The Open University of Sri Lanka

Faculty of Natural Sciences

Undergraduate Guidebook
2019 - 2020

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Programmes / Courses of Study Offered By the Faculty of Natural Sciences, OUSL

Programmes/Courses described in this Guidebook

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) (Faculty of Education)
Diploma in Microbiology  (Blended Online Programme)
Diploma in Environmental Science
Diploma in Natural Resources and Ecotourism
Diploma in Laboratory Technology
Advance Certificate in Wildlife Conservation & Management
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 and 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
Message from the Dean

Welcome to the Faculty of Natural Sciences.

Professor J. C. N. Rajendra
Dean/ Faculty of Natural Sciences

On behalf of the Faculty of Natural Sciences of the Open University of Sri Lanka (OUSL), let me welcome you to our university to pursue your higher studies and fulfill your educational aspirations. I am pleased that you have chosen a science degree programme offered by Sri Lanka’s only Open and Distance Learning University, to obtain the skills and qualifications required to succeed in any competitive environment.

Study in the sciences can take you anywhere that you want to go. Your science studies can start your journey to become a scientist or science-based professional in the 21st century. The Faculty of Natural Sciences at OUSL has over 30 years of experience delivering Science degree programmes through Open and Distance Learning (ODL) methodologies. Due to the nature of its teaching methodology and infrastructure, the OUSL is successfully able to serve a large student population spread throughout the country. Currently Faculty of Natural Science offers a wide range of quality academic programmes in varying disciplines in sciences. You can choose from a collection of programmes leading to Certificates, Diplomas, Degrees and Post-Graduate qualifications based on your interest and career prospects.

The degrees awarded by the OUSL are given the same recognition as those awarded to students studying at other Sri Lankan national universities who offer programmes through face-to-face. 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. Further, your training in the sciences involves not only acquiring new knowledge, but also applying findings to improve our world, and developing the critical reasoning and problem-solving skills required to use scientific knowledge wisely. It will equip you with the ability to contribute to the new frontiers in science discovery.

All of 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 ODL, 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, the Faculty of Natural Sciences at OUSL has very successfully educated thousands of individuals throughout the country. 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. As I mentioned earlier, you have the flexibility to choose the place, time and space at which you will pursue your studies at the OUSL. However, you should be self-motivated, persistent, learn to work independently, learn to manage your time and determined to work hard to complete your studies.

This undergraduate handbook is carefully designed to be as comprehensive as possible in giving all the essential information needed for a student who plans to follow the degree programme offered at the Faculty of Natural sciences of the OUSL.

Thank you for choosing your higher studies at the Faculty of Natural sciences of the OUSL and warmly welcome you as part of our undergraduate student community. Please go through the information to find out more about us. I wish you all the success in all your efforts to acquire a recognized qualification from our faculty.

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

Professor J. C. N. Rajendra
Dean/ Faculty of Natural Sciences
GENERAL INFORMATION

The University and the Faculty

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 nine Regional Centres and seventeen Study Centres located around the country (Fig. 1). The Central Campus and the Colombo Regional Centre are situated at Nawala. The other eight Regional Centres are situated at Kandy, Matara, Jaffna, Anuradhapura Batticaloa, Kurunegala, Badulla and Ratnapura.

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 six Departments; Botany, Chemistry, Computer Science, Mathematics, Physics and Zoology. The Department of Health Sciences 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.

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.
The Open University Regional Centres (OURC)

<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 (065-2222624)</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>
<tr>
<td>Ratnapura</td>
<td>SG90</td>
<td>OURC Hiddellana, Ratnapura (045-2228660)</td>
</tr>
</tbody>
</table>

The Open University Study Centres (OUSC)

<table>
<thead>
<tr>
<th>Centre</th>
<th>Code</th>
<th>Address (Telephone)</th>
</tr>
</thead>
<tbody>
<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>Inginiyagama 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 (035-2222501)</td>
</tr>
<tr>
<td>Moneragala</td>
<td>UP82</td>
<td>Technical College Junction, Sirigala, Potuvil Road, Moneragala (055-2273395)</td>
</tr>
<tr>
<td>Polonnaruwa</td>
<td>NC51</td>
<td>24th Mile Post, 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>Vavuniya</td>
<td>NP41</td>
<td>366, Kandy Road, Thethkawaththai, 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 (026-2222088)</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>Aathiparasakthy Ariviya College, Ward No. 04, Lranaippalai Veethy, Puthukkuduiruppa, Mullaitiv.</td>
</tr>
<tr>
<td>Mannar</td>
<td>NP44</td>
<td>OUSC, RDS Building, Minor Seminary Road, Chavatkaddu, Mannar. (0232-251999)</td>
</tr>
</tbody>
</table>

Figure 1
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 the award of 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 award of 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 or 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 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

Foundation courses are offered to those who need to attain 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 or 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 or Advanced Level Examinations. 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, consultation of reference material and practical classes.

Based on the SLQF recommendations, from 2017/2018 the credit rating of a Certificate will be 15 credits, a Diploma 30 credits and Undergraduate degrees 90 credits and 120 credits depending on the 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 2. Average total time expected to be spent on a 3 credit course is around 150 notional learning 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>2</th>
<th>3</th>
<th>5</th>
<th>6</th>
<th>9</th>
<th>15</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average study hours</td>
<td>100</td>
<td>150</td>
<td>250</td>
<td>300</td>
<td>450</td>
<td>750</td>
<td>1500</td>
</tr>
</tbody>
</table>

The maximum workload a student may undertake in an academic year is 30 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 30 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 to register up to 24 credits only 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 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>1</td>
<td>F1 C1</td>
</tr>
<tr>
<td>2</td>
<td>F2 C2</td>
</tr>
<tr>
<td>3</td>
<td>D3 U3 E3</td>
</tr>
<tr>
<td>4</td>
<td>D4 U4 E4</td>
</tr>
<tr>
<td>5</td>
<td>U5 E5</td>
</tr>
<tr>
<td>6</td>
<td>U6 E6</td>
</tr>
<tr>
<td>7</td>
<td>P7 E7</td>
</tr>
<tr>
<td>8</td>
<td>P8 E8</td>
</tr>
</tbody>
</table>

**Figure 2. Area/Discipline of study**

- Applied Mathematics AD
- Pure Mathematics PE
- Management Studies MS
- Botany BY
- Zoology ZY
- Faculty Courses FN
- Social Science DS
- Language Studies LE
- Computer Science CS
- Legal Studies LL
- Physics PH

**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 8 credits and a maximum of 30 credits.

Students may register simultaneously for up to 2 programmes of study, except for Foundation courses, subject to the permitted maximum of 30 credits in total per academic year.

In addition, students may register for continuing education courses up to 8 credits. Students registering for stand alone courses may register for up to 15 credits of courses per academic year.

Students registering for courses with an academic value adding up to 30 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 24 credits. Those registering for courses adding up to less than 30 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 for. 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 from Foundation Level.

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

Support for Learning

Realising the necessity to give assistance and guidance 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 the 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.

StART@OUSL

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 three compulsory courses; English for Academic Purposes (EGAP), Empowering for Independent Learning (EfIL), ICT skills and optional courses such as Soft Skills, Social Harmony and second National Language.

EfIL gives an opportunity for the students to become familiar with the practices of OUSL and network among them. The activities during 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, more importantly 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 sessions attentively.

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, Jaffna, Anuradhapura Regional centres. Several practical groups are conducted for courses with practical components and students can select the group at their choice. 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 OUSL Computer Centres located at centers specified in Appendix 2 (page 83). 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 and submit final examination applications etc. To access MyOUSL, use the link from the OUSL homepage at: http://www.ou.ac.lk/ OR type: http://my-ousl.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.
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/audio/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 website. 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.

Students are also instructed to use the libraries carefully.

### Regional Educational Services

The University has a network of Regional Centres/Study Centres distributed throughout Sri Lanka (Figure 1). These centres provide facilities for distribution of course material, limited reference facilities at libraries, counselling, day schools 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, Jaffna, Ambalangoda, Anuradhapura, Bandarawela, Batticaloa, Kegalle, Kurunegala, Polonnaruwa, Badulla and Ratnapura centres. Limited internet facilities are available at Colombo, Kandy and Matara Regional Centres.

### 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.

### University Enhancement Bursary

(Effective from Academic Year 2014/2015)

University Enhancement Bursaries are 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 amount of the scholarship varies based on the number of times the student is successful in meeting the bursary criteria. A student may be awarded a University Enhancement Bursary for a maximum of three times in his/her entire study period. A student who has been awarded either a Mahapola Scholarship or the University Bursary may he/she also be 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 if he/she has registered for a minimum of 21 credits of courses in the first year of registration at the OUSL and successfully complete all the credits he/she registered for in the same academic year. However, if a student chooses to register for more than 21 credits of courses, he/she shall be required to complete even the additional credits they have registered for to become eligible for the bursary.

b) In the subsequent year/ one student shall be required to register for a minimum of 30 credits of courses at the OUSL and successfully complete all the credits he/she registered for in the same academic year. However, if a student chooses to register for more than 30 credits, he/she shall be required to complete even the additional credits they have registered for to become eligible for the bursary.

c) A student who fulfills 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 fulfills 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 fulfills the requirements given in (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 OUSL students. In case of loss of student 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, online through MyOUSL you have to submit the duly completed application form to the SAR/Examinations. After processing your applications, the Examinations Division will send you relevant online admission forms for siting examinations prior to the commencement of the final examinations. Students may also request for results sheets and certificates from the Examinations 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 an 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 six Faculty Student Counsellors. All Students are advised to meet the Faculty Student Counsellors in the first instance.

Temporary Residential Facility (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/Student Affairs or from the Assistant Director of the regional center. 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 Junction).

Book Shop
A small bookshop at Block 9. Provides students to 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, CRC and Student Union Room 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 where students can take part. 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. Its objective is to 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 OUSL 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 B.Sc. degree programme are conducted at all Regional Centres except at Badulla, Kurunegala, and Ratnapura. 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.

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. Application forms 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 could be granted. It is the responsibility of the student to claim such exemptions granted at a subsequent registration.

Assessment and Evaluation

Evaluation in the Empowering for independent learning (EFIL) 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 offered by the faculty.

Continuous Assessments Tests

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 continuous Assessment mark termed as OCAM, is computed based on marks of assignments/assessment tests/practical tests.

OCAM requirement obtained for a course will be valid for two consecutive academic year includ-
ing the year in which the OCAM is obtained. After the lapse of this period, you will not have the opportunity to sit the final examination to upgrade RX/C’/D’/D/E grades. If you need to upgrade such grades, you will be required to re-register for the course once again.

For all students from the Academic year 2019/2020 the OCAM requirement obtained for a course will be valid for two consecutive academic years including the year in which the OCAM is obtained.

Final Examinations

The Faculty operates a two semester system for its courses for 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 OCAM requirement for a course can be carried forward only up to a limited period of time from the year of obtaining OCAM. 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 through MyOUSL

Each semester, students are required to inform the SAR/Examination about the courses they intend to sit final examinations by submitting the duly completed application form for final examinations. Online application is a must to enable the student to print their admission card without which student may be denied admission into exam hall. The student are expected to apply before the deadline.

Repeat Students

Any student failing to obtain a valid OCAM for 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 of C 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 have valid OCAM 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 the subsequent registration, provided the student is writing the examination before the end of the valid period of OCAM.

However, like repeat students, resit students are not given a grade higher than a minimum pass grade of C at the subsequent attempts of the final examination. Resit candidates are not required to repay any course fee.

Finance

Fee structure

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

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Fee</td>
<td>Rs. 400.00</td>
</tr>
<tr>
<td>Sports Club Fee</td>
<td>Rs. 25.00</td>
</tr>
<tr>
<td>Facilities Fees</td>
<td>Rs. 1500.00</td>
</tr>
<tr>
<td>Library facilities Fee</td>
<td>Rs. 100.00</td>
</tr>
<tr>
<td>Refundable Lab deposit</td>
<td>Rs. 1100.00</td>
</tr>
<tr>
<td>Tuition Fee</td>
<td>Rs. 2100.00 per credit</td>
</tr>
<tr>
<td>START@OUSL Fee</td>
<td>Rs. 7500.00</td>
</tr>
</tbody>
</table>

Vouchers for Payment of Fees

Fees are payable in two instalments. Each student will initially receive a voucher for the first instalment 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 instalment 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.

Umarani Coomaraswamy Gold Medal for Excellence in Botany

A Gold Medal and a certificate is presented to the student having the best performance in Botany in the BSc Degree programme. Botanical society of OUSL (BotSoc) established this prize in recognition of the services of Prof. Uma Coomaraswamy, Emeritus Professor of Botany.

The criteria to be adopted for the award of the Gold Medal are as follows:

- satisfies the requirements for the award of the B. Sc. Degree obtaining at least a Second Class Upper Division and,
- obtains at least A grades for 24 credits of Botany courses of the B. Sc. Degree Programme out of a total of 35 credits comprising of 8 credits at Level 3, 12 credits at Level 4 and 15 credits at Level 5.
- obtains the highest GPA that should be greater than 3.30 for the Botany courses adding up to a total of 35 credits as mentioned in (b) above.

Note:

- For the students who have offered more than 15 credits of Botany courses at Level 5 as specified above, the best grades adding up to 15 credits shall be considered.
- A student who has been found guilty of any examination offenses or offenses related to any disciplinary matters shall not be eligible for the Gold Medal.

- In the case of more than one student qualifying for the Gold Medal, the student having highest GPA for the BSc Degree shall be considered.

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 35 credits of Zoology courses, including 8 credits at Level 3, 12 credits at Level 4 and 15 credits at Level 5/6, and
- minimum A grade for the ZYU5608 - Zoology Project, and,
- obtained at least GPA 3.70 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 service of Prof. J.N.Oleap Fernando, former Professor of Chemistry.

It is awarded to the student having the best performance in all Chemistry courses offered by Department of Chemistry with exceptional perfor-
mance related to Physical Chemistry component related Courses at Level 3, Level 4 and Level 5. The award will carry a Gold medal, a certificate and a cash prize.

The student satisfying the following conditions will be awarded the J. N. Oleap Fernando Gold Medal with effect from 2017/2018 academic year.

a) satisfied the criteria for the award of the B.Sc degree and
b) obtained at least B grades in all Chemistry courses offered by the Department of Chemistry at Level 3 and Level 4, and,
c) obtained at least B grades in at least 18 credits of Chemistry courses at Level 5 [including Concepts in Spectroscopy (CYU5301) but excluding Literature Project in Chemistry (CYU5310) and Research Project in Chemistry (CYU5611)], and,
d) obtained at least A in the Basic Principles of Chemistry II (CYU3201) at Level 3 and Concepts in Chemistry (CYU4301) at Level 4, and,
e) obtained the highest weighted average mark (of not less than 65%) in the Chemistry courses referred to in (b) and (c) above.

In computing the weighted average mark for the students who have followed more than 18 credits of courses at Level 5, then the credits (courses) which carry best of such marks will be considered.

E. M. Jayasinghe Memorial Gold Medal for Excellence in Physics

A Gold Medal, a Certificate and a cash award of Rs 5,000 is presented to the student having the best performance in Physics in the B. Sc. Degree programme, and the selection will be based on the following criteria:

a) Satisfies the requirements for the award of the B.Sc. Degree or B.Sc. special degree in Physics obtaining at least a Second Class Upper Division and,
b) Obtains at least A grades for 25 credits of Physics courses of the B.Sc. Degree programme out of the total of 35 credits comprising of 8 credits at Level 3, 12 credits at Level 4 and 15 credits at level 5/6 including an A grade for the course PHU5300 – Nuclear and Particle Physics at level 5 and,
c) Obtained the highest GPA which should be greater than 3.30 for the Physics courses adding up to a total of 35 credits as mentioned in (b) above.

Notes:

- For the students who have offered more than 15 credits of Physics courses at level 5/6 as specified above, the best grades adding up to 15 credits shall be considered.
- A student who has been found guilty of any examination offenses or offenses related to any disciplinary matters shall not be eligible for the Gold Medal.
- In case of more than one student qualifies for the Gold medal, the student having the highest GPA for the B.Sc. Degree shall be considered.

H. Somadasa Gold Medal for Excellence in Pure Mathematics

A Gold Medal, a Certificate and a cash award is presented to the student having the best performance in Pure Mathematics in the B.Sc. Degree Programme.

The award is funded by the well wishers.

The criteria to be adapted for the award of the Gold Medal are as follows:

a) Satisfied the requirements for the award of the Bachelor of Science Degree or Bachelor of Science (Special) Degree securing at least a Second Class Upper Division and,
b) Obtained a minimum overall GPA of 3.3 for the Pure Mathematics courses offered at Level 3 namely, PEU3300, PEU3301 and PEU3202 and at Level 4 namely, PEU4300, PEU4301, PEU4302 and PEU4303 and a minimum of 18 credits of Level 5/6 Courses including PEU5300, PEU5301 and PEU5305 with a minimum of C grade for each of the above courses. The GPA will be calculated to the second decimal point. The final year project in Mathematics (General/Special) will be excluded from the above 18 credits.

c) The award goes to a student who meets the criteria (a), (b) and has obtained the highest GPA for the courses mentioned in (b).

If two or more students satisfy the above criteria in an Academic Year, the student who obtains the maximum average of the overall marks for the above courses will be awarded. In the rare event that two or more students get the same average of overall marks, the award will be shared equally by all.
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 B.Sc. 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 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.

Table

<table>
<thead>
<tr>
<th>Discipline</th>
<th>No. of credits at each Level</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5/6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>08</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>08</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Computer Sc.*</td>
<td>08</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Pure maths</td>
<td>08</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Applied maths</td>
<td>08</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>08</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Zoology</td>
<td>08</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

* including at least a grade A grade for Project in Computer Science.

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. N. 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 30 credits at Level 3 within a maximum of 03 academic years from first registration, and have registered up to at least 08 credits in the academic year of computation,

b) No E grades within courses considered in (a)

c) Have obtained at least B- grades in courses adding up to 25 credits (excluding LEE3410, CYE3200 and CSE3213) at Level 3, and,

d) A GPA of at least 3.30 with at least B+ grades for a minimum of 12 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.

The above-amended criteria will be effective from the Academic Year 20017/18.

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 thirty (30) credits inclusive of Botany as one of the main disciplines.

b. Completion of registration for the 12 credits of Botany courses at Level 4.

c. Minimum of C grades and a Grade Point Average (GPA) of 2.70 for courses adding up to 24 credits at Level 3 (inclusive of a minimum of B- grade for the Botany courses at Level 3 and exclusive of LEE3410, CYE3200 and CSE3213).

d. An annual income as specified.**

* 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**

Buckyball Society of the Department of Chemistry makes an annual award to each of the Chemistry courses in Levels 3-5 except for CYU3302, CYU4302, CYU5310 and CYU5313. In each course, it is awarded to the student who has secured the highest GPV and an A grade. Each award will carry a certificate and a cash prize. The award will be given to the following course units with effect from academic year 2017/2018 based on the following criteria.

CYU3300, CYU3201, CYE3200, CYU4300, CYU4301, CYU4302, CYU5300, CYU5301, CYU5302, CYU5303, CYU5304, CYU5305, CYU5306, CYU5307, CYU5308, CYU5309, CYU5312, CYU5313

The student/s satisfying the following conditions will be awarded the Buckyball Award for Excellence in Chemistry

(a) obtained an A grade or above in the relevant course unit in the year of first registration
(b) in the event of two or more students obtaining A grade or above then the highest overall raw mark (RM) of the relevant course unit will be considered for the award.
(c) in the event there are two or more students satisfying the above requirements (a) and (b), the award will be shared equally.

**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 based on the performance in all Chemistry courses available at Levels 3 and 4. A student who is a supplicant for the Degree award in the year of receiving the scholarship is not eligible for the consideration. Each scholarship will carry a certificate and a cash award.

The student/s satisfying the following conditions will be awarded the C-60 Scholarship/s with effect from 2017/2018 academic year.

(a) obtained at least a C grade in the following courses offered by the department at Level 3 and Level 4 [Basic Principles of Chemistry I (CYU3300), Basic Principles of Chemistry II (CYU3201), Basic Practical Chemistry CYU(3302), Inorganic Chemistry (CYU4300), Concepts in Chemistry (CYU4301), Practical Chemistry II (CYU4302) and Organic Chemistry I (CYU4303)], and,
(b) fulfilled the criterion (a) above in the year of first registration ,and,
(c) obtained an overall GPA of 3.00 or more in the above referred courses CYU3300, CYU3201, CYU3302, CYU4300, CYU4301, CYU4302 and CYU4303.
(d) in the event there are two or more students satisfying the above requirements (a), (b) and (c) then the highest GPA will be considered to award C-60 Scholarship.
(e) in the event there are two or more students satisfying the above requirements (a), (b), (c) and (d) then the student scored highest weighted average marks of all courses referred to in (a) will be considered for the above 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.

The student satisfying the following conditions will be awarded Buckyball Science Award for the best Level 3 student with effect from 2017/2018 academic year.

(a) obtained at least C grade in all the courses offered by the student in all three science disciplines including Chemistry as a discipline at Level 3, and,
(b) obtained at least 60% marks as overall weighted average for all the courses referred in (a), and,
(c) fulfilled the criteria (a) and (b) above in the year of first registration
(d) In the event there are two or more students satisfying the above requirements (a), (b) and (c) then the highest weighted overall average marks will be considered.
(e) In the event there are two or more students satisfying the above requirements (a), (b), (c) and (d), then the award will be shared equally.
**Professor GMKB Gunaherath Award for Organic Chemistry**

This is awarded to the student with the best performance in all Chemistry courses offered by the Department of Chemistry with the exceptional performance in Organic Chemistry courses at Levels 4 and Level 5. The award will carry a certificate and a cash prize. Based on the following criteria the award will be given from academic year 2017/2018.

The student satisfying the following conditions will be awarded the Professor G. M. K. B. Gunaherath Award for Organic Chemistry with effect from 2017/2018 academic year.

(a) obtained at least B+ grades in all Chemistry courses offered by the Department of Chemistry at Level 3 and Level 4, and,

(b) obtained at least 70% marks as weighted average for the following Organic Chemistry courses Organic Chemistry I (CYU4303) and Organic Chemistry II (CYU5303) with securing a minimum B+ grade in each of these two courses CYU4303 and CYU5303, and,

(c) In the event there are two or more students satisfying the above requirements (a) and (b) then the highest weighted average marks of Organic Chemistry I (CYU4303) and Organic Chemistry II (CYU5303) will be considered to award the winner.

(d) In the event there are two or more students satisfying the above requirements (a), (b) and (c), then the award will be shared equally between them.

**Professor JN Oleap 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. This requirements should be fulfilled in the year of first registration of the courses. The award will carry a certificate and a cash prize. Based on the following criteria the award will be given from academic year 2017/2018.

The student satisfying the following conditions will be awarded Professor J N Oleap Fernando Scholarship with effect from 2017/2018 academic year.

(a) obtained a minimum of grade C in each of the chemistry courses at level 3 and level 4 [CYU3302, CYU3300, CYU3201, CYU4300, CYU4303, CYU4301, CYU4302] and

(b) fulfilled of criteria (a) in the year of first registration and

(c) obtained a GPA of 3.70 or more in the above courses in criteria (a)

(d) in the event there are two or more students satisfying the above requirements (a), (b) and (c) then the highest GPA will be considered to award Professor J N Oleap Fernando Scholarship.

(e) in the event there are two or more students satisfying the above requirements (a), (b), (c) and (d) then the student scored highest weighted average marks of all courses referred to in (a) will be considered for the above scholarship.

The winner of the Professor JN Oleap 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 OCAM requirement 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**

Annually five (05) scholarships are awarded by the SPECTRUM – The Physics Society of the Department of Physics.

The guidelines and selection criteria for the awards are as follows.

(a) These scholarships are awarded to five (05) students in the B.Sc. Degree Programme every academic year. A total payment of Rs. 100,000/= (Rs. 20,000/= each for 05 students) will be awarded while recipients are studying at Level 4 or above. The scholarship will be directly credited to the student’s account at the University to meet his/her tuition fees.

(b) The selection for the scholarship will be based on academic performance and income.

(c) The Dean of the Faculty of Natural Sciences, The Head of the Department of Physics, President, Secretary and Treasurer of Spectrum will process the results after the ‘drop’ period of re-registration each academic year and make the final decision on students, who qualify for the scholarship based on academic performance and request.
them to declare the annual income for the final selection.

4. A student will qualify to be considered for the scholarship for the particular academic year if he/she has the following requirements at the time of selection;
   (a) Member of the Spectrum.
   (b) Registered for all courses at Level 3 adding up to a total of thirty (30) credits, including all Physics courses adding up to eight (08) credits.
   (c) Registered for all Physics courses at Level 4 adding up to twelve (12) credits, and chosen Physics as one of the main discipline.
   (d) Minimum of ‘C’ grades for all the Physics courses at Level 3.
   (e) Minimum of ‘C’ grades for courses adding up to twenty-four (24) credits at Level 3, excluding the continuing education courses.
   (f) A low annual family income (level of family income should be less that Rs. 360,000/= per year and to be certified by the Grama Niladari of the relevant area).
   (g) Had not received the Spectrum Scholarship earlier.

5. If more than five (05) students qualify for the award in any one academic year,
   (a) Any student who is already receiving any Bursary or Mahapola will be removed from the selection list for the award.
   (b) Priority will be given to students with higher GPA for the Physics courses at Level 3.

**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 OCAM requirement is obtained.

BYU3500, BYU3301, BYU4300, BYU4301, BYU4302, BYU4303, BYU5301, BYU5304, BYU5609

**Dean’s List Awards**

Criteria are as follows:

(a) Completed the final examinations with a minimum of 24 credits (out of the total registered), with a Grade Point Average* of 3.70 or better,
(b) Completed the final examinations of the 24 credits considered in (a) above, in the year of obtaining eligibility to sit final examination,
(c) 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 24 credits considered), with no resits or repeats among the completed credits,
(d) No F Grades permitted among the total registered courses in the relevant academic year; RX grades are permitted, and,
(e) 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 24 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 24 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. Department is also offering BSc Special Degree in Botany.

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, Diploma in Environmental Science, Diploma in Plant Tissue Culture Techniques and short courses postharvest handling of fruits and vegetable, Forest Management and its conservation and plant breeding providing on the job training.

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

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

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

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Department of Chemistry

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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We are happy to announce the establishment of the Department of Computer Science as the sixth department of the faculty of Natural Sciences, to contribute the B.Sc degree programme by offering computer science as the seventh discipline. Our department is located in the third floor of the Science and Technology building, of the Colombo Regional Center.

We have 20 years of experience in offering Computer Science discipline under the Department of Mathematics and Computer Science. It is open for any student who satisfies the qualification to enter the B.Sc. Degree Programme, regardless of whether they have offered courses from the Bio Science or the Physical Science streams of the Advanced/Foundation level. The aim of the courses offered to the B.Sc degree programme is to develop competent personnel who are capable of assuming positions in the fields of Computer Science and Information Technology. In addition, we offer certificate programmes, tailor made training programmes and short courses in computer application and networking, mainly to cater the user requirements.

To enhance the practical knowledge in Computer Science the department has a modern well equipped computer science laboratory and a digital computer laboratory in the Colombo Regional Center. A computer science laboratory is also located at the Kandy Regional Center.

With the Department of Computer Science you will have the opportunity to enhance your knowledge, skills towards to Computer Science and Information Technology with the passion of life-long learning.

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Department of Mathematics

Mathematics is said to be the queen of sciences. Also it is said to be the language of sciences. The necessity of Mathematics in science is emerging. Mathematics is all around us, in everything we do in our daily lives, including mobile devices, architecture, art, money, engineering and even sports. Mathematics provides logical thinking and analytical skills which are indeed needed to solve the real life problems.

The Department of Mathematics welcomes students who wish to follow undergraduate courses in the areas of Pure Mathematics, Applied Mathematics and Statistics. The Department guides students to become independent learners that enables them to pursue lifelong learning as per the mission of the University. Our courses are well written in self-learner friendly manner and are designed in such a way that they will widen the horizons in the fields of Pure and Applied Mathematics.

Special degrees are also offered by the Department in the disciplines of Mathematics, Applied Mathematics and Statistics for the students who perform well in Level 3 and Level 4.

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. Also Department renders services by providing statistical assistance to the Faculty. Further, it engages in interdisciplinary activities such as offering Mathematics and Statistics courses to other Faculties at the OUSL and for the other Universities.

Research opportunities are also available in the areas of Mathematics leading to higher degrees.

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Department of Physics

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 programme in Applied Electronics. Further, plans are underway to conduct a Certificate in Applied Earth Sciences. Students are encouraged to explore multidisciplinary programs in Physics.

Further information is available at:
www.ou.ac.lk/home/index.php/ousl/faculties-institutes/natural-sciences/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, BSc Special Degree, Certificate in Laboratory Technology (CLT) Diploma in Laboratory Technology, the PG Dip/MSc in Environmental Science. We also offer a Advance Certificate in Wildlife Conservation & Management, Diploma in Natural Resources and Ecotourism. 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 science. 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 and administrative sectors.

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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, and Zoology in any number of sittings. Appendix 1 gives 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.

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

- Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree.
- Practical Knowledge and Application: Demonstrate the competency to use the knowledge and practical skills appropriately.
- Communication: Demonstrate the competency in communicating efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society.
- Individual Work, Team Work and Leadership: Demonstrate the competency in working independently and in groups in addressing issues in multi-disciplinary environments and completing the tasks on time through collaborative learning while exhibiting leadership.
- Creativity and Problem Solving: Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions.
- Adaptability and Flexibility: Demonstrate the ability to adapt to diverse working environments using flexible approaches and strategies.
- Information and Communication Technology Literate: Demonstrate the competency of using Information and Communication Technology for numerical and statistical analysis, and in day to day applications.
- Vision for Life: Develop the capacity to project for future through identifying self-directed goals and continuously targeting towards them for self-improvement by undertaking further studies.
- Lifelong Learning: Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges.

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 Mathematics 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 90 credits. Those without exempting qualifications are also required to register for English, Mathematics and ICT skills. A student can register only for a maximum total of 30 credits at regular courses 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 through online before the stipulated deadline using the prescribed application form.
BSc Degree Programme - S1 Structure

The BSc Degree programme is of 90 credits and offers a combination of discipline-based courses, open electives and continuing education courses at Levels (L) 3, 4 and 5

Level 3 - Register within the maximum of 30 credits

Admission requirements

At least 3 passes in science in G.C.E (A/L) or foundation courses in science or any other equivalent qualification accepted by the senate.

Compulsory requirements

Choose a minimum of 30 credits with at least 6 credits from the compulsory open electives and 8 credits each from the three chosen disciplines. If not exempted, offer LEE3410, FDE3020, CYE3200, CSE3213.

Level 3 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU3301</td>
<td>3</td>
<td>Organization of Cells and Plant Biochemistry</td>
<td>Pass in Botany/Biology in GCE A/L or Foundation Courses in Biology</td>
</tr>
<tr>
<td>BYU3500</td>
<td>5</td>
<td>Diversity of Plants</td>
<td></td>
</tr>
<tr>
<td>CYU3300</td>
<td>3</td>
<td>Basic Principles of Chemistry I</td>
<td>Pass in Chemistry in GCE A/L or Foundation Courses in Chemistry</td>
</tr>
<tr>
<td>CYU3201</td>
<td>2</td>
<td>Basic Principles of Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CYU3302</td>
<td>3</td>
<td>Basic Practical Chemistry</td>
<td></td>
</tr>
<tr>
<td>PHU3300</td>
<td>3</td>
<td>General and Thermal Physics</td>
<td>Pass in Physics in GCE A/L or Foundation Courses in Physics</td>
</tr>
<tr>
<td>PHU3301</td>
<td>3</td>
<td>Basic Electromagnetism</td>
<td></td>
</tr>
<tr>
<td>PHU3202</td>
<td>2</td>
<td>Waves in Physics</td>
<td></td>
</tr>
<tr>
<td>ZYU3500</td>
<td>5</td>
<td>Animal Life and Diversity</td>
<td>Pass in Zoology/Biology in GCE A/L or Foundation Courses in Biology</td>
</tr>
<tr>
<td>ZYU3301</td>
<td>3</td>
<td>Biogeography</td>
<td></td>
</tr>
<tr>
<td>CSU3200</td>
<td>2</td>
<td>Introduction to Computer Programming</td>
<td>03 Passes in Science subjects in GCE A/L or Foundation Courses in acceptable science disciplines</td>
</tr>
<tr>
<td>CSU3301</td>
<td>3</td>
<td>Database Design and Implementation</td>
<td>CSU3200 (EL/CR)</td>
</tr>
<tr>
<td>CSU3302</td>
<td>3</td>
<td>Data Structures &amp; Algorithms</td>
<td></td>
</tr>
</tbody>
</table>
### Applied Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADU3300</td>
<td>3</td>
<td>Vector Algebra</td>
<td>Pass in Applied Mathematics / Combined Mathematics / Higher Mathematics in GCE A/L or Foundation Courses in Mathematics</td>
</tr>
<tr>
<td>ADU3201</td>
<td>2</td>
<td>Basic Statistics</td>
<td></td>
</tr>
<tr>
<td>ADU3302</td>
<td>3</td>
<td>Differential Equations</td>
<td></td>
</tr>
</tbody>
</table>

### Pure Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEU3300</td>
<td>3</td>
<td>Mathematical Logic and Mathematical Proofs</td>
<td>Pass in Pure Mathematics / Combined Mathematics / Higher Mathematics in GCE A/L or Foundation Courses in Mathematics</td>
</tr>
<tr>
<td>PEU3301</td>
<td>3</td>
<td>Foundations of Mathematics</td>
<td>PEU3300 (EL/CR)</td>
</tr>
<tr>
<td>PEU3202</td>
<td>2</td>
<td>Vector Spaces</td>
<td>PEU3301 (EL/CR)</td>
</tr>
</tbody>
</table>

**Pre-requisite to register for courses at Level 4:** Registration for a total of 30 credits of regular courses with 8 credits each from the three disciplines, adding up to a total of 24 credits and 6 credits of open elective courses at Level 3 as specified above, and Pass in FDE3020, and exemption/EL for CYE3200 and exemption/pass/concurrent registration for LEE3410.

### Continuing Education Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYE3200</td>
<td>2</td>
<td>Mathematics for Chemistry and Biology</td>
<td></td>
</tr>
<tr>
<td>LEE3410</td>
<td>4</td>
<td>English for General Academic Purposes (EGAP)</td>
<td></td>
</tr>
<tr>
<td>FDE3020</td>
<td>0</td>
<td>Empowering for Independent Learning (EfIL)</td>
<td></td>
</tr>
<tr>
<td>CSE3213</td>
<td>2</td>
<td>Information &amp; Communication Technology</td>
<td></td>
</tr>
</tbody>
</table>

**Total requirement:** 8 credits of continuing education courses including FDE3020

### Open Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLU3261</td>
<td>2</td>
<td>Understanding Law</td>
<td></td>
</tr>
<tr>
<td>MSU3208</td>
<td>2</td>
<td>Managing Your Work and People</td>
<td></td>
</tr>
<tr>
<td>DSU3298</td>
<td>2</td>
<td>Introduction to Sri Lankan Society</td>
<td></td>
</tr>
<tr>
<td>FNU3200</td>
<td>2</td>
<td>Ethics in Science &amp; Technology</td>
<td></td>
</tr>
<tr>
<td>ADU3218</td>
<td>2</td>
<td>Basic Statistics</td>
<td>For Mathematics Students, not offering Applied Mathematics (i.e., it is mutually exclusive with ADU3201)</td>
</tr>
<tr>
<td>FNU3201*CS</td>
<td>2</td>
<td>Communication Skills</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** ADU3218 is for Mathematics students not offering Applied Mathematics.

### Abbreviations:

- `*` - Compulsory for the relevant discipline specialization.
- `AM` - Compulsory for Specialization in Applied Mathematics.
- `M` - Compulsory for Specialization in Mathematics.
- `S` - Compulsory for Specialization in Statistics.
- `^` - Offered only for 4-year Special degree.
- `NM` - Students not offering both Applied Mathematics and Pure Mathematics in 3-year degree
- `CS` - Compulsory for specialization in Computer Science
- `**` - Offered only for 3-year degree

*NM - Compulsory for the relevant discipline specialization students not offering both Applied Mathematics & Pure Mathematics.
Level 4 – Register within the maximum of 30 credits

Pre-requisite to register for courses at Level 4

Registration for a total of 30 credits of regular courses with 8 credits each from the three disciplines, adding up to a total of 24 credits and 6 credits of open elective courses at Level 3 as specified above, and Pass in FDE3020, and exemption/EL for CYE3200 and exemption/pass/concurrent registration for LEE3410.

Level 4 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU4300</td>
<td>3</td>
<td>Plant Physiology</td>
<td>BYU3301 (EL/CR)</td>
</tr>
<tr>
<td>BYU4301</td>
<td>3</td>
<td>Genetics and Evolution</td>
<td></td>
</tr>
<tr>
<td>BYU4302</td>
<td>3</td>
<td>Systematics of Higher Plants and Animals</td>
<td>BYU3500 (EL/CR)</td>
</tr>
<tr>
<td>BYU4303</td>
<td>3</td>
<td>Principles of Microbiology</td>
<td></td>
</tr>
<tr>
<td>CYU4300</td>
<td>3</td>
<td>Inorganic Chemistry</td>
<td></td>
</tr>
<tr>
<td>CYU4301</td>
<td>3</td>
<td>Concepts in Chemistry</td>
<td>{CYU3300 &amp; CYU3201} (EL)</td>
</tr>
<tr>
<td>CYU4303</td>
<td>3</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CYU4302</td>
<td>3</td>
<td>Practical Chemistry II</td>
<td>CYU3302 (EL) and {CYU4301 &amp; CYU4303} (EL/CR)</td>
</tr>
<tr>
<td>PHU4300</td>
<td>3</td>
<td>Modern Physics</td>
<td>PHU4303 (EL/CR)</td>
</tr>
<tr>
<td>PHU4301</td>
<td>3</td>
<td>Electronics</td>
<td></td>
</tr>
<tr>
<td>PHU4302</td>
<td>3</td>
<td>Optics</td>
<td>{PHU3300 &amp; PHU3301 &amp; PHU3202} (EL/CR)</td>
</tr>
<tr>
<td>PHU4303</td>
<td>3</td>
<td>Mathematical Methods for Physics</td>
<td></td>
</tr>
<tr>
<td>ZYU4300</td>
<td>3</td>
<td>Animal Form and Function</td>
<td></td>
</tr>
<tr>
<td>ZYU4301</td>
<td>3</td>
<td>Ecology</td>
<td>ZYU3500 (EL/CR)</td>
</tr>
<tr>
<td>ZYU4302</td>
<td>3</td>
<td>Animal Development</td>
<td></td>
</tr>
<tr>
<td>ZYU4303</td>
<td>3</td>
<td>Animal Behaviour</td>
<td></td>
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</tbody>
</table>

Total requirement: A total of 30 credits of courses with 12 credits each from the two main disciplines and 6 credits from the third minor discipline.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSU4300</td>
<td>3</td>
<td>Operating Systems</td>
<td></td>
</tr>
<tr>
<td>CSU4301</td>
<td>3</td>
<td>Object Oriented Programming</td>
<td>{CSU3200 &amp; CSU3301 &amp; CSU3302} (EL/CR)</td>
</tr>
<tr>
<td>CSU4302</td>
<td>3</td>
<td>System Analysis &amp; Software Engineering</td>
<td></td>
</tr>
<tr>
<td>CSU4303</td>
<td>3</td>
<td>Computer Networks</td>
<td></td>
</tr>
<tr>
<td>ADU4300</td>
<td>3</td>
<td>Statistical Distribution Theory</td>
<td>ADU3201 (EL/CR)</td>
</tr>
<tr>
<td>ADU4301</td>
<td>3</td>
<td>Newtonian Mechanics I</td>
<td>{ADU3300 (EL/CR) &amp; ADU 3302 (EL)}</td>
</tr>
<tr>
<td>ADU4302</td>
<td>3</td>
<td>Vector Calculus</td>
<td>ADU3300 (EL)</td>
</tr>
<tr>
<td>ADU4303</td>
<td>3</td>
<td>Applied Linear Algebra and Differential Equations</td>
<td>ADU3302 (EL)</td>
</tr>
</tbody>
</table>

**Note:** ADU4301 and ADU4303 are compulsory for those offering Applied Mathematics at Level 4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>PEU4300</td>
<td>3</td>
<td>Real Analysis I</td>
<td>{PEU3300 &amp; PEU3301} (EL)</td>
</tr>
<tr>
<td>PEU4301</td>
<td>3</td>
<td>Real Analysis II</td>
<td>PEU4300 (EL/CR)</td>
</tr>
<tr>
<td>PEU4302</td>
<td>3</td>
<td>Linear Algebra</td>
<td>PEU3202 (EL)</td>
</tr>
<tr>
<td>PEU4303</td>
<td>3</td>
<td>Group Theory I</td>
<td>PEU3301 (EL/CR)</td>
</tr>
</tbody>
</table>

**Note:** PEU4300 and PEU4302 are compulsory for those offering Pure Mathematics at Level 4
Level 5 – Register within the maximum of 30 credits

Pre-requisite to register for courses at Level 5:
Registered for a total of 30 credits of courses with 12 credits each from the two main disciplines and 6 credits from the third minor discipline at Level 4 as specified above, and Pass in LEE3410, CSE3213 and CYE3200.

Level 5 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU5300</td>
<td>3</td>
<td>Environmental and Applied Microbiology</td>
<td>BYU4303 (EL)</td>
</tr>
<tr>
<td>BYU5301</td>
<td>3</td>
<td>Plant Pathology</td>
<td>BYU4303 (EL)</td>
</tr>
<tr>
<td>BYU5302</td>
<td>3</td>
<td>Plant Growth and Development</td>
<td>BYU4300 (EL)</td>
</tr>
<tr>
<td>BYU5303</td>
<td>3</td>
<td>Plants and Man</td>
<td>BYU3500 (Pass)</td>
</tr>
<tr>
<td>BYU5304</td>
<td>3</td>
<td>Soils and Plant Growth</td>
<td>BYU3500 (EL)</td>
</tr>
<tr>
<td>BYU5305**</td>
<td>3</td>
<td>Literature Review in Botany</td>
<td>(Selection by Department)</td>
</tr>
<tr>
<td>BYU5306</td>
<td>3</td>
<td>Plant Breeding</td>
<td>BYU4301 (EL/CR)</td>
</tr>
<tr>
<td>BYU5308</td>
<td>3</td>
<td>Postharvest Technology of Fresh Produce</td>
<td>BYU4300 (EL)</td>
</tr>
<tr>
<td>BYU5609</td>
<td>6</td>
<td>Horticulture</td>
<td>-</td>
</tr>
<tr>
<td>BYU5610**</td>
<td>6</td>
<td>Research Project in Botany</td>
<td>(Selection by Department)</td>
</tr>
</tbody>
</table>

Level 5
Total requirement: A total of 30 credits of courses with minimum 6 credits or maximum 18 credits of course each from a total of 24 credits from the two main disciplines and 6 credits from the minor disciplines and/or from open elective courses at Level 5.

Total requirement for Special Degree: A total of 30 credits of courses with minimum 21 credits from the subject of specialization as specified by the department and minimum 3 credits and maximum 6 credits from the other two disciplines and/or up to 6 credits of open elective courses at Level 5.
<table>
<thead>
<tr>
<th>Level 5 Courses, contd.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemistry</strong></td>
</tr>
<tr>
<td>CYU5300* 3 Organometallic Chemistry CYU4300 (EL)</td>
</tr>
<tr>
<td>CYU5301* 3 Concepts in Spectroscopy CYU4301 (EL)</td>
</tr>
<tr>
<td>CYU5302* 3 Analytical Chemistry {CYU3300 &amp; CYU3201 &amp; CYU3302} (Pass)</td>
</tr>
<tr>
<td>CYU5303* 3 Organic Chemistry II {CYU4303 &amp; CYU4302} (EL)</td>
</tr>
<tr>
<td>CYU5304* 3 Chemistry of Biomolecules CYU4303 (EL)</td>
</tr>
<tr>
<td>CYU5305 3 Natural Product Chemistry CYU5304 (EL/CR)</td>
</tr>
<tr>
<td>CYU5306 3 Biochemistry CYU5304 (EL/CR)</td>
</tr>
<tr>
<td>CYU5307 3 Chemical aspects of Food Industry CYU5304 (EL/CR) &amp; CYU 3302 (Pass)</td>
</tr>
<tr>
<td>CYU5308* 3 Instrumental Methods of Chemical Analysis CYU5302 (EL/CR)</td>
</tr>
<tr>
<td>CYU5309 3 Environmental Chemistry {CYU3300 &amp; CYU3201} (Pass)</td>
</tr>
<tr>
<td>CYU5310** 3 Literature Project in Chemistry Pass in 12 Credits of Chemistry courses in Level 4 and (Selection by Department)</td>
</tr>
<tr>
<td>CYU5311** 6 Research Project in Chemistry {CYU3300 &amp; CYU3201} (Pass)</td>
</tr>
<tr>
<td>CYU5312** 3 Industrial Chemistry I {CYU3300 &amp; CYU3201} (Pass)</td>
</tr>
<tr>
<td>CYU5313** 3 Polymer Chemistry</td>
</tr>
<tr>
<td>CYU5614* 3 Physical Chemistry I {CYU4301 &amp; CYU4302 &amp; CYU4303} (EL) and CYU5301 (EL/CR)</td>
</tr>
<tr>
<td>CYU5615* 3 Advanced Organic Chemistry {CYU4301 &amp; CYU4302 &amp; CYU4303} (EL) and CYU5303 (EL/CR)</td>
</tr>
</tbody>
</table>

CYU5310, CYU5611 Limited enrolment depending on the available facilities in the department

<table>
<thead>
<tr>
<th><strong>Physics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHU5300* 3 Nuclear and Particle Physics PHU4300 (EL/CR)</td>
</tr>
<tr>
<td>PHU5301* 3 Practical Physics {PHU4301 &amp; PHU5303} (EL/CR)</td>
</tr>
<tr>
<td>PHU5302 3 Atmospheric Physics -</td>
</tr>
<tr>
<td>PHU5303* 3 Data Acquisition and Signal Processing PHU4301 (EL/CR)</td>
</tr>
<tr>
<td>PHU5304 3 Biophysics -</td>
</tr>
<tr>
<td>PHU5305 3 Essentials of Geology -</td>
</tr>
<tr>
<td>PHU5306 3 Applied Geology PHU5305 (EL/CR)</td>
</tr>
<tr>
<td>PHU5307 3 Medical Physics -</td>
</tr>
<tr>
<td>PHU5308 3 Fundamentals of Geophysics PHU5305 (EL/CR)</td>
</tr>
<tr>
<td>PHU5309 3 Literature Survey Project in Physics (Selection by Department)</td>
</tr>
<tr>
<td>PHU5610 6 Research Project in Physics (Selection by Department)</td>
</tr>
<tr>
<td>PHU5311 3 Astronomy -</td>
</tr>
<tr>
<td>PHU5312* 3 Solid State Physics PHU4300 (EL/CR)</td>
</tr>
<tr>
<td>PHU5313* 3 Advanced Electromagnetism PHU4303 (EL/CR)</td>
</tr>
<tr>
<td>PHU5314* 3 Thermodynamics PHU4303 (EL/CR)</td>
</tr>
<tr>
<td>PHU5315 3 Renewable Energy Sources -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Zoology</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ZYU5300 3 Aquatic Biology -</td>
</tr>
<tr>
<td>ZYU5301 3 Fish Biology and Fishery Management -</td>
</tr>
</tbody>
</table>
### Level 5 Courses, contd.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZYU5302</td>
<td>3</td>
<td>Conservation &amp; Management of Biodiversity</td>
<td></td>
</tr>
<tr>
<td>ZYU5303</td>
<td>3</td>
<td>Environmental Toxicology</td>
<td></td>
</tr>
<tr>
<td>ZYU5304</td>
<td>3</td>
<td>Parasitology</td>
<td></td>
</tr>
<tr>
<td>ZYU5305</td>
<td>3</td>
<td>Human Biology</td>
<td></td>
</tr>
<tr>
<td>ZYU5306</td>
<td>3</td>
<td>Entomology</td>
<td></td>
</tr>
<tr>
<td>ZYU5307</td>
<td>3</td>
<td>Mammalian Biology</td>
<td></td>
</tr>
<tr>
<td>ZYU5608</td>
<td>6</td>
<td>Zoology Project</td>
<td>ADU5318 (EL/CR)</td>
</tr>
<tr>
<td>ZYU5309</td>
<td>3</td>
<td>Paleobiology</td>
<td></td>
</tr>
<tr>
<td>ZYU5310*</td>
<td>3</td>
<td>Concepts and Application on Evolutionary Biology</td>
<td>BYU4301 (EL)</td>
</tr>
<tr>
<td>ZYU5311*</td>
<td>3</td>
<td>Literature Review in Zoology</td>
<td></td>
</tr>
<tr>
<td>ZYU5313*</td>
<td>3</td>
<td>Research Methodology</td>
<td></td>
</tr>
</tbody>
</table>

#### Computer Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSU5300</td>
<td>03</td>
<td>IT Project Management</td>
<td>CSU4302 (EL/CR) + 3 credits of L4 CS courses (EL/CR)</td>
</tr>
<tr>
<td>CSU5301</td>
<td>03</td>
<td>Software Quality Assurance</td>
<td></td>
</tr>
<tr>
<td>CSU5302</td>
<td>03</td>
<td>Web Technologies</td>
<td></td>
</tr>
<tr>
<td>CSU5303</td>
<td>03</td>
<td>Management Information Systems</td>
<td></td>
</tr>
<tr>
<td>CSU5304**</td>
<td>03</td>
<td>Mathematics for Computing</td>
<td></td>
</tr>
<tr>
<td>CSU5305</td>
<td>03</td>
<td>Theory of Computing</td>
<td></td>
</tr>
<tr>
<td>CSU5306</td>
<td>03</td>
<td>Digital Electronics</td>
<td></td>
</tr>
<tr>
<td>CSU5307</td>
<td>03</td>
<td>Data Communication</td>
<td></td>
</tr>
<tr>
<td>CSU5308</td>
<td>03</td>
<td>Artificial Intelligence</td>
<td></td>
</tr>
<tr>
<td>CSU5309</td>
<td>03</td>
<td>Information Security and Cryptography</td>
<td></td>
</tr>
<tr>
<td>CSU5310</td>
<td>03</td>
<td>Computer Architecture</td>
<td></td>
</tr>
<tr>
<td>CSU5311</td>
<td>03</td>
<td>Computer Graphics</td>
<td></td>
</tr>
<tr>
<td>CSU5320</td>
<td>03</td>
<td>Project in Computer Science</td>
<td>12 credits of L4 CS courses (pass) and CSU5300 (EL/CR) and (EL/CR) in relevant L5 courses to be decided in consultation with prospective academic supervisor</td>
</tr>
</tbody>
</table>

#### Applied Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADU5300*</td>
<td>3</td>
<td>Linear Programming</td>
<td>Pass in Combined Mathematics / Higher Mathematics in GCE A/L / Foundation Courses in Mathematics, or Equivalent</td>
</tr>
<tr>
<td>ADU5301</td>
<td>3</td>
<td>Regression Analysis I</td>
<td>ADU3201 (EL)</td>
</tr>
<tr>
<td>ADU5302**</td>
<td>3</td>
<td>Mathematical Methods</td>
<td>ADU3302 (EL)</td>
</tr>
<tr>
<td>ADU5303</td>
<td>3</td>
<td>Newtonian Mechanics II</td>
<td>ADU4301 (EL)</td>
</tr>
<tr>
<td>ADU5304**</td>
<td>3</td>
<td>Operational Research</td>
<td>ADU5300 (EL/CR)</td>
</tr>
<tr>
<td>ADU5305</td>
<td>3</td>
<td>Statistical Inference</td>
<td>ADU4300 (EL/CR)</td>
</tr>
<tr>
<td>ADU5306</td>
<td>3</td>
<td>Fluid Mechanics</td>
<td>ADU4302 (EL)</td>
</tr>
<tr>
<td>ADU5307*</td>
<td>3</td>
<td>Numerical Methods</td>
<td>ADU3302 (EL)</td>
</tr>
</tbody>
</table>
Level 5 Courses, contd.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADU5308</td>
<td>3</td>
<td>Graph Theory</td>
<td>Pass in Combined Mathematics / Higher Mathematics in GCE A/L / Foundation Courses in Mathematics, or Equivalent</td>
</tr>
<tr>
<td>ADU5309</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>(ADU3201 or ADU3218 or ADU5318) (EL/CR)</td>
</tr>
<tr>
<td>ADU5310°</td>
<td>3</td>
<td>Time Series Analysis</td>
<td>ADU5301 (EL/CR)</td>
</tr>
<tr>
<td>ADU5311°</td>
<td>3</td>
<td>Regression Analysis II</td>
<td>ADU5301 (EL/CR)</td>
</tr>
<tr>
<td>ADU5312</td>
<td>3</td>
<td>Data Mining Techniques</td>
<td>(Only for Statistics Special)</td>
</tr>
<tr>
<td>ADU5313</td>
<td>3</td>
<td>Generalized Linear Models</td>
<td>(Only for Statistics Special)</td>
</tr>
<tr>
<td>ADU5314</td>
<td>3</td>
<td>Sampling Techniques</td>
<td>ADU5305 (EL/CR)</td>
</tr>
<tr>
<td>ADU5315°**</td>
<td>6</td>
<td>Project in Mathematics</td>
<td>Limited Registration</td>
</tr>
</tbody>
</table>

**Note:** ADU5302 is compulsory for those offering Applied Mathematics at Level 5.

**Pure Mathematics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEU5300 °M</td>
<td>3</td>
<td>Riemann Integration</td>
<td>PEU4301 (EL)</td>
</tr>
<tr>
<td>PEU5301</td>
<td>3</td>
<td>Ring Theory</td>
<td>PEU4303 (EL)</td>
</tr>
<tr>
<td>PEU5302</td>
<td>3</td>
<td>Combinatorics</td>
<td>Pass in Combined Mathematics / Higher Mathematics in GCE A/L / Foundation Courses in Mathematics, or Equivalent</td>
</tr>
<tr>
<td>PEU5303 °M</td>
<td>3</td>
<td>Number Theory</td>
<td>PEU3301 (EL)</td>
</tr>
<tr>
<td>PEU5304 °M</td>
<td>3</td>
<td>Introduction to Complex Analysis</td>
<td>{PEU4300 &amp; PEU4301} (EL)</td>
</tr>
<tr>
<td>PEU5305 °M</td>
<td>3</td>
<td>Complex Analysis I</td>
<td>PEU5304 (EL/CR)</td>
</tr>
<tr>
<td>PEU5306</td>
<td>3</td>
<td>Introduction to Dynamical Systems</td>
<td>{PEU4300 &amp; PEU4301} (EL)</td>
</tr>
<tr>
<td>PEU5307</td>
<td>3</td>
<td>Cryptography</td>
<td>PEU5303 (EL/CR)</td>
</tr>
</tbody>
</table>

**Note:** PEU5304 is compulsory for those offering Pure Mathematics at Level 5.

**Open Elective Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADU5318</td>
<td>3</td>
<td>Bio Statistics (Non-Mathematics Students)</td>
<td>CYE3200 (EL)</td>
</tr>
<tr>
<td>ADU5319</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>{ADU3201 / ADU3218 / ADU5318} (EL/CR)</td>
</tr>
<tr>
<td>ADU5320</td>
<td>3</td>
<td>Introduction to MATLAB Software</td>
<td>(For Mathematics Students only).</td>
</tr>
<tr>
<td>BYU5318</td>
<td>3</td>
<td>Environmental Studies</td>
<td>-</td>
</tr>
<tr>
<td>PHU5318</td>
<td>3</td>
<td>Electronics for Biology Students</td>
<td>(For Non-Physics students only)</td>
</tr>
</tbody>
</table>

**Abbreviations:**

* - Compulsory for the relevant discipline specialization.
* AM - Compulsory for Specialization in Applied Mathematics.
* M - Compulsory for Specialization in Mathematics.
* S - Compulsory for Specialization in Statistics.
* ^ - Offered only for 4-year Special degree.
NM - Students not offering both Applied Mathematics and Pure Mathematics
** - Offered only for 3-year degree
Evaluation
For all the courses evaluation procedure involves both continuous assessments and final examinations. Overall Continuous Assessment Mark (OCAM) to be considered for the final examination of a course; a student should score a minimum of 35% for its continuous assessments, which will be valid for two 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.

\[
\begin{align*}
\text{If } Y & \geq 40, \text{ then } Z = 0.4 \times X + 0.6 \times Y \\
\text{If } 30 \leq Y < 40, \text{ then } Z &= 0.4 \times X + 0.6 \times Y, \text{ subject to a maximum of 40.} \\
\text{If } Y & < 30, \text{ then } Z = Y
\end{align*}
\]

The overall assessment mark (Z%) of any course offered by the Faculty of Humanities & Social Sciences, except for the course LEE3410: English for General Academic Purposes shall be computed as follows:

\[
\begin{align*}
\text{If } Y & \geq 40, \text{ then } Z = 0.3 \times X + 0.7 \times Y \\
\text{If } Y & \geq 35 \text{ and } Y < 39, \text{ then } Z = 0.3 \times X + 0.7 \times Y \text{ subject to a maximum of 40} \\
\text{If } Y & < 34, Z = Y
\end{align*}
\]

The overall assessment mark (Z%) of the course LEE3410: English for General Academic Purposes shall be determined by the Faculty of Humanities & Social Sciences as follows:

\[
\begin{align*}
\text{If } Y & \geq 40, \text{ then } Z = 0.3 \times X + 0.7 \times Y \\
\text{If } Y & \geq 35 \text{ and } Y < 39, \text{ then } Z = 0.3 \times X + 0.7 \times Y \text{ subject to a maximum of 40} \\
\text{If } Y & < 34, Z = Y
\end{align*}
\]

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+, C, C-, D+, D, and E 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 90 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 x 4.00 = 24.00</td>
</tr>
<tr>
<td>A</td>
<td>15</td>
<td>15 x 4.00 = 60.00</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>20 x 3.00 = 60.00</td>
</tr>
<tr>
<td>C</td>
<td>43</td>
<td>43 x 2.00 = 86.00</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>6 x 1.00 = 6.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td></td>
</tr>
</tbody>
</table>

GPA = 236.00/90 = 2.62
BSc Degree (S1 Structure) Award Criteria (90 credits)

The BSc degree will be awarded in accordance with the provisions of the OUSL Regulation and Rule 1.1.1.1(g). 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 Division, before the date stipulated by the Faculty.

Minimum credit requirements

- Requirements in courses adding up to a total of 84 credits comprising:
  - 30 credits at L3 with 8 credits in each of the three chosen disciplines and 6 credits of open electives,
  - 30 credits at L4 with 12 credits in each of the two main disciplines and 6 credits from the remaining discipline chosen at L3,
  - 24 credits at L5 minimum 6 credits or maximum 18 from each of the two main disciplines and 06 credit from third discipline and/or open electives at Level 05,
  - At least D+ grades for the remaining 06 credits of courses at Level 05, and
  - Minimum C grade or exemption in CYE3200 for Chemistry and Biology students,
  - Minimum C grade or exemption in LEE3410. and CSE3213

Pass

- C grades or better in 84 credits (from among the 90 credits above) with 30 credits at L3, 30 credits at L4 and 24 credit at L5,
- Minimum D+ grades in the remaining 6 credits at Level 5
- Minimum GPA of 2.00,
- Complete the relevant requirements within a period of 9 academic years.

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

<table>
<thead>
<tr>
<th>Second Class (Lower Division) Honours</th>
<th>C grades or better in 84 credits and at least D+ grades for the remaining 06 credits of courses at Level 5,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B grades or better in at least 45 credits,</td>
</tr>
<tr>
<td></td>
<td>Minimum GPA of 3.00.</td>
</tr>
<tr>
<td>Second Class (Upper Division) Honours</td>
<td>C grades or better in 84 credits and at least D+ grades for the remaining 06 credits of courses at Level 5,</td>
</tr>
<tr>
<td></td>
<td>B+ grades or better in at least 45 credits,</td>
</tr>
<tr>
<td></td>
<td>Minimum GPA of 3.30.</td>
</tr>
<tr>
<td>First Class Honours</td>
<td>C grades or better in 84 credits and at least D+ grades in the remaining 06 credits of courses at Level 5,</td>
</tr>
<tr>
<td></td>
<td>A grades or better in 45 credits,</td>
</tr>
<tr>
<td></td>
<td>Minimum GPA of 3.70.</td>
</tr>
</tbody>
</table>
**BSc Degree Programme - Course Fees**

The Registration fee and other fees relevant for 2019/2020, 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. 2100.00 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>
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**Table 9 Practical Fees - to be paid only by those students offering the relevant courses.**

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<td>Rs.1500.00</td>
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</table>
BSc Special Degree Programme (SS Structure)

The BSc Special Degree Programme is of 120 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 60 credits at Levels 3 and 4, completed within 3 years from initial registration; with minimum C grades for the 30 credits at Level 3 and 12 credits of the subject of specialization at Level 4 with minimum GPA of 3.00 for the 42 credits at Levels 3 and 4 in the subject of specialization; minimum of B grades adding up to 15 credits out of a total of 20 credits in the subject of specialization at Levels 3 and 4 taken together and minimum C grade or exemption for the course CYE3200 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 30 credits from L5.

Level 5 Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU5300*</td>
<td>3</td>
<td>Environmental and Applied Microbiology</td>
<td>BYU4303 (EL)</td>
</tr>
<tr>
<td>BYU5301*</td>
<td>3</td>
<td>Plant Pathology</td>
<td>BYU4303 (EL)</td>
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<tr>
<td>BYU5302</td>
<td>3</td>
<td>Plant Growth and Development</td>
<td>BYU4300 (EL)</td>
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<tr>
<td>BYU5303</td>
<td>3</td>
<td>Plants and Man</td>
<td>BYU3500 (Pass)</td>
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<tr>
<td>BYU5304*</td>
<td>3</td>
<td>Soils and Plant Growth</td>
<td>BYU3500 (EL)</td>
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<tr>
<td>BYU5305**</td>
<td>3</td>
<td>Literature Review in Botany</td>
<td>(Selection by Department)</td>
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<tr>
<td>BYU5306*</td>
<td>3</td>
<td>Plant Breeding</td>
<td>BYU4301 (EL/CR)</td>
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<tr>
<td>BYU5308</td>
<td>3</td>
<td>Postharvest Technology of Fresh Produce</td>
<td>BYU4300 (EL)</td>
</tr>
<tr>
<td>BYU5609</td>
<td>6</td>
<td>Horticulture</td>
<td>-</td>
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<td>BYU5610**</td>
<td>6</td>
<td>Research Project in Botany</td>
<td>(Selection by Department)</td>
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### Level 5 Courses, contd.

**Chemistry**

<table>
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<tr>
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<th>Credits</th>
<th>Title</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>CYU5300*</td>
<td>3</td>
<td>Organometallic Chemistry</td>
<td>CYU4300 (EL)</td>
</tr>
<tr>
<td>CYU5301*</td>
<td>3</td>
<td>Concepts in Spectroscopy</td>
<td>CYU4301 (EL)</td>
</tr>
<tr>
<td>CYU5302*</td>
<td>3</td>
<td>Analytical Chemistry</td>
<td>{CYU3300 &amp; CYU3201 &amp; CYU3302} (Pass)</td>
</tr>
<tr>
<td>CYU5303*</td>
<td>3</td>
<td>Organic Chemistry II</td>
<td>{CYU4303 &amp; CYU4302} (EL)</td>
</tr>
<tr>
<td>CYU5304*</td>
<td>3</td>
<td>Chemistry of Biomolecules</td>
<td>CYU4303 (EL)</td>
</tr>
<tr>
<td>CYU5305</td>
<td>3</td>
<td>Natural Product Chemistry</td>
<td>CYU5304 (EL/CR)</td>
</tr>
<tr>
<td>CYU5306</td>
<td>3</td>
<td>Biochemistry</td>
<td>CYU5304 (EL/CR)</td>
</tr>
<tr>
<td>CYU5307</td>
<td>3</td>
<td>Chemical aspects of Food Industry</td>
<td>CYU5304 (EL/CR) &amp; CYU 3302 (Pass)</td>
</tr>
<tr>
<td>CYU5308*</td>
<td>3</td>
<td>Instrumental Methods of Chemical Analysis</td>
<td>CYU5302 (EL/CR) or CMU3123 (EL)</td>
</tr>
<tr>
<td>CYU5309</td>
<td>3</td>
<td>Environmental Chemistry</td>
<td>{CYU3300 &amp; CYU3201} (Pass)</td>
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<tr>
<td>CYU5310**</td>
<td>3</td>
<td>Literature Project in Chemistry</td>
<td>Pass in 12 Credits of Chemistry courses in Level 4 and (Selection by Department)</td>
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<tr>
<td>CYU5611**</td>
<td>6</td>
<td>Research Project in Chemistry</td>
<td>{CYU3300 &amp; CYU3201} (Pass)</td>
</tr>
<tr>
<td>CYU5312**</td>
<td>3</td>
<td>Industrial Chemistry I</td>
<td>{CYU3300 &amp; CYU3201} (Pass)</td>
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<tr>
<td>CYU5313**</td>
<td>3</td>
<td>Polymer Chemistry</td>
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</tr>
<tr>
<td>CYU5614***</td>
<td>6</td>
<td>Physical Chemistry I</td>
<td>{CYU4301 &amp; CYU4302 &amp; CYU4303} (EL) and CYU5301 (EL/CR)</td>
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<tr>
<td>CYU5615***</td>
<td>6</td>
<td>Advanced Organic Chemistry</td>
<td>{CYU4301 &amp; CYU4302 &amp; CYU4303} (EL) and CYU5303 (EL/CR)</td>
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CYU5310, CYU5611 Limited enrolment depending on the available facilities in the department

**Physics**

<table>
<thead>
<tr>
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<th>Prerequisites</th>
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<tbody>
<tr>
<td>PHU5300*</td>
<td>3</td>
<td>Nuclear and Particle Physics</td>
<td>PHU4300 (EL/CR)</td>
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<tr>
<td>PHU5301*</td>
<td>3</td>
<td>Practical Physics</td>
<td>{PHU4301 &amp; PHU5303} (EL/CR)</td>
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<td>PHU5302</td>
<td>3</td>
<td>Atmospheric Physics</td>
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<tr>
<td>PHU5303*</td>
<td>3</td>
<td>Data Acquisition and Signal Processing</td>
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<tr>
<td>PHU5304</td>
<td>3</td>
<td>Biophysics</td>
<td></td>
</tr>
<tr>
<td>PHU5305</td>
<td>3</td>
<td>Essentials of Geology</td>
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</tr>
<tr>
<td>PHU5306</td>
<td>3</td>
<td>Applied Geology</td>
<td>PHU5305 (EL/CR)</td>
</tr>
<tr>
<td>PHU5307</td>
<td>3</td>
<td>Medical Physics</td>
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<tr>
<td>PHU5308</td>
<td>3</td>
<td>Fundamentals of Geophysics</td>
<td>PHU5305 (EL/CR)</td>
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<td>PHU5309</td>
<td>3</td>
<td>Literature Survey Project in Physics</td>
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<td>Research Project in Physics</td>
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<tr>
<td>PHU5311</td>
<td>3</td>
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<tr>
<td>PHU5312*</td>
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**Zoology**

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<td>ZYU5301</td>
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<td>Fish Biology and Fishery Management</td>
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### Level 5 Courses, contd.

<table>
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<tr>
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<td>Conservation &amp; Management of Biodiversity</td>
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<td>ZYU5303</td>
<td>Environmental Toxicology</td>
<td>3</td>
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<tr>
<td>ZYU5304</td>
<td>Parasitology</td>
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<tr>
<td>ZYU5305</td>
<td>Human Biology</td>
<td>3</td>
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<td>ZYU5306</td>
<td>Entomology</td>
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<td>ZYU5307</td>
<td>Mammalian Biology</td>
<td>3</td>
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<td>ZYU5308</td>
<td>Zoology Project</td>
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<td>Paleobiology</td>
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<td>ZYU5310</td>
<td>Concepts and Application on Evolutionary Biology</td>
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<td>Research Methodology</td>
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#### Applied Mathematics

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<td>Linear Programming</td>
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<td>ADU5301</td>
<td>Regression Analysis I</td>
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<td>ADU3201 (EL)</td>
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<tr>
<td>ADU5302</td>
<td>Mathematical Methods</td>
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<td>ADU5303</td>
<td>Newtonian Mechanics II</td>
<td>3</td>
<td>ADU4301 (EL)</td>
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<td>ADU5304</td>
<td>Operational Research</td>
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<td>ADU5300 (EL/CR)</td>
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<tr>
<td>ADU5305</td>
<td>Statistical Inference</td>
<td>3</td>
<td>ADU4300 (EL/CR)</td>
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<td>ADU5306</td>
<td>Fluid Mechanics</td>
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<td>ADU4302 (EL)</td>
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<tr>
<td>ADU5307</td>
<td>Numerical Methods</td>
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## Level 5 Courses, contd.

<table>
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<th>Course Code</th>
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<th>Pre-Requisites</th>
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<tbody>
<tr>
<td>ADU5308</td>
<td>3</td>
<td>Graph Theory</td>
<td>Pass in Applied Mathematics / Combined Mathematics / Higher Mathematics in GCE A/L or Foundation Courses in Mathematics</td>
</tr>
<tr>
<td>ADU5309</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>{ADU3201 or ADU3218 or ADU5318} (EL/CR)</td>
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<tr>
<td>ADU5310*</td>
<td>3</td>
<td>Time Series Analysis</td>
<td>ADU5301 (EL/CR)</td>
</tr>
<tr>
<td>ADU5311*</td>
<td>3</td>
<td>Regression Analysis II</td>
<td>ADU5301 (EL/CR)</td>
</tr>
<tr>
<td>ADU5312</td>
<td>3</td>
<td>Data Mining Techniques</td>
<td>(Only for Statistics Special)</td>
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<tr>
<td>ADU5313</td>
<td>3</td>
<td>Generalized Linear Models</td>
<td>(Only for Statistics Special)</td>
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<tr>
<td>ADU5314</td>
<td>3</td>
<td>Sampling Techniques</td>
<td>ADU5305 (EL/CR)</td>
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<tr>
<td>ADU5615</td>
<td>6</td>
<td>Project in Mathematics</td>
<td>(Only for Mathematics General degree) and (Selection by Department)</td>
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</table>

**Note:** ADU5302 compulsory for those offering Applied Mathematics at Level 5 in S1 Structure.

### Pure Mathematics

<table>
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<th>Pre-Requisites</th>
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<td>PEU5300*</td>
<td>3</td>
<td>Riemann Integration</td>
<td>PEU4301 (EL)</td>
</tr>
<tr>
<td>PEU5301</td>
<td>3</td>
<td>Ring Theory</td>
<td>PEU4303 (EL)</td>
</tr>
<tr>
<td>PEU5302</td>
<td>3</td>
<td>Combinatorics</td>
<td>Pass in Applied Mathematics / Combined Mathematics / Higher Mathematics in GCE A/L or Foundation Courses in Mathematics</td>
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<tr>
<td>PEU5303*</td>
<td>3</td>
<td>Number Theory</td>
<td>PEU3301 (EL)</td>
</tr>
<tr>
<td>PEU5304*</td>
<td>3</td>
<td>Introduction to Complex Analysis</td>
<td>{PEU4300 &amp; PEU4301} (EL)</td>
</tr>
<tr>
<td>PEU5305*</td>
<td>3</td>
<td>Complex Analysis I</td>
<td>PEU5304 (EL/CR)</td>
</tr>
<tr>
<td>PEU5306</td>
<td>3</td>
<td>Introduction to Dynamical Systems</td>
<td>{PEU4300 &amp; PEU4301} (EL)</td>
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<tr>
<td>PEU5307</td>
<td>3</td>
<td>Cryptography</td>
<td>PEU5303 (EL/CR)</td>
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**Note:** PEU5304 compulsory for those offering Pure Mathematics at Level 5 in S1 Structure.

### Open Elective Courses

<table>
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<th>Pre-Requisites</th>
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<tbody>
<tr>
<td>ADU5318</td>
<td>3</td>
<td>Bio Statistics (Non-Mathematics Students)</td>
<td>CYE3200 (EL)</td>
</tr>
<tr>
<td>ADU5319</td>
<td>3</td>
<td>Design and Analysis of Experiments</td>
<td>{ADU3201 / ADU3218 / ADU5318} (EL/CR)</td>
</tr>
<tr>
<td>ADU5320</td>
<td>3</td>
<td>Introduction to MATLAB Software</td>
<td>(For Mathematics Students only).</td>
</tr>
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<td>BYU5318</td>
<td>3</td>
<td>Environmental Studies</td>
<td>-</td>
</tr>
<tr>
<td>PHU5318</td>
<td>3</td>
<td>Electronics for Biology Students</td>
<td>(For Non-Physics students only)</td>
</tr>
</tbody>
</table>

**Abbreviations:**

* - Compulsory for the relevant discipline specialization.

*AM - Compulsory for Specialization in Applied Mathematics.

*M - Compulsory for Specialization in Mathematics.

*S - Compulsory for Specialization in Statistics.

*^ - Offered only for 4-year Special degree.

** - Offered only for 3-year degree.
Admission requirements for Level 6
Valid OCAM/concurrent registration in the 30 credits each of specified compulsory course requirements at L6.

**Compulsory Requirements**
Select a maximum of 30 credits.

**Level 6 Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
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<tbody>
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<td>3</td>
<td>Plant Molecular Biology</td>
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<td>3</td>
<td>Bioinformatics</td>
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</tr>
<tr>
<td>BYU6302</td>
<td>3</td>
<td>Biotechnology</td>
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</tr>
<tr>
<td>BYU6303*</td>
<td>3</td>
<td>Experimental Design and Biological data Analysis</td>
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</tr>
<tr>
<td>BYU6304</td>
<td>3</td>
<td>Integrated Crop Protection</td>
<td>BYU5301 (EL)</td>
</tr>
<tr>
<td>BYU6305</td>
<td>3</td>
<td>Industrial Microbiology</td>
<td>BYU5300 (EL)</td>
</tr>
<tr>
<td>BYU6306</td>
<td>3</td>
<td>Molecular Systematics</td>
<td>BYU4302 (Pass)</td>
</tr>
<tr>
<td>BYU6307*</td>
<td>3</td>
<td>Advanced Plant Physiology and Biochemistry</td>
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</tr>
<tr>
<td>BYU6308*</td>
<td>3</td>
<td>Advanced Ecology</td>
<td></td>
</tr>
<tr>
<td>BYU6309</td>
<td>3</td>
<td>Soil Biology</td>
<td>BYU5304 (EL)</td>
</tr>
<tr>
<td>BYU6310</td>
<td>3</td>
<td>Advanced Plant Pathology</td>
<td></td>
</tr>
<tr>
<td>BYU6911*</td>
<td>9</td>
<td>Research Project in Botany(Special Degree)</td>
<td></td>
</tr>
<tr>
<td>BYU6313*</td>
<td>3</td>
<td>Special Topics in Botany</td>
<td></td>
</tr>
</tbody>
</table>

**Chemistry**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYU6600*</td>
<td>6</td>
<td>Advanced Concepts in Chemistry</td>
<td>CYU4300 (Pass) and CYU5300 (EL)</td>
</tr>
<tr>
<td>CYU6301</td>
<td>3</td>
<td>Selected topics in Inorganic Chemistry</td>
<td>CYU4300 (Pass)</td>
</tr>
<tr>
<td>CYU6302</td>
<td>3</td>
<td>Medicinal Chemistry</td>
<td>{CYU 5303 &amp; CYU5306} (EL)</td>
</tr>
<tr>
<td>CYU6303</td>
<td>3</td>
<td>Chemistry in Material Science</td>
<td>{CYU4301 &amp; CYU4300} (Pass) &amp; CYU5303 (EL)</td>
</tr>
<tr>
<td>CYU6304</td>
<td>3</td>
<td>Inorganic Spectroscopy &amp; Structural Chemistry</td>
<td>CYU4300 (Pass)</td>
</tr>
<tr>
<td>CYU6305*</td>
<td>3</td>
<td>Concepts in Industrial Chemistry</td>
<td>{CYU4300 &amp; CYU4301 &amp; CYU4303} Pass</td>
</tr>
<tr>
<td>CYU6606*</td>
<td>6</td>
<td>Advanced Experimental Chemistry</td>
<td>CYU4302 (Pass) &amp; {CYU5302 &amp; CYU5308} (EL)</td>
</tr>
</tbody>
</table>
### Level 6 Courses, contd.

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Title</th>
<th>Code</th>
<th>Type</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYU6307*</td>
<td>3</td>
<td>Industrial Training and Literature Seminar</td>
<td>CYU6305 (CR)</td>
<td>9</td>
<td>Research Project in Chemistry</td>
</tr>
<tr>
<td><strong>Physics</strong></td>
<td></td>
<td></td>
<td><strong>Zoology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHU6300*</td>
<td>3</td>
<td>Advanced Practical in Physics</td>
<td>{PHU4300 &amp; PHU5313} (EL/CR)</td>
<td><strong>Applied Mathematics</strong></td>
<td></td>
</tr>
<tr>
<td>PHU6301*</td>
<td>3</td>
<td>Advanced Solid State Physics</td>
<td>PHU5312 (EL/CR)</td>
<td>ADU6300</td>
<td>3</td>
</tr>
<tr>
<td>PHU6302*</td>
<td>3</td>
<td>Advanced Quantum Mechanics</td>
<td>PHU4300 (EL)</td>
<td>ADU6601</td>
<td>6</td>
</tr>
<tr>
<td>PHU6603*</td>
<td>6</td>
<td>Advanced Research Project in Physics</td>
<td>(For Degree with specialization in Physics)</td>
<td>ADU6602</td>
<td>6</td>
</tr>
<tr>
<td>PHU6304*</td>
<td>3</td>
<td>Advanced Electronics</td>
<td>PHU4301 (EL)</td>
<td>ADU6303</td>
<td>3</td>
</tr>
<tr>
<td>PHU6305</td>
<td>3</td>
<td>Nanophysics and its Applications</td>
<td>PHU4300 (EL)</td>
<td>ADU6304*</td>
<td>3</td>
</tr>
<tr>
<td>PHU6306*</td>
<td>3</td>
<td>Statistical Physics</td>
<td>PHU5314 (EL/CR)</td>
<td>ADU6305*</td>
<td>3</td>
</tr>
<tr>
<td>PHU6307</td>
<td>3</td>
<td>Modern Optics</td>
<td>PHU4302 (EL)</td>
<td>ADU6306</td>
<td>3</td>
</tr>
<tr>
<td>PHU6308*</td>
<td>3</td>
<td>Classical Mechanics</td>
<td>PHU4303 (EL)</td>
<td>ADU6307</td>
<td>3</td>
</tr>
<tr>
<td><strong>Zoology</strong></td>
<td></td>
<td></td>
<td><strong>Applied Mathematics</strong></td>
<td>ADU6308</td>
<td>3</td>
</tr>
<tr>
<td>ZYU6300</td>
<td>3</td>
<td>Management of Insect Pests and Vectors</td>
<td>ZYU5306 (EL)</td>
<td>ADU6309</td>
<td>3</td>
</tr>
<tr>
<td>ZYU6301</td>
<td>3</td>
<td>Aquaculture</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6302</td>
<td>3</td>
<td>Immunology</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6303</td>
<td>3</td>
<td>Molecular Biology</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6605*</td>
<td>6</td>
<td>Advanced Laboratory Techniques in Zoology</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6306</td>
<td>3</td>
<td>Ornithology</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6908*</td>
<td>9</td>
<td>Research Project in Zoology</td>
<td>ZYU5313 (EL/CR )</td>
<td>ADU6307</td>
<td>3</td>
</tr>
<tr>
<td>ZYU6309</td>
<td>3</td>
<td>Oceanography and Ocean Resources</td>
<td>-</td>
<td>Only for specialization in Statistics</td>
<td></td>
</tr>
<tr>
<td>ZYU6310</td>
<td>3</td>
<td>Wild life Management and Conservation</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZYU6311*</td>
<td>3</td>
<td>Special Topics in Zoology</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADU6300</td>
<td>3</td>
<td>Stochastic Processes</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADU6601</td>
<td>6</td>
<td>Applied Number Theory</td>
<td>PEU5303 (EL)</td>
<td>ADU6304*</td>
<td>3</td>
</tr>
<tr>
<td>ADU6602</td>
<td>6</td>
<td>Statistical Quality Control</td>
<td>-</td>
<td>ADU6305*</td>
<td>3</td>
</tr>
<tr>
<td>ADU6303</td>
<td>3</td>
<td>Actuarial Mathematics</td>
<td>-</td>
<td>ADU6306</td>
<td>3</td>
</tr>
<tr>
<td>ADU6304*</td>
<td>3</td>
<td>Computational Mathematics</td>
<td>ADU5307 (EL)</td>
<td>ADU6307</td>
<td>3</td>
</tr>
<tr>
<td>ADU6305*</td>
<td>3</td>
<td>Optimization Theory</td>
<td>ADU5300 (EL)</td>
<td>ADU6308</td>
<td>3</td>
</tr>
<tr>
<td>ADU6306</td>
<td>3</td>
<td>Mathematical Modelling</td>
<td>-</td>
<td>Only for specialization in Statistics</td>
<td></td>
</tr>
<tr>
<td>ADU6307</td>
<td>3</td>
<td>Advanced Statistical Distribution Theory</td>
<td>Only for specialization in Statistics</td>
<td>ADU6309</td>
<td>3</td>
</tr>
<tr>
<td>ADU6308</td>
<td>3</td>
<td>Survival Analysis</td>
<td>Only for specialization in Statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADU6309</td>
<td>3</td>
<td>Medical Statistics</td>
<td>Only for specialization in Statistics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ADU6610*<sup>S</sup>  
6  
Multivariate Analysis  
Only for specialization in Statistics

### ADU6611*<sup>M, AM, S</sup>  
6  
Research Project  
Only for specialization in Mathematics / Applied Mathematics / Statistics

#### Pure Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEU6300*</td>
<td>3</td>
<td>Group Theory II</td>
<td>PEU4303 (Pass)</td>
</tr>
<tr>
<td>PEU6601*</td>
<td>6</td>
<td>Point Set Topology</td>
<td>{PEU4300 &amp; PEU4301} (Pass)</td>
</tr>
<tr>
<td>PEU6602*</td>
<td>6</td>
<td>Measure Theory</td>
<td>PEU5300 (EL)</td>
</tr>
<tr>
<td>PEU6303</td>
<td>3</td>
<td>Complex Analysis II</td>
<td>PEU5305 (EL)</td>
</tr>
<tr>
<td>PEU6304</td>
<td>3</td>
<td>Functional Analysis</td>
<td>PEU6602 (EL/CR)</td>
</tr>
<tr>
<td>PEU6305</td>
<td>3</td>
<td>Introduction to Galois Theory</td>
<td>PEU5301 (EL)</td>
</tr>
<tr>
<td>PEU6306</td>
<td>3</td>
<td>Advanced Topics in Real Analysis</td>
<td>PEU4300 (Pass) and PEU5300 (EL)</td>
</tr>
</tbody>
</table>

**Note:** In case of Mathematics Special, remaining 9 credits should be selected from Pure Mathematics courses at level 5 and or level 6 with the approval of the department.

#### Open Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Pre-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FNU6300</td>
<td>3</td>
<td>GIS and Remote Sensing in Natural Resource Management</td>
<td>Only for special degree in any discipline</td>
</tr>
<tr>
<td>FNU6301</td>
<td>3</td>
<td>Environmental Degradation Management</td>
<td></td>
</tr>
<tr>
<td>FNU6302</td>
<td>3</td>
<td>Fundamentals of Environmental Impact Assessment</td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:**

- * - Compulsory for the relevant discipline specialization.
- **AM** - Compulsory for Specialization in Applied Mathematics.
- **M** - Compulsory for Specialization in Mathematics.
- **S** - Compulsory for Specialization in Statistics.
- **^** - Offered only for 4-year Special degree.
- **NM** - Compulsory for the relevant discipline specialization students not offering both Applied Mathematics & Pure Mathematics.
- **NM** - Students not offering both Applied Mathematics and Pure Mathematics in 3-year degree
- **** - Offered only for 3-year degree

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**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 35% for its continuous assessments, which will be valid for two years.

i) **Overall Mark**: For the courses offered by the Faculty of Natural Sciences, 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.

\[
\text{If } Y \geq 40, \text{ then } Z = 0.4 X + 0.6 Y \\
\text{If } 30 \leq Y < 40, \text{ then } Z = 0.4 X + 0.6 Y, \text{ subject to a maximum of 40.} \\
\text{If } Y < 30, \text{ then } Z = Y
\]

The overall assessment mark (Z%) of any course offered by the Faculty of Humanities & Social Sciences, except for the course LEE3410: English for General Academic Purposes shall be computed as follows:

\[
\text{If } Y \geq 40, \text{ then } Z = 0.3 X + 0.7 Y \\
\text{If } Y \geq 35 \text{ and } Y < 40, \text{ then } Z = 0.3 X + 0.7 Y, \text{ subject to a maximum of 40.} \\
\text{If } Y < 34, \text{ then } Z = Y
\]

The overall assessment mark (Z%) of the course LEE3410: English for General Academic Purposes will be determined by the Faculty of Humanities & Social Sciences as follows:

\[
\text{If } Y \geq 40, \text{ then } Z = 0.3 X + 0.7 Y \\
\text{If } 30 \leq Y < 40, \text{ then } Z = 0.3 X + 0.7 Y, \text{ subject to a maximum of 40.} \\
\text{If } Y < 30, \text{ then } Z = Y
\]

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+, 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 120 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.

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

where \(c_i\) is the credit rating of the \(i^{th}\) course, \(g_i\) is the GP value the student has obtained for the \(i^{th}\) course, \(l_i\) is 2 if the \(i^{th}\) course is in either Level 3 or 4, and \(l_i\) is 3 if the \(i^{th}\) course is in either Level 5 or 6.
BSc Special Degree (SS Structure) Award Criteria (120 credits)

For the award of the Bachelor of Science Special degree, a student may be required to complete 120 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 90 credits and satisfy 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(g). An extract of the award criteria is given below.

<table>
<thead>
<tr>
<th>Minimum credit requirements</th>
<th>Exemption and/or acquired the OCAM requirement in courses adding up to a total of 120 credits comprising:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 30 credits at L3 with 8 credits in each of the three chosen disciplines and 6 credits of open electives,</td>
</tr>
<tr>
<td></td>
<td>• 30 credits at L4 with 12 credits in each of the two main disciplines and 6 credits from the remaining discipline chosen at L3,</td>
</tr>
<tr>
<td></td>
<td>• 30 credits at Level 5 comprising minimum 21 credits from the subject of specialization, including all compulsory courses and minimum 03 credits and maximum 06 credits from the other two disciplines and/or upto 06 credits of open electives,</td>
</tr>
<tr>
<td></td>
<td>• 30 credits at Level 6 comprising minimum 24 credits from the subject of specialization (as specified by the department) which shall include a minimum of 6 credit research component (compulsory),</td>
</tr>
<tr>
<td></td>
<td>and Minimum C grade or exemption in CYE3200 for Chemistry and Biology students,</td>
</tr>
<tr>
<td></td>
<td>Minimum C grade or exemption in LEE3410 and CSE3213</td>
</tr>
<tr>
<td></td>
<td>Complete the above requirements within period of 6 academic years</td>
</tr>
</tbody>
</table>

| Pass | C grades or above for courses adding up to 120 credits, and, |
|      | a minimum Grade Point Average of 2.00 in courses adding up to 120 credits as specified.  |

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

<table>
<thead>
<tr>
<th>Second Class (Lower Division) Honours</th>
<th>B grades or above in courses adding up to at least 60 credits comprising 39 credits at Levels 5 and 6 out of a total of 45 credits of the subject of specialization at Levels 5 and 6 taken together, and,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a minimum Grade Point Average of 3.00 in courses adding up to 120 credits as specified.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Class (Upper Division) Honours</th>
<th>B+ grades or above in courses adding up to at least 60 credits comprising 39 credits at Levels 5 and 6 out of the total of 45 credits of the subject of specialization at Levels 5 and 6 taken together, and,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a minimum Grade Point Average of 3.30 in courses adding up to 120 credits as specified.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Class Honours</th>
<th>A grades or above in courses adding up to at least 60 credits comprising 39 credits at Levels 5 and 6 out of the total of 45 credits of the subject of specialization at Levels 5 and 6 taken together, and,</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a minimum Grade Point Average of 3.70 in courses adding up to 120 credits as specified.</td>
</tr>
</tbody>
</table>

Course Fees

Level 5- Rs. 2100.00
Level 6- Rs. 2640.00
Higher Diploma in Science [ HDip (Bs)] (S1 Structure)

Students who originally registered for the BSc Degree Programme may exit the programme and opt for a Diploma in Science after the acquisition of 60 credits by applying on the prescribed form to SAR/Examinations, before the stipulated date.

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 (g). An extract of the award criteria is given below.

| Minimum credit requirements | Exemption and/or valid OCAM requirement in courses adding up to a total of 60 credits comprising:
|                            | • 30 credits at L3 with 8 credit in each of the three chosen disciplines and 6 credits of specified open electives,
|                            | • 30 credits comprising 12 credits at L4 in each of the two main disciplines and 6 credits comprising discipline-based courses
|                            | • Pass in CYE3200, LEE3410 & CSE3213
| Pass                       | • C grades or above in courses adding up to a total of 60 credits courses in Level 3 and 4
|                            | • Minimum GPA of 2.00,
|                            | • Pass in CYE3200, LEE3410 & CSE3213
|                            | • Complete the relevant requirements within a period of 9 academic years.
| Merit Pass                 | • C grades or above in courses adding up to a total of 60 credits of courses in Level 3 and Level 4
|                            | • Minimum GPA 3.00
|                            | • Pass in CYE3200, LEE3410 & CSE3213

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 (g)
COURSE DETAILS

Bachelor of Science Degree Programme

LLU3261 - 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.

MSU3208 - 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 impact of culture 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 workplace; effective control; operations management in organization.

DSU3298 –Introduction to Sri Lankan Society

FNU3200 - 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.

PHU5318 - Electronics for Biology Students
Fundamentals of electronics; constant voltage and current sources; electronic diodes; rectifiers; junction transistors; small signal amplifiers; large signal amplifiers; feedback amplifiers; oscillators; regulated power supplies; wave shaping circuits; electronic measuring instruments; digital electronics; practicals upto 40 laboratory hours.

ADU5318 - 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; Classifications 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.

ADU3218 – Basic Statistics
See under the Applied Mathematics courses offered by the Department of Mathematics.

BYU5318 – 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.

FNU3201-Communication Skills

ADU5319 – 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, Randomized complete block design, Latin square design, factorial de-
signs, Split plot designs, mathematical models for data collected in designed experiments, analysis of designed experiment data and interpretation of results.

**CYE3200 - Mathematics for Chemistry & Biology**

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

**BOTANY**

**BYU3301 - 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

**BYU3500 - Diversity of Plants**

Origin and Diversity of Life; Viruses; Bacteria - Morphology and Structure; 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; Lycopsods; Horsetails; The ferns; Higher Ferns; The most advanced ferns – Mixtae; The Gymnosperms; Coniferephyes; 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

**BYU4300 - Plant Physiology**

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; Introduction to photosynthesis; Photochemical Biochemical reactions of Photosynthesis; Different pathways of CO2 fixation; Breakdown of storage plant materials; 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

**BYU4301 - Genetics and Evolution**

Heredity and its physical basis; Mendelian genetics; Chromosomes and the Distribution of Genetic Material; Deviation from Mendelian Inheritance; Penetrance and Expressivity; Naming of Genes and Loci; Sex Determination and sex Linkage; Linkage crossing Over and Chromosome Mapping; Variation in Chromosomal Number and Arrangement; Cytoplasmic inheritance; Quantitative Inheritance; The Origin of Species; Origin of Life and Development of Early organisms; Evolution of major plant and animal groups; Evolution of Mammals; The Pace of Evolution; Origin of angiosperms; Structural evolution in angiosperms

**BYU4302 – 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 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 Micromolecules); Numerical taxonomy, Flora and Fauna of Sri Lanka; Information technology and systematics; Ethics of Systematics

**BYU4303 – 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, introduction to genetic engineering; Concepts of microbial control and antimicrobial physical agents; Chemical agents in common use in sterilization and disinfection; Chemical agents used to cure diseases- Chemotherapy
BYU5300 - 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, 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; Application of genetic engineering, microbial deterioration of materials.

BYU5301 - 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;

BYU5302 - Plant Growth and Development
Plant growth; Growth regulatory substances; Auxins; Cytokinins; Gibberellins; Abscisic acid; Ethylene; Complications in the hormonal control; Applications of plant hormones in agriculture; Phytochrome and plant growth; Phytochrome mediated plant responses; Photoperiodism; blue light responses; Vernalisation; plant embryogenesis; Germination; Dormancy; Senescence and abscission

BYU5303 - Plants and Man
Man's association with plants; Food plants; cereals; legumes; Root crops; vegetables fruits; beverages; 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 products; wood.

BYU5304 - 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 fertilizer management; degradation of soils; soil improvement; soil conservation and sustainability. Importance of soil in crop production, soil and water managements.

BYU5305 - 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.

BYU5306 - Plant Breeding

BYU5308 – 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 of fresh produce Apparatus used in post-harvest technology

BYU5609- 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, Umbiliferae, Liliaceae and Leafy vegetables; Floriculture industry, Cultivation, Harvesting, grading, packing and transport of Anthuriums; Orchids; Foliage plants, Roses; Chrysanthemums and Gerbera; Landscape Horticulture

BYU5610 - Research Project in Botany (General Degree)

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.

BYU6300-Plant Molecular Biology

In this course a student is able to learn on regulation of gene expression, techniques for gene transformation, molecular biology of plant processes and applications issues related to plant molecular biology.

BYU6301 – Bioinformatics

Introduction to Bioinformatics biological bases of Bioinformatics Genomics Proteomics bases of algorithms Bioinformatics databases, Bioinformatics analysis in silica research Application of Bioinformatics.

BYU6302 – 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.

BYU6303 - Experimental Design and Biological Data Analysis

Variability in biological observation; Population and Sample; scale of measurement; Building hypothesis and testing; Fundamentals of Experimental Designing; Experimental Designs; Data entry, formats, preprocessing etc, Exploration of data (examination of data) Introduction to analysis of variance (ANOVA) mean separation; Correlation And Simple Linear Regression; Analysis of Covariance: Factoral Experiments; of Compounding; Fractional Experiments; Analysis of count data. Analysis of multi-way contingency tables; Analysis of binary data introduction to multivariate analysis, principles of data mining and common statistical software packages.

BYU6304 – 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.

BYU6305 - 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.

BYU6306 - 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.

BYU6307 – Advanced Plant Physiology and Biochemistry

Amino acids, proteins and enzymes; enzyme kinetics, regulation of metabolism, plant respiration, photosynthesis carbohydrate metabolism; Lipid metabolism Assimilation of nutrients, secondary metabolism and plant natural products; signal transduction in plants, plant responses to biotic and abiotic stresses, molecular- chemical mechanisms of plant hormone responses. Introduction to agricultural bio technology.

BYU6308 – 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.
BYU6309 – 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.

BYU6310 – 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

BYU6911 – Research Project in Botany (Special Degree)
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.

BYU6312 - 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

CYU3300 - Basic Principles of Chemistry I
Development of models for the structure of atom, Principles underlying the arrangement of Periodic Table, a brief description of elements, their behavior and reactions, Chemical bonding and related theories, Structure - bonding relationships and properties of molecules, Introduction to organic reactions, Acids and bases in organic chemistry, Structure, properties and chemistry of aliphatic hydrocarbons, alkyl halides, alcohols and epoxides.

CYU3201 – Basic Principles of Chemistry II
The behavior of ideal gases using the ideal gas model and the factors responsible for deviating from ideal behavior to non-ideal behavior of gases; basic concepts, terminology and mathematics of thermodynamics; heat and work; first and second laws of thermodynamics and their applications, internal energy; Heat capacity; expansion and compression of gases; Joule Thomson effect; free energy change; relationship between first and second laws; basic concepts and terminology; order of a reaction, elementary reaction; molecularity, rate equation, rate constant and catalyst; factors that affect the rate; Arrhenius equation; experimental methods in determining the kinetics of a reaction, cell diagram, anode, cathode and cell reactions of a cell diagram; electromotive force (emf) of a cell diagram and a cell reaction; emf and Gibbs free energy of a cell reaction; electrode potential; determination of pH, thermodynamic parameters of a reaction, endpoint of a titration and the solubility product of a sparingly soluble salt using potentiometry; primary, secondary and fuel cells.

CYU3302- Basic Practical Chemistry
This is a seven day practical course which is designed to give the first year students basics skills in working in an elementary chemistry laboratory. The laboratory classes are conducted in such a way to enhance their analytical thinking in problem solving with improvement of soft skills such as communicating, presentation, IT, writing etc. This course consists of a theory book which covers the concepts behind the experimental designed.

CYU4300 – Inorganic Chemistry
Solids& their structures; X-ray diffraction; crystal defects; Miller Indices; Symmetry in molecules; Coordination chemistry; nomenclature; isomerism and bonding in coordination compounds including theories of bonding; stability of coordination compounds; Introduction to Radio Chemistry.

CYU4301 – Concepts in Physical Chemistry
Electromagnetic radiation and its particle properties; Beer-Lambert law; absorption spectrometers; dipole moment; energy transitions and absorption spectra; stimulated emission, stimulated absorption and spontaneous emission; pure rotational spectra of diatomic molecules; rate constant, rate law, order of reactions; molecularity; elementary reaction; Arrhenius equation and its applications; mechanisms and the rate determining step; catalysis, complex reactions; reversible reactions; chain reactions; steady state approximation; experimental determination of rate constant and order of a reaction; experimental study of slow and fast reactions; conductivity and molar conductivity; ionic mobility; transport number; limiting molar conductivity; determination of the dissociation constant of a weak acid and the end-pint of an acid-base titration using conductivity meter; phase rule; phase diagrams, intensive and extensive variables; independent components; one component systems; ideal (binary) system; Raoult’s Law and Dalton’s Law; temperature/vapour pressure/ composition curves; non ideal binary systems deviations from Raoult’s Law; fractional distillation of mixtures; vapour pressure/temperature composition curves; azeotropes, solid-liquid equilibria; simple eutectic systems; compound formation; congruent and incongruent melting points; partially miscible binary systems; solubility curve upper
and lower critical temperatures; totally immiscible binary systems, steam distillation

**CYU4303 - Organic Chemistry I**

Stereochemistry, Reaction mechanisms, structure Activity relationships of some aliphatic compounds, chemistry of conjugated dienes and benzenoid compounds.

**CYU4302 - Practical Chemistry**

This unit gives you the essential theory required in understanding the experiments you will perform. The experiments include areas such as thermodynamic solubility product, phase diagram of partially miscible two components, kinetics, conductometry, spectroscopic methods i.e. Beer-Lambert law, rotational spectra etc. In addition you will learn about errors, treatment of results and calculation, report writing, Basic techniques in organic chemistry including Recrystallization, melting point determination, liquid – liquid extraction, Thin layer chromatography.

**CYU5303 - 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; Structure elucidation of organic compounds through spectroscopic methods. This course will have five day practical class.

**CYU5300 - 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 & hydroboraison of olefins, carbylation reactions, metathesis & polymerisation of olefins, palladium catalysed reactions.

**CYU5308 - Instrumental Methods of Chemical Analysis.**

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

**CYU5309 - Environmental Chemistry**

Environmental Chemistry of air (atmosphere), water (hydrosphere) and soil (geosphere) and air- water and solid- water exchanges of contaminants. Atmosphere: composition, (layer) structure and function; natural cycles: O\textsubscript{2}, N\textsubscript{2} and CO\textsubscript{2}; Temperature profile/structure of the atmosphere; Atmospheric (tropospheric and stratospheric) phenomena: green house effect, acid rain, photochemical smog and ozone deple- tion. 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.

**CYU5301 - 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 rotation-al spectrum of a diatomic molecule; classification of molecules based on their rotational characteristics; pure rotational spectra of polyatomic mol
CYU5313 - Polymer Chemistry
Classification of polymers; plastics, rubber and liquid resins; methods of polymerisation; types of copolymers; importance of copolymerisation; syntheses of copolymers; types of degradation; chemistry of rubber processing; chemical ingredients used in rubber processing; compounding rubber; vulcanising agents; accelerators; activators; antidegradants; fillers; processing aids; special additives; vulcanisation; thermoplastics; thermosets colourants; plasticizers; foaming agents; flame retardants; curing agents; processing techniques.

CYU5310 - Literature Project in Chemistry
The Department encourages students who have completed level 04 and started level 05 courses to register for the course- 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. The unit will be evaluated through a report, 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.

CYU5611 - 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 on 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.

CYU5614 – Physical Chemistry I
Surface chemistry; the liquid-gas interface, determination of molecular areas from adsorption measurements; the solid-gas interface; adsorption isotherms; colloid and macromolecular chemistry; activity coefficients; Debye-Huckel theory of activity coefficients; electrode potentials; further reaction kinetics; kinetics of complex reactions; investigation of fast reactions.

Quantum mechanics and classical mechanics; wave-particle duality of radiation; mathematics for quantum mechanics; eigen functions and eigen values; postulate of quantum mechanics; the molecular partition function and its physical interpretation; calculation of internal energy and entropy of an isolated system; statistical thermodynamics of a closed system in thermal equilibrium with its surrounding thermodynamics; partial molar properties; fugacity; the third law of thermodynamics and the determination of third law entropies; collision theory; potential energy surfaces; transition state theory; thermodynamic parameters of activation; unimolecular reactions 5- day practical – on kinetics, surface chemistry; conductometry, potentiometry, phase, colorimetry, partition coefficient.

CYU5615 – Advanced Organic Chemistry


Solvent effects: Intermolecular interactions, solvation, importance of entropy, classification of solvents, Hughes – Ingold rules, solvent polarity parameters, nucleophilicity, solvent assisted ionization, effect on spectra.

Effects of substituent on reactivity: Hammett equation, linear free energy relationships, Yukawa – Tsuno equation, Taft equation, use of Hammett equation in the study of reaction mechanisms.

Conformational analysis
Basic concepts in retrosynthetic analysis – disconnection, functional group interconversions, protecting groups, retron, synthon, reagents and polarity inversion Functional group-based strategies – one group disconnections, two group disconnections.

Regioselectivity, chemo selectivity, stereospecificity and stereoselectivity. Modern reagents for selected transformations – reactivity and selectivity. Analysis of selected well-known published syntheses

Application of advanced spectroscopic techniques
Application of 13C NMR, COSY, HSQC and HMBC in structure elucidation of Organic compounds.
CYU6600 – Advanced Concepts in Chemistry

Solid state chemistry - Introduction, crystal structures and crystal classes, Bravais lattices; Miller indices; determination of crystal structure: X-ray powder diffraction, electron and neutron diffraction; theory of bonding: Free electron theory in brief and band theory - metal (conductors), insulators and semi-conductors - intrinsic and extrinsic (n- and p- type). Hall effect, Importance of solids; properties of solids: electrical (dielectric, ferroelectric, pyroelectric and piezoelectric properties), magnetic (dia, para, ferro, ferri, and antiferro magnetic types; soft and hard magnetic materials) and optical properties; structure - property relationships - ferroics. Applications, solid state methods of synthesis, characterization of solids: Thermal analyses: TGA, DTA, DSC.

Group Theory: Definition of a group, point groups, determination of symmetry points groups of molecules, Rearrangement theorem, Matrix representation of groups, equivalent and reducible representations, irreducible representations and character tables, representations and quantum mechanics, molecular vibrations and point groups.

Advanced coordination Chemistry - Energy levels of atoms, Russell-Sanders coupling and term symbols, Fine structure and Zeeman and Stark effect, Ligand field theory, Molecular orbital theory, Electronic spectra of transition metal complexes, Orgel and Tanabe Sugano energy level diagrams, Racah parameters, Structural properties of sienel and inverse sienels, Magnetochrometry - Types of magnetism, Curie and Neel points, Determination of magnetic moments from magnetic susceptibility data, spin - orbit coupling, magnetic cross overs, Pascal constant and magnetic cross overs.

Inorganic reaction mechanisms - Introduction to kinetics and mechanisms, Substitution reactions of octahedral complexes, water exchange reactions, CB mechanism, rate law and their interpretation, Leaving and entering group effects, Effects of spectator ligands, sterechemical changes and steric effects in octahedral substitution. Substitution reactions of square planer complexes - general rate low, intimate mechanisms, factors effecting rates of square planer substitution, Electron transfer reaction between octahedral complexes, outer and inner sphere mechanisms.

Advance organometallic chemistry - Chemistry of metalloocene and Arenes, Platinum metals (Ru, Os, Rh, Ir, Pd and Pt). Synthesis and catalysis of named catalysts.

CYU6304 - Inorganic Spectroscopy and Structural Chemistry

IR spectroscopy, Theory and applications of ESR and Mossbauer spectroscopy and other major spectroscopic methods such as Raman Spectroscopy, UV-Photoelectron Spectroscopy (UPS), Spectroscopy, Auger Electron Spectroscopy, X-Ray Photo Electron Spectroscopy (XPS).

Molecular shapes from tetrahedron to icosahedron, Classification of boranes / borates, Isolable principle and bonding in boron clusters and cages, Nomenclature of boranes and borates; preparation and reactions of boranes, carboranes and metalloboranes, boron reagents in organic synthesis and catalysis, polymeric metal clusters.

CYU6305 - Concepts in Industrial Chemistry
Classification of Chemical industries, Flow diagrams, Material and energy balances, Unit operations, Unit processes, Role of chemical Thermodynamics in chemical Industry, Concepts of Chemical equilibrium and Thermo chemistry to an Industrial process, Waste Management, Safety concept in industry.

CYU6606 - Advanced Experimental Chemistry
Advanced techniques in Organic synthesis – synthesis of heterocyclic compounds, one-step/multi step synthesis, Grignard synthesis, etc. Separational (Chromatography) and Structure Elucidation Techniques, Extraction of Natural Products, experiments associated with Biochemistry - tests for carbohydrates, amino acids-, phytochemical screening of Ayurvedic herbs, Use of GC and other instruments,

Experiments to determine physical parameters involving equilibria, kinetics, electrochemistry, thermodynamics, spectrophotometry, surface chemistry (specific surface area of adsorbents), determination of activity coefficients.

Revisit basic techniques – titrimetry, gravimetry, colorimetry; preparation of inorganic complexes; synthesis and reactions of organometallic complexes, study of inorganic reactions mechanisms, Use of instruments such as AAS, flame photometry and other classical methods in analysis.

Environmental analysis – BOD, COD etc.

CYU6307 - Industrial training (4-5 weeks) and Literature Seminar Presentation
Placement in an Institute related to Chemical industry for 3 months completed with project report and a presentation.

Seminar on a current topic based on research paper and related reference.

CYU6608 - Research Project in Chemistry
The student must conduct a research project under the supervision of a senior staff member (supervisor) on a predetermined research topic. The unit will be evaluated through a proposal presentation, laboratory work, thesis report and a presentation, and an oral examination.

This course unit gives students a good opportunity to develop their research skills and ability to write a proposal and thesis based on a given format and improve their communication and presentation skills.
PURE MATHEMATICS

PEU3300 - Mathematical 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.

PEU3301 - Foundations of Mathematics
Sets; Algebra of Sets; Intervals and Cartesian Products; Order Relations; Zorn's Lemma, The Well–Ordering Theorem and The Axiom of Choice; Functions; Functions and Sets; Finite Sets and Infinite Sets; Countability; Order of Infinity; Algebraic Structure of the Real Number System; Order Structure of the Real Number System; Solution of an Inequality; Integers and Rationals; Bounds, Maxima and Minima; Bounds, Sups and Infs; Completeness Axiom; The Archimedean Property; Irrational Numbers; Algebraic Numbers and Transcendental Numbers; Dense Subsets of R; Metric Structure of the Real Number System; The Distance Function; The Meaning of Limit of a Sequence; The Meaning of Sum of a Series.

PEU3202 - 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; Orthogonal Bases; Change of Basis; Unitary Spaces.

PEU4300 - Real Analysis I

PEU4301 - Real Analysis II
Limit at a point, Right limit at a point, Left limit at a point, Algebra of Limits, Squeezing Theorem, Limits of composition, Sufficiently 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, Sufficiently of Sequence in Continuity, Algebra of Continuous functions, Limits of Composite functions, Monotone functions, Convex functions, Intermediate Theorem, Uniform Continuity. 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, Rolle's 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 McLaurin Series, Exponential function, Logarithmic function, Trigonometric function, The number e, Hyperbolic functions.

PEU4302 - Linear Algebra

PEU4303 - 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, Ho-
momorphism Theorem & it’s application, Direct product of two groups, Semi-direct product.

**PEU5301 – Ring Theory**

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, Quotientring, Homomorphism, Epimorphism, Monomorphism, Isomorphism, Isomorphism Theorem, Maximal ideal, Prime ideal, Product Ideals, sum of ideals, local ring, Field of quotients, 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) Î I[X] where I is an integral domain.

**PEU5303 – Number Theory**

History, early number theory; Sets of numbers N, Z, Z+, Z+, Z, Q, R, C, and irrational, Algebraic, Transcendental; How to identify Z; Properties of Z, Binomial 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; Theorems on primes; Fermat’s little theorem; Wilson’s theorem; Theory of congruencies; Properties of congruencies; Application and exercise; Divisibility tests; Linear congruencies and their solutions; Useful theorems using linear congruencies; Primitive roots of primes; Primitive roots of composites; Theory of indices; Number theoretic functions; Fibonacci and Lucas Sequences, Continued Fractions.

**PEU5304 - Introduction to Complex Analysis**


**PEU5300 – Riemann Integration**

Trapezoidal Rule and Simpson’s Rule, Riemann Sums, Upper Riemann Integral, Lower Riemann Integral, Properties of Upper and Lower Riemann Integrals, Riemann Criterion, Inequalities involving integrals, Algebra of integrable functions, InTEGRability of Monotone functions, InTEGRability of Continuous functions, Integrability of Composition of functions, Properties of integrable functions, Integral as a limit of Sums, Differentiation and integration, Fundamental Theorem of Calculus, Logarithmic function, Exponential function, Mean Value Theorem, Improper integrals of unbounded functions Improper integrals on unbounded intervals, General Improper integrals, The Gamma function, The Integral Test, Euler’s Constant

**PEU5305 – Complex Analysis I**


**PEU5306- 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, Equicocontinuous 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).

**PEU6300 - 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.

**PEU6305 - 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.

**PEU6601 - Point Set Topology**


**PEU6303 – Complex Analysis II**


**PEU6602 - Measure Theory**


**PEU6304 - 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, $L^p$ spaces I, $1 \leq p \leq \infty$ spaces II, spaces III, spaces I, spaces II, spaces III, Linear Functionals in Ban-

**APPLIED MATHEMATICS**

**ADU3300 – 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; The vector equation of a hyperbola; Vector equation of a sphere; Vector functions; Differentiation of vector functions; Integrating of vector functions; Curves in space.

**ADU3201 – Basic Statistics**
Classifications of Data; Tabular Data Summaries; Numerical Data Summaries: Measures of Locations; Measures of skewness; Measures of dispersion; 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

**ADU3302 – 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 homogeneous linear differential equations; Finding particular integrals; Power series; Series solutions; Legendre polynomials & Bessel functions; Difference equations.

**ADU4300 - 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; Chi-squared and F-distribution; Standard Normal and Student t distribution

**ADU4301 - 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.

**ADU4302 – 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.

**ADU4303- 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 dif-
ferential equations; first-order systems; further methods for linear 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

**ADU5307 - 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.

**ADU5300 - Linear Programming**


**ADU5301 - 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 , Cp-Statistic; Forward Selection Method; Backward Selection Method; Stepwise Selection Method; Model Fitting; Model Assessment; Model Application

**ADU5302- 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.

**ADU5308 - 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, Timetable 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.

**ADU5303 - 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.

**ADU5304 - Operational Research**

Introduction to Game Theory, Two person zero sum games, The maximin & minmax 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 Queueing 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.

**ADU5305- 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.
ADU5306 - 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 function; 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 equation; approximating the Navier-Stokes equations.

ADU5320 - Introduction to Mathematics Programming with MATLAB
Basic introduction to matlab with operations, matrices and linear algebra, functions and vectors, numerical methods, Fourier Transformation and application, Basic Statistics, Regression and time series, solving differential equations in matlab, Solving system of differential equations (linear and non-linear), Basic concepts of optimization techniques, applications and case studies of real world problems.

ADU5615 - 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, carrying out and report writing.

ADU6300 - 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.

ADU6601 - Applied Number Theory

ADU6602 - 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 Non-conformities, 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 (AOQ ), Average Outgoing Quality Limit (AOQ L), 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.

ADU6603 - 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.

ADU6611 - Research Project in Mathematics
This is a project course that requires the students to design, implement and conduct a project/sur-
vey 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**

**CSU3200 - Introduction to Computer Programming**


**CSU3301 - Database Design & Implementation**

Introduction to Databases, History of Databases, Introduction to Database Management Systems, Types of Databases , Hierarchical and Network Data Models, Relational, Entity Relationship and Object Oriented Data Models, Evolution of Data Models, Entity Relationship (E-R) Model, Logical Structure and Keys in Relational Models, Relational Algebra, Relational Database Model, Developing E-R Diagrams, Database Tables and Normalization, Introduction to SQL, Introduction to the Database Query, Categorize Data Using Operators, Summarizing Data Results From a Query, Sorting and Grouping Data, Restructuring the Appearance of Data, Understanding Dates and Times, Joining Tables in Queries, Using Sub-Queries to Define Unknown Data, Combining Multiple Queries into One, Stored Procedures and Functions.

**CSU3302 - Data Structures and Algorithms**


**CSU4300 - Operating Systems**


**CSU4301 - Object Oriented Programming**

Introduction to Object Oriented Programming, Object Oriented Programming Terminologies, Introduction to JAVA, Objects and Classes, Java Syntax for OOP, Classes and Objects in Java, Controlling access to Java classes, Class constructors in Java, Inheritance, Polymorphism, Overloading, Overriding, Abstract classes and methods, Final classes, Interfaces in Java, Inner classes, Association, Aggregation, Composition, Exception Handling, Threads and Multithreaded programming, Swing class.

**CSU4302 - System Analysis and Software Engineering**


**CSU4303 - Computer Networks**

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, 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, Threats to computer networks and threat mitigation.

**CSU5300 Information Technology Project Management**

Introduction, A Project and it’s Management, The Project Management Context – Project Life Cycle & Project Phases, Project Management Context – Project Stakeholder and Organizational Influ-

CSU5301 - Software Quality Assurance

CSU5302 - Web Technologies

CSU5303 - Management Information Systems.

CSU5304 – Mathematics for Computing

CSU5305 - Theory of Computing

CSU5306 – Digital Electronics
CSU5307 – Data Communication


CSU5308 - Artificial Intelligence


CSU5309 - Information Security and Cryptography


CSU5310 – Computer Architecture

Overview, Fundamentals of computer architecture, CUP organization, Pipelining, Memory hierarchies, interfacing and communication, Performance issues, Multiprocessors.

CSU5311- Computer Graphics


Physics

PHU3300/PHE3300 - General & Thermal Physics


PHU3301/PHE3301- 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.
**PHU3202/PHE3202 - Waves in Physics**

Simple harmonic motion, superposition of simple harmonic motion, damped oscillations, 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.

**PHU4300 - Modern Physics**

Special Theory of Relativity

Classical Mechanics and its Limitations: maximum speed limit, physical events and frames of reference, 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.

**PHU4301 - Electronics**


10 practical sessions (each session 3 hours duration)

**PHU4302 - 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.


**PHU4303 - Mathematical Methods for Physics**


**PHU5301 - 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; beta decay; the gamma rays; artificial (induced) radioactivity; nuclear reactions; nuclear fussion; nuclear fission; nuclear reactor; elementary particles; radiation detection devices; nuclear power safety-radiation hazards.

**PHU5301 - 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.

**PHU5302- Atmospheric Physics**


**PHU5303 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 idial 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.

**PHU5304/PHE5304- 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)

**PHU5305/PHE5305 - Essentials of Geology**


**PHU5306-Applied Geology**


**PHU5307/PHE5307 - Medical Physics**

Introduction to medical physics; Human disorders (Associated with a man); Radiotelemetry; Light and electronic optics; Laser in Medicine; Fiber optic light in medicines; Ultrasonic; Nuclear magnetic imaging (NMR or MRJ); X ray in medicine; Some instrumentation for medical diagnostic procedures; Positron emission tomography (PET); 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

**PHU5308-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
PHU5610-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.

PHU5311/PHE5311-Astronomy


PHU5312-Solid State Physics


PHU5313-Advanced Electromagnetism

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

PHU5314-Thermodynamics


PHU5315: Renewable Energy Sources

Introduction to Energy, Fundamentals of renewable energy sources, Available energy technologies, Energy efficiency and conversion, Solar energy, Quantifying solar energy, Collecting solar energy, photovoltaic cells, thermal energy, biomass, wind energy, wave energy, tidal energy.
energy, Solar collectors, Solar concentrators, Solar photovoltaics, Wind energy, Biomass energy, Hydropower, Wave energy, Geothermal energy, Ocean thermal energy, Ocean tidal energy, Fuel cells and renewable Hydrogen, Environment and renewable energy.

**PHU5318: Electronics for Biology Students**

Simple electronics circuits: Electric current, voltage & their relationships; Resistors & circuits involving resistors; Maximum power transfer theorem; Equivalent circuits; Kirchoff’s laws; Capacitors; Inductors; Alternating current circuit: RC circuits, RL circuits, LCR series circuits; Filters; Resonance circuits; Semiconductor diodes: N-type & P-type semiconductors, P-N junction diodes, application of PN junction diodes; Zener diodes, LEDs; Photo diodes; Bipolar junction transistors: Transistors, their configurations, characteristics and applications; Operational amplifiers: Properties and applications of Op-Amps, Op-Amp IC CA741 – its details and applications; Low voltage power supplies: Cells & Batteries; Converters, Rectifiers; Digital electronics: Introduction, binary number system, Logic gates, Boolean algebra; Combinational Logic gates: De Morgan’s theorem, Designing of combinational logic circuits using truth tables; Sequential Logic circuits: Flip flops Registers, & Counters; Colorimeters: Beer Lambert’s law; Spectrophotometer: Basics of spectrophotometer, & Data analyzing; Other analytical instruments: pH meter, conductivity meter, ECG, etc.

**PHU6300 Advanced Practical in Physics**

Michelson Interferometry; Determination of e/m ratio; Franck – Hertz experiment; Wein Bridge oscillator; Determination of Fourier coefficients; Photo-electric effect; Millikan’s oil drop experiment; Magnetic field inside a conductor; Electron spin resonance; Spectroscopy.

**PHU6301 Advanced Solid State Physics**

Review of basic concepts and phenomena in solid state physics and X-ray crystallography. The free electron theory, Electrons in a periodic potential, Bloch’s theorem, Nearly free electron model, Band gaps, Band structures, Fermi surfaces, concept of effective mass, theory of semiconductor and application, Hall effect, dielectrics, optical and magnetic properties, Superconductivity, Type I and Type II superconductors, Cooper pairs and BCS theory.

**PHU6302 Advanced Quantum Mechanics**

Revision of basic Quantum Mechanics, Solution of Schrödinger equation in simple cases, Operator formalism; basic postulates of quantum mechanics; Application of Schrödinger equation to three dimensional problems; Hydrogen atom; Operators in quantum mechanics; Schrödinger equation for two particle systems; Matrix representation of wave functions and operators; Matrix representation of angular momentum operators; eigenvalues and eigenvectors of matrices; Pauli spin matrices; Total Angular momentum and addition of angular momenta; Time independent and dependent perturbation theory; WKB approximation.

**PHU6603 Advanced Research Project in Physics**

An independent research (or developmental) project is performed individually under the guidance of a supervisor in the field of Physics. The project aims to deepen as well as broaden the aptitude towards scientific research, experimental / theoretical, and methodological knowledge. The work involves planning and execution of the research, which includes literature survey, critical analyses of relevant scientific literatures, student’s own data collection, analysis, interpretation and presentation of results. Oral and written presentations are also included in the work. The student is also expected to participate in seminars and other specified activities during the research period.

**PHU6304 Advanced Electronics**

Sensors and transducers: Optical, mechanical, magnetic, linear and rotational encoders; Buffer circuits; Analogue circuits: Integrators, Differentiators, peak detectors, Active filters, Passive filters, Spectrum analysis, Schmitt triggers, Timers, Oscillators, ADC, DAC; Digital electronics: Gates, Truth tables, Adders, Multiplexers, Flip flops, Registers, Counters; Computer simulation: creating, simulating, measuring and plotting various parameters; Fabrication of PCB. Microcontroller programming: basic I/O, ADC conversion, Serial communications, programming basics, Delays, Interrupts, I2C and SPI.

**PHU6305 Nanophysics and its Applications:**

Physics of low dimensional systems: Nanostructured systems and their physical properties; Crystalline materials and their properties; Electronic properties of atoms and solids; Magnetic materials; Bohr’s semi-classical model of atom; Extensions of Bohr model; Wave-particle duality of light and matter; Trapped particle in one dimension; Trapped particle in two dimensions; Trapped particle in three dimensions; Electron in 3-D quantum dots; Fabrication and Characterisation of nanostructured systems: Top-Down Fabrication Methods; Bottom-Up Fabrication Methods I; Bottom-Up Fabrication Methods II; Atomic Force Microscope; Scanning Electron Microscope; Transmission Electron Microscope; X-ray Diffraction Spectroscopy; UV-Vis Spectroscopy; Applications of Nano-devices: Electronics & Information technology; Energy and Environment; Health/Bio-nanotechnology and Biomedicine; Other Applications.

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PHU6306 Statistical Physics
Basic probability concepts; Binomial, Gaussian and Poisson distributions; micro states and macro states; Thermodynamic probability, statistical definition of temperature and entropy, Boltzmann distribution and canonical partition function, applications to paramagnetic system, perfect gas, the Maxwell-Boltzmann velocity distribution, equipartition theorem. Fermi - Dirac and Bose - Einstein statistics, application to black body radiation, Conduction electrons in metals.

PHU6307 Modern Optics
Periodic & Aperiodic Functions: Fourier Series, Fourier Transformations; Review of Electromagnetic Theory: Maxwell Equations in Vacuum, Intensity, Maxwell Equations in Media, Simple Dielectric Media, Monochromatic Waves and Complex Notation, Intensity in Complex Notation, Plane Waves, Vector Plane Waves, Wave Impedance; Coherence and Interference: Principle of linear Superposition, Young’s experiment, Michelson Interferometer, theory of partial coherence, coherence time and length, Spatial resolution, spatial coherence, Intensity interferometry. Diffraction: Huygens-Fresnel principle, Fraunhofer diffraction, Single and multiple slits, Circular aperture, Spatial resolution and Rayleigh’s criterion; Polarization: Vector Plane Waves, Polarization States, Polarization Devices; Optical spectra: Theory of atomic and molecular spectra, fine structure, multiplicity; Laser Physics: Laser Pumps, Light-Atom Interactions, Amplification, Pumping Schemes, Gain Coefficient; Non-linear Optics; Fourier Transform IR spectroscopy; Raman spectroscopy; Modern optical components;

PHU6308 Classical Mechanics
Generalized coordinates; Principle of least action; derivation of Lagrange’s equations of motion; Application of Lagrange’s equations; Conservation laws and symmetries in nature; Generalized force; generalized momentum; moving frames of reference; effects of the earth’s rotation; motion under a central conservative force; The centre of mass and relative coordinates; Rotational motion of a rigid body; moment of inertia; principal axes of inertia; Hamiltonian; Hamilton’s equations of motion; simple applications.

Zoology
ZYU3500 - Animal Life and Diversity
The classification and diversity in structure, function and development of the Protocista, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nematoda, Rotifera, Annelida, Mollusca, Arthropoda, Echinodermata, Hemichordata, and Chordata

ZYU4301 - 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

ZYU4300 - Animal Form and Function
Level of organization in the animal kingdom; 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

ZYU4302 - Animal Development
Phases of animal development including germ cell formation, fertilization, cleavage, gastrulation, organogenesis, growth and differentiation, human embryonic development, 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.

ZYU4303 - 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.

ZYU5300 - 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.

**ZYU5301 - 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.

**ZYU5302 - 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.

**ZYU5303- Environmental Toxicology**

Environmental, organosomal and sub-organosomal aspects of toxicology with a broad aim to assess, monitor and predict the fate and effects of foreign substances in the environment. Starting from fundamentals of ET; basic concepts, methods, and approaches for environmental toxicology, Toxicokinetics of Chemical Stressors; ET of individual substances or groups of substances, conclude with Methodological Approaches and Risk Assessment; complex issues that incorporate and integrate many of the concepts and approaches of ET.

**ZYU5304 - 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.

**ZYU5305 - 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.

**ZYU5306 - Entomology**

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.

**ZYU5307-Mamalian Biology**

Basic characters of mammals; origin and distribution; diversity; adaptive radiation of major orders of class Mammalia; Monotremata, Marsupialia, Insectivora, Dermoptera, Chiroptera, Lagomorpha, Pholidota, Primates, Rodentia, Lagomorpha, Cetacea, Carnivora, Proboscidea, Sirenia, Perissodactyla, Artiodactyla; evolutionary history, sociology, community ecology and conservation of mammals.

**ZYU5608 – 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 results 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.

**ZYU5309-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 sciences 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 sci-
ence. In this course, we will concentrate on the science rather than the popular activities.

**ZYU5310 - Concepts & Application in Evolutionary Biology**

Fitness and Adaptation, Plasticity and norms, Patterns of Diversity, Sexual Selection and Evolution of Sex, Evolutionary Behaviour, Evolution of Life Histories, Models of Speciation, Genetics of Speciation, Cases of Speciation, Coevolution, Extinction, Human Evolution, Human Diversity, Genes and Form, Schools of Systematics, Phylogenetic Inference, Molecular Evolution, Molecular Systematics, Conservation Genetics, Artificial selection

**ZYU5311 - Literature review in Zoology**

This course provides basic training on collecting literature, summarizing, critically evaluating and organizing a literature review on an approved topic. Submission of the proposal for literature review, literature survey report and finally the literature review article followed by a presentation and oral examination will contribute towards the overall grade. This course is offered only to Zoology Special students.

**ZYU5313 - Research methodology**

Concepts and principles of scientific research; Searching and maintaining literature; Experimenting and sampling animals; Ming maps for planning and designing research studies; Qualitative and quantitative information gathering; Basic statistics; Report writing, Publication as journal articles; Effective communication methods and presentation skills; Types of scientific publication.

**ZYU6300 - 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.

**ZYU6301 - 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.

**ZYU6302 - 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.

**ZYU6303 - 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.

**ZYU6605 - Advance Laboratory Techniques in Zoology**

Laboratory and general equipment maintenance; Health and safety in biological laboratories; Microscopy; Staining of microscopic animals, animal sections and tissues; Microscopy; Drawing and imaging; Dissections of invertebrate and vertebrates for comparative anatomy; Preparation of animals and skeletons for displaying; Mini Project in a selected field to apply techniques. This course is offered only to Zoology Special students.

**ZYU6306 - 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.

**ZYU6908 - Research Project in Zoology**

This course provides a basic training on carrying out a proper scientific investigation in the field of Zoology. Students are required to plan the investigation, write the project proposal, carry out...
the investigation based on the proposed methodology, analyse and interpret results, and submission of a dissertation. Project proposal, half term progress report, final dissertation, project presentation and oral examination will contribute towards the overall grade. This course is offered only to Zoology Special stud

**ZYU6309- Oceanography and Ocean resources**


**ZYU6310– Wildlife Management and Conservation**

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.

**ZYU 6311.Special Topics in Zoology**

This will be offered only to the final year Zoology special students. Students will be trained to write essays on current topics of Zoology which are of scientific interest. They need to gather information from various sources and write scientific essays for the topics given to them by the Zoology Department. The final examination will be a theory paper where students are required to write 3 essays.

**FNU6300– GIS and remote sensing in Natural Resource Management**

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

**FNU6302 – 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.

**FNU6301 - 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 (LEE3410) (scores given below should not be more than 3 years old)

- **IELTS**
  - Overall score of minimum 5.0 (academic) or 5.5 (general), with not less than 4.0 in writing

- **TOFEL**
  - 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

- **G.C.E (A/L) English Medium**
  - Student who have completed their advance level Examination in English Medium conducted by the department of Examination.

- **London A/L**
  - Students who have completed London A/L (Edexcel or Cambridge).

- **UTEL**
  - Score of not less than band 6.00 in all 4 skills.

- Successful completion of a Bachelors Degree/Postgraduate Diploma/Masters in the English medium.
- Successful completion of a Bachelors Degree/Postgraduate Diploma/Masters in the English medium.
- National Collage of Education-National Diploma in Teaching (English) conducted and awarded by the NIE.
- Higher National Diploma in English (SLIATE).
- Diploma in English from a recognized university.
- English as a subject at the G.C.E. Advance Level.
- Diploma in English Language and Literature and Advance Certificate in English conducted by Department of Language Studies.

* IELTS and TOEFL scores should be obtained not more than 3 years prior to the date of request.
### Specific Exemption for ICT Skills (CSE3213)

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<th>Course Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>UCTIT</td>
<td>Successful completion of the University Competency Test in Information Technology (UCTIT) conducted by the Higher Education for Twenty First Century (HETC) project of the Ministry of Higher Education.</td>
</tr>
<tr>
<td>ICT Technician</td>
<td>Successful completion of National Certificate in Information Communication Technology Technician (ICT Technician) NVQ L4 at Vocational Training Centre.</td>
</tr>
<tr>
<td>SCDL/ICDL</td>
<td>Successful completion of Sri Lanka Computer Driving License (SCDL) or International Computer Driving License (ICDL).</td>
</tr>
<tr>
<td>Short course in Professional Computer Applications</td>
<td>Successful completion of CPCA; Short course in Professional Computer Applications offered by the Department of Computer Science, The Open University of Sri Lanka.</td>
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### Specific Exemptions for CYE3200

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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
### OUSL Computer Centres

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<tr>
<th>Centre Address</th>
<th>Telephone No.</th>
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<tbody>
<tr>
<td><strong>Ampara</strong>&lt;br&gt;The OUSL Study Centre, Iginiyagala Road, Ampara</td>
<td>0632224388</td>
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<tr>
<td><strong>Ambalangoda</strong>&lt;br&gt;The OUSL Study Centre, Polwatta Road, Halwatura, Ambalangoda.</td>
<td>0912255310</td>
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<tr>
<td><strong>Ambalantota</strong>&lt;br&gt;OUSL Study Centre, Ragasaranagama, Lunama, Ambalantota</td>
<td>0112856203</td>
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<tr>
<td><strong>Anuradhapura</strong>&lt;br&gt;The OUSL Study Centre, Jayanthi Mawatha, Anuradhapura</td>
<td>0252224487</td>
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<tr>
<td><strong>Badulla</strong>&lt;br&gt;Sri Lanka Institute of Advanced Technological Education, Greenland Drive, Badulla</td>
<td>0112671783</td>
</tr>
<tr>
<td><strong>Batticaloa</strong>&lt;br&gt;The OUSL Study Centre, Bar Road, Batticaloa</td>
<td>0652222264</td>
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<tr>
<td><strong>Faculty of Education Building (ground floor)</strong>&lt;br&gt;The OUSL, Nawala, Nugegoda</td>
<td>0112814557</td>
</tr>
<tr>
<td><strong>Galle</strong>&lt;br&gt;OUSL Study Centre, Labuduwa, Galle</td>
<td>091-2223784</td>
</tr>
<tr>
<td><strong>Gampaha</strong>&lt;br&gt;Open University of Sri Lanka Study Centre, Gampaha Road, Miriswatta, Madugoda</td>
<td>0332234572/1</td>
</tr>
<tr>
<td><strong>Jaffna</strong>&lt;br&gt;Open University of Sri Lanka Study Centre, Browns Road, Kokuvil, Jaffna.</td>
<td>021-2221810</td>
</tr>
<tr>
<td><strong>Kalutara</strong>&lt;br&gt;Open University of Sri Lanka Study Centre, 66/2, Nagoda Road, Kalutara.</td>
<td>034-2220850</td>
</tr>
<tr>
<td><strong>Kandy</strong>&lt;br&gt;The OUSL Regional Centre, Pollgolla, Kandy</td>
<td>081-2494119</td>
</tr>
<tr>
<td><strong>Katunayake</strong>&lt;br&gt;Institute of Engineering Technology, Temple Road, Katunayake</td>
<td>0112252831</td>
</tr>
<tr>
<td><strong>Kegalle</strong>&lt;br&gt;OUSL Study Centre, Kumaratunaga Munidasa Mawatha, Kegalle</td>
<td>035-2222086</td>
</tr>
<tr>
<td>Location</td>
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<tr>
<td>Kurunegala</td>
<td>The OUSL Study Centre, Nissanka Mawatha, Malkaduwawa Kurunegala</td>
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<td>Matara</td>
<td>The OUSL Study Centre, Nupe, Matara</td>
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<td>Monaragala</td>
<td>The OUSL Study Centre, Potuvil Road, Monaragala</td>
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<td>Nawala</td>
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<td>Peradeniya</td>
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<tr>
<td>Polonnaruwa</td>
<td>OUSL Study Centre, Mahavali Housing Scheme, New Town, Polonnaruwa</td>
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<tr>
<td>Puttalam</td>
<td>Open University of Sri Lanka Study Centre, 137/1, Colombo Road, Puttalam.</td>
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<tr>
<td>Rathnapura</td>
<td>The OUSL Study Centre, Hidellana, Rathnapura</td>
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<tr>
<td>Trincomalee</td>
<td>Sri Lanka Institute of Advanced Technological Education, Selvanayagapuram Rd, Uppuweili, Trincomalee.</td>
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<tr>
<td>UOC</td>
<td>University of Colombo,“College House”,94, Kumaratunga Munidasa Mawatha, Colombo 03</td>
</tr>
<tr>
<td>Vavuniya</td>
<td>Open University of Sri Lanka Study Centre, 366, Thekkawatta, Vavuniya</td>
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<tr>
<td>Waligatta</td>
<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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OUSSL Holidays

The OUSSL 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