Hypotheses on the mean of a population; Comparison of two population means; Analysis of Count Data.

PCU1141/APU1141 – Basic Statistics
See under the Applied Mathematics courses offered by the Department of Mathematics and Computer Science.

PCU3104 – Environmental Studies
An Introduction to the environmental sciences; The Lithosphere; The Atmosphere; Hydrosphere; Structure of the biosphere; Energy flow and organisms; Interactions among spheres; Resources from the environment; Energy resources; Aquatic resources; Living resources; Human Population Growth; Atmospheric Pollution; Water Pollution; Loss of biodiversity; Soils and land degradation; Waste disposal; Environmental Policies and Management; Environmental problems in Sri Lanka; Environmental Ethics and philosophy

PCU1163 Communication Skills

PCU3142 – Design and Analysis of
Experiments

Need for design of experiments, Introduction to terminology used in experiment design, completely randomized design, concept of blocking, Randomized block design, Latin square design, factorial designs, Split plot designs, mathematical models for data collected in designed experiments, analysis of designed experiment data and interpretation of results.

PSE3117 - Mathematics for Chemistry & Biology

Numbers; Algebra, logarithms; trigonometric functions; limits; differentiation; integration; statistics; elementary probability theory; probability distributions.

BOTANY

BOU1101 - Organization of Cells and Plant Biochemistry

Introduction to Cells; Structure and functions of cell membrane and cell wall; The Cytoplasm and the Cytoskeleton; The Structure and Function of Cytoplasmic Organelles; Cell Cycle and Cellular Division –Mitosis; Cellular Reproduction -Meiosis

Metabolism and Energy Utilization; Amino acids, Peptides and proteins; Enzymes; Lipids; Carbohydrates; Nitrogen Assimilation; The Nature of Nucleic Acids; DNA Replication; Gene expression; The Genetic code and Synthesis of protein; Some Basics in Genetic Engineering

BOU1200 - Diversity of Plants

Origin and Diversity of Life; Viruses; Bacteria -Morphology and Structure; Bacteria Physiology, Growth and Reproduction; Cyanobacteria; General features of Fungi I–Vegetative features and Nutrition; General features of fungi II-Reproduction and Classification; Sub-divisions- Myxomycotina and Mastigomycotina; Sub-divisions- Zygomycotina; Sub-divisions- Ascomycotina; Sub-divisions- Basidiomycotina; Sub-division – Deuteromycotina; Special microbial relationships; The Algae; The Green Algae; The Brown Algae; The Red Algae; Evolutionary trends and the economic Importance of algae; Non Vascular Land Plants- Bryophytes; Liverworts; Hornworts and mosses; Vascular Plants; The earliest Vascular Plants- psilopsids; Lycopods; Horsetails; The ferns; Higher Ferns; The most advanced ferns – Mixtae; The Gymnosperms; Coniferophytes; Angiosperms or the Flowering plants; The Flower; Development of the Gametophytes, Pollination and Fertilization; Fruits, Seeds and Germination; The Cells and Tissues; The Structure of the primary plant body; The root; The Structure of the Primary Plant Body; The Shoot; Secondary Growth

BOU2200 - Plant Physiology

Plant cell and Cell organelles; Cell membrane; Plants and water; Free energy, chemical potential and water potential; Soils and water; Absorption and movement of water in plants; Stomata and stomatal physiology; Transpiration; Mineral nutrition of plants; Functions of essential elements; Absorption of mineral elements; Phloem translocation; Enzymes; more about enzymes; Introduction to photosynthesis; Photochemical Biochemical reactions of Photosynthesis; Different pathways of CO2 fixation; Respiration; Alternate pathways in respiration; Breakdown of storage plant materials; Nitrogen metabolism in plants; Plant growth and development; Phytohormones: Gibberellins and Cytokinins; Ethylene and abscisic acid; Plant movements; Control of Flowering; Dormancy of buds and seed; Plants under stress

BOU2102 – Systematics of Higher plants and Animals

Systematics of organisms; Development of Modern Systematics; Identification of plants and animals; Nomenclature; Biological Classification; Classification of life; A historical Perspective; Plant Classification

BOU2101 - Genetics and Evolution

Heredity and its physical basis; Mendelian genetics; Chromosomes and the Distribution of Genetic Material; Deviation from Mendelian In-
systems; Classification of animals; Variation and Speciation; Evolutionary taxonomy (Phylogeny); The Concept of Character and Sources of Taxonomic Evidence; Fundamentals of Molecular systematics (Plant Proteins, Nucleic Acid and Molecules); Numerical taxonomy, Flora and Fauna of Sri Lanka; Information technology and systematics; Ethics of Systematics

**BOU2103 – Principles of Microbiology**

Introduction to Microbiology; Historical development of microbiology; Viruses; Prokaryotic microorganisms - The bacteria; Eukaryotic microorganisms; Cultivation of microorganisms; Sterilization of instruments and media; Isolation of saprophytic microorganisms; Isolation of saprophytic microorganisms; Purification and maintenance of fungal and bacterial cultures; Isolation and purification of viruses; Microscopes; Techniques for microscopy; Identification of bacteria and fungi; Enumeration of bacteria and fungi; Quantitative measurements of viruses; Growth of microorganisms; Factors influencing microbial growth; Metabolism in microorganisms- Energy yielding processes; Genetics of bacteria; Concepts of microbial control and antimicrobial physical agents; Chemical agents in common use in sterilization and disinfection; Chemical agents used to cure diseases- Chemotherapy

**BOU3100 - Environmental and Applied Microbiology**

Microorganisms and their interactions in soil; soil microbial activities of ecological importance; methods of studying soil microorganisms; aquatic microorganisms; pollution of water supplies and quality of potable water and its treatment; sewage disposal and treatment; microorganisms of air, ecology, importance and control; microorganisms in food; microbial spoilage of foods; food-borne illnesses; principles and processes of food preservation; microbiological standards and quality control of foods; microorganisms of medical importance; relationships between microorganisms and man; infectious diseases; host's resistance to microbial infection; immune system and immunological tests; use of microorganisms in industry, agriculture and environment related issues; genetic engineering; microbial deterioration of materials.

**BOU3101 - Plant Pathology**

Introduction to plant pathology; Morphological symptoms of diseases in plants; Plant pathogenic microorganisms; Other animate agents of plant disease; Inanimate agents of plant disorders; Identification of plant diseases; Production and dispersal of inocula; Entry into the host plant; Growth and colonization; Mode of attack; Resistance to entry and spread; Effect of pathogens on host physiology; Survival of plant pathogens; Plant disease epidemiology; Plant disease control; Damping off of seedlings; Rots of fleshy tissues; Downy mildew diseases; Powdery mildew diseases and other mildews and molds; Leaf blights; Vascular wilt diseases; Root diseases of trees; Rust diseases; Smut diseases; Bacterial and Fungal galls; Leaf spot diseases; Cankers, scab diseases and anthracnoses; Miscellaneous diseases; Diseases caused by viruses and mycoplasma like organisms.

**BOU3102 - Plant Growth and Development**

Plant growth; Growth regulatory substances; Auxins; Cytokinins; Gibberellins; Ablastic acid; Ethylene; Complications in the hormonal control; Applications of plant hormones in agriculture; Phytochrome and Phytochrome and seed germination; Photoperiodism; Other light responses of phytochrome; Vernalisation; Zygotic embryogenesis; Germination; Dormancy; Senescence and abscission

**BOU3103 - Plants and Man**

Man's association with plants; Food plants; Cereals; Legumes; Root crops; Vegetables; Fruits; Beverage plants and beverages; Spices and flavouring materials; Sugar producing plants; Medicinal plants; Fumitories and masticatories; Fibres and fibre plants; Essential oils; Vegetable oils; Fats and waxes; Rubber and other latex products; wood.

**BOU3104 - Soils and Plant Growth**

Soil; rocks and minerals; processes of soil development; decomposition and destructive processes; constructive process; classification and survey of soils; colour, particle size distribution and texture; structure, consistency and porosity; aeration, temperature and colour; chemical properties of soil; plant nutrients; microorganisms in soil; soil organic matter; biologically mediated processes in the soil; fertility characteristics in soils of Sri Lanka and land utilisation; fertilisers and fertiliser management; degradation of soils; soil improvement; soil conservation and sustainability.

**BOU3105 - Literature Review in Botany**

A limited number of selected students are registered to carry out a literature review on an approved topic under the supervision of a senior staff member. Submission of a report/dissertation followed by a presentation and an oral examination is a requirement for the final examination.

**BOU3106 - Plant Breeding**

Plant Breeding; Quantitative inheritance in Plant Breeding, Population Genetics, Values and Means, Variance, Populations in Plant Breeding, Breeding self pollinated crops; Breeding cross pollinated crops; Methods of Breeding Asexually Propagated Plants and Mutation Breeding, Plant Tissue Culture, Some Applications in Tissue Culture, Somaclonal Variation and Mutant selection, Protoplast Fusion and Somatic Hybridization,

**BOU3107 – Forest Resources and their Management**

This unit will give you a sound knowledge on forest resources available worldwide, concepts and terminology in forest science and forest ecosystem management. This unit will also provide field experience in forest science and make you aware how these valuable resources are managed/coordinated to have environmentally friendly sustainable management system for our forests. The knowledge gained will be important mainly for those who are employed in this field and related areas to carry out their duties effectively.

**BOU3108 – Post-harvest Technology of Fresh Produce**

Introduction to post-harvest technology; Contribution of fresh produce to human nutrition; Pre and post-harvest physiology / biochemistry of fresh produce; Ethylene in post-harvest technology; Post-harvest losses of fresh produce and their control; Harvesting and field handling; Packaging and Packing; Cooling of fresh produce; Transport of fresh produce; Storage of fresh produce; Packing house operations; Specialized utilization of horticultural produce; Quality assurance; Marketing management for post-harvest operations; Apparatus used in post-harvest technology.

**BOU3209 – Horticulture**

What is Horticulture; Soil and soil management; Fertilizer and fertilization; Water management; Plant growing structures; Hydroponics; Control plant growth; Biological and Chemical control; Plant propagation; Vegetative propagation; Nursery management; Cultivation of fruit plants; Banana; Pineapple; Papaya; Citrus; Mango; Under Utilized fruits; Vegetable cultivation; Present status and potential of vegetable cultivation in Sri Lanka; Vegetable crops of family- Solanaceae, Fabaceae, Cucurbitaceae, Cruciferaceae, Umbelliferae, Liliaceae and Leafy vegetables; Floriculture industry, Cultivation, Harvesting, grading, packing and transport of Anthuriums; Orchids; Foliage plants, Roses; Chrysanthemums and Gerbera; Landscape Horticulture.

**BOU4100 – Plant Molecular Biology**

This course unit will deal with the regulation of gene expression; application of gene transfer technology; cloning of plant genes; molecular biology of plant processes; application of molecular biology in plant breeding and issues/ethics in plant molecular biology.

**BOU4101 – Bioinformatics**

Bioinformatics is the application of Information technology to the field of molecular biology. This course unit will assist the students especially for those who are following research projects to create data bases, algorithms and computational and statistical techniques. This unit will also give necessary theoretical knowledge to solve problems in managing and analyzing biological data.

**BOU4102 – Advanced Biotechnology**

In this unit, a student is able to study how advanced technology based on biology can be used in Agriculture, Food Science, Medicine and Genetic Engineering. More emphasis will be given on how this field should be utilized to solve the current issues related to Biology and achieve our targets in developing our economy.

**BOU4103 – Experimental Design and Biological Data Analysis**

This unit will be very useful for those who have plans for higher studies by research in the field of Biology. Analysis of Biological data has become a special topic among researchers and this unit will no doubt help to fill that void in the broad field of Statistics.

**BOU4104 – Integrated Crop Protection**

In the field of Crop Science under the discipline of Botany, protection of crops from variety of pests and pathogens is an important area to be dealt with. For those who are in related fields, this will give a better knowledge and understanding on how to protect our harvest from pathogens and their control.

**BOU4105 – Industrial Microbiology**

Introduction and Scope of Industrial Microbiology: Growth and growth kinetics of microorganisms: Fermentation systems: Solid state fermentation; Microbial biochemistry/ Metabolism and Energy conversion; Microorganisms in Industry; Enzymes, Pharmaceuticals and Food and Beverages; Biological fuel generation through fermentation; Microbiological Environmental applications; Fermentor designs and construction; Introduction to downstream processing; Product development and regulations; Economics and Marketing in Industrial Microbiology.

**BOU4106 – Molecular Systematics**

The Molecular Systematics also known as Molecular Phylogenetics, is the use of the structure of molecules to gain information on an organism’s evolutionary relationships. Early attempts at molecular systematics were also termed as chemotaxonomy and made use of proteins, enzymes, carbohydrates and other molecules which were separated and characterized using techniques such as chromatography. With recent advances, this can be done using the living organism containing DNA, RNA, and proteins. The developed relationship will show the evolutionary tree for a particular species.
BOU4107 – Advanced Plant Physiology and Biochemistry
Advanced Plant Physiology & Biochemistry is a course that disseminates information about fundamental plant processes important in the production of agronomic and horticultural crops. The knowledge gained can be applied in multidisciplinary basic research programs that address practical problems, providing a comprehensive physiological and biochemical basis of important plant attributes. This also serves as "bridging" scientists who facilitate communication and information exchange among consumers, farmers/growers and basic scientists.

BOU4108 – Advanced Ecology
Advanced Ecology is a course that disseminates knowledge beyond the basic concept in Ecology. Its deals with the topics and modern methods of sending and approach Ecological issues in present day world.

BOU4109 – Soil Biology
This unit will mainly educate a student on advanced interactions and biochemical reactions that are taking place within biological organisms in the soil environment. The knowledge to be gained will help the student to understand the complex biological nature of soil organisms in maintaining soil fertility required by plants.

BOU4110 – Advanced Plant Pathology
Spore germination and its regulation; Cytology of penetration; Forces by which pathogens attack – Introduction; Pathogen-produced enzymes in plant disease; Microbial toxins in plant disease; Growth regulators in plant disease; Effect of infection on host physiology-Photosynthesis, Carbohydrate, Nucleic acid and protein metabolism and growth regulator in balances; Water transport, cell permeability and respiration; Effect of environment on disease development; Plant defenses-Preexisting defenses and induced defenses, Phytoalexins; Genetics of plant disease; Plant disease epidemiology and control

BOU4311 – Research Project in Botany
A limited number of selected students are registered to carry out a research project on an approved topic under the supervision of a senior staff member.

Submission of a report/dissertation followed by a presentation and an oral examination is a requirement for the final examination.

BOU 4112 – Plant Virology
Plant virology is often considered as a part of Plant Pathology or the study of plant diseases and plant health. This unit will give an in-depth look in to viruses and virus-like agents hostile in plants: their structure, classification and evolution, their ways to infect and exploit cells for virus reproduction, the diseases they cause, the techniques to isolate and culture them, and their use in research and therapy.

BOU4113 - Special Topics in Botany
Students will be asked to write an essay on a chosen topic related to the field of Botany after registration. The student can select a topic from among the subject areas given by the department. Basic outline and how to write will be explained at a day school.

CHEMISTRY

CMU1220/ CME 3220 - Basic Principles of Chemistry
This course will cover the basic principles underlying the topics in Atomic structure and Periodic Table, Structure, Bonding and Properties of molecules, Introduction to Organic Chemistry, Introduction to Chemical Thermodynamics, Electrochemistry and Chemical Kinetics.

CMU1121- Practical Chemistry
This seven (7) day practical course is designed to give the first year students basic skills in working in an elementary Chemistry laboratory. The Experiments designed for the course will illustrate the theoretical concepts in Chemistry learned in CMU1220 plus some Chemistry concepts already known to students. Course will also include a theory component to cover the theoretical concepts covered in the practicals.

CMU2220/CME4220 - Concepts in Chemistry
The course will cover basic concepts in the areas of conductivity, Phase equilibria, Kinetics, Thermodynamics and Molecular Spectroscopy. The course will also have a 5 day practical component.

CMU2221/CME4221 - Organic Chemistry I
Main topics covered in this course will be Stereochemistry, Chemistry of some organic compounds, and mechanistic approach of studying organic reactions, Structure elucidation of organic compounds through spectroscopic methods. The course will also have a 5 day practical component.

CMU2122/CME4122 - Inorganic Chemistry
Solids & their structures; X-ray diffraction; crystal defects; symmetry in molecules, coordination chemistry: nomenclature, isomerism and bonding in coordination compounds including Theories of bonding; stability of coordination compounds, Introduction to Radiochemistry.

CMU3120/CME5120 - Organic Chemistry II
Properties and reactions of some aromatic heterocyclic compounds. Synthetic organic chemistry: including synthesis of C-C and C-
N bonds, oxidation and reduction. Properties and reactions of polycyclic aromatic hydrocarbons.

The course will have a five day Practical component.

CMU 3122/CME5122 - Organometallic Chemistry
Nomenclature, relationship between geometry and the number of valence electrons, monohapto ligands, polyhapto ligands, types of reaction of organometallic compounds, metal carbonyls, alkyl metal complexes, metal hydrides, dihydrogen complexes, catalysts & hydrogenation of olefins, isomerization, hydrocyanation, hydrosilation & hydroboration of olefins, carbylation reactions, metal carbonyls, metal hydrides, dihydrogen complexes, catalysts, hydrogenation of olefins, palladium catalysed reactions.

CMU3123/CME5123 - Analytical Chemistry
Classical methods of Analysis: acid-base titrimetry; complexometric titrations; gravimetry; redox titrations. Separation methods: solvent extraction. Introduction to electro analytical methods: conductometry and potentiometry. Overview of analytical chemistry; introduction to spectroscopy; Beer-Lambert law; Thermal analysis.

There will be a 5 day practical session.

CMU3124/CME 5124 - Chemistry of Biomolecules
This course covers topics on primary metabolites such as carbohydrates, Amino acids peptides and proteins, lipids and nucleic acids. Also, enzymes, coenzymes, vitamins and which are important in metabatonic pathways will be discussed.

This course is a prerequisite to follow courses CMU3125, CMU3126 and CMU3127.

CMU3125/CME5125 - Natural products Chemistry
Relationship between primary and secondary metabolites, chemistry and biosynthesis of terpenes, steroids, alkaloids and phenolic compounds. Chemical ecology and biopsectroscopy.

CMU3126/CME5126 - Biochemistry
Energy metabolism, Enzymes, carbohydrate metabolism, amino acids, protein and fat metabolism.

CMU3127/CME5127 - Chemical aspects of Food Industry
Macro and micronutrients, water activity and food. An overview of food components such as carbohydrates, proteins and lipids. Enzymes, natural pigments and flavour compounds, toxins and contaminants, principles of food processing, quality assurance and legislation.

There will be a 3 day practical session.

CMU3128/CME5128 - Instrumental methods of Chemical Analysis
UV-Visible spectrometry and its applications; fluorescence, atomic emission, infra-red, Raman and mass spectroscopy; introduction to electrochemistry; potentiometric, coulometric, electro-gravimetric, voltammetric and polarographic methods of analysis; chromatographic methods; gas chromatography, liquid chromatography, and HPLC; Radioanalytical techniques. There will be a five day practical session.

CMU3129/CME 5129 - Environmental Chemistry
Environmental Chemistry of air (atmosphere), water (hydrosphere) and soil (geosphere) and air- water and soil- water exchanges of contaminants. Atmosphere: composition, (layer) structure and function; natural cycles: O2, N2 and CO2; Temperature profile/structure of the atmosphere; Atmospheric (tropospheric and stratospheric) phenomena: green house effect, acid rain, photochemical smog and ozone depletion. Atmospheric pollution. Water: Chemistry of water, types and properties of water bodies; hydrological cycle. Redox reactions, hydrolysis, complexation; pollution of water. Soil: structure; Air- water, solid- water interaction; Environmental pollution of air, and soil.

CMU3131/CME 5131 - Concepts in Spectroscopy
Pure vibrational spectra of diatomic molecules; anharmonicity of vibrations in a diatomic molecule; pure vibrational spectroscopy of polyatomic molecules; effects of non-rigidity on the rotational spectrum of a diatomic molecule; classification of molecules based on their rotational characteristics; pure rotational spectra of polyatomic molecules; vibration-rotation spectra of diatomic and polyatomic molecules; skeletal group vibrations; Raman scattering phenomenon; pure rotational Raman spectroscopy; high resolution vibrational Raman spectroscopy; usage of IR and Raman spectroscopy in molecular structure determination; electronic states of diatomic molecules; electronic spectra of diatomic molecules with vibrational and rotational fine structure; Jablonski diagrams; origin of an NMR spectrum; effects of spin-spin interactions through chemical bonds on NMR spectra; experimental setup and a classical view of the NMR process; pulsed Fourier transform NMR spectroscopy; relaxation processes in NMR spectroscopy.

CMU3232/CME5232 - Industrial Chemistry
Chemistry and industry; ceramic and glass, cement, metal extraction and Industrial utilization of plant oils, coconut oil extraction soap, detergent and biodiesel production,
CMU3235 - Research Project in Chemistry

The Department encourages students to complete level 04 and start level 05 before you select a Research Project in Chemistry. Limited number of projects is available. The student has to conduct a research project under the supervision of a senior staff member (internal supervisor) and/or a scientist appointed by the Chemistry Department (external supervisor) on a predetermined topic. Six to eight weeks before beginning of this unit, the student has to make a short presentation on the proposed research work and literature on the date announced by the Department. This course should be completed within one academic year. The student has to submit the final report/dissertation or before the date announced by the Chemistry Department.

After submitting the report/dissertation, student has to make a short presentation on his/her research project. This is followed by an oral examination, to test the student's knowledge about his/her research project. The course unit gives students a good opportunity to improve their practical skills (techniques/designing of experiments, interpretation of data etc.) as well as communication and writing skills.

CMU3314 - Literature Project in Chemistry

The Department encourages students who have completed level 04 and started level 05 courses to register for the unit- Literature Project in Chemistry. Only a limited number of projects are available. The selected student has to conduct a literature survey under the supervision of a senior staff member (supervisor) on a predetermined topic. Six to eight weeks before beginning of this unit, the student has to make a short presentation on his/her research project. This is followed by an oral presentation and an oral examination.

This course unit gives students a good opportunity to improve their communication and writing skills as well as their ability to read and compile information independently.

PURE MATHEMATICS

PUU1140/PUE3140 - Logic and Mathematical Proofs

Valid Statements; Logical Connectives, Simpler Statements and Compound Statements; Logical Connective “not”; Logical Connective “and”; Logical Connective “or”; Logical Connective “implies”; Logical Connective “if and only if”; Relations among Logical Connectives – Distributive Laws; Relations among Logical Connectives – De Morgan’s Laws; Conditional Statements and Biconditional Statements; Conditional Proof and the Definition of P; Tautologies, Contradictions and Proof by Contradiction; Quantifiers, Statements with more than one Quantifier; The Generalized Laws; Ordinary Language, Logic and Daily Life; Proof of a Disjunctive Statement; Proof of a Conjunctive Statement; Proof of a Conditional Statement; Proof of a Biconditional Statement; Proof of an Existential Statement; Proof of a Universal Statement; Proof of a Statement with more than one Quantifier; Proof of a General Statement; Proof of a Negation of a Statement and Proof by Contradiction; Proof of a General Statement.

PUU1142/PUE3142 - Vector Spaces

Vector Space; Subspaces; Spanning Sets; Linear Independence and Dependence; Basis of a vector space; Dimension of a vector space; Linear Transformations; Homomorphism of a Vector Space; Isomorphism of Vector Spaces; Matrices and Linear Transformations; Rank and Nullity of a Linear Transformation; Invariant Subspaces; Inner Product Spaces; Euclidean Spaces; Length of a vector in a Euclidean Space; Concept of angle in Euclidean Space; Orthogonal Set ; Ortho-normal Bases; Change of Basis; Unitary Spaces.
PUU2140/PUE4140 - Sequences and Series

PUU2141/PUE4141 - Continuous Functions
Limit at a point, Right limit at a point, Left limit at a point, Algebra of Limits, Squeezing Theorem, Limits of composition, Sufficient of Sequences, Infinite Limits, Limits at Infinity, Algebra of Limits at Infinity, Left Continuity at a point, Right Continuity at a point, Continuity at a point, Continuity on an interval, Discontinuities, Continuity on a closed and bounded interval, Images of intervals under continues functions, Sufficient of Sequence in Continuity, Algebra of Continuous functions, Limits of Composite functions, Monotone functions, Convex functions, Intermediate Theorem, Uniform Continuity.

PUU2142/PUE4142 - Linear Algebra
Linear simultaneous equations and their solutions; matrix operations; Gauss-Jorden reduction; Elementary transformations; Elementary matrices and equivalent matrix; Square matrices its transpose and inverses; Determinants; Adjoins of a matrix; Cramer’s Rule; Application of matrix theory to linear equations; Conditions for consistency; General solution; Eigen values and eigen vectors; Some results related to eigen values; Triangular form of a matrix; Canonical form; Linear mappings; Kernal and Image of a linear mappings.

PUU2143/PUE4143 - Differentiable Functions
Derivative and Differentiability at a point, Left Derivative, Right Derivative, Algebra of Differentiable functions, Differentiability on an interval, Product Rule, Quotient Rule, Chain Rule, Continuity of Derivative, Local maxima and Local minima, Rolles Theorem, Mean value Theorems, Monotone functions, Differentiable functions, L'Hôpital's Rule, Derivatives of Higher Orders, Taylor's Theorem, Derivatives of power series, Taylor series and McClaurin Series, Exponential function, Logarithmic function, Trigonometric function, The number $\pi$, Hyperbolic functions.

PUU2144/PUE4144 - Group Theory I
Binary operations, Introduction to groups, Elementary properties of groups, Subgroups, Finite groups, Dihedral groups & their properties, Symmetric & alternating groups, Cyclic groups & their properties, Abelian groups, Cosets, Lagrange's Theorem, Introduction to direct product of two groups, Classification of finite groups of order 9-12, Normal subgroups, Properties of normal subgroups, Normalizer & centralizer, Conjugate elements & class equations, Quotient groups, Group Homomorphism, Group Isomorphism, Homomorphism Theorem & it’s application, Direct product of two groups, Semi-direct product.

PUU3240/PUE5240 – Ring Theory & Field Theory
Arbelian Groups, co-sets, Ring and Sub ring, Commutative ring, Commutative ring with 1, Units of ring, Sub ring having a different 1, Zero divisors, Integral domain, Characteristic of a ring, Division ring, Field, A Finite integral domain is a field, Ideal, Quotient ring, Homomorphism, Epimorphism, Monomorphism, Isomorphism, Isomorphism Theorem, Maximal ideal, Prime ideal, Product Ideals, sum of ideals, local ring, Field of quotient, PID, UFD, Euclidean domains, Prime Element, Irreducible element, Polynomial, If $F$ is a field then $F[x]$ is a PID, $R$ and $R[x]$, Polynomials over Ring $R[x]$, Zeros of a polynomial, Division algorithms for $R[x]$, Number of zeros of $f(x)$ $\overline{I}\{x\}$ where $I$ is an integral domain, field from ring.

PUU3141/PUE5141- Algebra of Complex Numbers

PUU3242/PUE5242 - Combinatorics
History of counting, Functions & Sets, Functions & counting, Sets & counting, Matrices & counting, Examples where counting is needed, Pigeon hole principle, Factorials, Multiplication Principle, Application of the multiplication principle, Additive principle, Application of the additive principle, Problems related to counting, Permutation functions, Permutations, Idea of unordered & ordered selections, Introduction to combinations, Combinations, Problem related to cyclic order, Counting problems related to partition functions, Worked examples of permutations & combinations-part I, Worked

**PUU3143/PUE5143 - Riemann Integration**


**PUU3245/PUE5245 - Complex Analysis I**

Algebra Properties of complex numbers, Complex plane, Sets in the complex plane, Open sets and Closed sets, Limit points, The stereographic projection, Polar forms, Roots of complex numbers, Sequences of complex numbers, Series of complex numbers, Power series, Functions of complex variables, Limits, Continuity, The derivative, Cauchy-Riemann equations, Analytic functions, Sufficient conditions, Harmonic functions, The exponential function, Trigonometric functions, Hyperbolic functions, The logarithmic function, Definite integral of a complex valued function of real variable, Contours, Contours integrals, ML-inequality, Path independence of Contours integrals, Ring theorem in the plane, Cauchy’s theorem, Cauchy’s integral formula, Cauchy’s integral formula for derivatives, The taylor series, The Laurent series, Types of singularities, Classifications of singularities, Residues, The residues theorem, Evaluation of integral of the form , Evaluation of integral of the form , where P(x) and Q(x) are polynomials.

**PUU3244/PUE5244 - Number Theory & Polynomials**

History, early number theory; Sets of numbers N, Z,+Z, Z,Q,R,C, and irrational, Algebraic, Transcendental; How to identify Z; Properties of Z, Binominal theorem; Induction; Well ordering principle; Properties of Z modulo n; Residue classes; Division algorithm; Greatest common divisor; Euclidean algorithm; Seeking non-negative integer solutions for problems faced by common people; Primes and their distribution; Prime number theorem; Theorems on primes; Fermat’s little theorem; Willson’s theorem; Theory of congruences; Properties of congruences; Application and exercise; Divisibility tests; Rational 0 theorem; Linear congruences and their solutions; Useful theorems using linear congruences; Primitive roots of primes; Primitive roots of composites; Theory of indices; Number theoretic functions; Euler’s j(n) function and solving of j(n); Euler’s theorem; v(n) and other functions; Mobious inversion formula; Cryptography; Early cryptography; RSA; Quadratic congruences; Quadratic reciprocity; Legendry symbol; Elliptic curves; Methods of factorization.

**PUU4141- Advanced Topics in Real Analysis**

**Normed vector spaces:** Definition, equivalent Norms, Norms that arise from inner products, Norms defined on R n.

**Sequence and functions spaces:** Norm convergence of these spaces, Completeness, Limits in functions spaces, Continuous functions on compact sets, Equiuniform families of functions, Completion of a Normed space.

**Series:** Non absolute convergence, Absolute convergence in Normed vector spaces,

**Series of functions:** Absolute and uniform convergence, Interchangeability of limits, Differentiability and integrability of series of real functions.

**Integration of vector valued functions:** The extension theorem for linear maps, The integral of step maps and the extension of the integral to regulated maps, Properties of the integral, The derivative and relations between integration and differentiation, Interchanging derivatives and integrals (also involving improper integrals).

**PUU4142 - Group Theory II**

Group Isomorphism, Caley’s Theorem, Group Automorphism, Direct product and Semi-direct product, Factor Group, Finitely Generate Abelian Group, Simple Group, Class of group, Radicals & Residuals, Commutator of a Group, Three Subgroup Lemma, Commutator subgroups, Series of Groups, Composition series, Soluble Groups, Examples of Sluble Group, Group action on sets, Stabilizer and orbits of an action, Conjugate class and class equation, The Sylow Theorem, Application of Sylow Theorem, Maximal Subgroups, Cauchy’s Theorem, Sylow p-subgroups of a Group, Groups of even order, Free groups,
Homomorphism of free group, Free Abelian Groups, General linear Groups, Classification of finite Groups of order 8 to 12, Klein-4-Subgroups, Elementary Abelian Groups, Inner Automorphism, Extensions, Split Extension.

**PUU4144 - Introduction to Galois Theory**

Fields and Galois theory: Algebraic and transcendental extensions; Finitely generated and finite dimensional towers; Algebraic numbers; Gaussian integers; Quadratic integers; Applications; Rule and compass constructions; Galois groups of polynomials; Galois correspondence and applications; Finite fields; Insolvability of quintic equations; Fundamental theorem of algebra.

**PUU4240 - Point Set Topology**


**PUU4243 – Complex Analysis II**


**PUU4245 - Measure Theory**


**PUU4246 - Functional Analysis**

Metric Spaces, Normed Linear Spaces, Complete Normed Linear Spaces (Banach Spaces), Bair’s Theorem, Continuous Functions in Complete Normed Linear Spaces, Semi Continuous Functions in Complete Normed Linear Spaces, $\int^p$ spaces I, $1 \leq p \leq \infty$ spaces II, spaces III, spaces I, spaces II, spaces III, Linear Functionals in Banach Spaces, Dual of a Banach Space, Dual of spaces, Dual of spaces, Weak-Topology on a Dual Space, Double Dual of a Banach Space, Weak *-Topology on a Double Dual, Embedding of Banach a Space in its Double Dual, Reflexivity of Banach Spaces, The Banach Space $C([a, b])$, The Banach Space $c$, The Banach Space $c_0$, The Hah-Banach Theorem, The Open Mapping Theorem, The Closed Graph Theorem, The Principle of Uniform Boundedness, The Banach-Steinhaus Theorem, Quotients of Banach Spaces, Product of Banach Spaces, Dual of a Product of Banach Spaces, Dual of a Quotient Space, Finite Dimensional Normed Linear Spaces, Hilbert Spaces, The Riesz Representation Theorem, Orthonormal Sets of Vectors and Bases, Isomorphic Hilbert Spaces, The Direct Sum of Hilbert Spaces, Complemented Subspaces of Banach Spaces.

**APPLIED MATHEMATICS**

**APU1140/APE3140 – Vector Algebra**

Scalars, Vectors and addition of vectors; Multiplication of vectors by scalars; Centroids; Linear combinations of vectors; Vectors in component form in two dimensions; Vectors in component form in three dimensions; The straight line; Proof of well known theorems in plane geometry using vectors; Scalar product; Vector product; Geometrical proofs using scalar product & vector product; Scalar triple.
products; Vector triple product; Product of four vectors; Parametric form of the vector equation of plane; The normal form of the vector equation of a plane; The vector equation of a circle; The vector equation of an ellipse; Vector functions; Differentiation of vector functions; Integrating of vector functions; Curves in space.

APU1141/APE3141 – Basic Statistics
Classifications of Data; Tabular Data Summaries; Numerical Data Summaries: Measures of Locations; Measures of dispersion; Measures of skewness; Introduction to probability; Mathematical Expectation and Variance; Introduction to Probability Random Variables; Classifications of Random Variables as Discrete vs Continuous; Probability Mass Function; Probability Density Function; Cumulative Distribution Function; Empirical Distribution Function; Discrete Uniform Distribution, Geometric Distribution, Binomial Distribution, Poisson Distribution, Uniform Distribution, Normal Distribution, Exponential Distribution

APU1142/APE3142 – Differential Equations
Introduction to ordinary differential equations; Variable separable equations; Homogeneous equations; First order linear equations; Partial derivatives, exact differential equations; Integrating factors; Two special types of second order equations; Problems in mechanics; Problems in population growth; Rate and mixture problems; Problems in economics; Homogeneous linear ordinary differential equations; Second order homogeneous linear ordinary differential equations with constant coefficients; Non homogenous linear differential equations; Finding particular integrals; Power series; Series solutions; Legendre polynomials & Bessel functions; Difference equations.

APU2140/APE4140 - Statistical Distribution Theory
Introduction to Probability Distributions: Negative Binomial Distribution, Hyper Geometric Distribution; Gamma Distribution, Chi-squared Distribution; Student t Distribution; F- Distribution; Joint Probability Distributions; Marginal Distributions; Conditional Probability Distributions; Moment Generating Function; Applications of Moment Generating Function; Cumulant Generating Function; Applications of Cumulant Generating Function; Relations between different Distributions; Normal and Chi-squared Distribution; Exponential and Poisson Distribution; Exponential and Gamma Distribution; Chi-squared and F-distribution; Standard Normal and Student t distribution

APU2141/APE4141 - Regression Analysis I
Identifying relationships between variables; Modelling relationships between variables; Linear and Non-Linear Models; Measuring Strengths of Linear Association: Pearson Correlation Coefficient; Simple Linear Regression Model; Model Assumptions; Interpretation of Model Parameters; Model Building; Model Assessment; R² as a measure, Adjusted R², Model Applications; Multiple Linear Regression Model; Multicollinearity and dealing with multicollinearity; Variable Selection: Use of R², Cp-Statistic; Forward Selection Method; Backward Selection Method; Stepwise Selection Method; Model Fitting; Model Assessment; Model Application

APU2142/APE4142 - Newtonian Mechanics I
Description of motion; laws of motion; motion in one dimension; curvilinear motion in intrinsic coordinates; curvilinear motion on a plane using polar coordinates; motion in three dimension; motion of a particle under a central force; law of Gravitation; motion under gravitational attraction; energy in orbits; motion of a system of particles; modelling the motion of a rocket; moment of inertia of a rigid body; angular momentum of a rigid body; rotation about a fixed axis; Rolling and sliding motion.

APU2143/APE4143 - Vector Calculus
Functions of more than one variable; first order partial derivatives; some applications of partial derivatives; higher-order partial derivatives and Taylor polynomials; maxima and minima; vector calculus; scalar and vector fields; differentiating scalar fields; the scalar line integral; the curl of a vector field; multiple integrals; vector field theory; cylindrical and spherical polar coordinates; surface integrals; the divergence of a vector field; gauss’ divergence theorem; stokes’ theorem.

APU2144/APE4144 - Applied Linear Algebra and Differential Equations
understand matrix arithmetic, operations and properties of Matrix Arithmetic, the value of the determinant of a square matrix, the rank of a matrix, existence of the inverse of a matrix and evaluate it, the Gaussian elimination method and the Gauss-Jordan elimination method for solving a system of equations, the eigen values and eigen vectors of a matrix, the inverse of a matrix using Cayley-Hamilton theorem, diagonalise powers of a matrix, quadratic form, canonical form, complex matrices.
Simultaneous differential equations; first-order systems; second-order homogeneous systems; forced oscillations; boundary value problems; change of variables; first-order partial differential equations; the solution of first-order partial differential equations; the chain rule; the method of characteristics for first-order equations; second-order partial differential equations; solving simple equations; classification and characteristics of initial and boundary conditions; separation of variables

**APU3240/APE5240 - Numerical Methods**

Introduction; algorithms and flowcharts; errors in computations; Bisection method for the solution of single equations; the simple iterative method; Newton Raphson method; solution of polynomial equations Honer's method; linear interpolation; Lagrange. Interpolation and errors; interpolation by Newton's formulae; difference tables & numerical differentiation; least squares polynomial fitting; numerical integrations using Trapezoidal rule and Simpson rule; accuracy of numerical integration; numerical solution of first order ordinary differential equations using Euler and Taylor series method; second order and fourth order Runge-Kutta methods, Predictor-Corrector method.

**APU3141/APE5141 - Linear Programming**


**APU3143/APE5143 - Mathematical Methods**

Laplace transformations; Fourier series-periodic functions; fourier series; half-range expansions; convergence of fourier series; operations on fourier series; Sturm-liouville theory-orthogonal set of functions; strum-liouville problems; the Legendre equation; the Bessel equation.; Laplaces equation; boundary value problems.

**APU3244/APE5244 - Graph Theory**

Introduction to graphs, Matrix representation of a graph, Graphs Isomorphism, Types of graphs, Connectivity, Eulerian graphs, Hamiltonian graphs, Applications- Shortest path problems etc, Travelling salesman problem, Introduction to trees, Binary trees, Tree traversals, Trees & sorting, Spanning trees, Minimal spanning trees, Planner graphs, Euler's formula, Dual of plana graphs, Graph colouring, Edge colouring, Tableau scheduling, Directed graphs, Applications to directed graphs, Line graphs, Line graphs & traversability, Total graphs, Blocks, Cut points & bridges, Factorization, Hall's marriage theorem, Transversal theory, Applications of Hall's theorem, Menger's theorem, Network flows, Introduction to matroids, Examples of Matroids, Matroids & graphs, Steiner triple systems, Partitions, Infinite graphs.

**APU3145/APE5145 - Newtonian Mechanics II**

Newton's laws of motion; different coordinate systems; Lagrange's equations and the Variation principle; Euler's equations; motion of a particle due to rotation of the earth Hamiltonian mechanics; Canonical transformations; Poisson brackets.

**APU3146/APE5146 - Operational Research**

Introduction to Game Theory, Two person zero sum games, The maximin & minimax principle, Games without saddle point, Graphical solutions to game theory, Dominance Property, The modified Dominance Property, Reducing the game problem to a Linear programming Problem, Introduction to Queueing Theory, Queueing system, Characteristics of Queuing systems, The M/M/1 Queueing system, M/M/1/FIFO Queueing model M/M/1/N/FIFO Queueing model, The M/M/C Queueing system, M/M/C/FIFO Queueing model, M/M/C/N/FIFO Queueing model, Introduction to inventory management, Introduction to Economic Order Quantity (EOQ), Techniques of inventory control with known demand, EOQ with uniform demand, EOQ with finite rate of replenishment, EOQ with shortage, Multi-Item deterministic problem, Techniques of deterministic problem, Techniques of inventory control stochastic problems.

**APU3147/APE5147 - Statistical Inference**

Introduction to statistical Inference, Parameter, Point estimation, Method of moments, Likelihood function, method of maximum likelihood, Properties of estimators, Sufficiency, Unbiased estimators, mean squared error, minimum variance unbiased /estimators, paramal estimators, Statistical tests, Uniformly most powerful test.
**PU3150/APE5150 - Fluid Mechanics**

Properties of a fluid; the nature of fluid mechanics; some simple experiments; formulating mathematical models; fluid statics; kinematics of fluids; path lines and streamlines; the stream functions; modelling by combining stream function; description of fluid motions; Euler’s equation; Bernoulli’s equation; vorticity and circulation; inviscid flow around an obstacle; the flow of a viscous fluid; solving the Navier-Stokes equations; approximating the Navier-Stokes equations.

**APU3251 - Project on Self Study**

This is a project course that requires the students to design, implement and conduct a project/survey in any of the areas in Pure Mathematics, Applied Mathematics and Statistics. The course is designed with the aim of enhancing the skills of students in planning, carrying out and report writing.

**APU4240 - Stochastic Processes**

Introduction to stochastic processes; States of a stochastic process; Classifications of states of a stochastic process; Properties of a stochastic process: stationarity, independent increments, stationary increments; Gaussian Processes; Markov Property; Discrete time Markov chains; Continuous time Markov chains; Sojourn time; Determination of the expected sojourn time of a Markov chain; Long term behaviour of Markov chains; Recurrent events; Random Walk; Brownian Motion; Counting Processes: Binomial counting processes, Poisson Processes, Renewal Processes; Applications of stochastic processes in Insurance and Finance.

**APU4241 - Applied Number Theory**


**APU4242 - Statistical Quality Control**

Introduction, Statistical Process Control, Chance and Assignable Causes of Quality, Control Chart, Control Limits, Choice of Control Limits, Sigma Control Limits, Probability Control Limits, Actions Limits and Warning Limits, Analysis of Patterns on control charts, Control Charts for attributes, Control Charts for Fraction Nonconforming (p Charts), Choosing Sample Size, Interpretation of points Below the LCL, Operating Characteristic Curve (OC curve), Average Run Length, Average Time to Signal, Control chart for number of Nonconformities, Control charts for Variables, X-bar and R Charts, Estimating Process Capability-bar and S charts, Estimating Process Capability, Acceptance Sampling, Single Sampling Plan for Attributes, Sampling plan, Producer’s Risk and Consumer’s Risk, Operating Characteristic Curve (OC Curve) for a sampling plan, Designing a Sampling Plan with a Specified OC Curve, AQL and LTPD, Rectifying Inspection, Average Outgoing Quality (AQL), Average Outgoing Quality Limit (AOQL), Double sampling plan for attributes, Average Total Inspection per Lot (ATI), The Average Sample Number (Size), Rectifying Inspections, Advantages and Disadvantages of Double Sampling Plans.

**APU4243 - Actuarial Mathematics**

Time value of money, Annuities, Random variables, Commonly used Random variables, Multivariate probability, Continuous survival models, Important survival models, Random variable for time until death for a life age X, The central rate of failure, The life time table, Curtate future life time, Select mortality, Contingent payment models for life insurance, Whole life insurance, Term insurance, Endowment insurance, Deferred insurance, Insurance payable at the end of the year of death, Variable benefit insurance, Relating discrete & continuous insurances, Whole life insurance applications, Life annuities, Continuous annuities, Continuous temporary life annuities, Deferred life annuities, Special annuities, Discrete life annuities, Life annuities with monthly payments, Premiums, Fully continuous benefit & premium, Fully discrete benefit & premium, Semi continuous benefit premiums, Monthly benefit premiums, Benefit reserves, Reserves in the continuous case, Fully discrete level benefit reserves, Multiple life random variables, The joint life status survival model, Premium benefits for the joint life status, Multiple decrements.

**APU4351 - Research Project in Mathematics**

This is a project course that requires the students to design, implement and conduct a project/survey in any of the areas in Pure Mathematics, Applied Mathematics and Statistics. The course is designed with the aim of enhancing the skills of students in planning and carrying out a research and relevant report writing.
Computer Science

CPU1140 - Fundamentals of Computers

Computer Concepts, Types of Computers; Architecture and Design of Computers; Computer Storage Devices; Keyboards and Pointing Input Devices; More Pointing Input Devices; Image, Video and Audio Input Devices; Visual, Graphic and Audio Output Devices; Printer Technologies; Ports of Computers; Video, Audio Ports and Power Connectors; System Software; Programming Software; Application Software; Computer Arithmetic; Signed Integers & fractions in Binary; Character Representation; Other Radix Systems; Boolean algebra; Logic gates; Communication Concepts; Classification of Networks; Some Network Devices; Internetworking and the Internet.

CPU1141 - Introduction to Computer Programming


CPU1142 - Data Structures and Algorithms


CPU2140 - System Analysis and Software Engineering


CPU2241 - Database Management Systems

Introduction to databases, History of databases, Use of the file systems to store data, Database systems, Types of databases and database management systems, Hierarchical and network database implementation models, Relational data model, Entity Relationship data model, Object Oriented data model, The evolution of data models and their characteristics, Pros and cons of different data models, Logical structure and view of data, Keys and integrity rules in the relational model, Relational algebra, Relational database model, entity relationship (E-R) model, Entity types, E-R model symbols, developing E-R diagrams, converting an E-R model into a database structure, E-R modeling symbols, different E-R modeling styles, database tables and normalization (1st, 2nd, 3rd, Boyce-Codd normal forms), denormalization, using structured query language (SQL) for data definition and data manipulation, SQL queries and sub queries, SQL operators and functions, stored procedures.

CPU2242 - Object Oriented Programming using C++ and Java

Procedure oriented vs. Object oriented, Object Oriented Software Design, Software for Object Oriented Programming, Java and WWW, OOP terminology, Objects and Classes, C++ Syntax for OOP, Class constructors and destructors in C++, Some special operators in C++, Classes and Objects in Java, Constructing Java Classes, Controlling access to Java classes, Some special classes in Java, Overloading, Inheritance, Superclass and Subclass, Abstract classes, Inheritance, Polymorphism, Coercion, Overloading, Parametric Polymorphism, Inclusion Polymorphism, Java Abstract Classes in Polymorphism, Aggregation.

CPU3140 – Mathematics for Computing

Conquer Algorithms and Recurrence Relations, Relations, Properties of relations, Equauece, partial and total orders, Introduction to Graphs, Connectivity of Graphs, Euler and Hamilton paths, Graph Isomorphism, Trees, Applications of Trees.

**CPU3141 - Digital Computer Fundamental**

Number system and Binary asthmatic, Binary code and other codes, Logic gates, Boolean algebra and logic simplification, Maxterms, Mintems – canonical forms and Quine – Mckluskeu method, Digital integrated circuits, Combinational logic circuits and adders, Combinational logic circuits – other types of circuits, Sequential logic basic, Sequential circuits – Flip Flops, Types of flip flops, Counters and Registers, Asynchronous sequential circuits, Design of asynchronous circuits, asynchronous counters and synchronous counters, Circuit hazards, The processor – CPU, Memory organization, Digital memory, Programmable logic devices, The digital computer and Microprocessor, Microprocessor programming, Hardware description language, Digital system projects using HDL, Digital communication concepts.

**CPU3242 - Operating Systems**


**CPU3243 - Principles and Techniques of Artificial Intelligence**


**CPU3144 - Theory of Computing**

Systems, programs and translators, Translator classification and structure, Phases in translation, Interpreters, Language theory- Introduction, Formal languages, Grammars, Derivations, Programs, Operations on programs, Problems, Transformation of problems, Finite Memory Programs, Finite State Machines, Operation on finite state machines, Determinism and non-determinism, Relations and Languages of FSM, Finite State Automata, Finite State Automata and Grammars, Limitations of finite memory programs, Closure Properties of finite memory programs, Decidable properties of finite memory programs, Recursive finite-domain programs, Push down transducers, Determinism and non-determinism, From Recursive Finite Domain Programs to Pushdown, Context-Free Languages, From Context free Grammars to Recursive Finite Domain Programs, Properties of context-free grammars, Turning Transducers, Configurations and Moves of Turning transducers, Determinism and non-determinism in turning transducers, Programs and turning transducers, Non-determinism versus determinism of Turning transducers, Universal turning transducers, Undecidability, Turning Machines and Type 0 languages.
**CPU3245 - Computer Networks and Security**

Fundamentals of networking, Open Systems Interconnection (OSI) and Internet models of networking, Functionality of layers of OSI / Internet models, Networking media and network devices (switches, routers), Network protocols, IP addressing, subnets & supernets, routing, configuring network switches and routers, network services and server systems, Windows Networking and server installation, Active directory installation and configuration, User/computer policy management, Linux / Unix overview and system installation, configuring Linux systems, setup network services in Linux, Wireless and mobile networking standards, Threats to computer networks and threat mitigation, Computer viruses and prevention measures, spam and malware mitigation techniques, Social and educational networking, New trends in networking.

**CPU3146 Information Technology Project Management**

what is a project?, Importance of project management, Project life cycle, project stakeholder & organization structures strategic planning and project selection project management process. project management knowledge areas (project Integration management project cost management, project risk management, project time management, quality management, project Human Resource management, project communication management, project procurement management, project risk management), project management tool.

**CPU3147 (Software Quality Assurance)**

Introduction to software quality assurance, quality assurance concepts, problems in software development process, software quality assurance stands, software testing, software bugs, software testing in different environment, types of testing quality assurance vs quality control, the cost of quality, software, quality factors, what is quality software what is defect the five level of maturity, factors affecting software testing, tester’s work bends, level of testing, static vs dynamic testing, testing techniques, the importance of work processes, testers competency, project relations, motivation, mentoring & recognition, team building, risk concept & vocabulary, risk associated with software testing, create the test plan.

**CPU3148 Management Information systems.**

Introduction to MIS Information system in the enterprise, (information system, org, Mgt, & strategy) The digital firm, ethical & social issues in digital firm, IT infrastructure & platform, organizing data in a traditional file environment, telecommunication & networking in today business work, the internet technologies & tools for communication & E-business, the wireless computing landscape, M-commerce & mobile computing system vulnerability & abuse technologies c tools for security & control enterprise application e business process integration managing knowledge in digital firm, Intelligent techniques used in MIS, decision making & decision support systems, redesigning the organization with information systems BPR & process improvement, overview of systems development alternative system building approach, understanding business value of system & managing change, managing implementation technology challenges of global systems

**CPU3149 :Web Technologies**


**CPU3151: Information Security and Cryptography**

Acquire knowledge in Computer Security in several abstraction levels and about cryptography, Computer systems security, Program level security, Secure applications, security devices, secure designs, secure protocols, Security standards, information security models, Cryptography and related concepts, theories, standards, and methods, Attacks and counter measures.

**CPU 3152 – Data Communication**

Introduction to data communication, data communication, network and internet, introduction to OSI model, introduction to

**CPU3250 – Project in Computer Science**

Emphasis is given to the application of software/hardware technologies, where there is a strong problem-solving component. Report writing skills and presentation skills are also expected as a major part of the project. The final evaluation is based on the Final Dissertation, Software Demonstration, Viva and the supervisor's overall assessment on the performance throughout the year.

**CPU4140/CPU4151 - Advanced Database Systems**


**CPU4151- Electronic Commerce**


**CPU4152-Information Systems Management & Professional Ethics**

Importance of Information system and management, using IT for strategic reasons and ethical issues in IS management, Management Information systems and Role of information worker, Professional ethics, privacy and accountability, IT capacity building, IT planning process, IT policy and frameworks, Different types of policies, issues in enforcement of IT policies in an organization, Government vs Private sector policies, software piracy and licensing issues, Legal issues in IT, Intellectual property laws in Sri Lanka and Overseas, Intellectual property laws related to IT, Electronic contracts and cyber laws, Cyber crime and governing laws.

**CPU4153: Human Computer Interaction**

Perceives and interacts with computers, how to model computer users, interaction design, testing and evaluation, define HCI in software process, exercise HCI basics through a design project which will help to solve problems in interactive software and websites

**CPU4154: Software Architecture and Designing**

Mapping enterprise strategic vision to architectural model, Architectural modeling
through views, Evaluation of architectures, design patterns and application frameworks, Principles of software design, Modularization of functionality and elicitation of system properties, Design strategies and evaluation of designs, Cross-cutting concerns in a software design, Practice of software architecture and design, Design of distributed systems, component based design and software as a service, Documenting software architectures, Reuse of architectures, Case studies in software architecture and design

CPU4155: Information Technology Social Aspects & Infrastructure Management

Basic principles related to Management, Risks and options in an uncertain organizational environment for the technology management process, The development, management and exploitation of information systems and their impact on organizations and the society and the technological factors that drive success in innovation, processes, systems, and services, How different technologies can be managed for competitive advantage, The development of appropriate business policies and strategies and their implementation, Range of contemporary and pervasive issues, which may change over time.

CPU4156: E-Governance

Uses of specific IT systems in the organization, The role of ICTs as a development tool, The basic principles of managing IT in the organization, How to analyze and identify the IT induced organizational changes, How to deliver services online efficiently, Elaborate a successful modernization using to ICTs.

CPU4157: Management Theories and Practices

Basic management functions, Realistic and practical applications of management concepts, Internal and external factors that affect organizational design and production, Problem-solving strategies and critical thinking related to Information system development using the management knowledge

CPU4158: Selected Topics in Information Technology

Math and Statistics for IT, System Integration and Architecture, Platform Technologies, Database Administration,

CPU4359: Research Project in Information Technology

Identify research opportunities in the area of Information Technology, ability to solve the problems by using techniques, skills and information technology tools, disseminate information effectively through oral and written presentations, work independently in seeking and acquiring new knowledge

CPU4141 – Data Mining & Machine Learning


CPU4143: Computer Architecture

Design basics of the computer microprocessor, Computer organization base and explores techniques that go into designing a modern microprocessor, basic building blocks of the microprocessor and interaction mechanisms in the computer, instruction set of architecture, Performance issues, performance benchmarking, communication, ILP, TLP, input/output and storage systems.

CPU4145: Computer Interfacing

Digital interfaces, including memory, serial, parallel, synchronous and asynchronous, Digital, analog interfaces, Hardware implementations of interrupts, buses, input/output devices, Microcontroller architecture, Microcontroller based design techniques, Role of the computer architect and assembly programming, Understand interfacing techniques and practice them in lab experiments
**CPU4146: Selected Topics in Computer Science**


**CPU4242 - Computer Graphics & Image Processing**


**CPU4244 - Advanced Networking**

Fundamentals of networking (quick revision of CPU3245), Network models and IP addressing (IPV4 and IPV6), IP routing and load balancing in small and large networks, Setting up / design of networks (small, campus, large), network services (DNS, DHCP, MAIL, Directory, WEB), Network clustering and load balancing, Virtual servers and applications, Setting up and using Multimedia technologies (VOIP, VOD, Internet radio, Streaming), Storage networks (NAS SAN), Wireless networks and routing. Firewalls and Network access control, Wide Area Networking Technologies and Distributed networks, Quality of Service in networks and Disaster recovery techniques

**CPU4347 - Research Project in Computer Science**

Identify research opportunities in the area of computer science, ability to solve the problems by using techniques, skills and computer science tools, disseminate information effectively through oral and written presentations, work independently in seeking and acquiring new knowledge

**Physics**

**PYU1160/PYE 3160 - General & Thermal Physics**


**PYU1161/PYE 3161 - Basic Electromagnetism**

Electric charge and Coulomb’s Law; electric field and lines of force; electric flux and Gauss’ Theorem; electric potential; dielectrics; capacitors; current electricity and Ohm’s Law; electrical circuits and Kirchhoff’s Laws; magnetic action of moving charges; force on moving charges in a magnetic field; moving coil galvanometers; electromagnetic induction; Inductance; transformers; magnetic properties of materials; transient phenomena and AC theory; Practicals up to 24 laboratory hours.

**PYU1162/PYE 3162 - Waves in Physics**

Simple harmonic motion, superposition of simple harmonic motion, damped oscillations, forced oscillations and resonance, waves in physical media Properties of sound waves, interference of sound waves, intensity and sound level, interaction of sound waves and acoustics, ultrasonic waves Introduction to EM waves, production of EM waves and their uses, wave equation and wave properties, basic modes of propagation of EM waves, reflection, transmission, diffraction, interference and polarization of EM waves

**PYU2160 - Modern Physics**

Special Theory of Relativity

Classical Mechanics and its Limitations: maximum speed limit, physical events and
frames of references, Galilean Transformations, nature of light and its propagation, Special Relativity and Relativistic Motion: postulates of special theory of relativity, nature of time and simultaneity, Lorentz transformation, Relativity of Time and Length: time dilation, length contraction, Lorentz transformation, transformation of velocities, Relativistic Mechanics: relativistic mass, momentum and energy, equivalence of mass and energy, Additional Topics on Relativity

Quantum Mechanics

Inadequacies of classical physics; distribution of energy in the blackbody radiation; Quantization of energy: Planck’s theory; theories of specific heat solids; photoelectric effect; einstein’s equation for the photoelectric effect and compton scattering; de Broglie hypothesis; experimental verification of de Broglie hypothesis; Heisenberg’s uncertainty principle; Schrodinger’s wave equation; application of Schrodinger’s equation further application of Schrodinger’s equation

PYU2164 –Optics

Wave Front, Wave Packets, Principle of Superposition and Huygen’s Principle, Interference Patterns by the Method of Deviation of Wave Front, Interference Patterns by the Methods of Deviation of Amplitude, Industrial Applications of Interference,


PYU2165 –Mathematical Methods for Physics


PYU2262 Electronics


10 practical sessions (each session 3 hours duration)

PYU 3160/PYE 5160 - Nuclear and Particle Physics

Introduction to background material; the constitution of the atom and the failure of classical physics; alpha particles scattering by atoms; Rutherford scattering formula; models of the atoms; Bohr theory for hydrogen like atoms; fine structure of hydrogen atoms; general introduction to the nucleus; some properties of nuclei; semi-emperical mass formula; natural radio activity; radio active equilibrium; radio activity: alpha decay; gamma decay; the beta rays; artificial (induced) radioactivity; nuclear reactions; nuclear fission; nuclear fission; nuclear reactor; elementary particles; radiation detection devices; nuclear power safety-radiation hazards.

PYU 3161 - Practical Physics

Introduction to building blocks of microprocessors and microcontrollers, Registers, Counters, Timers, Digital to analogue conversion (DAC), Analogue to digital conversion (ADC), Harvard and Von-Neumann Architecture, Family of PIC microcontrollers, Power supply requirements for PIC microcontrollers, PIC Explanation of the PIC pin count, Registers, Internal and External Oscillators of the PIC, Input/output Ports, Memory organization and function registers of the PIC, Assembly language programming, programme simulation with software, in circuit serial Programming (ICSP) of the PIC, RS 232 programmers, PIC Microcontroller applications.
PYU3162- Atmospheric Physics

PYU3164 Data Acquisition and Signal Processing
Introduction to data acquisition systems; displacement, force and weight sensors; optical sensors and radiation detectors; more radiation detectors; controlling external devices; analysis of operation amplifiers circuits; deviations of Op-amps from ideal behaviour; clipping clamping and filter circuits; delay lines; computers, Schmidt triggers and discriminators; noise; multiple time average and phase sensitive detection; spectrum analysis; interfacing analogue and digital worlds; digital to analogue circuits; analogue to digital conversion circuits; introduction to microprocessors preliminary concepts; components of a microprocessor; memory; programming’s microprocessor; motorola MC 6809 processor; designing with MC 6809; microprocessor support chips; introduction to IBM PC; interfacing to IBM PC; interrupts in IBM PC; ISA Bus, standard interfaces.

PYU3165/PEY5165 Biophysics
Introduction of biophysics: Expenditure of energy, human mechanics, the eye, The physics of hearing, biomedical measurements, Temperature measurements, pressure measurements, Physics for biological functions: building blocks of nature, Molecules, Interaction between molecules, interaction of ions and molecules with water, motion of molecules in a fluids, emission and absorption light, elements of equilibrium thermodynamics, biological systems and thermodynamics, Investigation of biological processes: Interference and diffraction of light, spectroscopy, Introduction of X-ray diffraction, X ray diffraction methods and analysis, Nuclear Magnetic Resonance spectroscopy (NMR)

PYU3266/PEY5266 Essentials of Geology

PYU3167/PHE 5167 - Medical Physics
Introduction to medical physics; Human disorders (Associated with a man); Radiotelemetry; Light and electronic optics; Laser in Medicine; Fiber optic light in medicine; Ultrasonic; Nuclear magnetic imaging ( NMR or MRJ ); X ray in medicine; Some instrumentation for medical diagnostic procedures; Positron emission tomography (PEY); Computer axial tomography (CAT) or CT, SPECT and simulators; Production unit and dosimetry; Radiation protection; Computer in medicine; Medical statistic; Nuclear medicine instrumentation; Evaluation of radiation hazards; Cancer; Clinical radiotherapy equipment; Clinical radiation generators; Limitation of radiotherapy; Delivery of the dose prescribed by the doctors; Radiobiology

PYU3168 Fundamentals of Geophysics
Introduction to Geophysics: Basic characteristics of Earth: size, shape, mass, structure, age, Earth geometry, spherical coordinates, Plate tectonics: Divergent, convergent and conservative plate boundaries, Plate movement on Flat Earth, Rotation poles and present day plate motions, Past plate movements, role of Earth’s magnetic field, Gravity Methods: Principles, gravity of the earth, Consequences of spherical geometry, Isotasy and mountain heights, Gravity measurements and anomalies, Gravity measurements of Sri Lanka, Magnetic Methods: Principles, Magnetism of the earth, Magnetic measurements, Data processing, Interpretation of field examples, Magnetic survey in Sri Lanka, Seismology: Seismic Theory, Types of seismic waves, Elasticity and elastic waves Earthquake location and magnitudes, Seismology and Earth’s interior, Reflection field methods and instruments, data processing, interpretation, Seismicity of Sri Lanka, Electrical Methods: Electric

**PYU 3169 Literature Project in Physics**

The department encourages students to complete level 04 and start level 05 before you select a Literature Project in physics. Limited number of projects are available. The student has to conduct a literature survey under the supervision of a senior staff member on a predetermined topic. This course should be completed within one academic year and produce a report on a timetable agreed with your supervisor. The student has to submit a report on or before a date announced by the Physics Department.

**PYU 3170 Research Project in Physics**

The Department encourages students to complete level 04 and start level 05 before you select a Research Project in Physics. Limited numbers of projects are available. The student has to conduct a research project under the supervision of a senior staff member of the Department of Physics on a predetermined topic. This course should be completed within one academic year. The student has to submit the final report on or before the date announced by the Department of Physics. After submitting the report, student has to make a short presentation on his/her research project. This is followed by an oral examination, to test the student’s knowledge about his/her research project. The course unit gives students a good opportunity to improve their research skills.

**PYU3171 Environmental Geology**

Fundamental concepts in environmental geology: Introduction to environmental geosciences, Geology and environment, Geologic factors that may impact upon human life or way of life, Environmental problems and possible alternative solutions to such problems, Natural geologic hazards: earthquakes and plate tectonics, earthquakes in Sri Lanka and Indian ocean, tsunami, volcanic eruptions, tornado, future trends, Earth resource utilization & pollution: land degradation & pollution, industrial, agricultural and mining pollution, waste disposal, water, mineral and energy resources and conservation, Social Environment: Geologic factors affecting on land degradation, landslides, soil erosion, gem mining, rock quarrying, sand mining, hydropower, Geochemistry & Health: Fluoride & Iodine related health problems, Case studies in Sri Lanka, Geological considerations in Urban & Development Planning: Importance of geological considerations in land reclamation, land-use planning, town planning, Geological aspects in development projects - hydropower power, Mining, coastal development, infrastructure development projects, Case studies from Sri Lanka

**PYU3172/PYE5172 Astronomy**


**PYU3173 Solid State Physics**


**PYU3174 Thermodynamics**

PYE3175 Advanced Electromagnetism
Introductory vector algebra. Maxwell’s equations, Electromagnetic waves in free space and non conducting media. Wave propagation in conducting media, skin effect, poynitng vector electromagnetic waves in bounded media, wave guides, transmission line theory, electromagnetic radiation dipole antennas

Zoology
ZLU1280 - Animal Life and Diversity
The classification and diversity in structure, function and development of the Protoctista, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nematoda, Rotifera, Annelida, Mollusca, Arthropoda, Echinodermata, Hemichordata, and Chordata

ZLU1181 - Biogeography
History of biogeography, geographic template and patterns of variation in the terrestrial environment, distribution of individual species, basic patterns in species distributions, zoogeographic regions of the world, patterns of variation in geographic range, species diversity and individual traits, fundamental biogeographic processes, continental drift and plate tectonics, earth’s tectonic history, glaciation events of the Pleistocene epoch, patterns in island biogeography, biogeographic categories of islands, biogeography of Sri Lanka, biogeography of humanity

ZLU2280 - Animal Form and Function
Organization of animal cell; membrane structure and functioning; types of tissues; feeding and digestion; respiration & circulation, immune systems; homeostasis, osmoregulation and excretion; endocrine system, function of hormones; muscular system, movement of animals; neurons & nervous system, sensory systems; asexual and sexual reproduction

ZLU2281 - Fundamentals of Ecology
Levels of organization beyond the individual organism; principles governing the distribution of organisms in the environment; concept of ecosystem and its functioning; major biomes of the world; natural communities in Sri Lanka; characteristics of populations; nature of communities & community dynamics; environmental impacts, conservation & management of ecosystems.

ZLU2182 - Animal Development
Phases of animal development including germ cell formation, fertilization, cleavage, gastrulation, organogenesis, growth and differentiation, post-embryonic development; analysis of development including cell determination, cell differentiation, cellular basis of morphogenesis, genes and development, early patterning of vertebrate body; recent advances in developmental biology.

ZLU3180/ZLE 5180 - Aquatic Biology
Physiochemical characteristics and biological components of freshwater water bodies; classification of lakes; adaptations of fresh water organisms; productivity and trophic status in fresh water bodies; brackish water environments (estuaries, lagoons) and their characteristics; oceanic environment, its characteristics and habitats.

ZLU3181/ZLE5181 - Fish Biology and Fishery Management
Introduction to fish biology and fisheries management; evolutionary history of fishes; major groups of living fishes; external anatomy of fishes; internal anatomy, systems and their functions; estimation of parameters related to diet and reproduction; growth of fish; characteristics of fisheries, fishing gears and crafts; population dynamics of fishes; estimation of fish population size; mortality, recruitment and gear selectivity; yield; habitat improvement; commercially important fish species in Sri Lanka; management of fishery resources in Sri Lanka

ZLU3182/ZLE5182 - Conservation & Management of Biodiversity
Introduction to biodiversity and its conservation; distribution of biodiversity, causes and mechanisms for the loss of biodiversity, conservation at the species and population level, conservation at the community/ecosystem level, conservation and human societies, international approaches to conservation and sustainable development, the role of conservation biologists in achieving sustainable development.

ZLU3183/ZLE5183 - Animal Behaviour
History of animal behaviour; the concept of classical ethology and the current approaches to study behavior; inherited and learned behaviour and its functional significance; general principles and central concepts of behavioural ecology in terms of habitat selection, feeding, anti-predatory behaviour, reproduction and social organization; genetics, development and evolution of behaviour; communication in animals and their applied behaviour.

ZLU3184/ZLE5184 - Parasitology
Fundamental principles and concepts of parasitism covering types of parasites, host
parasite interactions and adaptations for parasitism; life cycles, morphology, transmission and the control of medically important parasites belonging to Protoctista, Platyhelminthes, Nematoda and Arthropoda; detection of parasites in the laboratory.

**ZLU3185/ZLE5185 - Human biology**

The characteristics of the human being; origin and evolution of humans; human variability; human adaptability; integumentary and musculoskeletal system; integration and coordination functions of the nervous system; human nutrition and metabolism; the respiratory, circulatory, excretory and fluid regulation processes of humans; physiology of the human reproductive system; pregnancy and contraception; human growth and development; human diseases, health and hygiene

**ZLU3288/ZLU4388 – Zoology Project**

A basic training on carrying out a scientific investigation related to Zoology is provided to students. Students are required to plan the investigation, write the project proposal carry out the scientific investigation based on the proposed methodology, analyze and interpret result and submit a project report. Half term progress reports, oral presentations and final report will contribute towards the overall grade. A limited number of students will be registered for this course depending on their interest and writing skills in English.

**ZLU3186/ZLE 5186 - Insect Biology**

External morphology of insects and classification; insect integument; biogeography and evolution; environment, biodiversity and conservation; modes of life; behavior; social insects; digestive system; tracheal system and gas exchange; blood, circulatory system and functioning; excretory system; reproductive system and potentiality for reproduction; insect development; nervous system and sense organs; chemical communication.

**ZLU3189/ZLE 5189-Paleobiology**

Paleobiology

That we offer under the zoology department here is a growing and comparatively new discipline which combines the methods and findings of the natural science biology with the "geobiology". Paleobiological research uses biological field research of current biota and of fossils millions of years old to answer questions about the molecular evolution and the evolutionary history of life. In this scientific quest, macrofossils, microfossils and trace fossils are typically analyzed. However, the 21st century biochemical analysis of DNA and RNA samples offers much promise, as does the biometric construction of phylogenetic trees. There are popular activities in Sri Lanka and in the world, which in many ways parallel Paleobiology. However, many are probably not doing science. In this course, we will concentrate on the science rather than the popular activities.

**ZLU4180 - Management of Insect Pests and Vectors**

Introduction to insect pests and vectors; pest damage, yield loss and assessment; pests of rice, fruit and vegetables, plantation crops, stored products; insect vectors of plant diseases; forest entomology; major insect vectors of diseases; transmission of pathogens by vectors; insecticidal control; biological control; use of resistant crop varieties; cultural practices; methods of vector control and management; interference and disruption; regulatory control; pest management approaches and strategies.

**ZLU4181 - Aquaculture**

Introduction to aquaculture industry; fish culture systems; planning for aquaculture development; water sources; site selection and construction of different aquaculture facilities; supplying quality water; obtaining quality seeds; maximizing growth; minimizing mortalities; harvesting and post-harvest technology; management of fish culture facilities and economic considerations; biology and culture methods of fin fish species, shrimps, bivalves, sea weeds and ornamental fish

**ZLU4182 - Immunology**

Host defence, innate immunity, acquired immunity, acquired immune response, antigens and antibodies, MHC molecules, T cells and B cells mediated immune responses, regulation of immune responses, cell mediated and humoral immune responses, immunity to infection, vaccination against infection, immunity to tissue transplants, immunity to tumours, hypersensitivity diseases, autoimmune diseases, immunodeficiencies and other disorders of the immune system

**ZLU4183 - Molecular Biology**

Overview of prokaryotic and eukaryotic cells; general structure of proteins; chromosome and chromatin structure and function; structure and organisation of genomes and genes; structure and function of nucleic acids; properties of nucleic acids; DNA replication; DNA damage, repair and recombination; gene expression and protein synthesis; tools in DNA manipulation including an introduction to genetic manipulation of animals; applications of recombinant DNA technology; Human Genome project and ethical aspects of gene technology

**ZLU4184 – Wildlife Conservation and Management**

Basics of population, community and ecosystem ecology; biodiversity and its values; introduction to Sri Lankan biodiversity and wildlife; history
of wildlife conservation in Sri Lanka; threats to wildlife and related issues; animal behaviour; wildlife management; options available for wildlife conservation; elephant conservation in Sri Lanka; protected areas in Sri Lanka; protected area planning; wildlife policy, elephant conservation policy and fauna and flora protection ordinance; ecotourism principles and practices; Field sampling methods of fauna and flora; Report writing and presentations on field visits.

**ZLU4285 – Advanced Laboratory Techniques in Zoology**

A self-study practical course unit which includes experiences in organization of a zoology laboratory; preparation of reagents; collection, culture, preservation and identification of animals; preparation of skeletons and models; microscopy; microphotography; histology, histo-chemistry and immuno-histochemistry; techniques in immunology; cytotaxonomy; techniques in biochemical characterization; techniques in entomology and parasitology; haematology and molecular biology; spectroscopy; chromatography; centrifugation; application of radioactive isotopes in experiments; data analysis, interpretation and presentation; communication and collaboration with other scientists.

**ZLU4286 - Ornithology**

Introduction to birds and bird taxonomy, bird flight, other means of locomotion, digestive system, food & feeding habits, circulatory system, respiratory system, energy balance & thermoregulation, nervous system- brain & senses, vocal communication, territorial & colonial behavior, mating systems, avian reproduction- anatomy & the bird egg, nests, clutch size, incubation, & hatching, parental care, migration and orientation, important bird areas of the world and Sri Lanka, status of bird diversity in Sri Lanka, bird study methods, birds and biodiversity conservation-local regional and global issues, field project

**ZLU4187 – Zoology Essay**

Students will be trained to write on contents of scientific interests in English medium. They will be required to find literature and write essays on current topics of scientific interests related to Zoology. The final examination will be a theory paper where students are required to write 3 essays. A limited number of students will be registered for this course depending on their interest and writing skills in English.

**PCU4180– GIS in Natural Resource Management(GIS)**

Introduction to GIS, understanding datums, map projections, coordinate systems, map scale, basic characteristics of maps, sampling the world, data models, digital databases, components of the GIS and data inputs, elementary spatial data analysis, feature measurements in GIS, classification of digital objects, global positioning systems, fundamentals of remote sensing.

**PCU4182 – Fundamentals of Environmental Impact Assessment (EIA)**

Introduction to EIA, EIA concepts, screening, scoping, project affected environment and legislation, impact identification, impact prediction, impact evaluation, mitigation of impacts, environmental management plan, EIA report writing, evaluation of EIA reports, EIA procedures in Sri Lanka, role of public participation.

**PCU4281 - Environmental Degradation and Management (EDM)**

Understanding our environment, environment sustainability, state of the Sri Lankan environment, key environmental issues in Sri Lanka, causes of environmental degradation, linkages to global environment, combating environment degradation, valuing the environment, policy and institutional set-up in Sri Lanka, environmental monitoring.
## Appendix 1 Schedule of Exemptions

### Specific Exemptions from Foundation courses in Science

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### Specific Exemptions for EGAP (LSE3202) (scores given below should not be more than 3 years old)

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<th>IELTS*</th>
<th>TOFEL*</th>
<th>G.C.E (A/L) English Medium</th>
<th>UTEL</th>
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<tr>
<td>Overall score of minimum 5.0 (academic) or 5.5 (general), with 4.0 in writing</td>
<td>Paper based: overall score of minimum 450 with 3.5 in writing; Computer based: overall score of minimum 200 with 3.5 in writing; Internet based: overall score of minimum 90 with 3.0 (scaled score of 20) in writing</td>
<td>Student who have completed their advance level Examination in English Medium conducted by the department of Examination.</td>
<td>Score of not less than band 6.00 in all 4 skills.</td>
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<tr>
<td>Successful completion of a Bachelors Degree/Postgraduate Diploma/Masters in the English medium.</td>
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* IELTS and TOEFL scores should be obtained not more than 3 years prior to the date of request.

### Specific Exemption for ICT Skills (CSU1149/CSU1152)

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<th>ICT Technician</th>
<th>SCDL/ICDL</th>
<th>CPCPA</th>
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<tr>
<td>Successful completion of the University Competency Test in Information Technology (UCTIT) conducted by the Higher Education for Twenty Fist Century (HETC) project of the Ministry of Higher Education.</td>
<td>Successful completion of National Certificate in Information Communication Technology Technician (ICT Technician) NVQ L4 at Vocational Training Centre.</td>
<td>Successful completion of Sri Lanka Computer Driving License (SCDL) or International Driving License (ICDL)</td>
<td>Successful completion of CPCPA; Certificate in Professional Computer Applications (Comprising of L2 Courses) offered by the Department of Mathematics and Computer Science, The Open University of Sri Lanka.</td>
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### Specific Exemptions for PSE3117

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<th>Course Code</th>
<th>1st year Examination in Science of a recognized University</th>
<th>National Diploma in Mathematics</th>
<th>GCE A/L-Combined/Higher/Pure/Applied Maths, Trained Teachers’ Certificate in Maths, PSF1301+PSF2301/PSF1302+ and PSF2302 NDT/JTO/IESL PartI</th>
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## Appendix 2
### NAC centres

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<th>Centre Address</th>
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<tbody>
<tr>
<td>CNAC Facility of Education Building (ground floor)</td>
<td>011-2814557</td>
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<tr>
<td>The OUSL, Nawala, Nugegoda</td>
<td></td>
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<tr>
<td>NAC-2- Nawala, Colombo Regional Centre Building (ground floor)</td>
<td>011-2810088</td>
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<td>The OUSL, Nawala, Nugegoda</td>
<td>011-2881080</td>
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<tr>
<td>NAC - Kandy</td>
<td>081-2494119</td>
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<td>The OUSL Regional Centre, Polgolla, Kandy</td>
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<tr>
<td>NAC - Monaragala</td>
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<td>NAC - Kurunegala</td>
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<tr>
<td>University of Colombo, “College House” 94, Kumaratunga Munidasa Mawatha, Colombo 03</td>
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<tr>
<td>Open University of Sri Lanka Study Centre, Browns Road, Jaffna</td>
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<tr>
<td>NAC - Pattalum</td>
<td>Ms.Nirosha – 071-4484854</td>
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<tr>
<td>Open University of Sri Lanka Study Centre, 137/1, Colombo Road, Pattalum.</td>
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<tr>
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<tr>
<td>institute of Agro Technology and Rural Sciences of the University of Colombo. Weligatta New Town, Weligatta, Hambantota</td>
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Appendix 3 Statistics: Programme completion
BSc (Natural Sciences) Graduates

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OUUSL Holidays

The OUSL recognises seven special holidays on which no compulsory activities will be scheduled.

1. Thai pongal Day
2. Independence Day
3. Sinhala and Hindu New Year Day
4. May Day
5. Wesak Full Moon Poya Day
6. Prophet Mohammed’s Birthday
7. Christmas day
Your responsibilities as a student of The OUSL

The Open University of Sri Lanka is committed to a working and learning environment which is friendly, peaceful and safe for all staff and students. Such an environment can only be created by a collective effort of all concerned parties. Students being the largest category in the University, their conduct and behaviour have a considerable impact on the environment of the University.

The Faculty of Natural sciences wishes to emphasise the following regarding responsibilities of students.

- Always carry the Record Book with you while in the University, as a proof of identity.
- Comply with the rules and regulations of the University.
- Engage in your studies in a serious manner, taking advantage of the educational opportunities provided.
- Maintain the highest standards of academic integrity.
- Treat the university community (students and staff) with dignity and respect.
- Safeguard the good name of the Faculty and the University.
- Protect and refrain from damaging University property.

The General By Law for student discipline, No 02 of 2008, OUSL and Prohibition of Ragging and Other Forms of Violence in Educational Institutions Act, No.20 of 1998 (Parliament of the Democratic Socialist Republic of Sri Lanka) require the University to prevent or effectively deal with any disturbances to the working and learning environment. Copies of these documents are available in the main library and the regional libraries (Reference section).