UWI

ST. AUGUSTINE CAMPUS

POST GRADUATE

Science & Technology

REGULATIONS & SYLLABUSES

2015 2016

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HOW TO USE THIS HANDBOOK

Faculty Handbooks are available in both a printed format and an electronic format.

The *printed version* of the Faculty Handbook is an abridged version which contains only the relevant Faculty regulations as well as select extracts of University regulations. It also contains full programme descriptions.

The *electronic version* of the Faculty Handbook which is found online, also includes specific programme regulations and course prospectus showing the requirements for progression and graduation in specific programmes of study.

To find out more about the contents of a specific course or programme of study, please refer to the full, online version of the Faculty Handbook, which is available for download at **www.sta.uwi.edu/facultybooklets.asp**

Students should note that their progress through a programme of study at the University is governed by Faculty regulations and University regulations. Should there be a conflict between Faculty Regulations and University regulations, University regulations shall prevail.

Notwithstanding the contents of Faculty Handbooks, the University reserves the right to modify, add or altogether remove from a programme of study, certain aspects of any course offered by the University, as described in either or both the electronic and printed versions of the relevant Faculty Handbooks.

PRINTED VS ONLINE FACULTY HANDBOOKS

Information	*Printed Handbook*	*Online Handbook*
Staff Listings	✔	✔
Relevant Faculty Regulations – eg. Admission Criteria, Exemptions, Progression, GPA, Leave of Absence, etc.	✔	✔
Relevant University Regulations including Plagiarism Regulations and Declaration Forms	✔	✔
Other Information: eg. Co-Curricular courses, Language courses and Assistance for Students with Disabilities.	✔	✔
Programme Descriptions and Course Listings – includes list of courses to be pursued in each programme (degrees, diplomas and certificates), sorted by level and semester; course credits and credits to be completed for each programme – majors, minors and specials.	✔	✔
Course Descriptions including details on prerequisites and methods of assessment		✔

ACADEMIC CALENDAR 2015-2016

ACTIVITY	SEMESTER 1 AUGUST - DECEMBER 2015	SEMESTER 2 JANUARY - MAY 2016	SUMMER MAY - JULY 2016
Semester **BEGINS**	August 23, 2015	January 17, 2016	May 15, 2016
Registration	August 17 – September 11, 2015	January 11 – February 05, 2016	May 09 – June 04, 2016
Teaching **BEGINS**	September 01, 2015	January 18, 2016	May 16, 2016
Orientation and Ice Breaker (UWILIFE)	**August 28, 2015**		
Late registration / Late Payment Fee of TT$200.00 **APPLIES**	September 07, 2015	February 01, 2016	May 31, 2016
Application to Carry forward Coursework **ENDS**	September 11, 2015	February 05, 2016	June 03, 2016
Change in Registration (ADD/DROP) **ENDS**	September 11, 2015	February 05, 2016	June 03, 2016
Application for Leave of Absence **ENDS**	September 11, 2015	February 05, 2016	June 03, 2016
Application for Exemptions **ENDS**	September 11, 2015	February 05, 2016	June 03, 2016
Teaching **ENDS**	November 28, 2014	April 17, 2015	July 11, 2015
Semester II Break	**April 19 – 26, 2015**		
Examinations **BEGIN**	December 02, 2015	April 25, 2016	July 12, 2016
Examinations **END**	December 18, 2015	May 13, 2016	July 22, 2016
Semester **ENDS**	December 18, 2015	May 13, 2016	July 22, 2016
ELPT TEST: Scheduled for the following dates	August 17, 2015 and October 15, 2015	February 18, 2016	-
SPECIALLY-ADMITTED 2015/2016	**SEMESTER I**	**SEMESTER 2**	**ENTIRE ACADEMIC YEAR**
Application for Specially Admitted OPENS	November 10, 2014	November 10, 2014	November 10, 2014
Application for Specially Admitted ENDS	June 30, 2015	December 18, 2015	June 30, 2015
CEREMONIES			
Matriculation Ceremony	September 17, 2015		
Graduation Dates	October 10, 2015 (Open Campus) October 22 - 24, 2015 (St. Augustine)		

MESSAGE FROM THE DEAN

Welcome to the Faculty of Science & Technology (FST), The University of the West Indies, St. Augustine. We are extremely proud and delighted that you have chosen the FST for your post-graduate training. This new Faculty, which partially replaces the former Faculty of Science & Agriculture, has a strong history in research, innovation and development. We offer a range of post-graduate diplomas, M.Sc., M.Phil., and Ph.D. degrees in disciplines such as Mathematics, Physics, Chemistry, Computer Science, Environmental Science, and Biological Sciences.

The FST is the second largest faculty at the St Augustine Campus and also the most diverse in terms of academic programmes offered. In the FST, we have highly qualified and competent academic, administrative, technical and support staff, and many state-of-the-art laboratories. Several of our academic staff are world-renowned, and some of them were actually post-graduate students at the UWI. We recognize that post-graduate students are the lifeblood of research and innovation in our faculty and encourage you to develop new, creative and interesting ideas. We promise to support you in this effort and offer you post-graduate training that is second to none.

The FST consists of five departments: Chemistry, Computing & Information Technology, Life Sciences, Mathematics & Statistics, and Physics. This booklet contains important information on our various post-graduate programmes and courses and we encourage you to become very familiar with it.

The FST provides post-graduate students with an intellectually stimulating atmosphere conducive to development of critical thinking skills and research. For M.Phil. and Ph.D. degrees, apart from being assigned a supervisor or supervisors, we have also established advisory committees. There are also ongoing research seminars by students, staff and visiting scientists; all post graduate students are required to attend these seminars.

On behalf of the staff of the FST, I wish you a very warm welcome and success in your chosen higher degree, either taught or by research. I also wish you an enjoyable stay in our Faculty and hope that you would have a thoroughly satisfying experience and look back on these years as the most stimulating, productive and rewarding time of your life.

Professor Indar Ramnarine
DEAN

PRINCIPAL OFFICERS AND ADMINISTRATIVE STAFF

DEAN
Professor Indar Ramnarine
BSc (UWI), MSc (Wales), MBA (Heriot-Watt), PhD (UWI)
Ext. 84484
Email: indar.ramnarine@sta.uwi.edu

DEPUTY DEANS

Graduate Studies and Research
Dr. Margaret Bernard
BSc, MPhil, PhD (UWI)
Graduate Studies and Research
Ext. 83098 / 84504
Email: margaret.bernard@sta.uwi.edu
Web: http://www2.sta.uwi.edu/~mbernard

Outreach
Dr. Donna Comissiong
BSc, MPhil, PhD (Northwestern Univ.)
Outreach
Ext. 83099 / 84504
Email: donna.comissiong@sta.uwi.edu

Under Graduate Student Matters
Dr. Shirin Haque
BSc, MPhil, PhD (UWI)
Undergraduate Student Matters
Ext. 83123/ 84504
Email: shirin.haque@sta.uwi.edu

Physical Facilities
Dr. Russel Ramsewak
BSc, PhD (UWI)
Physical Facilities
Ext. 83536 / 84504
Email: russel.ramsewak@sta.uwi.edu

SECRETARIAT:
ADMINISTRATIVE OFFICER
Mrs. Indira Ousman
BSc, MSc (UWI)
Ext. 84479
Email: indira.ousman@sta.uwi.edu

DEAN'S SECRETARY
Mrs. Wendy-Ann Wellington
BSc (UWI)
Ext. 84481
Email: wendyanne.wellington@sta.uwi.edu

SECRETARY
Mrs. Laneta Teemal
BSc (UWI)
Ext. 84480
Email: laneta.teemal@sta.uwi.edu

ACCOUNTING ASSISTANT
Mrs. Claire Licorish
BSc (UWI)
Ext. 84477
Email: claire.licorish@sta.uwi.edu

STUDENT SERVICES, SUPPORT & DEVELOPMENT UNIT:
ADMINISTRATIVE ASSISTANT
Mrs. Tara Sookhoo
BSc (UWI)
Ext. 84483
Email: tara.sookhoo@sta.uwi.edu

ADMINISTRATIVE ASSISTANT
Mrs. Laura Rambaran-Seepersad
BSc, MBA (UWI)
Ext. 84508
Email: laura.rambaran-seepersad@sta.uwi.edu

ADMINISTRATIVE ASSISTANT
Ms. Afiya Jules
BSc (UWI)
Ext. 84474
Email: afiya.jules@sta.uwi.edu

SECRETARY
Ms. Kereen Olivier
BSc, MSc (UWI)
Ext. 84478
Email: kereen.olivier@sta.uwi.edu

CLERICAL ASSISTANT
Mrs. Sue-Ann Lee Willock
Ext. 84509
Email: sue-ann.lee@sta.uwi.edu

INFORMATION COMMUNICATION MANAGEMENT UNIT:
LAN ADMINISTRATOR

Mr. Krishna Ramdass *(On Sabbatical Leave 2015/2016)*
BSc Gen., Dip. Ed (UWI). MSc (Portsmouth University)
Ext. 84482
Email: krishna.ramdass@sta.uwi.edu

Mr. Naresh Seegobin
BSc, MSc (UWI)
Ext. 84482
Email: naresh.seegobin@sta.uwi.edu

THE UNIVERSITY OF THE WEST INDIES BOARD FOR GRADUATE STUDIES AND RESEARCH

REGULATIONS FOR GRADUATE DIPLOMAS AND DEGREES

WITH EFFECT FROM August 2014

SECTION 1 - GENERAL REGULATIONS

GRADUATE DIPLOMAS AND DEGREES

Graduate Diplomas

1.1 Graduate Diplomas shall be awarded on the basis of:
- (a) written examinations together with a research paper or project report; or
- (b) requirements prescribed for specific Graduate Diplomas in the respective Faculties.

Taught Masters and DM Degrees

1.2 Taught Masters degrees and the Doctor of Medicine degree shall be awarded on the basis of:
- (a) written examinations together with a research paper or project report; or
- (b) requirements prescribed for specific degrees in the respective Faculties.

Research Degrees: MPhil, PhD, MD

1.3 The MPhil, PhD and MD shall be primarily research degrees and shall be awarded primarily on the basis of examination by thesis. Other requirements shall be as specified in the respective Faculties.

Professional Doctorates

1.4 Professional Doctorates shall be awarded on the basis of examination by written papers together with examination of the thesis. Other requirements shall be as specified in Programme and Faculty Regulations.

QUALIFICATIONS FOR ADMISSION

1.5 The following are eligible to apply for registration for a Graduate Diploma or degree:
- (a) Graduates of the University of the West Indies;
- (b) Persons who possess a degree from an approved university;
- (c) Persons holding such other suitable qualifications and/or experience as the Board for Graduate Studies and Research may approve.

Specially Admitted Students

1.6 In addition to the persons mentioned above, the Vice-Chancellor may also admit to the University as specially admitted students, for limited periods, such persons as he may deem fit.

1.7 Such persons are deemed eligible for special admissions:
(a) Persons sponsored by the Governments or other employers to read certain courses, not for credit towards a University qualification, under a special arrangement.
(b) Any individual who wishes to pursue and develop a particular area of intellectual interest.
(c) Graduates of the University of the West Indies or other approved universities who wish to pursue a particular course or courses.

1.8 Applications for special admission must be made on the appropriate forms.

1.9 To be considered for entry as "specially admitted students" applicants should normally possess an undergraduate degree. Those students who do not satisfy the requirements for entry to the University should provide satisfactory evidence of their previous studies. In appropriate cases they may be required to sit for a special entrance examination. In the assessment of the qualifications of applicants due allowance shall be made for their maturity.

1.10 Such students shall be required to comply with the University Regulations for students as are in force.

MINIMUM ENTRY REQUIREMENTS

Graduate Diplomas, Taught Masters Degrees and DM Degrees

1.11 The minimum requirement for admission to a Graduate Diploma, Taught Masters or DM degree programme shall be a minimum GPA of 2.5 or a Lower Second Class Honours degree or its equivalent, unless the Campus Committee for Graduate Studies and Research in any particular case otherwise decides.

MPhil Degrees

1.12 The minimum requirement for admission to MPhil programmes shall be a minimum GPA of 3.0, or an Upper Second Class Honours degree or its equivalent, unless the Campus Committee in any particular case otherwise decides.

PhD and MD Degrees

1.13 The minimum requirements for admission to PhD and MD programmes:
(a) Approved graduate degrees awarded primarily for research;
(b) Taught Masters degree from the UWI or another approved University, provided that the Masters programme included a research component of at least 25% of the total credit rating and the applicant achieved at least a B+ average or its equivalent;
(c) Approval of upgrade application;
(d) Such other qualifications and experience as the Board for Graduate Studies and Research may approve.

Professional Doctorates

1.14 The minimum requirements for admission to Professional Doctorates:
Taught Masters degree in an appropriate field from the UWI or another approved University, having achieved at least a B+ average or its equivalent, and possessing the required experience in the field (as specified in the relevant Programme requirements).

APPLICATION PROCEDURE

For information on the application procedure, please visit the Graduate Information Portal (GRIP) at **www.uwi.edu/grip**

APPOINTMENT OF SUPERVISORS

1.15 Persons related to candidates for Graduate Diplomas or degrees may not be appointed to supervise such candidates. For this purpose, a person shall be deemed to be related to the candidate as a parent, child, grandparent, grandchild, step-parent, step-child, sibling, spouse, fiancé, fiancée, or cohabitee, or any offspring of the above or any other relationship that may give rise to a conflict of interest.

1.16 A staff member registered for a graduate degree shall not be appointed as a Supervisor of a student, unless the Board for Graduate Studies and Research in any particular case decides otherwise. Such a staff member may only be appointed to supervise a student registered for a taught degree below the level of the one for which the staff member is registered.

1.17 A staff member without a graduate degree or with a degree of a lower level than the one to be supervised, but with long teaching and research experience, may be appointed as Supervisor, but such recommendations for appointment shall be subject to approval by the Board for Graduate Studies and Research.

1.18 Supervisors of students pursuing research degrees must have held a graduate degree, of the same or higher level as the degree being supervised, for at least three years, unless the Campus Committee in any particular case otherwise decides.

Research Degrees

1.19 Before a student is accepted to an MPhil, PhD or MD programme, at least one supervisor shall be appointed by the Campus Committee on the recommendation of the Head of Department.

1.20 Where more than one Supervisor is appointed for a student, one shall be designated Chief Supervisor and the other(s) shall be designated Co-Supervisor(s). A person not on the staff of the UWI but fully qualified, may also be appointed a Co-Supervisor but may not be Chief Supervisor, except where approved by the Board for Graduate Studies and Research.

1.21 In cases of co-supervision of research which involves disciplines in more than one Department, the Chief Supervisor shall be from the Department in which the student is registered, unless the Campus Committee in any particular case decides otherwise.

1.22 By the end of the Semester in which the student is first registered, a Committee of Advisors shall be nominated by the Head of Department and appointed by the Campus Committee. The Committee of Advisors shall comprise a minimum of three persons, and shall include the student's Supervisor(s).

1.23 Supervisors shall provide academic guidance and direction to students in the conduct of the students' research. (See Graduate Studies Guide for Students and Supervisors)

1.24 The Chief Supervisor, or sole supervisor as the case may be, shall communicate regularly with the student and Co-Supervisor if applicable, convene meetings of the Committee of Advisors at least once per year, and by regular reports, inform the Campus Committee of the state of the student's work.

Professional Doctorates

1.25 Supervisors of professional doctoral theses must be nominated by the relevant Head of Department and approved by the Campus Committee at least three months prior to the scheduled commencement of the research component of the work.

Research Papers and Project Reports

1.26 Supervisors of research papers and project reports must be nominated by the relevant Head of Department and approved by the Campus Committee at least two months prior to the scheduled commencement of the work by the candidates.

REGISTRATION

1.27 A candidate may not be registered for two or more programmes simultaneously, whether at UWI or at any other institution, unless the Board for Graduate Studies and Research in any particular case decides otherwise.

1.28 A student awaiting the final results of a programme in which he or she is registered may be provisionally accepted by the Board for Graduate Studies and Research into another programme pending the outstanding results.

1.29 The period of registration for a Graduate Diploma or degree shall date from the start of the semester in which the candidate is first registered.

1.30 All students, including those who proceed on electives and attachments to other institutions, are required to register each semester.

Deadlines for Registration

1.31 Deadlines for registration shall be as follows:

(a) Continuing students and new students admitted in Semester I:
  (i) Normal Registration: First week of Semester I
  (ii) Late Registration: Up to the end of the third week of Semester I. A late registration fee will be charged.

(b) New students admitted in Semester II:
  (i) Normal Registration: First week of Semester II
  (ii) Late Registration: Up to the end of the third week of Semester II. A late registration fee will be charged.

(c) The University Registrar/Campus Registrar may delegate to Campus Committees responsibility with respect to the above deadlines.

1.32 Late registration and changes in registration after the above deadlines will be permitted only in exceptional circumstances and with the approval of the Campus Committee, on the recommendation of the relevant Head of Department. Continuing students who have failed to register by the applicable deadlines shall be deemed to have withdrawn, and shall be required to apply for re-admission.

1.33 Students are deemed to have failed any required examination in courses for which they have registered but which examination they have not taken, except in exceptional circumstances as determined by the Chair of the relevant Campus Committee.

1.34 Candidates who have submitted their theses, research papers or project reports before the end of a Semester, but the examination of which has not been completed at the start of the following Semester, must re-register in the new Semester, but need only pay the applicable registration fee. Any costs incurred by candidates in being present for oral examinations, should the Regulations or the Examiners require that they be so examined, shall be borne by the candidates.

Identification Cards

1.35 All registered students are required to have a University ID card which they must produce at the Library, examination rooms and other places as may be requested.

Leave of Absence

1.36

(a) A student who for good reason wishes to be absent from an academic programme for a semester or more must apply for formal leave of absence to the Campus Committee, stating the reasons for the application.
(b) The length of such leave of absence, if granted, will be subject to approval by the Campus Committee, but will not be less than one semester or greater than one academic year in the first instance, terminating at the end of the semester or the academic year for which the application is approved.
(c) Leave of absence will not be granted for more than two consecutive academic years, unless the Board for Graduate Studies and Research in any particular case decides otherwise.
(d) Applications for leave of absence for a semester shall be submitted by the end of the third week of the relevant semester;
(e) Applications for leave of absence for the academic year shall be submitted by the end of the third week of Semester I.

Residence Requirements

1.37 Candidates for the MPhil, PhD, and MD who are not graduates of the UWI must complete at least one semester of their graduate work in residence at the UWI or at any institution that may be approved from time to time by the Board for Graduate Studies and Research.

1.38 Candidates for the MPhil, PhD, and MD who hold a first degree of the UWI and wish to conduct a portion of their research in a country outside the Caribbean region, may do so provided that satisfactory evidence has been presented to the Board for Graduate Studies and Research that adequate facilities are available for the proposed programme of work and that adequate arrangements have been made for supervision.

Intellectual Property

1.39 As a UWI student, the candidate agrees to abide by the UWI Policy on Intellectual Property located on the Graduate Information Portal at **www.uwi.edu/grip**.

CHANGES IN REGISTRATION

Transfer and Upgrading of Registration

1.40 A candidate registered for the MPhil degree who wishes to upgrade his or her registration to the PhD may apply after a period of one year full-time, or two years part-time, from the date of initial registration, and should complete the upgrade of registration by the end of three years full-time, or five years part-time, from the date of initial registration. The candidate must have the support of the Supervisor and the relevant Head of Department and have given evidence of having the qualifications necessary for writing a thesis for the PhD.

1.41 A candidate who is registered for a Taught Masters degree may apply after a period of one Semester for transfer of registration to the MPhil if, in the opinion of the Head of Department, the candidate has given evidence of having the qualifications necessary for writing the thesis for the MPhil. A candidate registered for the MPhil/PhD programme who wishes to pursue a Taught Masters degree shall withdraw from the MPhil/PhD, without penalty, and apply for registration in a Taught Masters programme.

1.42 The procedure to be followed by Heads of Departments in the upgrading and transfer of registrations under Regulations 1.40 and 1.41, shall be as prescribed by the Board for Graduate Studies and Research in the Manual of Procedures for Graduate Diplomas and Degrees.

1.43 A candidate whose application for upgrading or transfer of registration under Regulations 1.40 and 1.41 has been approved shall have the years spent in the MPhil programme counted toward the years spent in the PhD programme (see Regulations 1.49 and 1.50).

1.44 A candidate who is registered for the PhD and who has not yet submitted the thesis for examination may apply to the Campus Committee to change registration to MPhil and submit the thesis for examination for the MPhil degree. Where these applications are granted, the registration for the PhD will lapse and the registration for the MPhil will be deemed to have started from the date of the original registration for the MPhil/PhD.

Full-time and Part-time Registration

1.45 Candidates registered as either full-time or part-time students may apply to the Campus Committee to change their registration status.

1.46 Full-time students may take employment for not more than twelve hours per week without losing their fulltime status otherwise they shall be registered as part-time. However, research students who hold Teaching or Research Assistantships in the area of their research programmes may be registered as full-time students, provided that their employment commitment does not exceed twenty hours per week.

1.47 A candidate who has been registered as a full-time student for two years in the case of the MPhil or three years in the case of the MD, PhD and Professional Doctorate shall not benefit from any extension of time for completion of the requirements of the degree by virtue of any change to part-time registration thereafter (see Regulation 1.53).

TIME LIMITS FOR REGISTRATION

1.48 The minimum period of registration for the MPhil is 2 years full-time, and for the MD, PhD, and Professional Doctorate, is 3 years full-time, unless the Campus Committee in any particular case otherwise decides. The minimum period of registration for the MPhil and Professional Doctorate is 4 years part-time, and for the MD and PhD, 5 years part-time.

1.49 Candidates for the MPhil are required to submit their theses for examination within 3 years of their initial registration for full-time studies or, subject to Regulation 1.47, within 5 years of their initial registration for part-time studies, unless the Campus Committee in any particular case otherwise decides.

1.50 Candidates for the PhD, MD and Professional Doctorates are required to submit their theses for examination within 5 years of their initial registration for full-time studies or, subject to Regulation 1.47 within 7 years of their initial registration for part-time studies, unless the Campus Committee in any particular case otherwise decides.

1.51 The minimum period of registration for a Taught Masters degree shall be one year for full-time students and two years for part-time students, unless the Board for Graduate Studies and Research in any particular case otherwise decides (see the relevant Programme Requirements). Assessment of the taught component must be completed before a research paper or project report can be submitted for examination. A candidate who is permitted to re-write any component of the programme is allowed a consequential extension of these time limits.

1.52 A candidate whose period of registration is about to end (see Regulations 1.49-1.50) may apply for an extension of time. Such application must be accompanied by a statement explaining why the thesis, research paper or project report has not been completed and indicating how much work remains to be done. Campus Committees may approve extensions of time limits of up to 1 year for submission of project reports and research papers, and up to 2 years for MPhil, PhD, MD and Professional Doctorate theses.

1.53 Extensions of time limits in excess of those in Regulation 1.52 may be granted by the Campus Committee where it considers that exceptional circumstances exist.

1.54 For the purposes of calculating time limits for registration, part-time registration is treated as equivalent to one-half year of full-time registration only for the first two years of full-time equivalent (FTE) registration for the MPhil, or three years FTE registration in the PhD. Thereafter, part-time registration will be treated as equivalent to full-time.

WITHDRAWAL

Students Deemed To Have Withdrawn

1.55 Where a student does not meet the final deadline for submission of any requirement for a Graduate Diploma or degree that student's registration and the right to re-registration shall expire at the end of the semester during which the final deadline occurs. Such students are deemed to have withdrawn.

Students Required To Withdraw

1.56 Students registered in Graduate Diplomas, Taught Masters degrees or programmes in which courses are delivered over a short period may, on account of poor performance, be required to withdraw by the Campus Committee at the end of Semester I, II or at any point within a Semester, as may be prescribed by the approved Programme requirements.

1.57 Candidates required to withdraw at the end of Semester I shall be refunded any fees already paid towards Semester II.

RE-ADMISSION OF CANDIDATES

1.58 The re-admission of students who had been deemed to have withdrawn or required to withdraw must be approved by the Campus Committee. Such applicants required to withdraw will be considered for readmission not less than two years after their withdrawal, unless the Board for Graduate Studies and Research in any particular case otherwise decides.

1.59 Applicants re-admitted to a Graduate Diploma or degree programme may, with the approval of the Campus Committee, be credited with courses passed during the applicant's previous registration provided that not more than five years have lapsed since the date of expiry of the applicant's previous registration for those courses, or that the course content has not changed significantly in the interval. An applicant may be allowed credit for courses passed after more than five years have lapsed provided the relevant Head of Department submits in writing the reasons for the recommendation, for the approval of the Board for Graduate Studies and Research. Approval of such credit will be granted only where the candidate's performance has been significantly better than a minimal pass, unless the Board for Graduate Studies and Research in any particular case decides otherwise. In cases where a student has been required to withdraw through failure of a research paper or project report and is re-admitted, the research paper or project report which is pursued must address a new topic.

REGISTRATION OF QUALIFYING CANDIDATES

1.60 Students for admission to Graduate Diploma and degree programmes may be required by the Board for Graduate Studies and Research to take qualifying courses and to write examinations in these courses. Such students shall be registered as qualifying students and not as candidates for the diploma or degree. The qualifying courses shall be recommended by the relevant Head of Department for approval by the Campus Committee.

1.61 Students who are required to write qualifying examinations shall do so within two semesters of registration as a full-time student or four semesters of registration as a part-time student. The examination shall be conducted through the Campus Registrar who shall advise the candidates of the date, time, and place, not later than four weeks in advance of the examination.

1.62 Students will not be allowed to repeat a qualifying examination or any part thereof, except in exceptional circumstances and with the approval of the Campus Committee, on the recommendation of the Examiners.

1.63 Students cannot proceed to register for a Graduate Diploma or degree programme unless they have successfully completed the required qualifying examinations.

DEPARTMENTAL EXAMINATIONS

1.64 Students for admission to Graduate Diploma and degree programmes who are deemed generally acceptable but deficient in knowledge of particular aspects of the subject concerned may be required to follow courses, specified by the Campus Committee on the recommendation of the Head of Department, in addition to the courses required for the diploma or degree, and to pass the appropriate examinations before submitting any thesis, research paper, or project report as required. Such examinations shall be termed Departmental Examinations.

1.65 Students who are required to write Departmental Examinations shall register for the appropriate examinations at such time as is determined by the Campus Committee, on the recommendation of the Head of Department. The examinations shall be conducted through the Campus Registrar, who shall advise the candidates of the date, time and place not later than four weeks in advance of the examination.

COURSE OF STUDY

Graduate Diplomas, Taught Masters and DM Degrees

1.66

(a) The course of study for a Graduate Diploma or Taught Masters degree shall include, in addition to the required courses, supervised research work culminating in the submission of a research paper or project report, except as stated in approved Programme requirements. The subject of any such research paper or project report shall be recommended by the relevant Head of Department to the Campus Committee for approval not later than two months before the date of submission of the research paper or project report.

(b) The course of study for a DM degree includes both an academic programme and clinical rotations covering all aspects of the discipline over 4 to 7 years depending on the discipline. For all disciplines, it is necessary to be attached to an accredited hospital or to be assigned to clinical duty. All DM candidates are required to complete successfully a research project or case book before the final examination.

Research Degrees and Professional Doctorates

1.67 A candidate for the MPhil, PhD, MD or Professional Doctorate is required to follow such courses of study, and to undertake such other work, as may be approved by the Campus Committee on the recommendation of the relevant Head of Department, and to pass the appropriate examinations before submitting the thesis:

(a) For students enrolled in an MPhil degree, a minimum of 6 credits should be taken through courses, and for students enrolled in a PhD programme, a minimum of 9 credits should be taken through courses.

(b) For students upgrading from MPhil to PhD, their MPhil courses will contribute to the course requirements for the PhD.

(c) Students entering either the MPhil or PhD degree already holding a Taught Masters degree may apply to the Campus Committee for exemption from the course requirements of the research degree.

RESEARCH SEMINARS

1.68 Students enrolled for an MPhil degree must satisfactorily complete at least two research seminars, to be convened by the relevant Head of Department, prior to the submission of their MPhil thesis. Students enrolled for a PhD or MD degree must satisfactorily complete three such seminars. The upgrade seminar will count as one of the three seminars for the PhD, provided that it is not the last seminar. Assessment of students' seminars must be included in their Progress Reports. Students enrolled in Professional Doctorates must satisfactorily complete research seminars as specified in Programme requirements.

PROGRESS REPORTS

1.69 Each Chief Supervisor or sole Supervisor as the case may be, shall submit biannually to the Campus Committee through the Head of Department, a report on the work of any candidate placed under his or her supervision. Members of the Committee of Advisors are required to meet at least once per year with the student, and based on their meeting(s), shall submit to the Campus Committee, through the Head of Department, an annual report on the student's progress. These reports should say what work the candidate has done, assess the work, indicate what remains to be completed and whether the candidate is on schedule. The Supervisor shall supply the student with a copy of these reports, and the student shall be invited to verify that he or she has seen these reports.

1.70 Where the candidate disagrees with the Supervisor's assessment of the candidate's progress, he or she shall so indicate to the Campus Committee in writing. The Campus Committee shall consider the candidate's objections, together with the Supervisor's report, and may, if it sees fit, refer the matter for the report from another person qualified under these Regulations to supervise the candidate. If the Campus Committee decides against accepting the Supervisor's assessment, it may, and shall if the candidate requests, replace the Supervisor with another Supervisor appointed after consultation with the Dean of the Faculty and Head of Department.

1.71 Candidates whose work is at any time reported by their Supervisors to be unsatisfactory may be required to withdraw.

MARKING SCHEME

1.72 The marking scheme for graduate degrees and diplomas is as follows:

Passing Grades:

A	70 -100%
B+	60 - 69%
B	50 -59%

Failing Grade:

F	0 -49%

Where students are writing Qualifying Courses or Departmental Examinations, the minimum pass will be as indicated above. The minimum passing grade will not necessarily qualify the student for entry into all graduate programmes. The threshold for admission will be determined by the programme.

THE AWARD OF DISTINCTION AND OF HIGH COMMENDATION

1.73 In the case of Graduate Diplomas and Taught Masters degrees which require the submission of a project report or research paper, a distinction is awarded to candidates who achieve an average of 70% or better (Grade A) in the written courses and a mark of 70% or better in the research paper or project report. A candidate failing a course (including an elective course) required for the completion of the programme shall be ineligible for the award of distinction. Failure in a co-requisite course or in a qualifying course shall not exclude the student from receiving a distinction.

1.74 In the case of programmes conducted entirely by courses, candidates must obtain an A grade in at least 70% of the courses and the average mark of all courses must not be less than 7% to qualify for distinction. A candidate failing a course (including an elective course) required for the completion of the programme shall be ineligible for the award of distinction. Failure in a co-requisite course or in a qualifying course shall not exclude the student from receiving distinction.

1.75 The award of an MPhil/PhD shall be conferred with high commendation where the Examiners are unanimous in their recommendation that such an award should be made. In the case of Professional Doctorates, candidates should also have attained a Grade A average over the coursework component of the programme, and a candidate failing a course (including an elective course) required for the completion of the programme shall be ineligible for the award of high commendation. Failure in a co-requisite course shall not exclude the student from receiving high commendation.

POSTHUMOUS AWARD OF DIPLOMA OR DEGREE

1.76 Where a candidate dies after submission but prior to forwarding the thesis, research paper or project report for examination, the Campus Registrar shall in all cases inform the Examiners of the status of the candidate. Where the Examiners require only editorial changes, the Campus Committee may authorise the candidate's Supervisor to effect such changes. Where Examiners require substantive changes, the matter shall be referred to the Board for Graduate Studies and Research for determination.

1.77 Where a candidate dies after Examiners have reported, but prior to completing required corrections, the procedure at Regulation 1.76 shall apply with respect to the required changes.

1.78 The Board for Graduate Studies and Research shall consider the award of a posthumous diploma or degree only on receipt of a formal request by the candidate's personal representative. The Board shall consider the particular circumstances of each request prior to approving the award of the diploma or degree.

1.79 The posthumous award of a diploma or degree shall be considered only when the thesis, research paper or project report needed to complete programme requirements has been submitted to the Campus Registrar for examination, unless the Board for Graduate Studies and Research in any particular case otherwise decides.

CHEATING

1.80 Cheating is any act intended to benefit one's self or another by deceit or fraud.

1.81 A candidate must not directly or indirectly give assistance to any other candidate, or permit any other candidate to copy from or otherwise use his or her papers. A candidate must not directly or indirectly accept assistance from any other candidate or use any other candidate's papers. These behaviours will be regarded as cheating.

1.82

(a) If any candidate is suspected of cheating, or of attempting to cheat, the circumstances shall be reported in writing to the Campus Registrar. The Campus Registrar shall refer the matter to the Chair of the Campus Committee for Graduate Studies and Research. The Chair shall appoint an Investigating Committee of not less than 5 members to consider the case. If the Chair so decides, the Committee shall invite the candidate for an interview and shall conduct an investigation. If the candidate fails to attend the

interview, and does not offer a satisfactory explanation, the Committee may hear the case in the candidate's absence.

(b) When investigating allegations of cheating, the quorum of the meeting shall include the Chair of the Campus Committee for Graduate Studies and Research, at least one (1) other member of the Campus Committee and the graduate student representative on the Campus, or in his/her absence, a student nominated by the President of the Student Society. In the event that the Chair of the Campus Committee for Graduate Studies and Research is unable to attend, either Co-Chair of the Board for Graduate Studies and Research shall appoint an Acting Chair. The Campus Registrar shall be the Secretary to the Committee.

(c) If the candidate is found guilty of cheating or of attempting to cheat, the Committee may recommend to the Board for Graduate Studies and Research that the candidate be disqualified from the examination concerned, or disqualified from all his/her examinations taken in that examination session; or disqualified from all further examinations of the University for any such period of time as it may determine.

(d) A student may appeal to the Senate from the decision of the Board for Graduate Studies and Research. Appeals against decisions of the Board for Graduate Studies and Research shall be received by the Campus Registrar within two weeks of the date on which the decision is communicated to the student. Such appeals shall be heard by an Appeal Committee of Senate. Such an Appeal Committee may uphold or reverse the decision and may vary the penalty in either direction within the limits prescribed in (b) above. The decision of the Appeal Committee of Senate shall be final.

(e) Regulations 1.82(a)-(d) apply to all forms of cheating except plagiarism.

Plagiarism

1.83 Regulations applicable to plagiarism are provided in Appendix 1 to these Regulations.

SECTION 2 - REGULATIONS FOR WRITTEN EXAMINATIONS AND COURSEWORK

GENERAL EXAMINATION REGULATIONS

2.1 Candidates taking courses for Graduate Diplomas and degrees shall be examined by means of one or more of the following:
- (a) Written Examinations;
- (b) Coursework, which shall include practical work, essays and other forms of course-work exercise or written test or any combination of these prescribed by Programme Regulations and approved by the Board for Graduate Studies and Research;
- (c) Oral Examinations, if recommended by the Examiners of written examinations or coursework and approved by the Campus Committee.

2.2 No candidate will be permitted to repeat the examination in any one course on more than one occasion, unless the Board for Graduate Studies and Research in any particular case decides otherwise.

2.3 Candidates permitted a second attempt at a course, in cases of courses with mixed methods of assessment, will be required to rewrite only that component failed, unless the Campus Committee in any particular case decides otherwise. Marks allotted to the component passed at the first attempt will be credited to the candidate at his or her second attempt at the course.

2.4 In exceptional circumstances a third attempt may be granted by the Board for Graduate Studies and Research. In these instances, the Examiners may recommend a passing mark of no more than 50% as the final overall mark for the course.

2.5 The number of courses in which a candidate may be permitted a repeat examination shall be specified in the Requirements for the particular programme, subject to the approval of the Board for Graduate Studies and Research.

2.6 Candidates who repeat the examination in any course shall not be eligible for the award of a diploma or degree with distinction.

2.7 The conduct of examinations in conformity with these Regulations and the decisions of the Senate shall be under the overall administrative control of the University Registrar. However, the Campus Registrar shall act on the advice of either the Chair of the Board for Graduate Studies and Research or the Chair of the relevant Campus Committee for Graduate Studies and Research, who shall consult the relevant Dean and Head of Department.

2.8 Any of these Regulations for examinations of graduate diplomas and degrees may be waived by the Chair of the Board for Graduate Studies and Research, who shall report his or her action to the next meeting of the Board.

WRITTEN EXAMINATIONS

Declaration of Interest

2.9

(a) All categories of staff are required to submit a declaration of interest to the Campus Registrar if they have a relative writing an examination in which they are involved. Failure to comply with this regulation will result in the candidate's results being declared null and void and the staff member being reported to the Disciplinary Committee.

(b) Where a member of staff has a relative writing examinations for a course taught by him or her, that member shall be divorced from the setting of the examination paper and another Examiner must be appointed to set the paper and to examine a sample of the scripts, including the script(s) of the relative. Such sample should comprise 10% of the total scripts but in no case be fewer than five scripts.

(c) For the purposes of these Regulations, a person shall be deemed to be related to the candidate as a parent, child, grandparent, grandchild, step-parent, step-child, sibling, spouse, fiancé, fiancée, or cohabitee, or any offspring of the above.

Appointment of Examiners

2.10 Examiners shall be appointed by the Campus Committee, following receipt of nominations from Faculty Boards. Such nominations should be submitted to the Campus Registrar no later than two months prior to the date of the examination.

2.11 Every written examination for a Graduate Diploma or degree, whether taken at one time or in sections, shall be set and graded by two Internal Examiners, one of whom shall be appointed First Examiner.

2.12 The minimum qualifications required for an Internal Examiner are:

(a) An appointment in the grade of Lecturer or above;

(b) A record of scholarly publications;

(c) At least three years' experience as an Examiner at an approved University.

2.13

(a) A Head of Department wishing to recommend for appointment as an Examiner a staff member who does not satisfy one or more of the qualifications listed in Regulation 2.12 shall make an appropriate case to the Campus Committee.

(b) In instances where part-time members of staff are being recommended as Internal Examiners, their degrees, relevant qualifications, lists of publications, University titles and current academic appointments shall be submitted to the Campus Committee.

2.14 The Campus Committee shall recommend to the Board for Graduate Studies and Research those courses, or groups of courses, in which it is not necessary to appoint External Examiners or in which it is desirable to appoint Independent Examiners.

2.15 External Examiners shall be appointed by the Campus Committee following receipt of nominations from the relevant Head of Department.

2.16 A person who is currently a member of staff, or on the Council, the Campus Council or the University Strategy and Planning Committee, or who has so served within the prior five year period, shall not be appointed External Examiner.

2.17 An External Examiner shall not be appointed for more than three years in the first instance. Such appointment may not be extended beyond one additional three year period, unless the Board for Graduate Studies and Research in any particular case otherwise decides.

2.18 At the time of nomination of External Examiners, their degrees, relevant professional qualifications, lists of publications, University titles and current academic appointments shall be submitted to the relevant Campus Committee for approval.

Duties of Examiners and Heads of Departments

2.19 The setting of the examination question paper should be based on full consultation between the Internal Examiners and should normally reflect the consensus of all Examiners concerned.

2.20 The duties of the First Examiner shall include:
(a) Preparing a camera-ready copy of the question paper and a marking scheme;
(b) Ensuring that all scripts are seen by at least two Examiners;
(c) Determining the marks, including reconciling the marks between different Examiners where necessary, and preparing the marksheets;
(d) Forwarding copies of the signed component marksheets by the prescribed deadline to the Campus Registrar on completing the examination of each course;
(e) Forwarding to the External Examiner through the Campus Registrar, on completion of marking: marksheets appropriately signed; the question paper(s); the relevant marking schemes; solutions and other relevant material including approved course descriptions; and a sample of the scripts and coursework assignments covering performance at all grades, chosen in consultation with the other Internal Examiners (see Regulations 2.29, 2.32, 2.67).

2.21 The Head of the Department, or his or her nominee, is responsible for the administrative arrangements involved in the setting and marking of examination papers and the submission of draft papers to the Campus Registrar. In cases where the Head of the Department, or his or her nominee, encounters problems in ensuring the smooth running of the examination process, he or she shall notify the Campus Registrar in writing, with a copy to the person(s) appropriate.

2.22 The Internal Examiners shall be responsible for the preparation of draft question papers for the marking of other examination exercises, and for participation in oral examinations where required.

2.23 All Examiners marking scripts must perform full examining duties (as defined in the University Examination Regulations for First Degrees, Diplomas and Certificates).

2.24 The First Examiner shall be in attendance at the start and during the first half hour of each written examination, except where the written examination requires the expertise of more than one Internal Examiner in which case all Internal Examiners shall be present. In such circumstance where there are no resident Examiners, the First Examiner shall be available for the first half hour of the examination to respond to telephone enquiries.

2.25 The Head of Department or his nominee shall use his or her best efforts to ensure that:
(a) The agreed examination papers are submitted to the Campus Registrar by the dates prescribed, and that such question papers are signed by the Internal Examiners;
(b) The examination papers are checked for accuracy by the Internal Examiner(s), at least two days before the examination;
(c) The scripts are marked by both Internal Examiners;
(d) The scripts, signed marksheets and other relevant examination material are returned to the Campus Registrar within three weeks of the date of the examination.

2.26 In cases where the Head of the Department, or his or her nominee, encounters problems in ensuring the smooth running of the examination process, he or she shall notify the Campus Registrar in writing, with a copy to the person(s) as appropriate.

2.27 All Examination material shall be addressed to the Campus Registrar under confidential cover, and shall be handed in personally to the Examinations Section by the Head of Department or by the First Examiner. In no circumstance shall a script or other completed examination exercise leave a country unless it has been marked by at least one Internal Examiner, or a facsimile copy has been made. Lost examination scripts will be dealt with as outlined in the University Examination Regulations for First Degrees, Associate Degrees, Diplomas and Certificates save that the reference therein to the Chair, Campus Committee on Examinations will be taken to mean Chair, Campus Committee for Graduate Studies and Research.

2.28 Consultation on the examination papers and scripts shall be conducted through the relevant Campus Registrar.

2.29 There may be full External Examination of any course or External Examination through post facto review. Full External Examination of courses apply to at least the first two years of every new programme after which External Examination will normally be post facto.

2.30 The minimum duties of the External Examiner in the Full External examination process shall be:
(a) to review and comment on the examination paper(s) and such other examination material as may be referred to him or her by the First Examiner through the Campus Registrar;

(b) to assess students' examination scripts, coursework assignments (when sent to the External Examiner; see Regulation 2.67) and other responses, and to recommend marks in any case in which he or she does not agree with the mark awarded by the Internal Examiners. The External Examiner shall include in his or her report the reasons for any substantial

disagreements so indicated. When such disagreements affect the issue of pass or fail, the External Examiner should submit his or her mark to the appropriate Campus Registrar as soon as possible;

(c) to report to the relevant Campus Registrar within six weeks of the receipt of the scripts on the standard of the examinations as a whole;

(d) to comment in the report on the relevance of the examination paper(s) and coursework topic(s), as appropriate, to the course objectives;

(e) to comment on comparability of the course(s) with those in similar programmes in other institutions, and to make recommendations where appropriate for the general improvement of the course(s);

2.31 In the case of Full External Examination, the External Examiner shall receive:

(a) Course descriptions and all its elements;

(b) The examination scripts and other relevant examination material;

(c) The marksheets appropriately signed;

(d) The approved examination question paper(s) and, where appropriate, solutions;

(e) The coursework assignments, where relevant (see Regulation 2.64);

2.32 With respect to External Examination through post facto review, the External Examiner shall receive, for each of the courses for which he or she is responsible, a copy of the approved course description and all its elements, the question paper, the marksheet, marking scheme and solutions, a representative sample of the scripts, and where relevant (see Regulation 2.64), a sample of the coursework and any Master's project reports.

2.33 The duties of the External Examiner in post facto reviews shall include:

(a) Undertaking a review of the standard of each examination after the scripts have been marked, and where relevant (see Regulation 2.64), of the standard of the coursework;

(b) Acting as a reviewer, and advising in this capacity on curricular matters in the area of study to which he or she is appointed;

(c) Writing a report to the Campus Registrar on each course examined. Copies of reports of External

(a) Examiners shall be sent by the Campus Registrar to the relevant Head of Department, Faculty Dean and Campus Committee. The External Examiner shall submit his or her report no later than four weeks after the receipt of the scripts.

2.34 Each External Examiner shall return to the Campus Registrar, in sealed registered packets, all scripts, marksheets and such other examination materials as may have been referred to him. These should be sent by airmail unless they need to be returned more urgently for the attention of the Board of Examiners.

2.35 Copies of reports from External Examiners shall be sent by the Campus Registrar to the relevant Campus Committee, Faculty Dean and Head of Department.

Confidentiality and Format of Question Papers

2.36 The confidentiality of all examination matters shall be preserved.

2.37

(a) The final draft question paper(s) shall be signed by the Internal Examiners and shall be on such form(s) as the University Registrar may prescribe.

(b) The final approved question paper(s) shall be printed or otherwise reproduced as prescribed by the Campus Registrar.

(c) No question paper shall be adopted as an examination paper unless it has been signed by the Internal Examiners.

2.38 Examiners must not transmit question papers by unsecured means.

Conduct of Written Examinations

2.39 Instructions to candidates taking written examinations, and duties of Invigilators, shall be as in the University Examination Regulations for First Degrees, Diplomas and Certificates, except that functions assigned to the Campus Committee on Examinations, its Chair, or the Chair of the Board for Undergraduate Studies, shall be performed respectively by the Campus Committee for Graduate Studies and Research, its Chair, or the Chair, Board for Graduate Studies and Research.

2.40 The dates of all examinations, other than Special Examinations, shall be as prescribed by the Campus Registrar.

2.41 The Examination Timetable, in respect of written examinations, shall be published at least one month before the examinations begin. Any changes in dates after publication shall be brought to the attention of candidates by means of additional notices posted on the official Examination Notice Board or an approved electronic medium at each Campus. Candidates will not be informed individually of such changes. In no case will any such change be made later than one week prior to the commencement of the series of examinations.

2.42 Each Chair of a Campus Committee is authorised to grant permission for the holding of a Special Examination on the recommendation of the relevant Head of Department.

2.43 Examinations being taken by both full-time and part-time students will be scheduled in accordance with the full-time programme.

2.44 No candidate shall be admitted to any examination unless:
(a) He or she has satisfied all the requirements and passed all the qualifying examinations prescribed in the Programme Requirements; or
(b) He or she has been exempted from any such requirements by the Campus Committee on the recommendation of the relevant Head of Department.

2.45 Any candidate who has been absent from the University for a prolonged period during the academic year for any reason other than certified illness, or whose attendance at prescribed lectures, classes, practical classes, tutorials or clinical instructions has been unsatisfactory, or who has failed to submit essays or other exercises set by his or her teachers, may be debarred from the relevant University examination(s) by the Board for Graduate Studies and Research, on the recommendation of the relevant Head of Department.

2.46 Any student who, having registered for a course, fails to take the examination shall be deemed to have failed the examination unless the Board for Graduate Studies and Research, on the recommendation of the relevant Head of Department, in any particular case decides otherwise.

2.47 If the performance of a candidate in any part of any examination is likely to have been affected by factors of which the Examiners have no knowledge, the candidate may report the circumstances in writing to the Campus Registrar. If the candidate decides to report such circumstances, he or she must do so within seven days of that part of the examination which may have been affected.

2.48 The Campus Registrar may pass the information referred to in Regulation 2.47 to the Chair of the Board of Examiners, if in his or her opinion it is likely to assist the Examiners in the performance of their duties. Boards of Examiners shall not take cognizance of illness, or other circumstances claimed to affect the performance of candidates, if these have not been referred to them by the Campus Registrar.

2.49 Any student who, for reason of permanent or temporary incapacity, desires special arrangements during examinations shall apply to the Campus Registrar through the relevant Dean of the Faculty or Head of Department. The arrangements desired should be specified, and the Campus Registrar may require a Medical Certificate as proof of such incapacity. Such student(s) shall be given extra time in which to write the relevant examination(s). The Campus Registrar shall inform the Board of Examiners of the circumstances in which the examination was performed.

2.50 Any amanuensis or secretarial assistance provided to students with special needs shall be approved by the Campus Registrar. The University will normally defray the additional costs involved.

2.51 In cases of illness, the candidate shall present to the Campus Registrar a medical certificate, as proof of illness, signed by the University Medical Officer or by other Medical Practitioners approved for this purpose by the University. The candidate shall send the medical certificate to the Campus Registrar within seven days from the date of that part of the examination in which the performance of the candidate is affected. A certificate received after this period will be considered only in exceptional circumstances.

2.52 Where, in the opinion of the University Medical Officer or any other approved Medical Practitioner concerned, a student is unable to submit a medical certificate in person, the University Medical Officer may do so on his behalf, within the time period prescribed in Regulation 2.51.

2.53 In the case of written examinations, every script shall bear the candidate's ID number but not his or her name.

2.54 The place, time and date at which a written examination shall be held will be determined by the Campus Registrar.

COURSEWORK REGULATIONS

2.55 Any coursework component, which is intended to count towards the final mark for a course, must be approved by the Board for Graduate Studies and Research.

2.56 The relevant Head of Department or Nominee must advise the students in writing about the coursework requirement before the end of the second week of the semester in which the coursework assignment is due, unless the Campus Committee in any particular case otherwise decides. Copies of this advice must be posted on the appropriate Faculty or Department Notice Boards or an approved electronic medium.

2.57 The submission date(s) of coursework assignments which count towards the final mark for a course shall be posted on Faculty or Departmental Notice Boards or an approved electronic medium at least

two weeks in advance of the submission date(s) for the particular assignments.

2.58 Any student who fails to submit by the posted submission date, a coursework assignment which is intended to count towards the final mark for a course shall be deemed to have failed the assignment unless the Campus Committee, on the recommendation of the relevant Head of Department, in any particular case otherwise decides.

2.59 In the case of written examinations of coursework, the Lecturer or Internal Examiner for the course shall be present for at least the first half hour of the examination, and appropriate invigilation shall be arranged by the relevant Head of Department or Examinations Section where appropriate for the entire examination.

2.60 In the case of written examinations of coursework, the Examinations Section shall determine the place, time and date at which the examination will be held, and this information shall be posted on the relevant Faculty or Departmental Notice Boards or an approved electronic medium at least two weeks in advance of the examination date.

2.61 For all coursework assignments, and for written examinations of coursework, the candidate's work must bear either the candidate's ID number or his or her name, as prescribed by Faculty Regulations.

2.62 Coursework assignments and examinations should be examined by at least two Internal Examiners. Where the Internal Examiners fail to agree on a coursework mark, the Head of Department shall determine the coursework mark in consultation with the Internal Examiners. In such a case, he or she must submit a full report to the Campus Committee.

2.63 Internal Examiners are permitted to inform students of their grades and marks for individual pieces of coursework as soon as an agreed grade and mark are available.

2.64 In cases where coursework counts for more than forty percent (40%) of the total assessment of a course, the coursework must be sent to the External Examiner in accordance with Regulations 2.29 and 2.32.

2.65 For all coursework assessment, the First Examiner is required to submit to the Head of Department, before the date of the written examination for the course, a coursework marksheet indicating marks for each coursework component and the final coursework percentage and grade.

2.66 In respect of any courses in which the students collaborate in teams and submit team reports as components(s) of their coursework requirements, the report of each team may identify which portions of its contents have been contributed by which student. All coursework shall be written work except where the Board for Graduate Studies and Research gives approval for an alternative procedure.

ORAL EXAMINATIONS

2.67 The Examiners appointed to examine a written paper may put oral questions to a candidate in any case in which they believe that this will help towards a more accurate assessment, if the Chair of the Campus Committee so approves.

2.68 In cases where a student fails a written examination of a course within 5% of the pass mark, the Examiners may recommend an oral examination to the Chair of the Campus Committee.

2.69 In cases of students failing the written examination component of a course on the first attempt, being allowed an oral examination, and performing satisfactorily in the oral examination, the Examiners shall recommend a passing mark of no more than 50% for the written component. This shall then be combined with the coursework mark to obtain the final overall mark for the course. In cases of students failing the written examination component of a course on the second attempt, being allowed an oral examination, and performing satisfactorily in the oral examination, the Examiners shall recommend a passing mark of no more than 50% as the final overall mark for the course.

2.70 The Campus Registrar shall set the time and place of the oral examination.

2.71 Oral examinations will be conducted by at least two Examiners, and chaired by the relevant Head of the Department or a senior member of the Faculty nominated by the Chair of the Campus Committee, if the Head of the Department is absent or is an Examiner. A report of the examination must be submitted to the Campus Committee.

2.72 The Examiner of an oral examination shall not serve as Chair.

2.73 The Examiners at an oral will normally be the persons who examined the written paper, but if one Examiner is not available, the Chair of the Campus Committee, in consultation with the relevant Head of Department, may appoint another Examiner in his or her place.

EXAMINERS' MEETINGS

2.74 The marks obtained by all candidates in each course examined shall be presented by the Internal Examiners to a Board of Examiners.

2.75 The relevant Head of Department, or Faculty Dean, shall chair the Board of Examiners, unless in any particular case the Campus Committee otherwise decides.

2.76 The Board of Examiners shall consist of all of the Internal Examiners appointed for all of the courses offered in the Programme concerned, unless in any particular case the Campus Committee decides otherwise. The Campus Registrar must be notified in advance of all meetings of Boards of Examiners and shall attend. The Minutes of these meetings shall be prepared by the relevant Faculties.

2.77 The Chair of the Campus Committee may attend meetings of the Boards of Examiners.

2.78 In cases where full external examination of a course is retained and where the External Examiner's judgement of a candidate's performance is at variance with that of the Internal Examiners', each of the Internal Examiners shall be requested to provide a comment on the External Examiner's position for the guidance of the Board of Examiners and Campus Committee. Where the judgement of the examiners continues to differ, the Campus Committee shall determine the candidate's result in the light of the collective comments of all Examiners.

2.79 A list of candidates and their results in every examination, and the recommendations arising therefrom, shall be drawn up at each meeting of a Board of Examiners, signed by the Chair of the meeting, and communicated to the Campus Registrar within two weeks of the meeting for the approval of the Campus Committee.

2.80 All examination results and marksheets shall be approved and signed by the Chair of the Campus Committee.

2.81

(a) All proceedings at meetings of Examiners shall be strictly confidential. Except as provided for in (b) and (c) below, examination results, grades and marks shall not be communicated in advance of publication to anyone except to the appropriate officers of the University. Copies of examination marks circulated to Boards of Examiners shall be treated as secret and confidential. The First Examiner for the course may, after the official marksheet has been approved and signed, disclose the final mark to the student.

(b) Heads of Departments, Chairs of Boards of Examiners, or Chairs of Campus Committees are permitted, in cases where this is considered necessary, to advise students in relation to their continuing registration on the basis of their performance at examinations before the final examination results are published.

(c) In respect of coursework, Examiners may inform students of their marks and grades for individual pieces of coursework as provided for in Regulation 2.63.

(d) After publication of results, the relevant Campus Registrar is authorised to issue final examination marks and grades to individual students.

REVIEW OF EXAMINATION RESULTS

2.82

(a) A student who is dissatisfied with the results of his or her examination should report his or her dissatisfaction in writing to the Campus Registrar. Such a report must be made within two weeks of the publication of results.

(b) The Campus Registrar shall forward the student's report to the Chair of the Campus Committee.

(c) Only students who have failed a course may request to go through their script or coursework with the Examiner (utilizing any approved electronic teleconferencing system if necessary);

(d) Students may request to have their script or coursework re-marked by a new and independent Examiner.

2.83 The student may inform the Campus Registrar that he or she wishes to have the examination re-marked, and must pay the relevant fee to have this done.

2.84 The right to report dissatisfaction and request a re-mark shall apply to both the coursework and written examinations.

2.85

(a) Where a re-marking is requested, the Campus Registrar shall inform the Chair of the Campus Committee, who shall request the relevant Head of Department, or in his or her absence the relevant Faculty Dean, to nominate a new and independent Examiner from within or without the University for appointment by the Chair of the Campus Committee, to re-mark the examination script or coursework.

(b) Where the Head of the Department is an Examiner, the nomination shall be made by the Dean. Where both the Dean and the Head of the

Department are Examiners, the Chair of the Campus Committee shall make the appointment after such consultation, as he or she considers appropriate.

(c) The new and independent Examiner no later than ten (10) days after receiving the script shall return the re-marked script or coursework with a written report and, where applicable, signed mark-sheet or grade-sheet to the Campus Registrar.

2.86 In the case of the re-marking of a script or coursework the mark of the new and independent Examiner shall be regarded as the final mark.

2.87 The Campus Registrar shall inform the candidate of the result of the re-marking.

2.88 Where the re-marking under Regulation 2.83 results in a higher mark than that previously recorded, the fee shall be refunded, provided that the increased mark results in a change of grade.

2.89 The results of the re-marking shall be conveyed by the Campus Registrar to the Chair of the Campus Committee, the Chair of the Board of Examiners and the relevant Head of Department.

SECTION 3 - REGULATIONS FOR THE EXAMINATION OF RESEARCH PAPERS, PROJECT REPORTS AND THESES

APPOINTMENT OF EXAMINERS

3.1 Examiners shall be nominated by the relevant Head of Department at least three months before the proposed date of submission of theses, and at least two months before the proposed date of submission for research papers and project reports. Heads of Departments are required to submit the names of nominated Examiners to the Campus Committee on the prescribed form and to advise Internal Examiners of their nomination, in writing. These nominations shall remain confidential.

3.2 All Examiners shall be appointed by the Campus Committee on behalf of the Board for Graduate Studies and Research, on the recommendation of the relevant Head of Department.

3.3 For all research papers and project reports contributing to more than 25% of the programme credit rating, at least three Examiners shall be appointed, one of whom shall be external.

3.4 For all theses at least three Examiners shall be appointed including one Internal Examiner and two External Examiners. The Supervisor shall not be an Examiner of a thesis. One of the External Examiners shall be appointed as an Additional External Examiner who shall be engaged: (a) when the first External Examiner indicates that he/she is unavailable or unwilling to serve as an Examiner of the thesis; or (b) different recommendations are made by the Internal Examiner and the External Examiner as to whether the thesis should Pass or Fail.

3.5 For oral examinations, and for practical or written tests required by Examiners after reading theses, research papers or project reports, the Examiners shall be the same persons appointed by the Campus Committee, but the Board for

Graduate Studies and Research may, at its discretion, appoint Examiners specifically for oral examinations.

3.6 The minimum qualifications required for an Examiner of a research paper or project report are:
(a) An appointment in the grade of Lecturer/Assistant Professor or above at an approved University;
(b) A record of scholarly publications;
(c) At least three years' experience as an Examiner at an approved University.

3.7 The Examiners (Independent Internal and External) of an MPhil, PhD or Professional Doctorate thesis are expected to be specialists and active researchers in their field, and should preferably have substantial experience in the supervision and examination of theses and should not be previously involved in the instruction or the work of the candidate being examined. The minimum qualifications required are:
(a) For MPhil and PhD degrees, an appointment in the grade of Associate Professor/Senior Lecturer or above;
(b) A record of scholarly publications;
(c) At least three years' experience as an Examiner at an approved University;

3.8 The Campus Registrar shall inform Examiners of their appointment by the Campus Committee.

EXAMINATION OF RESEARCH PAPERS AND PROJECT REPORTS

3.9 Research papers or project reports which constitute 25% or less of the programme credit rating shall be assigned a mark by each Internal Examiner who shall report to the Campus Registrar individually on his or her assessment of the work. Where the marks differ substantially, the final mark will be determined by the Campus Committee in accordance with the Manual of Procedures for Graduate Diplomas and Degrees.

3.10 Research papers or project reports for which the credit weighting is greater than 25% shall require examination by an External Examiner. Such project reports and research papers will be simultaneously examined by all Examiners who will each submit a report, a grade and a mark to the Campus Registrar. Should the marks of Examiners differ substantially the final mark will be determined by the Campus Committee in accordance with the Manual of Procedures for Graduate Diplomas and Degrees.

3.11 Examination of clinical research projects shall be governed by the relevant Regulations for Postgraduate Clinical Programmes.

3.12 The regulations applicable to examination of research papers are as follows:
(a) Candidates shall only be required to make corrections to research papers or project reports before the award of a final grade where minor corrections would enable an agreed marginal failure (4549%) to be awarded the minimum passing mark (50%).
(b) A research paper or project report which has been failed by the Examiners will be allowed only one re-submission. The re-submission must be within a six month period following initial notification of the failure. Re-submitted research papers or project reports will only receive the minimum passing mark (50%).
(c) Research papers or project reports assigned an A grade shall be deposited in the Campus Library. Research papers or project reports assigned a lesser grade may also be deposited, on the recommendation of the Supervisor to the Campus Committee.
(d) Candidates may be required to make corrections to research papers or project reports to be lodged in the Campus Library to ensure that such work reaches acceptable standards of presentation. Such corrections shall not alter the final grade assigned.

EXAMINATION OF THESES

Entry for Examination by Thesis

3.13 A candidate must submit for the approval of the Campus Committee, the exact title of his or her thesis at the time when he or she applies for entry to the examination. An approved thesis title may not be changed except with the permission of the Campus Committee.

3.14 The MPhil candidate must have satisfactorily completed two (2) seminars before applying for the examination of the thesis. The PhD candidate must have satisfactorily completed three (3) seminars before applying for the examination of the thesis. The Professional Doctorate candidate must have satisfactorily completed seminars as specified in Programme and Faculty Regulations before applying for the examination of the thesis (See Regulation 1.68).

3.15 The candidate must apply to enter for the examination by thesis on the prescribed form not less than three months before the expected date of submission of the thesis. The application must be accompanied by the required examination fee.

3.16 The candidate must submit the Application for Examination of Thesis form to the Campus Registrar through the Supervisor who shall indicate his or her approval by signing a Certificate of Completion of Thesis/Research Paper/Project form. In signing a Certificate of Completion of Thesis/ Research Paper/Project form, the Supervisor will be required to certify:
(a) whether, to the best of his or her knowledge, the work in the thesis was done by the student,
(b) whether, in the Supervisor's opinion, the thesis is ready for examination, and
(c) whether the student has indicated that the work was checked for plagiarism.

3.17 If the Supervisor has concerns about the integrity of the thesis, he or she shall so indicate to the Campus Registrar, in writing, and the Campus Committee shall establish a Review Committee to assess the concern. In such circumstances, the Review Committee will make a recommendation to the Board for Graduate Studies and Research on the admissibility of the thesis for examination.

3.18 If, in the opinion of the Supervisor, the academic content or technical presentation of the thesis is such that the thesis is not ready for examination, he or she shall so indicate to the Campus Registrar and the candidate in writing. In such circumstances, the Campus Committee will meet with interested parties who may include the candidate, the Supervisor, the student's Committee of Advisors, the relevant Head of Department or, if the Head is Supervisor, the relevant Faculty Dean. Should the consensus from the meetings be that the thesis is not yet suitable for examination the student should be informed and counselled. Where the student insists on submitting the thesis for examination in the present form, the Board for Graduate Studies and Research may decide that it is appropriate to submit a report of the Campus Committee's deliberations to the Examiners.

3.19 Five copies of the thesis for examination shall be submitted to the Campus Registrar, one of these shall be an electronic copy submitted with written verification by the Supervisor.

3.20 A candidate for a graduate degree examined by thesis may not submit the thesis for examination on more than two occasions, and in any case, must submit the thesis within the time limits imposed for the particular degree (see Regulations 1.49, 1.50, 1.52-1.53).

Form of Submission of Theses

3.21 Requirements for the presentation of theses are set out in the Thesis Guide published by the Board for Graduate Studies and Research. Theses which are not presented in accordance with the provisions of the Guide shall not be sent for examination.

Access to Theses

3.22
(a) At the time of submission every candidate shall sign a Declaration Form for the Reproduction of Thesis/ Research Paper/Project permitting access in the libraries of the University to the thesis, research paper or project report accepted for a graduate diploma or degree.
(b) Where a candidate has good reason he/she may apply for an embargo, wholly or in part, to be placed on the reproduction and distribution of his/her Thesis/Research Paper/Project for three years after the date of its deposit.

Examination Procedures for Theses

3.23 Candidates for degrees examined by thesis are required to satisfy the Examiners in such oral, practical or written examinations as stipulated by the Board for Graduate Studies and Research and in Faculty Regulations.

3.24 Examiners of theses are required to report to the Board for Graduate Studies and Research, through the Campus Registrar, within two months of the date of delivery of a thesis. The report shall contain:
(a) An evaluation of the thesis;
(b) A recommendation in accordance with Regulations 3.25-3.31 including an indication of whether high commendation should be awarded ;
(c) An indication of any changes in the thesis which the Examiner thinks should be made before the award of the degree.

3.25 Subject to Regulations 3.28-3.31, the Examiners of a PhD or Professional Doctorate thesis shall, after reading the thesis, examine the candidate orally and may, at their discretion, also examine the candidate by practical or written questions or by both of these methods.

3.26 If an Examiner of an MPhil or MD thesis deems that the thesis needs to be examined further, the candidate may be required to be examined by oral, practical, or by written examination, or by any combination of these methods.

3.27 If, in the opinion of the Examiners, an MPhil thesis is of such high standard and potential that it might be developed into a submission for the PhD degree, the Examiners may recommend that the candidate be permitted to transfer registration to the PhD and to submit within a timeframe specified by the Board, but it shall be the right of the candidate at any time to accept conferment of the MPhil degree.

3.28 If, in the opinion of the Examiners, a PhD thesis is of insufficient merit to justify the award of the PhD degree, the Examiners may, without further test, recommend that the candidate be permitted to resubmit the thesis with revision for the MPhil degree, or that the MPhil be awarded without further revision of the work.

3.29 The Examiners may, without further test, recommend that a thesis be rejected. A candidate whose thesis is rejected by the Board for Graduate Studies and Research after it has received reports from all of the Examiners, shall not be permitted to present the same thesis for examination, or a revised version of the thesis with the same title, unless re-approval of candidature has been granted by the Board for Graduate Studies and Research.

3.30 If, in the opinion of the Examiners, the thesis is inadequate, but of sufficient merit to justify a second attempt at the examination, the Examiners may, without further test, recommend that the candidate be permitted to resubmit the thesis for examination in a revised form. A candidate who is required by the Examiners to make such major changes to the thesis and to resubmit the thesis in a revised form for examination, must resubmit within eighteen months of the date of notification. The Campus Committee shall send to the candidate pertinent comments of the Examiners relating to the changes they propose.

3.31 If, in the opinion of the Examiners, the thesis is adequate but defective in minor ways which do not require it to be resubmitted for examination, they may require the candidate to make such amendments to the thesis as will remove the defects indicated, to the satisfaction of the Supervisor and/or Internal Examiner as determined by the Campus Committee, before the award of the degree. Subject to Regulation 3.31, such changes shall be made after the oral examination for PhD candidates. A candidate who is required by the Examiners to make such amendments to the thesis must do so within a period of six months after the date of notification.

3.32 If there are substantial differences in recommendations amongst the Examiners, the Chair of the Campus Committee may circulate the conflicting reports among the Examiners and attempt to arrive at a common position. If a common position among the differing Examiners cannot be reached, the Chair of the Campus Committee shall engage the Additional External Examiner who shall examine the thesis and report in accordance with Regulation 3.24.

3.33 If the reports of the Examiners indicate that a thesis requires extensive revision, but not re-submission, in accordance with Regulation 3.31, the Board for Graduate Studies and Research may direct that the candidate be requested to effect such revision to the satisfaction of the Supervisor and/or Internal Examiner prior to any oral examination. Such revision should be completed within twelve months of the date of notification.

3.34 If, in the opinion of the Examiners, the thesis is adequate but the candidate fails to satisfy the Examiners at the oral, practical, or written examination held in connection therewith, the Examiners may recommend that the candidate be permitted to submit to a further oral, practical or written examination within a period not exceeding eighteen months from the decision of the Board for Graduate Studies and Research. In such cases, the Board for Graduate Studies and Research may direct the candidate to effect any revision required to the satisfaction of the Supervisor and/or Internal Examiner prior to the further oral examination.

3.35 If, in the opinion of the Examiners, the thesis is adequate, and if the candidate satisfies the Examiners in any oral, practical or written examination required, the Examiners shall recommend that the degree be conferred. Where Examiners recommend conferment of the degree, they are required to certify that the thesis is worthy of publication as a thesis approved for the relevant degree of the University of the West Indies.

3.36 Oral examinations will be held within one month of receipt of the written reports of all of the Examiners, unless the Campus Committee in any particular case decides otherwise.

3.37 Candidates will be required to present themselves for any oral, practical or written examination at the time, place and date set, in writing, by the Campus Registrar.

3.38 An oral examination shall be chaired by a senior academic appointed by the Campus Committee and shall be attended by the Independent Internal and the External Examiner. In cases where the Additional External Examiner has been engaged,

he/she shall also be present at the oral examination. Where there is a disagreement among the Examiners, the recommendation of the majority shall be accepted as the final recommendation to the Board for Graduate Studies and Research.

3.39 The Chair of the oral examination and the Examiners shall send a report on the oral examination to the Chair of the Campus Committee in which they shall report on the candidate's knowledge of his or her field of study and make a recommendation in accordance with the 3.34 and 3.35 of these Regulations. The report should provide the Board with the details of any further changes required of the candidate by the Examiners before recommending the award of the degree. The Chair of the Campus Committee shall forward the recommendation of the Examiners to the Board for Graduate Studies and Research for approval.

3.40 Candidates who
(a) fail to present themselves for any oral or written examination; or
(b) fail to re-submit a revised thesis within the time periods specified in these Regulations; or
(c) (c) fail to satisfactorily make alterations in accordance with Regs. 3.28 and 3.31 and who have not been granted an extension in respect of Regulation 3.30, 3.31 and 3.33 shall be deemed to have failed the examination.

APPENDIX 1 - UNIVERSITY REGULATIONS ON PLAGIARISM

GRADUATE DIPLOMAS AND DEGREES

Application of these Regulations

1 These Regulations apply to the presentation of work by a student for evaluation, whether or not for credit, but do not apply to invigilated written examinations.

Definitions

2 In these Regulations, "plagiarism" means the unacknowledged and unjustified use of the words, ideas or creations of another, including unjustified unacknowledged quotation and unjustified unattributed borrowing;

"Level 1 plagiarism" means plagiarism which does not meet the definition of Level 2 plagiarism;

"Level 2 plagiarism" means plagiarism undertaken with the intention of passing off as original work by the plagiariser work done by another person or persons.

3 What may otherwise meet the definition of plagiarism may be justified for the purposes of Regulation 2 where the particular unacknowledged use of the words, ideas and creations of another is, by the standards of the relevant academic discipline, a function of part or all of the object of the work for evaluation whether or not for credit, including without limitation:
(a) The unacknowledged use is required for conformity with presentation standards;
(b) The task set or undertaken requires producing a result by teamwork for joint credit regardless of the level of individual contribution;
(c) The task set or undertaken requires the use of an artificial language, such as is the case with computer programming, where the use of unoriginal verbal formulae is essential.

4 The fact that a user enjoys the right of use of certain words, ideas and creations as a matter of intellectual property, does not justify their unacknowledged use under Regulations 2 and 3.

5 In these Regulations,
"BGSR Regulations" means the University of the West Indies Regulations for Graduate Diplomas and Degrees;
"Campus Co-ordinator" means the Campus Co-ordinator for Graduate Studies and Research.

Evidence of Plagiarism

6 In order to constitute evidence of plagiarism under these Regulations, there must be identified as a minimum the passage or passages in the student's work which is/are considered to have been plagiarised and the passage or passages from which the passages in the student's work are considered to have been derived.

Student Certification

7 When a student submits for examination prepared work under Regulation 1, the student shall sign a statement, in such form as the Board for Graduate Studies and Research may prescribe, that the work submitted is free of plagiarism including unattributed unjustified quotation or paraphrase. The student may utilize electronic vetting to facilitate the assessment and certification. The results of the electronic vetting shall be provided to the Supervisor by the student when the work is submitted to the Supervisor for approval to submit for examination.

8 Quotation or paraphrase is attributed for the purpose of Regulation 7 if the writer has indicated that the work is not the writer's own, even if the source is not identified.

9 Absence of certification does not prohibit the University from proceeding with a charge of plagiarism.

Electronic Vetting for Plagiarism by the University

10 The Campus Coordinator may authorise or direct the Faculty Office, or other authorized body on behalf of the Campus Committee, that the work submitted under Regulation 7 be subjected to further electronic scrutiny in order to verify its freedom from plagiarism before being submitted to the Examiners. The results of the electronic vetting shall be submitted to the Campus Coordinator, the Dean and the Head of Department, and shall be considered in determining whether the University proceeds with submission of the work to the Examiners. The results of such electronic vetting although capable, where the requirements of Regulation 6 are satisfied, of constituting evidence under these Regulations, are not thereby conclusive of any question as to whether or not plagiarism exists.

11 Where suspected plagiarism is detected, whether through the procedures outlined in Regulation 10, or whether subsequently during the course of examination, the person(s) detecting the suspected plagiarism, whether the Dean, Head of Department or Examiner, shall:
(a) where there is suspected evidence of Level 1 plagiarism in work which does not constitute a thesis or major project report (defined as the report comprising 25% or more of the total credits for the programme), refer the matter to the Examiners for their consideration as a charge of Level 1 plagiarism under Regulation 12; or
(b) where there is suspected evidence of Level 1 plagiarism in a thesis or major project report, refer the matter to the Campus Coordinator as a charge of Level 1 plagiarism under Regulation 13; or
(c) where there is suspected evidence of Level 2 plagiarism, refer the matter to the Campus Coordinator as a charge of Level 2 plagiarism under Regulation 19.

Level 1 Plagiarism

Plagiarism in work which does not constitute a Thesis or Major Project Report

12 In work submitted for examination which does not constitute a thesis or major project report under the University Regulations for Graduate Degree and Diplomas, and where the Examiners are satisfied that Level 1 plagiarism has been committed, they shall levy a penalty for the Level 1 plagiarism charged in the form of a reduction in the marks which would have otherwise been awarded. The First Examiner must inform the Campus Registrar of the penalty levied and of the evidence of plagiarism. When the normal examination process is complete, the Campus Registrar must communicate this information to the student.

Plagiarism in Theses and Major Project Reports

13 In the case of theses and major project reports, evidence of Level 1 plagiarism must be reported to the Campus Co-ordinator to support a charge of Level 1 plagiarism by the Dean, the Head of Department or an Examiner, where the person making the report considers that Level 1 plagiarism has been committed. Such a report and charge may be made regardless of the outcome of any scrutiny under Regulation 10.

14 If the Campus Co-ordinator considers that Level 1 plagiarism has been committed as charged, the Campus Co-ordinator shall return the submitted work to the student for revision and resubmission within a period determined by the Campus Coordinator but which may not exceed one year. The outcome and the penalty levied shall be reported to the Board for Graduate Studies and Research and the University Registrar. The University Registrar shall inform the student of the outcome of the assessment and the penalty levied.

Appeals

15 In the case of work which is neither a thesis nor a major project report, a student may appeal against the finding of plagiarism or the penalty levied under Regulation 12 to the Head of Department or, where the Head of Department is the First Examiner who has levied the penalty, to the Dean. Where the same person discharges both the functions of Dean and Head of Department and is also the First Examiner who has levied the penalty, the appeal is to the Campus Co-ordinator.

16 In the case of theses and major project reports, the student may appeal to the Board for Graduate Studies and Research from a decision of the Campus Co-ordinator under Regulation 14.

17 The Board for Graduate Studies and Research, the Campus Co-ordinator, the Dean or the Head of Department, as the case may be, hearing the appeal, in a Level 1 plagiarism case, may hear the appeal by correspondence. In the case where the Board or person hearing the appeal is not satisfied that there has been plagiarism, or considers that the penalty levied was excessive, they may allow the appeal or remit or reduce the penalty accordingly.

18 The Board for Graduate Studies and Research, Campus Co-ordinator, Dean or Head of Department, hearing the appeal, as the case may be, shall report the outcome of the appeal to the Campus Registrar, who shall advise the student accordingly.

Level 2 Plagiarism

19 When a Campus Co-ordinator receives a report of suspected Level 2 plagiarism under Regulation 11c, whether the evidence is in a thesis, a major project report or in work which does not constitute either a thesis or major project report, the Campus Co-ordinator may either:

(a) where not concurring with the identification of evidence of Level 2 plagiarism, communicate with the person(s) reporting the suspected plagiarism, whether the Dean, Head of Department or Examiner, declining to proceed further in relation to the Level 2 proceedings, and shall in addition:

(i) indicate that the decision is intended to preclude the invocation of the procedures for Level 1 plagiarism; or

(ii) indicate that the avenue is open for the matter to be treated as a case of suspected Level 1 plagiarism under Regulation 12 in work which does not constitute a thesis or major project report, or as a case of suspected Level 1 plagiarism under Regulation 13 in work which constitutes a thesis or major project report; or

(b) refer the matter to the University Registrar who shall inform the person(s) reporting the suspected plagiarism and the student that there is a case to be answered, subject to an application under Regulation 20.

20 Where the Campus Co-ordinator replies in the terms of Regulation 19a, the Dean, Head of Department or Examiner may apply, no later than the elapse of two complete calendar weeks after the reply has been notified, through the University Registrar to the Chair of the Board for Graduate Studies and Research seeking a reversal of the Campus Co-ordinator's decision.

21 The Chair of the Board for Graduate Studies and Research may:

(a) where concurring with the identification of evidence of Level 2 plagiarism, uphold the application in Regulation 20 and treat the case as one which has been referred to the Chair under Regulation 19b; or

(b) deny the application.

22 A denial by the Chair of the Board for Graduate Studies and Research of an application under Regulation 21b is, subject to Regulation 32, conclusive in relation to an allegation of Level 2 plagiarism in the case under consideration.

23 A denial by the Campus Co-ordinator under Regulation 19a which is, after the elapse of three complete calendar weeks after the reply has been notified, not the subject of an application under Regulation 20, or a denial by the Chair of the Board for Graduate Studies and Research under Regulation 21b, terminates the proceedings on the plagiarism charge, subject to Regulation 32 and save to the extent that the Campus Co-ordinator has ruled otherwise under Regulation 19aii.

24 Where the matter has been referred under Regulation 19b or an application has been upheld under Regulation 21a, the Chair of the Board for Graduate Studies and Research, at the request of the University Registrar, shall establish a Committee of Inquiry comprising:

i. The Chair of the Board for Graduate Studies and Research or his/her nominee.

ii. One Academic Board representative from each campus sitting on the Board for Graduate Studies and Research.
iii. One postgraduate student representative from among those sitting on the Board for Graduate Studies and Research.

Four members of the Committee including the Chair shall constitute a quorum.

25 The Committee of Inquiry is not a court of law but the hearing shall be conducted in accordance with the rules of natural justice. The Committee may summon witnesses to give evidence.

26 The Committee of Inquiry reserves the right to have legal representation.

27 The student shall be given a written notice from the University Registrar specifying the allegations of the Level 2 plagiarism, along with a copy of all material relevant to the charge and made available to the Committee, at least fourteen days before the hearing of the allegation and within one calendar month of the case first being reported to the Campus Co-ordinator.

28 The student shall have a right to appear before the Committee of Inquiry and to be accompanied or represented by a friend or by an attorney-at-law whose expenses will be borne by the student.

29 The student shall have the right to ask questions of witnesses, to call his/her own witnesses, to make statements on his/her own behalf, and to make submissions.

30 If the student fails to make an appearance before the Committee of Inquiry and does not offer a satisfactory excuse, the Committee of Inquiry may hear the case in the student's absence.

31 Where a Committee of Inquiry has been established under Regulation 24, the procedure under these Regulations prevails, subject to Regulation 32, over any other disciplinary proceedings against the student based on the same facts and, without prejudice to Regulation 38. Any other such disciplinary proceedings must be terminated, subject to being re-opened to consider a recommendation of the Board for Graduate Studies and Research under Regulation 34b.

32 Where other disciplinary proceedings based on the same facts have been completed or have reached the stage of a hearing, whichever comes first, any procedure under these Regulations based on a charge of Level 2 plagiarism shall be terminated.

33 (i) If the Committee of Inquiry is satisfied, after holding a hearing, that the student has committed Level 2 plagiarism, it shall in making a determination on the severity of the penalty take into consideration:
a. the circumstances of the particular case;
b. the seniority of the student; and
c. whether this is the first or a repeated incidence of plagiarism by the student.

(iii) (Where a determination on the severity of the penalty has been made, the Committee of Inquiry shall report its conclusions and recommendations to the Board for Graduate Studies and Research which shall:
(a) if the work in which the plagiarism occurred was not a thesis or major project report, fail the student in the assignment and hence the course in which the assignment was submitted, with the option to re-take the course at a time specified by the Board;
(b) if the work in which the plagiarism occurred was a major project, fail the student in the project report, with the option to re-do and re-submit a project report on a different topic at a time specified by the Board;
(c) if the work in which the plagiarism occurred was a thesis, either:
i. find the thesis to be inadequate, requiring re-submission of the revised thesis within eighteen months of the date of notification; or
ii. fail the thesis, with no allowance for re-submission.

34 The Board for Graduate Studies and Research may also, if the Committee of Inquiry so recommends after being satisfied that the student has committed Level 2 plagiarism, either:
(a) exclude the student from all further examinations of the University for such period as it may determine; or
(b) recommend to the relevant Academic Board that the student should be dismissed from the University, with or without the possibility of re-entry.

35 The decisions taken by the Board for Graduate Studies and Research following receipt of the conclusions and recommendations from the Committee of Inquiry with respect to the outcome of the hearing and the severity of the penalty shall be communicated by the Chair of the Board to the University Registrar who shall inform the student, the Dean, the Head of Department and the Examiners of the decisions taken.

Clearance on a Charge of Level 2 Plagiarism

36 If the Committee of Inquiry is not satisfied, after holding a hearing, that the student has committed Level 2 plagiarism, it will direct the Campus Co-ordinator to reply to the Dean, the Head of Department, the Examiners and the student, through the University Registrar, advising them of the decision against proceeding further on the charge of Level 2 plagiarism, and may in addition:

(a) indicate that the decision is intended to preclude the invocation of the procedures for Level 1 plagiarism; or

(b) indicate that the avenue is open to pursue the matter as a case of Level 1 plagiarism under Regulation 12 in work which does not constitute a thesis or major project report, or as a case of Level 1 plagiarism under Regulation 13 in work which constitutes a thesis or major project report.

37 A determination of the Committee of Inquiry under Regulation 33 terminates the Level 2 plagiarism proceedings and also precludes any further Level 1 plagiarism proceedings except as indicated by the Committee of Inquiry under Regulation 36b.

Appeal to the Senate

38 A student may appeal to the Senate from any decision of the Board for Graduate Studies and Research under Regulations 33 and 34a and of Academic Board under Regulation 34b.

Delegation by Dean or Head of Department

39 The Dean or Head of Department, as the case may be, may generally or in a particular instance delegate that officer's functions under these Regulations.

Supervisor's Conflict of Interest

40 Any person who has at any time been a supervisor of work in relation to which an issue of plagiarism is being considered under these Regulations must withdraw from performing any functions under these Regulations other than those of supervisor and examiner.

DEFINITIONS AND NOTES

In Sections 1, 2 and 3 of these Regulations for Graduate Diplomas and Degrees:

Campus Committee means the Campus Committee for a Campus of the Board for Graduate Studies and Research;

Department includes an Institute, Centre or other Unit of Learning and Research;

Head of Department means the Head, however styled, of a Department;

Programme means a selection of courses (designed to achieve pedagogical goals) the taking of which is governed by certain regulations and the satisfactory completion of which (determined by such regulation) makes a candidate eligible for the award of a degree/diploma or certificate;

Admission to a Programme means the acceptance of the candidate's right to register to participate in the Programme as a student;

Campus Registrar includes any Assistant Registrar made responsible by the Campus Registrar for the administration of matters pertinent to Graduate Studies and Research.

A period of one (1) year full-time is equivalent to two (2) years part-time, but see Regulations 1.58-1.63. These Regulations should be read in conjunction with the *Manual of Procedures for Graduate Diplomas and Degrees.*

GENERAL INFORMATION ON POSTGRADUATE STUDIES IN THE FACULTY OF SCIENCE AND TECHNOLOGY

1. ROLE OF THE SCHOOL FOR GRADUATE STUDIES AND RESEARCH (SGS&R)

The School for Graduate Studies and Research has the overall responsibility for the development of graduate studies and research on all four campuses of The University of the West Indies. The School is chaired by its Pro Vice Chancellor (PVC, Graduate Studies) and is governed by the Board for Graduate Studies and Research. There is a committee of the SGS&R on each campus called the Campus Committee for Graduate Studies and Research. The SGS&R works closely through these four (4) Campus Committees to manage and administer activities related to research and graduate studies. The School assists academic departments with the maintenance and development of coherent graduate studies programmes and, through the Board for Graduate Studies and Research, approves the establishment of new postgraduate programmes and the award of degrees.

2. TYPES OF GRADUATE PROGRAMMES OFFERED IN THE FACULTY OF SCIENCE AND TECHNOLOGY.

The Faculty offers a wide range of certificates, diplomas, taught Master's degree as well as research degrees (MPhil and PhD)

(a) Taught Programmes

The programmes for the Master of Science (MSc) degrees and for Postgraduate Diplomas consist mainly of a set of lectures, seminars, coursework assignments and either a project or a research paper. The Faculty also offers Diplomas and Certificates by distance.

(b) (i) Research Degrees

The Master of Philosophy (MPhil) and the Doctor of Philosophy (PhD) degrees are research degrees that primarily involve independent study, directed by one or more supervisors. All MPhil and PhD programmes of study culminate in the presentation of a thesis conveying the results of the independent study and research carried out by the graduate student. It is necessary that graduate students, supervisors, advisory committees and examiners ensure that the qualitative and quantitative distinction between the MPhil Degree and PhD Degree be understood and maintained.

(ii) **The MPhil Thesis**

The MPhil thesis reviews the state of knowledge in a particular field, creates and evaluates a new design or novel experiments in a particular aspect of an area of study or makes an appropriate critique or interpretation of the subject. The Master's thesis should be evidence of the graduate student's ability to effectively review the relevant literature in the field, to undertake independent research and to present the results in a clear, systematic and scholarly form.

It is normally expected that a Master's thesis will make some independent contribution to knowledge or understanding in the subject area in which the student is working.

(iii) The Doctoral Thesis

A Doctoral thesis must set forth a significant contribution to knowledge or understanding, adding to or critiquing through approved research methodologies the current theoretical underpinnings and empirical base in the student's field of study.

The thesis must be set forth in a scholarly manner demonstrating the original and independent investigations conducted and setting forth unambiguously its achievements, contributions and findings in a format appropriate to Doctoral Theses in the particular discipline.

The Doctoral Thesis must reflect not only mastery of the subject area under investigation and competence in research techniques, but also the ability to select an important problem for investigation and to deal with it in a mature, competent manner.

The Doctoral Degree is, by nature and tradition, the highest certificate of membership in the academic community. It is meant to indicate the presence of superior qualities of mind, intellectual interest and high attainment and knowledge in a chosen field. It is not conferred merely as a certificate for a prescribed course of study and research, no matter how faithfully pursued. Independent achievement at a high intellectual level is a prerequisite to its conferment. A Doctoral Thesis or parts thereof must be judged to be potentially publishable.

The award of a PhD also requires the candidate to defend his/her thesis at a public oral examination. Many research degrees now contain a taught element. The intention of these taught courses is to provide students with research techniques and skills that will not only help them complete their current research topic, but will also stand them in good stead for life after University.

With the exception of holders of MPhil degrees from recognised Universities, candidates interested in pursuing the PhD degree are normally required to register for the MPhil Degree in the first instance. If your Supervisors are happy with your progress, then provisions exist to upgrade your registration from the Master's to Doctoral level without first submitting a Master's dissertation.

If you decide to pursue a research degree, it is very important that the thesis topic you choose is of genuine and sustainable interest to you.

3. REGISTRATION

The academic year is divided into two (2) semesters as follows:

Semester I - August to December
Semester II - January to May

Candidates for the MPhil or PhD degree may register during the first two weeks of either Semester but it is more usual for such candidates to begin their studies at the start of the academic year. A candidate wishing to pursue a taught Master's Degree or an Advanced Diploma programme MUST begin his/her studies at the start of the academic year unless otherwise specified.

Students from Trinidad & Tobago may be registered for full-time or part-time studies. You will not be registered for full-time studies if you spend an average of twelve or more hours a week in paid employment. For a student registering as part-time, proof of leave of absence from your job must be submitted at the time of registration. Overseas students will normally be required to register as full-time studies.

No allowances will be made with respect to attendance at lectures, laboratories, tutorials or examinations for students on the condition of their employment.

4. TIME LIMITATION

The following table shows IN GENERAL the time limitation (in years) for postgraduate degrees:

	FULL TIME		PART TIME	
PROGRAMME	**Minimum**	**Maximum**	**Minimum**	**Maximum**
Diplomas	1	---	2	---
MSc (taught)	1	2	2	4
MPhil	2	3	---	5
PhD	3	5	5	7

5. ACADEMIC SUPERVISOR

Each research student is assigned one or more supervisors who will guide the student through his/her studies. The appointment of a supervisor(s) is recommended by the relevant Head of Department after careful consideration of the Faculty member's expertise and experience. Also, a Committee of Advisors shall be appointed by the Board for Graduate Studies and Research for each MPhil and PhD student. This Committee shall comprise a minimum of three persons, including the supervisor(s) of your research programme.

6. ASSESSMENT

a. Taught Programmes

The methods of assessment may vary, but examinations are conducted mainly by written papers supplemented by in-course testing, practical examinations, a project report, a research paper, or a combination of these methods.

Candidates are required to pass all courses and all coursework, designated by the Department as forming part of the higher degree programme for which they are registered, with a mark of 50% or better.

To qualify for a distinction, a candidate must achieve an average of 70% or better (Grade A) in the written courses and a mark of 70% or better in the research paper or project report. A candidate failing a course shall be ineligible for the award of distinction.

Note that in calculation of averages, marks are not rounded to the nearest whole number. Hence, for example, an average mark of 69.9 in written courses does not qualify for distinction.

b. MPhil/ PhD Thesis and Examination

All research degrees are examined by theses. In addition, research students will be required to pass courses amounting to a MINIMUM of 6 credits for the MPhil and 9 credits for the PhD degree. For the MPhil degree the candidate may be required to defend his/her thesis by an examination. Every candidate for the PhD must defend his/her thesis by an oral examination.

High commendation may be bestowed on a candidate for either the MPhil or the PhD degree where the Examiners are unanimous in their recommendation that such an award should be made.

A candidate who is unsuccessful in the examination for the PhD may apply to the Board for Graduate Studies and Research for transfer of registration to the relevant MPhil and for permission to resubmit the relevant thesis or a revised version of it for examination for a Master's degree. Where the application is approved, the registration for the PhD will lapse and the registration for the MPhil will be deemed to have started from the date of registration for the PhD.

7. UPGRADING OF REGISTRATION

Postgraduate students who are registered for the MPhil degree and who wish to be considered for the upgrading of their registration to PhD must apply to do so in the second year of registration on the written recommendation of their supervisor(s). Applications for upgrading will normally not be considered after the third year of registration. A supervisor must state why he/she considers the student to be outstanding and whether in his/her opinion the work can be developed to the level of the PhD. Applicants for upgrade must submit a written proposal outlining the work done to date and how they propose to develop this work into a PhD and must defend their proposal for upgrading at an open seminar convened for this purpose.

All recommendations from Departments for PhD upgrade registrations are subject to the approval of the Board for Graduate Studies and Research.

8. GRADUATE RESEARCH SEMINARS:

All postgraduate research students are required to present seminars as follows:

- MPhil - at least two
- PhD - at least three

These seminars will be examined and graded on a 'pass' or 'fail' basis. Students are also required to attend a minimum of 75% of all Departmental/Faculty seminars. A Seminar attendance register will be kept by all Departments.

GENERAL INFORMATION ON THE FACULTY OF SCIENCE & TECHNOLOGY

PROGRAMMES

The Faculty of Science and Technology offers training at the graduate level in the Life and Physical Sciences with a wide range of practical and business applications from Environmental Sciences and Management to Information Technology, Computational Mathematics, Material Science, Molecular Biology, Alternative Energy, Medical Physics and Natural Products to name a few. A number of these programmes are multidisciplinary in nature and are done in conjunction with other Departments/Faculties. This training allows students to acquire the range of marketable skills essential in the light of globalisation. Postgraduate programmes in the following areas are currently offered.

POSTGRADUATE DIPLOMA:
Biodiversity Conservation and Sustainable Development in the Caribbean (Offered by Distance Teaching)

MASTER OF SCIENCE (MSc) DEGREES:

- Computer Science and Technology
- Mathematics
- Statistics
- Occupational and Environmental Safety and Health
- Biodiversity Conservation and Sustainable Development in the Caribbean (Offered by Distance Teaching)
- Renewable Energy Technology
- Biotechnology
- Biomedical Physics *(pending)*

MASTER OF PHILOSOPHY (MPhil) AND DOCTOR OF PHILOSOPHY (PhD) DEGREES:

- Biochemistry
- Chemistry
- Computer Science
- Environmental Biology
- Mathematics
- Microbiology
- Physics
- Plant Science
- Statistics
- Zoology

ENTRY REQUIREMENTS

Candidates seeking entry to the Diploma, or MSc, or MPhil programmes in the Faculty must satisfy the minimum requirements of the Board for Graduate Studies and Research (Lower Second Class Honours for MSc and Upper Second Class Honours or equivalent for MPhil) AND must hold a BSc degree at the prescribed level in Natural Sciences (or an equivalent qualification) from an approved University. In exceptional cases, students may be admitted with a pass degree and considerable work experience in a related area.

For direct entry into the PhD programme, a student must satisfy minimum entry requirements of the Board of Graduate Studies & Research AND have obtained a MPhil degree (or an equivalent qualification) in an appropriate field of study in science from an approved tertiary level institution.

INFORMATION RESOURCES AT THE ALMA JORDAN LIBRARY

A crucial part of your postgraduate training is learning to use data and information resources for academic purposes. In this world of too much information – knowing when you need information, what kind of information you need, what information is available and how to search for, select and obtain relevant information are crucial information literacy skills required for your assignments, research and career.

Our wide-ranging collection spans several subject areas relevant to the Faculty of Science and Technology, including Actuarial Science, Agricultural Sciences, Astronomy, Chemistry, Computer Science, Information Technology, Life Sciences, Mathematics, Physics and Statistics.

Aside from holding over 430,000 books, 800 print journal titles, and 55,300 bound journal issues. We offer access to more than 67,000 electronic journals, 35,200 e-books and 252 databases—much of this material is not available freely on the Internet.

Moreover, a sizeable body of Caribbean research may be accessed from maps, newspapers, theses and over 150 Special collections in the West Indiana and Special Collections Division. The Institutional Repository (UWISpace) contains not only abstracts of UWI theses, but also publications of our own faculty members. Online resources can be accessed on and off-campus.

In addition to providing resources you may consult and borrow, the Library offers audio-visual, computing, photocopying and printing facilities, as well as areas for quiet study and seminars.
Other services include our Reference Service and our Interlibrary Loan/Document Delivery service, which helps you to obtain books and articles that we do not hold.

You may attend specialist information literacy training on using the Library's resources, finding information resources beyond Google and arrange for consultation sessions that will help you to improve your research and citation skills, the latter being a crucial academic competency.

I strongly encourage you to take advantage of our thesis checking service—knowing UWI's guidelines on format, citations and references will help your thesis meet the required standard.

My staff and I will be pleased to assist you. You can visit us on Floor 2 of the Alma Jordan Library or contact me:

Mrs Shamin Renwick
BSc, MPhil, MLIS (UWI), FCLIP
Faculty Liaison Librarian (Food and Agriculture & Science and Technology)
Science and Agriculture Division
The Alma Jordan Library
Tel.: 662 2002, ext. 83596, 83395
E-mail: **shamin.renwick@sta.uwi.edu**

Alma Jordan Library: **http://libraries.sta.uwi.edu/ajl**

Science and Technology- Library page:
http://libraries.sta.uwi.edu/ajl/index.php/science-and-technology

1 NOTE: *Where course codes were not available at the time of publication of this information guide, please consult the department office.*

DEPARTMENTS OF THE FACULTY OF SCIENCE AND TECHNOLOGY

The Faculty consists of five (5) departments:

- Chemistry
- Computing and Information Technology
- Life Sciences
- Mathematics and Statistics
- Physics

DEPARTMENT OF CHEMISTRY

MAIN OFFICE
Ground Floor, C3 Building
Tel: (868) 662-2002 Ext. 83570/82091
Tel: (Direct Line) 662-6013
Fax: (868) 645-3771
Email: chemistry.department@sta.uwi.edu

STAFF LISTING

HEAD OF DEPARTMENT
Dr. Lebert Grierson
Ext. 82091
Email: lebert.grierson@sta.uwi.edu

SENIOR Administrative Assistant
Mrs. Roxanne Ali-Hassan
BSc (UWI)
Ext. 83785
Email: roxanne.ali-hassan@sta.uwi.edu

Secretary *(Acting)*
Mrs. Charmaine Joseph-Peters
Tel: 1 (868) 662-2002 Exts. 83570, 82091;
Tel: 1 (868)-662-6013
Fax: (868) 645-3771
Email: charmaine.joseph-peters@sta.uwi.edu
chemistry.department@sta.uwi.edu

Clerical Assistants
Ms. Joan Hernandez
Ext. 82092
Email: joan.hernandez@sta.uwi.edu

Ms. Racquel Dolly
Ext. 83266
Email: racquel.dolly@sta.uwi.edu

OCCUPATIONAL AND ENVIRONMENTAL SAFETY AND HEALTH UNIT
Coordinator
Ms. Wendy Lawrence
BSc. MPhil (UWI) and MBA (Henley)
Ext. 83268
Email: wendy.lawrence@sta.uwi.edu

Administrative Assistant
Ms. Tamika Elcock-John
BSc (Lond), MSc (UWI)
Ext. 83269
Email: tamika.elcock@sta.uwi.edu

ACADEMIC STAFF/DEVELOPMENT ENGINEERS

D. Beckles
AB (Harvard), MSc, PhD (Rice University)
Lecturer, Environmental Chemistry
Microbial degradation; xenobiotic compounds in aqueous/non-aqueous systems
Ext. 83534
Email: denise.beckles@sta.uwi.edu

G. Bent
BSc, PhD (UWI)
Lecturer, Analytical Chemistry
Environmental Monitoring and Food Safety
Ext. 83533
Email: grace-anne.bent@sta.uwi.edu

L. Cox
BS (Morgan), MS, PhD (Astate)
Contract Officer III
Research Consulting and Analytical Services
Ext. 84334
Email: leonette.cox@sta.uwi.edu

R. Fairman
BSc, PhD (UWI)
Lecturer, Inorganic Chemistry
Functionalised Macrocylces; Rational Design and Construction of Supramolecular Assemblies
Ext. 82281
Email: richard.fairman@sta.uwi.edu

M. Forde
MChem (Edin), PhD (Cardiff)
Lecturer, Chemistry
Ext. 83544
Email: michael.forde@sta.uwi.edu

L. Grierson
BSc, PhD (Lond)
Lecturer, Physical Chemistry
Biophysical Chemistry and Material Sciences
Ext. 83532
Email: lebert.grierson@sta.uwi.edu

N. Jalsa
BSc, PhD (UWI)
Lecturer, Organic Chemistry
Biological Chemistry
Ext. 83546
Email: nigel.jalsa@sta.uwi.edu

N. John-Thomas
BSc (UWI), PhD (Howard)
Lecturer, Chemical Education
Chemical Education - Assessment Teaching and Curriculum Development
Ext. 83270
Email: nicole.john@sta.uwi.edu

F. Julien
BSc Chem Engineering (Hampton)
BSc Electrical Engineering (Ryerson)
Development Engineer - Mass Spectrometry Services
Ext. 84051
Email: franklyn.julien@sta.uwi.edu

A. Kumar
MSc (Gorakhpur); PhD (Tripura)
Lecturer, Inorganic Chemistry
Synthesis and study of inorganic coordinate and organometallic complexes; Dye sensitized solar cells materials
Ext. 83261
Email: arvind.kumar@sta.uwi.edu

W. Lawrence
BSc, MPhil (UWI) and MBA (Henley)
Coordinator, Occupational and Environmental Safety and Health
Ext. 83268
Email: wendy.lawrence@sta.uwi.edu

A. R. Maxwell
BSc, MSc (UWI), PhD (Br. Col)
Professor, Organic Chemistry
Structure Elucidation and Bioactivity of Natural Products; Synthesis of Chiral Catalysts
Ext. 83263
Email: anderson.maxwell@sta.uwi.edu

T. Mohammed
BSc, PhD (UWI), MBA (Harriot-Watt)
Lecturer, Analytical Chemistry
Ext. 82283
Email: terry.mohammed@sta.uwi.edu

R. Pingal
BSc, PhD (UWI)
Lab Manager/ Lecturer, Organic Chemistry
Natural products chemistry and biotesting
Ext. 83535
Email: ramish.pingal@sta.uwi.edu

R. Ramsewak
BSc, PhD (UWI)
Senior Lecturer, Organic Chemistry
Structure elucidation of natural products and determination of biological activities.
Ext. 83536
Email: russel.ramsewak@sta.uwi.edu

M. Seepersaud
BSc, MPhil (UWI), PhD (CUNY)
Lecturer, Bioorganic Chemistry
Ext. 83272
Email: mohindra.sspersaud@sta.uwi.edu

G. Singh

BSc (Liv.), PhD (Man)
Professor of Chemistry
Organic synthesis; carbohydrate and peptide chemistry
Ext. 83538
Email: gurdial.singh@sta.uwi.edu

N. Singh

BSc, PhD (UWI)
Development Engineer - NMR Services
Ext. 84053
Email: nadia.singh@sta.uwi.edu

D. Stephenson

BA (York), MPhil (CNAA) PhD (Lond)
Senior Lecturer, Physical Chemistry
Nuclear Quadrupole and Nuclear Magnetic Resonance Spectroscopy
Ext. 83260
Email: david.stephenson@sta.uwi.edu

R. Taylor

BSc, PhD (UWI)
Lecturer, Inorganic Materials Chemistry
Materials Chemistry/Liquid Crystals
Ext. 82272
Email: richard.taylor@sta.uwi.edu

A. Wilson

BSc, PhD (UWI)
Lecturer, Physical/Corrosion Chemistry
Electroactive polymers
Ext. 82283
Email: ann.wilson@sta.uwi.edu

W. R. Chan

BSc, MSc, (Lond-UCWI), PhD (Lond)
Professor Emeritus
Extraction and structure elucidation of natural products
Email: wilfred.chan@sta.uwi.edu

B. S. Mootoo

BSc (Lond-UCWI), MSc (Lond), PhD (UWI)
Professor Emeritus
Extraction and structure elucidation of natural products
Ext. 83873
Email: baldwin.mootoo@sta.uwi.edu

A. Pelter

BSc, PhD, D.Sc. (Brist)
Honorary Professor
Organic Synthesis

C. E. Seaforth

BSc (Lond-UCWI), PhD (Wales)
Honorary Lecturer
Extraction and structure elucidation of natural products

PROGRAMMES

MSC/ MPHIL/PHD

The Department of Chemistry offers one taught master's programme leading to the MSc in Occupational and Environmental Health and Safety, as well as MPhil and PhD degrees by research in the areas of Natural Products, Inorganic and Materials Chemistry, Liquid Crystals, Environmental Chemistry and Waste Management, Bio-analytical Chemistry, Nuclear Magnetic and Nuclear Quadrupole Resonance Spectroscopy, Supramolecular Chemistry, Organic Synthesis, Microcalorimetric studies on Biological Systems; Corrosion Chemistry and Chemical Education.

Students may register on a part-time or full-time basis. The Board for Graduate Studies and Research offers a limited number of scholarships to students of the highest academic standing registering for MPhil/ PhD Some Departmental funding, in the form of full-time demonstratorships, is available for registered MPhil/ PhD students not on scholarship.

RESEARCH INTERESTS

Topics which are currently being actively investigated by staff include:

- isolation and structure elucidation of Natural Products from terrestrial plants and marine organisms including synthesis and bioactivity testing;
- optical, electronic, magnetic and catalytic properties of organometallic complexes;
- solar cell materials;
- perfluorated phosphine based catalysts;
- rational design and construction of supramolecular assemblies;
- environmental monitoring and hazardous waste management and disposal;
- food safety;
- biosensors for environmental clinical and forensic applications;
- applications of immobilised enzymes and biomolecules, bioseparation processes;
- nuclear magnetic and quadrupole resonance studies of dynamic equilibria;
- calorimetric studies on biological systems;
- the preparation of carbohydrates and novel boron-based catalysts for organic synthesis;
- hydration processes in cement admixtures;
- investigation of aggregate structures in biological membrane models;
- virgin and waste polymer cracking in a fluidised-bed reactor
- synthesis of chiral ligands based on the [2.2] paracyclophane framework for use in chiral synthesis;
- microbial degradation and fate of xenobiotics in environmental systems;
- air quality monitoring
- endocrine disruptors in freshwater systems;
- corrosion chemistry;
- electroanalytical methods;
- carbohydrate synthesis;
- biological/biophysical chemistry;
- oxidation of methane;
- peptide chemistry; synthesis and optimization of macrocylic pharmacophores as PPI inhibitors; passive permeability evaluation of Peptoids.
- biotransformation to produce novel chemical entities
- enzymes in ionic liquids;
- thermotropic phase behaviour of metal containing liquid crystal compounds;
- chemical education - assessment teaching and curriculum development.
- low temperature selective hydrocarbon oxidation
- photocatalysis (materials development, CO2 oxidation, water splitting)
- zeolite catalysis
- bio-renewable chemicals from agricultural waste
- Petroleum Chemistry - production and refining
- Pollution prevention and remediation
- Occupational Health and Safety

FACILITIES

The Department is well-equipped with laboratory space, computer facilities, and instrumentation to support research programmes. Instruments include:

- Gas, Liquid and Chromatographs;
- Setaram Modular TGA/DSC/DTA/TMA (up to 1700oC);
- Setaram micro DSC III microcalorimeter (with batch and continuous flow cells, heat capacity and flow mix cells);
- Two (2) Gamry high sensitivity modular electrochemical workstations for electrochemical and corrosion measurements;
- Home-constructed Taylor-Aris equipment for diffusion measurements;
- Inert Atmosphere Glove Box;
- Bruker 300, 400 and 600 (cryoprobe) NMR spectrometers;
- FTIR (ATR), Diode-Array, and UV-VIS Spectrometers;
- Nuclear Quadrupole Double Resonance Spectrometer;
- GC- and LC-/Electron spray ionisation (ESI)-Time of Flight Mass Spectrometers;
- Rapid Stopped-flow Kinetic Spectrometer
- Perkin-Elmer Fluorescence Spectrometer
- Varian Atomic Absorption Spectrometer with graphite furnace;
- Perkin-Elmer Inductively Coupled Plasma Mass Spectrometer
- Jasco Model J-720 Spectropolarimeter;
- Olympus Phase Contrast and Polarizing Microscopes;
- Veeco Multimode V Atomic Force Microscope/Scanning Electrochemical Microscope
- Linux cluster parallel supercomputer with GROMACS and GAUSSIAN and computational software
- KSV Langmuir-Blodgett apparatus

MSc in Occupational and Environmental Safety and Health (OESH)

Recent developments in areas such as legislation, global trade and rapidly changing technology, have placed new expectations and demands of occupational and environmental safety and health on governments, environmental management, business enterprises, educational institutions, trade unions, workers and the public. Within this scenario, there is an urgent and growing need for the development of a cadre of professionals with competencies in Occupational and Environmental Safety and Health (OESH). Developed in 2005 in Mona, Jamaica, UWI's OESH Programme addresses the growing requirement for all employers, managers, supervisors, policy makers and public leaders to have a functional awareness of the key issues related to environmental and occupational safety and health. The Master of Science in Occupational and Environmental Safety and Health commenced at the St. Augustine campus in September 2009.

OBJECTIVES
The Master's programme is designed to prepare persons to function in key areas such as:
Enforcement - to ensure compliance, research and development, training, organisational systems and practice, policy and standards development.

Graduates would be able to develop, design, implement and manage complex OESH programmes and systems and to provide consultancy services and to educate others.

ENTRY REQUIREMENTS
Applicants must have either a first degree or its equivalent in basic or applied sciences; candidates with any other BSc degree or equivalent with suitable work experience will also be considered.

DELIVERY MODE
Intense, modular face-to-face sessions conducted on weekends and holidays, a few weekdays (when foreign lecturers are involved) and agreed evenings. Full-time practitioners in the OESH field are especially encouraged to apply.

The programme will be delivered by international, regional and local lecturers.

COURSE OF STUDY
For the MSc in OESH, students are required to complete 34 credits of core courses and a research project of 9 credits as outlined below. Each 4 credit course consists of 48 hours of lectures and field visits and/or laboratory work where applicable. Full-time students will normally require 18 months and part-time students three years to complete the programme requirements. The full-time programme will normally consists of two semesters of coursework and examinations followed by the research project while the part-time programme involves four semesters of coursework and examinations followed by the research project.

COURSE ASSESSMENT
This involves coursework, in-course tests and a three (3) hour written examination paper at the end of each semester.

COURSE LISTING
YEAR I
SEMESTER 1 (17 CREDITS)

Course Code	Course Title	Credits
OESH 6100	Advanced Environmental Health	4
OESH 6200	Advanced Occupational Safety and Health	4
OESH 6000	OESH and Public Policy	4
OESH 6600	Independent Study and Research Method	4
OESH 6300	Seminar	1

SEMESTER 2 (17 CREDITS)

Course Code	Course Title	Credits
OESH 6030	Advanced Topics in OESH: OESH Disorders	4
OESH 6010	Advanced Topics in OESH: Measurement methods and Ventilation	4
OESH 6040	Advanced OESH Management Systems	4
OESH 6050	Advanced Topics in OESH: Ergonomics	4
OESH 6300	Seminar	1

YEAR II

Course Code	Course Title	Credits
OESH 6700	Research Project	9

OESH Postgraduate Research Programme

Every MPhil/PhD student is required to pursue a minimum of two 4 credit courses. One of these is a general course for all students called introduction to Research Techniques in Chemistry (CHEM 6560) and the other course is one in the student's area of interest. In addition, each MPhil or PhD student is required to register for graduate research seminars two for the MPhil and three for the PhD.

The list of courses (4 credits each) offered by Chemistry Department for MPhil / PhD students :

Course Code	Course Title
CHEM 6160	Metal - Organic Chemistry
CHEM 6161	Physico-Chemical Properties of Inorganic Complexes
CHEM 6260	Advanced Topics in Spectroscopy and Organic Synthesis
CHEM 6460	Advanced Topics in Analytical Chemistry
CHEM 6461	Advanced Topics in Bio-analytical Chemistry
CHEM 6560	Introduction to Research Techniques in Chemistry
CHEM 6561	Advanced Topics in Environmental Chemistry
CHEM 6562	Advanced Topics in Polymer Chemistry

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

2nd Floor, Natural Sciences Building
Tel: (868) 662-2002 Exts. 83080, 83640
Email: dcit@sta.uwi.edu
Website: http://sta.uwi.edu/fst/dcit /

STAFF LISTING

HEAD OF DEPARTMENT
Dr. Permanand Mohan
Ext. 83101
Email: permanand.mohan@sta.uwi.edu

POSTGRADUATE PROGRAMME COORDINATOR
Prof. Patrick Hosein
Ext. 83501
Email: patrick.hosein@sta.uwi.edu

ADMINISTRATIVE ASSISTANT

Mrs. Avril Patterson-Pierre
BA (Heriot Watt)
Ext. 83798
Email: avril.patterson-pierre@sta.uwi.edu

SECRETARY
Mrs. Stacey Greene-McNeil
BSc (UWI)
Ext. 83080
Email: stacey.greene-mcneil@sta.uwi.edu

CLERICAL ASSISTANTS
Mr. Nirvan Bhagwandeen
Ext. 83640
Email: nirvan.bhagwandeen@sta.uwi.edu

Ms. Niala Ragoo
BSc (UH)
Ext. 83640
Email: niala.ragoo@sta.uwi.edu

NETWORK SYSTEMS ADMINISTRATOR
Mr. Naresh Seegobin
BSc, Msc (UWI)
Ext. 82299
Email: naresh.seegobin@sta.uwi.edu

PC NETWORK SUPPORT TECHNICIAN
Mr. Garvin Cadogan
BSc (SAM)
Ext. 82299
Email: garvin.cadogan@sta.uwi.edu

SENIOR RESEARCH TECHNICIAN
Mr. Russell Joseph
Ext. 82299
Email: russell.joseph@sta.uwi.edu

SENIOR LABORATORY ASSISTANT
Mr. Chris Sammy
Ext. 82299
Email: chris.sammy@sta.uwi.edu

ACADEMIC STAFF

Margaret Bernard
BSc, MPhil, PhD, (UWI)
Senior Lecturer, Computer Science
E-Learning, Information Visualization, Data Management,
Ext. 83098
Email: margaret.bernard@sta.uwi.edu
Web: http://www2.sta.uwi.edu/~mbernard

Wayne Goodridge
BSc, MPhil (UWI), PhD (Dalhousie)
Lecturer, Computer Science
Computer Networking, Systems Designs, Computer Security and Digital Watermarking, Internet Technologies
Ext. 83948
Email: wayne.goodridge@sta.uwi.edu

Michael Hosein
BSc, MPhil (UWI), PhD (UWI)
Lecturer, Computer Science
Availability in Distributed Systems, Wireless E-Learning, Wireless Applications
Ext. 82300
Email: michael.hosein@sta.uwi.edu

Patrick Hosein
BSc (EECS), BSc (Math), MSc, EE, PhD (MIT)
Wireless Communications, Network Optimization, Performance Engineering
Professor, Computer Science
Ext. 83501
Email: patrick.hosein@sta.uwi.edu

René Jordan
BSc (UWI), MSc, PhD (Leeds)
Lecturer, Computer Science
Geographic Information Systems
Email: rene.jordan@sta.uwi.edu

Noel Kalicharan
BSc, MSc (Br. Col), PhD (UWI),
Senior Lecturer, Computer Science
Programming Aptitude, Educational Testing, Mental Arithmetic
Ext. 83224
Email: noel.kalicharan@sta.uwi.edu

Duc Kieu
BSc (Vietnam), MSc (Australia) PhD (Taiwan)
Lecturer, Computer Science
Multimedia Security (Digital Watermarking and Steganography)
Ext. 83872
Email: duc.kieu@sta.uwi.edu

Salys Lackan
BSc (UWI), MSc (Univ. Of Trento), MSc (Univ. of Rwth Aachen),
Assistant Lecturer, Computer Science
Mobile Health, Blended Learning, Computer-supported Ubiquitous Learning and Advanced Technologies in Education
Email: salys.lackan@sta.uwi.edu

Permanand Mohan
BSc (UWI), MSc (Sask), PhD (UWI)
Senior Lecturer, Computer Science
Advanced Learning Technologies, Mobile Learning
Ext. 83101
Email: permanand.mohan@sta.uwi.edu

Alexander Nikov
MSc PhD (TU Sofia), Dr. habil. (TU Braunschweig)
Senior Lecturer, Computer Science
User Experience Design, Human Computer Interaction, Usability Engineering, Computational Intelligence Modelling, Emotional User Experience-Personalized User Experience, Emotion-Oriented eCommerce
Exts. 83117, Usability Lab: 84127
Email: alexander.nikov@sta.uwi.edu
Web: http://www2.sta.uwi.edu/~anikov/

Shiek Yussuff
BSc (UG), MSc (Surrey), MSc (Lond)
Lecturer, Computer Science
Object-Oriented Programming, Software Engineering
Ext. 83219
Email: sheik.yussuff@sta.uwi.edu

MSc / MPhil / PhD PROGRAMMES

The Department of Computing and Information Technology offers a taught Master's programme leading to the MSc in Computer Science and Technology, with Specializations in (I) Cloud Technologies and (II) Mobile Computing.

The Department also offers MPhil and PhD research degrees on either a part-time or full-time basis. MPhil and PhD students are required to complete 6/9 credits of taught masters courses. Interested applicants are required to consult with the department to ensure that research facilities are available for their research area. The Board for Graduate Studies and Research offers a limited number of scholarships to students of the highest academic standing registering for MPhil/PhD.

Some departmental funding in the form of teaching assistantships and demonstratorships are available for registered MPhil/PhD students not on scholarship. The research areas are shown below.

RESEARCH INTERESTS

The current research in progress or research areas where activities are planned include:

1. WIRELESS COMMUNICATIONS:

- Radio Resource Management for Next Generation Cellular Networks
- Performance and Capacity Analysis of Wired and Wireless Networks
- Pricing and QoS for 4G Networks
- Mobile Apps for monitoring accessibility, retainability and throughput of wireless networks

2. WIRELESS AND MOBILE COMPUTING

- Mobile Software: research is being conducted into its design and application. Educational and other areas, e.g. agriculture, are used as case studies.
- Enabling technologies include Bluetooth and SMS.

3. DISTRIBUTED SYSTEMS

- The design and performance of Internet based distributed systems, especially those based on pessimistic and optimistic protocols.

4. ARTIFICIAL INTELLIGENCE

- Mainstream High-Performance-Computing for Artificial Intelligence research and applications.
- Application of Artificial Intelligence to the Resolution of Real World Problems.

5. e-LEARNING:

- Encompassing all aspects of the use of computer technology to facilitate education, particularly Web-based Instructional Systems.
- Integrating web-based and classroom teaching in Secondary Schools and the Caribbean.
- Aggregating and sequencing XML Reusable Learning Objects in a peer-to-peer system.
- Educational Data Mining (Moodle plug-in).
- Computer Suopported Collaborative Learning.
- Accessibility for visually impaired.
- Mobile Application.

6. DATA MANAGEMENT AND DATAMINING:

particularly applied to agriculture, energy sector, poverty monitoring.

- Database Systems, Federated Databases, Data Warehousing/Data Mining.

7. GEOGRAPHIC INFORMATION SYSTEMS

- Developing social simulations using multi agent simulations and GIS techniques. This is with a view of further understanding some of the topical issues in the Caribbean, for example, urban planning, crime, and migration patterns in relation to social development policy.

8. DECISION SUPPORT SYSTEMS AND GEOGRAPHICAL INFORMATION SYSTEMS

- Development of theoretical decision models to solve spatial multiple criterion problems.

9. COMPUTER SECURITY AND WATERMARKING

- Developing digital watermarking techniques.

10. SOFTWARE ENGINEERING

- Embedded Systems.
- Development of timetabling solutions.

11. USABILITY, PERSONALIZATION AND EMOTIVE DESIGN

Research on usability, personalization and emotive (user emotions) design based on modern mathematical models (computational intelligence: fuzzy logic, neural networks, swarm optimization, etc.) is carried out at the Caribbean's first Usability Lag at the Department of Computing and Information Technology. Its multidisciplinary areas are, as follows:

- User-experience design and development: user-experience design and development of Interactive systems/products/workplaces like websites, eServices, mobile devices, office workplaces.
- Usability Testing: usability tests In the Caribbean's first Usability Lab for interactive systems/products/workplaces.

- Personalization: design and development of user-adapted/personalized interactive systems and products.
- Emotive design: research on user emotions/affect/mood/enjoyability issues in design and development of interfaces/systems/products/workplaces that adaptively and positively appeal to the emotions of the user. use of advanced technologies for recognition of emotion-based on facial expressions, EEG, ECG,

12. MOBILE HEALTH

- Mobile telemedicine for patients suffering from diabetes and cardio-vascular disease in the Caribbean.

POSTGRADUATE COURSES

MSc in Computer Science and Technology with Specializations in Mobile Computing and Cloud Technologies

Objectives

The objectives of this revised program can therefore be summarized as:

- To produce students who are better equipped for present and future ICT careers by teaching them to not only understand present technologies but also be able to learn and adapt as technologies continue to change. This will be achieved through more design-based assignments and less traditional solution-based assignments.
- Better integration of theory and practice through classroom presentations of theory followed by laboratory exercises.
- To take advantage of the rapid changes in education due to the Internet.
- Introduce a sustainable self-financed program and hence reduce the financial burden on the UWI
- Have a more focused program so that we offer fewer, more expertly taught courses. The areas of focus can be modified as the needs of the community vary.
- Share common courses within the campus to more efficiently utilize human resources.

Entry Requirements

To be admitted to this programme a candidate should possess a BSc degree in Computer Science or a major in Computer Science or equivalent (with a minimum GPA 2.5) with a minimum average of B+ (3.0) in any two (2) of the following courses or equivalent.

Course Code	Course Title
COMP 2000	Data Structures
COMP 2500	Object-Oriented Programming
COMP 3000	Design and Analysis of Algorithms
COMP 3100	Operating Systems

Candidates without the above may be considered for entry upon successful completion of qualifying courses. These qualifying courses will be chosen by the programme coordinator for each such candidate based on their background and their intended area of specialization.

Examination
Students will be required to pass both the coursework and the written examination. The pass mark is 50%. The grading scheme for graduate degrees is as follows: A 70 - 100%; B+ 60-69%; B 50-59%.In the case of the Research Project, evaluation will be based on the project report.

Award of Degree
To qualify for the award of the degree, candidates must pass all six core courses, four elective courses and the Research Project. The degree shall be awarded in two categories - Distinction and Pass. For the award of the degree with distinction, the candidate must have obtained an average mark of 70% or more, across all core courses and elective courses as well as 70% or more in the Research Project. A Candidate failing a course shall be ineligible for the award of distinction.

Prizes
- The Teleios Systems Ltd. prize is awarded to the candidate with: the best MSc Research Project in Computer Science
- Trinidad and Tobago Network Information Centre (TTNIC) prize for the MSc (Computer Science) Graduate with the Highest Overall Examination Average

Course of Study
For the MSc in Computer Science and Technology programme with specializations in Cloud Technologies and Mobile Computing, students are required to complete a set of core courses, elective courses and a research project. The core courses will cover material that is essential for any Computer Science graduate while the elective courses will be offered in the areas of specialization. Students would also be required to take a course on research methods that will help them with their research project. The research project will be a major component of the degree and will be required to be in the area of specialization of the student. Each student must take a total of 39 credits consisting of 18 core course credits, 12 elective course credits and a 9-credit research project. Students will also be required to prepare at least one conference paper (submission of which will be left up to the supervisor). A wider audience will read this condensed version of their research project.

Full time students will have to take 5 courses per semester and do their research project during the summer following their second semester. Part time students can take 2-3 courses per semester and start their project once their courses are complete.

Specializations
Each specialization will consist of four elective courses. Students who have opted for the specialization must pass all four electives in order to graduate. All four courses in each specialization will be offered within each academic year. The areas of specialization were chosen based on the expected ICT needs of Trinidad and Tobago and the Region in the coming years. They are Cloud Technologies and Mobile Computing.

> **Cloud Technologies:** This specialization is geared toward those students wishing to pursue careers in Information Systems, Database Management, Cloud Computing and Cloud Storage.
>
> **Mobile Computing:** This specialization is geared toward students wishing to work in the wireless communications industry, either as network designers or as application developers.

CORE COURSES (3 CREDITS EACH)

Course Code	Course Title
COMP 6401	Advanced Algorithms
COMP 6501	Research Methods, Entrepreneurship and Intellectual Property
COMP 6601	Distributed Computer Systems
COMP 6701	E-Commerce and M-Commerce Systems
COMP 6801	Network and Computer Security
COMP 6104	Advance Computer Networks

ELECTIVE COURSES (3 CREDITS EACH)

Cloud Technology Specialization Courses

Course Code	Course Title
COMP 6300	Advanced Internet Technologies
COMP 6901	Software Project Engineering and Management
COMP 6802	Distributed and Parallel Database Systems
COMP 6905	Cloud Technologies

Mobile Computing Specialization Courses

Course Code	Course Title
COMP 6910	Wireless Networks
COMP 6915	Mobile Applications
COMP 6920	Mobile Computing
COMP 6925	Applied Operations Research

DEPARTMENT OF LIFE SCIENCES

MAIN OFFICE
Ground Floor Natural Sciences Building
PBX: 1 868 662 2002; Exts. 83095; 83111; 83789; 82045
FAX: 1 868 663 5241; 663-5409

STAFF LISTING

HEAD OF DEPARTMENT
Dr. A. Ramsubhag
Ext. 83086
Email: adesh.ramsubhag@sta.uwi.edu

SENIOR ADMINISTRATIVE ASSISTANT
Mrs. Deborah Alleyne
BSc (UWI)
Ext. 83789
Email: deborah.alleyne@sta.uwi.edu

SECRETARIES
Mrs. Paulette Belfonte-Paul
BSc (UWI)
Ext. 83111
E-mail: paulette.belfonte@sta.uwi.edu

Mrs. Casandra James-De Freitas
Ext. 82045
Email: casandra.james@sta.uwi.edu

CLERICAL ASSISTANTS
Mrs. Abigail Joefield
Ext. 82047
E-mail: abigail.joefield@sta.uwi.edu

Ms. Leela Jagdeo
Ext. 82045
E-mail: leela.jagdeo@sta.uwi.edu

Ms. Liesha Joseph
Ext. 82080
E-mail: liesha.joseph@sta.uwi.edu

ACCOUNTING ASSISTANT
Ms. Geeta Badloo
Ext. 83788
E-mail: geeta.badloo@sta.uwi.edu

ACADEMIC STAFF
J. B. Agard
BSc (UWI), MSc (Manch.), PhD (UWI)
Professor of Tropical Island Ecology
Social-Ecological systems in development planning; small island biodiversity and ecosystem services; climate change vulnerability impact and adaptation scenarios, carbon sequestration and greenhouse gas emission reduction
Ext. 83095
Email: john.agard@sta.uwi.edu
Sabbatical Leave 2015/16

M. Alkins-Koo
BSc (UWI), MSc (Lond.), PhD (UWI)
Senior Lecturer, Zoology
Freshwater Ecology; The assessment and monitoring of anthropogenic impacts in freshwaters
Ext. 83094
Email: mary.alkins-koo@sta.uwi.edu

Y. S. Baksh-Comeau
BSc, MPhil (UWI)
Curator National Herbarium of T&T;
Systematics of the vascular flora of Trinidad & Tobago including Plant Ecology; Ethnobotany; Phytogeography; Biodiversity & Conservation
Ext. 83326
Email: yasmin.baksh-comeau@sta.uwi.edu

G. F. Barclay
BA (Mt Allison), PhD (Aberdeen)
Lecturer, Plant Sciences
Hormonal control of plant development; Phytoplankton and pollution modeling; Chemistry of greenheart durability
Ext. 83112
Email: gregor.barclay@sta.uwi.edu

L. Beddoe
BSc, MPhil (UWI)
Programme Manager, MSc/Diploma Biodiversity Conservation and Sustainable Development in the Caribbean
Ext. 83739
Email: leeann.beddoe@sta.uwi.edu

V. J. Bowrin
BSc (UWI), PhD (Purdue)
Lecturer, Biochemistry
Pigeon pea flower abscission; Development of a monounsaturated coconut oil
Ext. 82079
Email: valerie.bowrin@sta.uwi.edu

D. D. Chadee
BSc (Dalhousie), MPhil (UWI), PhD, MPH, D.Sc. (Dundee)
Professor, Environmental Health
Ecology and control of parasitic diseases and insect vectors. Climate Change and Public Health Diseases
Ext. 83740
Email: dave.chadee@sta.uwi.edu

B. N. Cockburn
BSc, PhD (UWI)
Senior Lecturer, Biochemistry
Metabolic diseases; Nutritional content of foods; Genetic diversity of sweet potato
Ext. 83541
Email: brian.cockburn@sta.uwi.edu

E. J. Duncan
BSc (Lond UCWI), PhD (St. Andrews)
Professor Emeritus, Botany
Plant Tissue Culture, Algal Biology, Plant Reproductive Biology
E-mail: julian.duncan@sta.uwi.edu

W. Elibox
BSc, PhD (UWI)
Lecturer, Genetics
Genetic improvement of anthurium, hotpepper, sugarcane, cocoa, tomato through Breeding and Biotechnology
Ext: 83108
E-mail: winston.elibox@sta.uwi.edu

A. Farrell
BSc (Edinburg); P.Dip, PhD (Trinity College, Dublin)
Lecturer, Plant Physiology
Plant Physiology and Ecophysiology, Plant Productivity and response to aboitc stress; Genotype x environment interactions
Ext. 82047
Email: aidan.farrell@sta.uwi.edu

J. Gobin
BSc, MPhil (UWI), PhD (Exeter, UK)
Lecturer, Zoology
Marine Ecology including Benthic Ecology; Rocky shore fauna & marine invasive species
Ext. 82046
Email: judith.gobin@sta.uwi.edu
Sabbatical Leave 2015/16

A. Hailey
BSc (Lond), PhD (Nottingham)
Professor, Zoology
Animal Ecology; Behaviour & Ecophysiology; Herpetology
Ext. 82206
Email: adrian.hailey@sta.uwi.edu

J. Jayaraman
BSc, MSc, PhD (Annamalai)
Professor, Biotechnology and Plant Microbiology
Plant-Microbe interactions, Induced Resistance, Plant-Metabolic Engineering, Biopharming, Phyto-nutraceuticals, Seaweed products, Bioelicitors, Integrated disease management, Antibiotic resistance
Ext. 83092
Email: jayaraj.jayaraman@sta.uwi.edu

A. Khan
BSc, PhD (UWI)
Senior Lecturer, Plant Sciences
Integrated Pest Management; Biological Control
Ext. 83087
Email: ayub.khan@sta.uwi.edu

A. Lennon
BSc, D.Phil (Sussex)
Lecturer, Biochemistry
Plant Respiratory Complexes; IMMUTANS and alternative oxidases; flavonoid biosynthesis in anthurium
Ext. 83216
Email: adrian.lennon@sta.uwi.edu

A. Mohammed
BSc, PhD (UWI)
Lecturer, Zoology
Ecotoxicology; Environmental Pollution Chemistry; Carbon sequestration and emissions monitoring
Ext. 82046
Email: azad.mohammed@sta.uwi.edu

M. P. Oatham
BSc (Western Aust.), PhD (Kent)
Lecturer, Plant Sciences
Forest Ecology and Management
Ext. 83088
Email: mike.oatham@sta.uwi.edu

D.T. Phillip
BSc, MPhil (UWI), PhD (St. Andrews)
Lecturer, Life Sciences
Fisheries Biology and Management; Environmental Microbiology; Coral Reef Ecology, Freshwater Ecology
Ext. 82208
Email: dawn.phillip@sta.uwi.edu

I. W. Ramnarine
BSc (UWI), MSc (Wales), PhD (UWI), MBA (Heriot-Watt)
Professor, Ichthyology Fisheries and Aquaculture / Fisheries Biology and Management; Aquaculture; Aquaponics; Fish and Crustacean Biodiversity; Ecology, Behaviour and Evolution of Guppies; Wetlands Ecology
Ext. 83093
Email: indar.ramnarine@sta.uwi.edu

S. Rampersad
BSc, PhD (UWI)
Lecturer, Biochemistry
PR proteins; Plant defense elicitors; Fruit rot disease complex in pumpkins; Vascular wilt in pumpkins
Ext. 83109
Email: sephra.rampersad@sta.uwi.edu

A. Ramsubhag
BSc, PhD (UWI)
Senior Lecturer, Microbiology and Plant Pathology
Environmental microbiology, microbial biotechnology, metagenomics, novel antibiotics, bacterial plant pathogens
Ext. 83086, 83111
Email: adesh.ramsubhag@sta.uwi.edu

L. Rostant,
BSc, MPhil (UWI), PhD (University of Florida)
Lecturer, Interdisciplinary Ecology, Wildlife Biology; Conservation Biology
Co-ordinator; MSc/Diploma Biodiversity Conservation and Sustainable Development in the Caribbean
Ext 83739
Email: luke.rostant@sta.uwi.edu

J. Rouse-Miller
BSc, MPhil PhD (UWI)
Lecturer, Plant Sciences
Plant Tissue Culture; Anatomical and Molecular aspects of pigeon pea abscission
Ext. 83089
Email: judy.rouse-miller@sta.uwi.edu

M. Rutherford
BSc (Glasgow); MSc (James Cook)
Museum Curator
Ext. 82231
Email: mike.rutherford@sta.uwi.edu

P. Umaharan
BSc (Peradeniya), PhD (UWI)
Professor of Genetics (on secondment to Cocoa Research Centre, UWI)
Transformation of tropical crop species; Genetic analysis of resistance to tropical diseases and resistance breeding; Genetic Diversity and Plant Genetic Resource Management
Exts. 83111 / 82114
Email: pathmanathan.umaharan@sta.uwi.edu

RESEARCH INTERESTS AND FACILITIES

The Department of Life Sciences specialises in two (2) of the most innovative and dynamic areas of current research and development, namely (a) Small Island Biodiversity and Environmental Management and (b) Biotechnology and Molecular Biology. Research focuses on biodiversity and ecosystem services, conservation biology and natural resources management (e.g. tropical forests, fisheries and aquaculture), pollution impacts and management, climate change vulnerability impact and adaptation. There is also a long history of research and development projects in Biotechnology and Molecular Biology as they relate to agriculture and human wellness. Current research projects use approaches such as Recombinant DNA Technology. Research also focuses on providing new knowledge on the physiology and metabolism of tropical plants in important areas such as tuberisation, abscission and mechanism of resistance to pests and pathogens. Studies in Microbiology and Crop Protection are also important focal areas. In addition to the above, research is ongoing in the traditional disciplines such as Biochemistry, Botany, Zoology, Ecology, Epidemiology and control of diseases of public health importance.

The Department offers graduate programmes leading to MPhil and PhD degrees in all areas of research being pursued by academic staff as outlined above. The Department has supporting specialist research laboratories in Biotechnology and Tissue Culture, Entomology, Environmental Biology, Ecology, Parasitology, Ecotoxicology, Biosystematics, Biochemistry, Histology, Microbiology, and Aquaculture and Fisheries. The Department also maintains the National Herbarium, Zoology Museum, Land Arthropod Collection and several greenhouses.

Applicants to the MPhil or PhD research programme, should liaise with their potential supervisor for guidance in developing a clear research project and research proposal which must be submitted to the Head of Department. Guidelines for the preparation of a research proposal are available at **http://sta.uwi.edu/fsa/lifesciences/documents/researchproposal.pdf** . Supervisors listed in the application form should have agreed to do so.

PROGRAMMES

Diploma / MSc in Biodiversity Conservation & Sustainable Development in the Caribbean

The online graduate degree in Biodiversity Conservation and Sustainable Development in the Caribbean is a taught programme geared towards building and strengthening capacity in environmental management, biodiversity conservation and sustainable development in the Caribbean. The programme will be offered in two forms, Graduate Diploma and MSc and can be undertaken either on a full time or part time basis. Teaching on this programme will involve a blend of internet-based distance teaching and face-to-face training.

Objectives

The main objective of this graduate degree is to supply the region with qualified professionals who have a comprehensive knowledge of the concepts and principles of a wide range of science and environmental management issues related to tropical biodiversity. Advanced practical skills in environmental monitoring, impact analysis, environmental management, data management and policy issues will be taught in this programme. In addition, a working knowledge and appreciation of the major disciplines within environmental science and a multidisciplinary overview of environmental data collection and analysis together with an acquired and improved range of transferable skills including group work, scientific research, data analysis, report writing and oral presentation, will be provided to learners in this programme. As such it will provide students with a set of skills that will allow them to advance their careers in the environmental management and biodiversity conservation fields within their government, public sector, NGOs and industrial organisations.

Entry Requirements

Candidates applying for admission are required to satisfy the relevant general regulations of the Faculty and the University's Board for Graduate Studies and Research. The prerequisite for entry into the programme is a bachelor's degree in one of the following disciplines: natural sciences, engineering, agricultural sciences, geography, education or an appropriate social sciences from an approved university, with at least lower second-class honours or a minimum GPA 2.0 (or equivalent qualification and work experience).

Duration

Students enrolled in the Diploma Programme will be required to complete the course in either 1 year (full time) or 2 years (part time).

Students enrolled in the MSc Programme will be required to complete the degree in 1½ years (full time) or 3 years (part time).

Modes of Delivery

As a post-graduate Diploma/MSc level course, a variety of methods of delivery will be employed, which include face-to-face interactions, virtual seminars, tutorials, field visits and a research project. This will be supported by distance learning and e-based course assignments as well as project and scenario based workshops, case studies and assignments in which group work and student centred learning approaches are adopted. Thus, increasing onus will be put on the student to take responsibility and control of their own learning. This will lead to the point of the final research project in which the student will be responsible for the development, management and reporting of a study with the supervisor acting as an advisor and facilitator. Additionally, the programme aims to maximise access by professionals working in government, NGO and commercial organisation by supporting face-to-face sessions with distance learning, assignments etc. which students can undertake from their home.

Course Assessment

A variety of course assessment techniques will be utilized throughout the programme.

Research Project

A Research Project is a fundamental component of the MSc programme and this is reflected, not only in the credit weighting, but by the fact that the MSc runs for an extra 6 months so that the student may have the necessary time to complete the project to a high standard.

The aim of the research project is to allow the student to synthesise and articulate several aspects of the taught programme within a single themed research topic. In addition, it will provide the opportunity for further detailed skills training in specific aspects of environmental monitoring, assessment or management of tropical biodiversity. It will allow the student to pursue an individual study on a particular research topic or issue of interest to the student and will incorporate technical skills training specific to the individual student. As such, the research project will provide the opportunity to develop a specific set of practical and reporting skills that will be of use to the student in their future career.

Award of Diploma/Degree

In this joint Diploma/MSc, the main awarding University will be the University delivering the most teaching to the specific student. Thus, prospective students should note that their degree will be awarded based on the number of credits taught by the various partner institutions.

Diploma in Biodiversity Conservation and Sustainable Development in the Caribbean

The Diploma programme consists of 24 credits and students will be required to complete any seven (7) core courses and one (1) of the options in order to successfully complete it. Each course carries 3 credits.

CORE COURSES

Course Code	Title
BIOL 5200	Characteristics of Biodiversity
BIOL 5201	Threats to Tropical Biodiversity
BIOL 5206	Management and Analysis of Environmental Data
BIOL 5208	Conservation and Management of Biodiversity
BIOL 5210	Field Practicum
BIOL 5212	Taxonomy and Biodiversity Informatics
BIOL 5214	Environmental Resources Policy

OPTIONS

Course Code	Title
BIOL 5202	Environmental Law and Multilateral Environmental Agreements
BIOL 5203	Environmental Economics
BIOL 5204	Environmental Impact Assessment
BIOL 5205	Principles and Practice of Geoinformatics
BIOL 5207	Sustainable Use and Management of Natural Resources
BIOL 5209	Pollution and Ecotoxicology
BIOL 5213	Advanced GIS
BIOL 5215	Socio-ecology and Natural Resources Management

MSc in Biodiversity Conservation & Sustainable Development in the Caribbean

The MSc programme consists of 45 credits. Students will be required to complete the following courses:

- Seven 3-credit core courses and one 12-credit Research Project (BIOL 6211)
- Four Optional 3-credit courses

CORE COURSES

Course Code	Title
BIOL 6200	Characteristics of Biodiversity
BIOL 6201	Threats to Tropical Biodiversity
BIOL 6206	Management and Analysis of Environmental Data
BIOL 6208	Conservation and Management of Biodiversity
BIOL 6210	Field Practicum
BIOL 6212	Taxonomy and Biodiversity Informatics
BIOL 6214	Environmental Resources Policy
BIOL 6211	Research Project

OPTIONS

Course Code	Title
BIOL 6202	Environmental Law and Multilateral Environmental Agreements
BIOL 6203	Environmental Economics
BIOL 6204	Environmental Impact Assessment
BIOL 6205	Principles and Practice of Geoinformatics
BIOL 6207	Sustainable Use and Management of Natural Resources
BIOL 6209	Pollution and Ecotoxicology
BIOL 6213	Advanced GIS
BIOL 5215	Socio-ecology and Natural Resources Management

Post Graduate Diploma, and Master of Science (MSc.) in Biotechnology

The development of a master's and PG diploma programme is conceived because of the urgent necessity of the UWI and the Caribbean region to immediately invest in biotechnology, which is considered to be the most promising and fastest-growing technology of the present era. The field of biotechnology is recognized for its potential to offer solutions to worldwide problems, from food security and health to clean energy and environmental sustainability. Situated in a strategic location, Trinidad and Tobago and rest of the Caribbean have the unique advantage to explore this growing global demand in biotechnology. This postgraduate programme will provide the basic expertise, skill sets, necessary infrastructure and knowledge base which would serve to ultimately build capacity in this region. It would create avenues for advanced research and enhance intellectual capacity to enable the development of industrial and business activity, leading to generation of employment opportunities in this frontier field. This programme will be offered at both the Post Graduate Diploma and the Masters levels.

Academic Aims and Objectives

This programme is intended to meet the needs of a broad range of professionals whose basic learning and knowledge are in life sciences, medicine and agriculture. The potential users of this programme would be natural and applied scientists, teachers, medical, paramedical and technical professionals. This is an entirely new programme and is designed to provide the basic learning, necessary skill sets, knowledge and hands-on experience in contemporary biotechnology which would ultimately contribute to the higher learning, capacity building and career advancement of enrolled users.

- To produce qualified biotechnologists with the competence to provide services to Medical Biotechnology, Agricultural Biotechnology, Industrial Biotechnology, Environmental Biotechnology and Bioinformatics and Biotechnology-based business development;
- To build national and regional technological and infrastructural capacities for imparting terminal education, training and research on contemporary biotechnology;
- To develop and foster collaborations with developed countries and institutes of Global excellence, facilitating the exchange of knowledge and development of cooperation in related industries;
- To strategically prepare the Caribbean region to actively interact with the developing World in the Biotechnology services, research and development;

Learning Outcomes

Students completing the programme would be able to:

- Demonstrate a comprehensive understanding of the latest theory and techniques of molecular biology, bioinformatics and biotechnology;
- Apply current tools of biotechnology to solve problems related to the environmental conservation, crop genetic improvement, nutrition, human and animal health; bioprocessing industries; environmental conservation;
- Develop practical industrial applications within existing industries or new venture (entrepreneurship) activities;
- Exercise individual judgment and initiative in biotechnological principles and applications;
- Analyse and appraise the social & environmental impacts of biotechnology;
- Establish new work programmes in the fields of biotechnology;
- Develop a research question in a specialized area of biotechnology and evaluate this research with appropriate justification*;
- Compose, execute and present a suitable high quality research project in biotechnology*.

**Not applicable for the Postgraduate Diploma programme.*

Entry Requirements:

Admission requirements for this programme are as follows:

- First degree from a recognized University in Biology/Biochemistry/Agriculture or other Natural Sciences, Medicine and Veterinary Science with a minimum of lower second class honours
- Significant work experience in a related field would be an asset;
- Candidates applying for the program should have completed and secured a minimum "B" grade in at least three of the following Level II/III undergraduate courses or their equivalents (UWI-St. Augustine, Mona and Cave Hill or other recognized Universities/Colleges in the region/elsewhere)
  - Genetics
  - Microbiology
  - Molecular biology
  - Microbial Biotechnology
  - Plant Biotechnology
- Students successfully completing the Biotechnology minor/specialization at UWI-St. Augustine or major at UWI, Mona would be eligible subject to fulfillment of the grade and GPA requirements

- Persons without adequate coverage of these areas may be required to pursue and pass (at least 50% final marks) appropriate qualifying courses before admission into the MSc or diploma programme
- Candidates not meeting the grade or GPA requirements but who have sufficient work experience in a relevant area may also be admitted under special circumstances. As part of the selection process, the department reserves the right to interview applicants for further exploration of their qualifications, experience and interest. They may be further required to complete minimum pre-requisite courses based on their needs as directed by the Programme Coordinator or Department Head
- Students enrolled for PG Diploma can apply to transfer to the MSc. programme before completion of their coursework. Students granted permission to transfer would be required to pay the additional fees and complete the additional coursework

Delivery

Lectures would be delivered via face-to-face and blended learning modes (e.g. WebEx) and available to students from both St. Augustine and Mona campuses simultaneously. All lectures, assignments, handouts, and review materials would be available online to all students registered under the programme. Lectures are supplemented with laboratory work and tutorials.

Programme Content and Structure

CORE COURSES (MSC / PGD* Codes)

Code	Title	Credit	Semester
BIOT 6000 / BIOT 5000*	Molecular Biology and R-DNA Technology	3	1
BIOT 6001/ BIOT 5001*	Microbial and Environmental Biotechnology	3	1
BIOT 6002 / BIOT 5002*	Advances in Plant Genetic Engineering and Plant Biotechnology	3	2
BIOT 6003 / BIOT 5003*	Medical and Veterinary Biotechnology Biotechnology and Health	3	1
BIOT 6004 / BIOT 5004*	Immunotechnology and Molecular Therapies	3	2
BIOT 6005 / BIOT 5005*	Industrial Biotechnology and Bioprocessing	3	1
BIOT 6006 / BIOT 5006*	Bioethics, Biosafety and Intellectual Property Rights (IPR) in Biotechnology	3	2
BIOT 6007 / BIOT 5007*	Bioinformatics	3	1
BIOT 6014	Research Project		

OPTIONAL COURSES

(MSC – Any 3 courses)
(PGD – Any 2 courses)

Code	Title	Credit	Semester
BIOT 6008 / BIOT 5008*	Genomics and Proteomics Technologies	3	2
BIOT 6009 / BIOT 5009*	Molecular Diagnostics		
BIOT 6010 / BIOT 5010*	Plant Breeding	3	2
BIOT 6011 / BIOT 5011*	Applied Bioinformatics	3	2
BIOT 6012 / BIOT 5012*	Directed Reading and Seminar	3	2
BIOT 6013 / BIOT 5013*	Entrepreneurship in Biotechnology	3	2

Research Project:
1 semester research work + Presentation and Report
12 credits Supervised

Credits
The proposed M.Sc. program comprises 42 compulsory credits:

- eight (8) core courses (3 credits each)
- three (3) 2 optional courses from 5 (3 credits each)
- Research Project (12 credits)

The Postgraduate Diploma programme would comprise of 30 compulsory credits:

- 8 core courses and 2 optional courses

Programme duration:

- The master's course would be 1.5 years full-time or 2.5 years part-time
- The PG diploma would be 1 year full-time or 2 years part-time;

Regulations and Assessment

Students should refer to the Manual of Procedures for Graduate Diplomas and Degrees, the regulations for Graduate Diplomas and Degrees, the Graduate Studies Guide for Students and Supervisors, and the Thesis Guide.

Assessment of Students' Performance
Examinations are held according to the UWI's regulations:

- In order to pass a course, a candidate must attend at least 75% of the lectures, tutorials and laboratory sessions; He/she must have submitted the relevant project/reports pertaining to all laboratory or industry work and must have satisfied the examiners in the associated examinations and course work;
- Examinations associated with each course shall be conducted by means of written and/or practical papers, normally taken at the end of the semester in

which the candidate has registered. However, performance in course work in the form of essays, in-course tests, projects, or continuous assessments of theoretical and /or practical work, all contribute towards the final grade awarded in a course;

- All the online submissions should go through plagiarism screening through "Turnitin" software tool. The University's policy on plagiarism would be strictly enforced for all the submitted course work.
- All the activities related to course work have their own deadline and this has to be strictly adhered to. Any delay in submission would lead to rejection of submission or proportional reduction of marks.
- When theoretical and/or practical coursework contributes towards an examination, candidates must satisfy the examiners (≥50% marks) in each component;
- Candidates who score 50% and above would be deemed to have successfully passed the course;
- In respect of any candidate who fails the coursework or written examination at the first attempt, a second attempt may be allowed upon approval from the Board of Examiners and the Campus Committee for Graduate Studies and Research;
- Candidates permitted a second attempt at a course, having failed either the coursework or the written examination at the first attempt, will be required to rewrite only that component (written examination or coursework) failed, unless the Campus Committee in any particular case decides otherwise. Marks allotted to the component passed at the first attempt will be credited to the candidate at his or her second attempt at the course;

- No candidate will be permitted to repeat the examination in any one course on more than one occasion, unless approval is given by the Board for Graduate Studies and Research;
- Candidates who repeat the examination in any course shall not be eligible for the award of a diploma or degree with distinction.
- A student in the master's programme who fails the Research Project may, upon approval by the Board of Examiners and the Campus Committee for Graduate Studies and Research, be granted a Diploma providing all the course requirements are met

Grading System

Percentage	*Grades*
70 – 100	A
60 – 69	B+
50 – 59	B
0 - 49	F

Progress through the Programme

- Full-time students required to complete all courses (core and optional) within one academic year (5 – 6 courses per semester). After completing all core and the required optional courses, full-time master's students would then be allowed to start the research project, which should be completed within one or two semester;
- Part-time students are required to complete the courses within two academic years (2 – 3 courses per semester). After completing all core and optional courses, part-time master's students would then be allowed to start the project which should be completed within two semesters.

Time limits for completion and enforced withdrawals

Candidates would be required to withdraw from the programme if he/she fails more than six (6) credits in any one semester or fails any course or course component in a second sitting;

However, if the candidate has exhausted the maximum time limit with a deficit of no more than 6 credits for completion of the degree requirement, the Board of Examiners may recommend to the Campus Committee for Graduate Studies (after consultation with the Programme Coordinator) an extension of the period of study by one or two semesters.

Re-admission to the programme after enforced withdrawal

Candidates, who have had to withdraw from the programme because of poor academic performance, may re-apply for admission after one year of separation.

ADDITIONAL COURSES

The following four (4) credit courses offered by the Department of Life Sciences are available for MPhil/ PhD students:

Course Code	**Course Title**
BIOL 6062	Bioethics
BIOL 7063	Light Microscopy & Digital Image Processing

DEPARTMENT OF MATHEMATICS AND STATISTICS

MAIN OFFICE
2nd Floor, Natural Sciences Building
Tel: (868) 662-2002 Exts. 82049, 83553, 83641
Fax: (868) 645-7132
Email: dms@sta.uwi.edu

STAFF LISTING

HEAD OF DEPARTMENT
Dr. Robin Antoine
Ext. 82048
Email: robin.antoine@sta.uwi.edu

ADMINISTRATIVE ASSISTANT
Mrs. Deloris Adams-Carrington
BSc (UWI)
Ext 83780
Email: deloris.adams@sta.uwi.edu

SECRETARY
Ms. Nisha Hazelwood
Exts. 82048, 82049
Email: nisha.hazelwood@sta.uwi.edu

RECEPTION - CLERICAL ASSISTANTS
Ms. Cristal Warner
BSc (UWI)
Ext. 83553
Email: cristal.warner@sta.uwi.edu

Mr. Kevin Awai
Ext. 83641
Email: kevin.awai@sta.uwi.edu

ACADEMIC STAFF
R. Antoine
BSc, MSc (UWI), MS, PhD (FSU)
Senior Lecturer, Mathematics
Ext. 82048
Email: robin.antoine@sta.uwi.edu

B. Bhatt
BSc, MSc, PhD (University of Rajasthan), FIMA
Professor, Mathematics
Ext. 83859
Email: bal.bhatt@sta.uwi.edu

D. Comissiong
BSc, MPhil, (UWI), PhD (Northwestern Univ.)
Senior Lecturer, Mathematics
Ext. 83099
Email: donna.comissiong@sta.uwi.edu

C. de Matas
BSc, MPhil (UWI), MA (Pgh), PhD (UWI)
Lecturer, Mathematics
Ext. 83499
Email: charles.dematas@sta.uwi.edu

I. Dialsingh
BSc, M.Sc (UWI), PhD (PSU)
Lecturer, Mathematics
Ext. 83554
Email: isaac.dialsingh@sta.uwi.edu

D. Doctor
BSc, MSc (UWI), ASA
Lecturer, Actuarial Science
Ext. 83947
Email: dane.doctor@sta.uwi.edu

E.J. Farrell
BSc (UWI), M.Math. PhD (Wat), FTICA
Professor Emeritus
Ext. 83102
E-mail: edward.farrell@sta.uwi.edu

S.R. Gunakala
BSc (Acharya Nagarjuna Univ.- India),
MSc (Osmania Univ. - India),
MPhil (Madurai Kamaraj Univ. - India),
PhD (Sri Venkateswara Univ. - India)
Lecturer, Mathematics
Ext. 84491
Email: sreedhara.rao@sta.uwi.edu

K. Rahaman
BSc, PhD (UWI)
Senior Lecturer, Mathematics
Ext. 83082
Email: karim.rahaman@sta.uwi.edu

H. Ramkissoon
BSc (UWI), MSc (Tor), PhD (Calg)
Professor Emeritus
Ext. 82529
Email: harold.ramkissoon@sta.uwi.edu

A. Shirley
BSc (UWI), MSc, PhD (Northeastern)
Lecturer, Mathematics
Ext. 82495
Email: angela.shirley@sta.uwi.edu

S. Smart
H.B.Sc. LL.B, FSA, CERA, PRM
Senior Lecturer, Actuarial Science
Ext. 83553
Email: stokeley.smart@sta.uwi.edu

V. Tripathi
BSc, MSc PhD (Agra)
Senior Lecturer, Statistics
Ext. 83872
Email: vrijesh.tripathi@sta.uwi.edu

S. Wahid
BSc, MPhil, PhD, (UWI), FTICA
Senior Lecturer, Mathematics
Ext. 83081
Email: shanaz.wahid@sta.uwi.edu

RESEARCH INTERESTS AND FACILITIES

The Department of Mathematics and Statistics offers MSc Degrees in Mathematics and in Statistics. The Department also offers programmes leading to the MPhil and PhD degrees. The MSc degrees are awarded on the basis of taught courses and a research project.

The MPhil and PhD are research degrees awarded on the submission and successful defence of a thesis. Each MPhil/ PhD student must also do a minimum of 8/9 credits at graduate level, as recommended by his/her Supervisor. After evaluation by his/her supervisor, MPhil and PhD candidates may be required by the Department to take substantially more credits of taught courses than the University stipulated minimum.Interested applicants should consult the Head of the Department concerning available research facilities.

Transfer from the MPhil to the PhD degree programme is possible but depends on the progress of the research undertaken and the recommendation of the supervisor and the approval of the Board for Graduate Studies and Research.

In Mathematics, the current research areas are Graph Theory and Combinatorics, Fluid Dynamics, Mathematical Modelling and Biomathematics.

PROGRAMMES

MSc in Statistics

Objectives

To provide graduates with a comprehensive and advanced knowledge of Statistics so as to enable them to function effectively as professional Statisticians and to provide them with an adequate background for further study and research in Statistics.

Programme Co-ordinator: Dr. Robin Antoine

Entry Requirements

To be admitted to the programme a candidate should possess a BSc degree with at least Lower Second Class Honours or its equivalent (GPA 2.0). Candidates are expected to have a minimum grade B (quality point 3.0) in the following courses or its equivalent:

Course Code	Title
MATH 2110	Linear Algebra
MATH 2120	Analysis & Mathematical Methods I
MATH 2140	Introduction to Probability
MATH 2150	Introduction to Statistics

In addition to the above, the following courses offered by the Department of Mathematics and Statistics will be an asset: MATH 3450 (M 35A) Statistical Theory I and MATH 3460 (M 35B) Statistical Theory II. Applicants who do not satisfy these requirements may be admitted upon successful completion of qualifying courses.

Course of Study

For the MSc programme in Statistics, students are required to complete (32 credits) consisting of:

(i) 5 core courses (20 credits)

AND

(ii) 3 elective courses (12 credits) with an 8-credit Research Project (STAT 6000) which must be chosen in collaboration with at least one Lecturer in Statistics.

The course of study shall extend over one (1) year of full time study or two (2) years of part time study, however, at the present time, only a part-time programme is available.

Examination

Students will be required to pass both the coursework and the written examination. The pass mark is 50%. The grading scheme for graduate degrees is as follows: A 70 - 100%; B+ 60-69%; B 50-59%. In the case of the Research Project, evaluation will be based on the project report.

Award of Degree

To qualify for the award of the degree, candidates must pass all five Core courses, three Elective courses and the Research Project. The degree shall be awarded in two categories - Distinction and Pass. For the award of the degree with distinction, the candidate must have obtained an average mark of 70% or more, across all Core courses and Elective courses as well as 70% or more in the Research Project.

A candidate failing a course shall be ineligible for the award of distinction.

CORE COURSES: (4 CREDITS EACH)

Course Code	Title
STAT 6100	Applied Probability Theory
STAT 6110	Applied Statistical Inference
STAT 6120	Linear Statistical Methods
STAT 6130	Sampling Theory & Techniques
STAT 6140	Experimental Design and Analysis

SELECT 3 OF THE FOLLOWING ELECTIVE COURSES
(4 Credits)

Course Code	Title
STAT 6150	Stochastic Process & Applications
STAT 6160	Data Analysis
STAT 6170	Multivariate Analysis
STAT 6180	Advanced Topics in Statistics
STAT 6181	Computational Statistics I
STAT 6182	Computational Statistics II

MSc in Mathematics

OBJECTIVES
To impart a knowledge of Mathematics which would enable graduates to perform more effectively in the workplace and also enhance their research capability.

Programme Co-Ordinator: Dr. Donna Comissiong

Entry Requirements
To be admitted to the programme, a candidate should (normally) possess a BSc degree majoring in Mathematics or equivalent (minimum GPA 2.0) with at least Lower Second Class Honours. Candidates with lower qualifications may be considered but will be required to pass qualifying courses, as prescribed by the department. All candidates must have passed the following courses (or its equivalent):

Course Code	Title
MATH 2100	Abstract Algebra
MATH 2110	Linear Algebra
MATH 2120	Analysis & Mathematical Methods I
MATH 2160	Analysis & Mathematical Methods II

Duration of Study
The course of study will extend over one year of full-time study or two years of part-time study. Part-time students will normally be required to complete the degree within two years of registration; and must complete it within three years.

Examination
Students will be required to pass both the coursework and the written examination. The pass mark is 50%. The grading scheme for graduate degrees is as follows: A 70 - 100%; B+ 60-69%; B 50-59%. In the case of the Research Project, evaluation will be based on the project report.

Award of Degree
To qualify for the award of the degree, candidates must pass all three Core courses, five/six Elective courses and the Research Project. The degree shall be awarded in two categories - Distinction and Pass. For the award of the degree with distinction, the candidate must have obtained an average mark of 70% or more, across all Core courses and Elective courses as well as 70% or more in the Research Project.

A candidate failing a course shall be ineligible for the award of distinction.

Course of Study
The MSc programme consists of 3 core courses **and** 5/6 electives

EITHER
(i) 5 elective courses and an 8-credit Research Project. (**MATH 6000)**
OR
(ii) 6 elective courses and a 4-credit Research Project. (**MATH 6001**)

A Research Project must be chosen in collaboration with at least one Lecturer in Mathematics. An 8- credit project is equivalent to two courses. A 4- credit project is equivalent to one course.

CORE COURSES: (4 CREDITS EACH)

Course Code	Title
MATH 6100	Algebra (Group Theory and Applications)
MATH 6110	Real Analysis
MATH 6120	Differential Equations

ELECTIVE COURSES: (4 CREDITS EACH)

Course Code	Title
MATH 6130	Algebra (Group Actions)
MATH 6140	Advanced Mathematical Methods
MATH 6150	Viscous Flows
MATH 6160	An Introduction to Non-Newtonian Fluid Mechanics
MATH 6170	Advanced Discrete Mathematics (F-Polynomials of Graphs)
MATH 6180	Probability
MATH 6190	Numerical Analysis
MATH 6191	Asymptotic & Perturbation Analysis
MATH 6192	Advanced Mathematical Modeling
MATH 6193	Numerical Methods for Partial Differential Equations
MATH 6310	Complex Analysis
MATH 6620	Topology
MATH 6630	Functions Analysis
MATH 6640	Theory of Integration
MATH 6194	Discrete Mathematics
MATH 6195	Finite Element Analysis

DEPARTMENT OF PHYSICS

3rd Floor, Natural Sciences Building
Tel: (868) 662-2002 Exts. 82050, 82051
Fax: (868) 662-9904
Email: physics@sta.uwi.edu

STAFF LISTING

HEAD OF DEPARTMENT
Dr. Ricardo Clarke
Ext. 82050
E-mail: physics@sta.uwi.edu

ADMINISTRATIVE ASSISTANT
Mrs. Zuwena Williams-Paul (on leave during 2015/2016)
BSc, MSc (UWI)
Ext. 83846
Email: zuwena.williams-paul@sta.uwi.edu

ADMINISTRATIVE ASSISTANT
Ms. Lydia Doyle
BSc (UWI)
Ext. 83846
Email: lydia.doyle@sta.uwi.edu

MSC. RENEWABLE ENERGY TECHNOLOGY COORDINATOR
Haraksingh, Indra
BSc, Dip.Ed, PhD (UWI)
Lecturer, Environmental Physics
Ext. 83122, 82495
Email: indra.haraksingh@sta.uwi.edu

SECRETARY
Mrs Virginia Briggs
BSc (UWI)
Ext. 82593, 83113, 82051
Email: virginia.sadd-nagim@sta.uwi.edu

ACADEMIC STAFF

Andrews, Roger
BSc, PhD (Lond.)
Lecturer, Quantum Physics
Ext. 83114
Email: roger.andrews@sta.uwi.edu

Clarke, Ricardo
BSc, MPhil, PhD (UWI)
Lecturer, Environmental Physics
Ext. 83121
Email: ricardo.clarke@sta.uwi.edu

De Souza, Keith
BSc, MSc (UWI), PhD (Southhampton)
Lecturer, Electronics
Ext. 83103
Email: keith.desouza@sta.uwi.edu

Haque, Shirin
BSc, MPhil (Phyics), MPhil (Psychology), PhD (UWI)
Senior Lecturer, Astronomy
Ext. 83123
Email: shirin.haque@sta.uwi.edu

Haraksingh, Indra
BSc, (UWI), PhD(UWI) BSc, Dip.Ed, PhD (UWI)
Lecturer, Environmental Physics
Ext. 83122, 82495
Email: indra.haraksingh@sta.uwi.edu

Knight, Joscelyn
BSc (UWI), PhD (Camb.)
Senior Lecturer, Materials Science
Ext. 83125
Email: joscelyn.knight@sta.uwi.edu

Sekhon, Satpal
BSc (GNDU), MSc, PhD (Punjabi)
Professor, Physics
Ext. 82591
Email: satpal.sekhon@sta.uwi.edu

Sharma, Davinder Pal
BSc, MSc, PhD (GNDU)
Lecturer, Electronics
Ext. 83105
Email: davinder.sharma@sta.uwi.edu

Williams, Sybele
BSc, MPhil (UWI), MSc (Lough.) PhD (RWTH Aachen)
Lecturer, Bioengineering and Ergonomics
Ext. 83124
Email: sybele.williams@sta.uwi.edu

Zyuzikov, Nikolay
BSc, (MEPHI), MSc (QMUL), PhD (MRRC)
Lecturer, Medical Physics
Ext. 83113
Email: nikolay.zyuzikov@sta.uwi.edu

ABOUT THE DEPARTMENT OF PHYSICS

The Department of Physics at St. Augustine offers graduate programmes in all areas of research being pursued by academic staff as outlined below.

Entry Requirements

Candidates applying for admission are required to satisfy the relevant general regulations of the Faculty and the University's Board for Graduate Studies and Research.

The minimum qualification for admission to the MPhil programme is a BSc General Honours degree in Physics (minimum GPA 3.0) or its equivalent from an approved University.

RESEARCH INTERESTS AND FACILITIES

The current research in progress or research areas where activities are planned include:

(1) Fuel Cell and Lithium Battery Research

The Fuel Cell and Lithium Battery Research is carried out at Caribbean's First Fuel Cell Materials Research Lab (FCMRL) at Dept. of Physics and broad areas are as follows:

d. Development of Membranes for Fuel Cells:
The main area of research is to develop new and novel electrolyte membranes for applications in Polymer Electrolyte Membrane Fuel Cells (PEMFC) and Direct Methanol Fuel Cells (DMFC's). Various chemical and physical techniques are used to develop these membranes. The membranes developed are then evaluated using various characterization techniques and later tested in fuel cells. Research on materials for Solid Oxide Fuel Cells (SOFC's) will be started shortly.

e. Development of Catalysts for Fuel Cells:
New and novel catalysts are under process of development at FCMRL. The goal is to develop new non platinum based catalysts to work with the developed membranes. Research is also carried out on the nano tubular support for the catalysts and their testing in fuel cells.

f. Modelling of Fuel Cells:
Modelling is a very important aspect of fuel cell development and is done to evaluate various parameters related to fuel cell in order to use top to bottom approach in fuel cell development. Various models for different phenomenon are developed using various software's like Matlab etc.

g. Development of Dye sensitized Solar Cells:
Materials for application in Dye sensitized solar cells are also synthesized and dyes are made in collaboration with Chemistry Department. Solar cells will be synthesized and tested in future.

h. Development of Electrolytes for Lithium Batteries:
Non-aqueous polymer electrolytes in gel as well as film form are developed under this area of research for application in lithium batteries. Various techniques are used including acid-base approach, ternary system approach, polymer-in-salt approach etc. The materials developed are tested for their suitability in lithium batteries using different characterization techniques.

(2) Ceramics and Refractories

(a) Development of ceramics and refractories based on regional materials for a wide range of applications. Current research includes:
- Chemical and mineralogical characterisation of raw materials, compositional studies, synthesis, high-temperature solid-state reactions,
- Physical and mechanical testing, x-ray and electron microscopy. Analyses, micro-structure/property relationships.

(3) Medical Physics and Bioengineering

- Recordings of mass potentials as well as signals from neurons to determine the manner in which the brain interacts with its neural network functions. EEG studies.
- Blood flow studies for photoplethysmography
- Magnetocardiography using superconducting quantum interference device (SQUID).
- Objective assessment of the scoliotic spine.
- Anthropometrics and ergonomics.
- Assessment of human movement, fitness testing
- Radiation biology and Medicine
- Low doses and Non-Targeted effects of ionizing radiation

(4) Astronomy

(a) Theoretical Astronomy
The area of focus in theoretical astronomy is with statistical analyses on the large scale structure of the Universe as well as quasars.

(b) Observational Astronomy
Observational astronomy offers opportunities to study variable stars and other objects such as quasars and BL lac objects. This is done with the 16' L X 200 Meade Telescope equipped with CCD camera.

(c) Astrobiology
Mud volcanoes and the pitch lake are studied as analog sites for Mars and Titan respectively as conditions for extremophiles.

(5) Solar Energy Studies

The design, construction and testing of low and high temperature flat plate collectors for use with

(i) Solar crop dryers and
(ii) Solar air conditioners, refrigerators and solar powered heat engines,
(iii) Solar timber dryers.
(iv) Solar water decontamination methods for rural areas.
(v) Solar Distillation
(vi) Materials for Photovoltaics

This area of research may be done as a joint effort with other departments.

(6) Geothermal Energy Studies

- Geophysical surveys - Resistivity and Seismic
- Methods of identification of fractured reservoirs
- Geothermal Heat Pumps

(7) Earth Materials Studies

- Various aspects of Mineralogy and Petrology of Trinidad and Tobago, including resources of the continental shelf.

(8) Environmental Physics

- Environmental monitoring with respect to sound and aerosols in certain work environment.
- Implications of sea surface temperatures for the Caribbean region in environmental studies.
- Climate change studies/modeling.
- Air pollution modeling (with respect to the regional industries).
- Solar water decontamination methods for rural areas.
- Lava flow problems (in collaboration with the Department of Mathematics and Seismic Research Unit).
- Wind potential assessments for Trinidad and Tobago.
- Rain erosivity determination.

(9) Quantum Optics

Quantum physics and solar energy technologies and medical technologies.

(10) Fibre-Optics, Optoelectronics

Optoelectronics, fibre-optics and solar energy technologies and medical technologies.

(11) Electronics

- VLSI (Very Large Scale Integration) Implementation of Digital Signal Processing (DSP) Algorithms.
- Simulation and Design of Communication Systems.
- Design of Speech Recognition Systems.
- Design of Spectrum Analyzer
- Digital system Design using FPGA (Field Programmable Gate Array)

MSc in Renewable Energy Technology (RET)

This master's programme is the result of an urgent need for the Caribbean region to become equipped in terms of building capacity in technologies which will support protection of the environment and also meet the challenges of escalating price and availability of fossil fuels and their use. The emphasis in this master's programme is on providing new graduates and persons already working in various sectors of the economy, with professional training and education in renewable energy technologies. The programme will provide expertise in these areas which will help to build capacity in the region and open possibilities for further study and research.

Aims and Objectives

This programme is intended to meet the needs of a broad range of professionals whose occupations are related to science and energy, and sustainable development. Included will be natural scientists, engineers and technical-related professionals, as well as those from the social sciences such as administrators. This programme is an entirely new programme, consisting of new and existing courses.

Admissions Criteria

B.Sc. Science degree.
Students normally would be required to have an Upper Second Class Honours degree in Physics, Mathematics or Engineering. Other qualifying students with a first degree would be required to undergo the Preliminary Study. Students must complete and pass this not-for-credit preparatory course prior to the first semester.

Course of Study

All students must take 8 compulsory courses worth 24 credits, 4 elective courses worth 12 credits, and a 9-credit Final Research Project – for a total of 45 credits.

Programme Content

The courses for the programme are listed below, with the eight (8) compulsory courses. Students will also be required to complete four (4) courses from the list of six (6) Elective courses, as well as the 9-credit Research Project course. The Core and Elective courses, together with the Research Project, total 45 credits.

COURSE LISTING
CORE COMPULSORY (8 COURSES – 24 CREDITS)
SEMESTER I

Course Code	Course Title	Credits
RENT 6001	Energy Economics	3
RENT 6002	Shaping Sustainable Energy Systems	3
RENT 6004	Solar Energy Conversion	3
RENT 6005	Wind Energy I	3
RENT 6006	Bioenergy I	3
RENT 6007	Energy Use and Energy Auditing	3

SEMESTER II

Course Code	Course Title	Credits
RENT 6003	Programme and Project Management	3
RENT 6008	Electrical Integration of Renewables	3

ELECTIVES (4 COURSES – 12 CREDITS)
SEMESTER II

Course Code	Course Title	Credits
RENT 6009	Hydro and Marine Power	3
RENT 6010	Geothermal Energy	3
RENT 6011	Energy Storage	3
RENT 6012	Advanced Solar Energy	3
RENT 6013	Wind Energy II	3
RENT 6014	Bioenergy II	3
RENT 6000	Research Project	9

Three months work + Presentation and Report

MSc in Biomedical Physics

(with specialization in either Medical Physics or Movement Science & Rehabilitation)

Biomedical Physics is an applied branch of Physics concerned with the application of concepts and methods in Physics to the solution of problems in Biology and Medicine. This master's degree is a unique interdisciplinary program which was developed in recognition of the blurring of boundaries between the physical sciences which has led to explosive advancements in diagnostic processes, medical devices and technologies as well as improvements in available treatment modalities. It is an excellent opportunity for students to enhance their education in Physics, Biology, Electronics and Bioengineering while developing their analytical and problem-solving skills. The wide spectrum of knowledge required of the Biomedical Physicist makes this profession both challenging and rewarding as they improve their understanding of the study of the human body and attempt to solve current medical problems.

Aims and Objectives

This programme is intended to specially train and augment the education of qualified natural scientists and engineers so as to ensure that (i) graduating students have sufficient competence in either of two specializations in the field of Biomedical Physics in order to start a career or continue in research and development, and (ii) the requirements of international professional societies are incorporated to a sufficient level so as to prepare graduates interested in obtaining accreditation.

Entry Requirements

Students will request entry into a specific specialization, either Medical Physics or Movement Science & Rehabilitation, of the Biomedical Physics programme. Admission requirements for this programme are as follows:

- First degree from a recognized University in Physics and Applied Physics, Biomedical / Mechanical / Electrical Engineering with a minimum of lower second class honours (Weighted GPA: 2.50 – 2.99). Another option would be a B.Sc. in Biomedical Technology in addition to a qualifying year during which requisite courses in Pure Physics at the undergraduate level would be completed including Vibrations, Waves and Optics (3 credits), Electromagnetism (3 credits) and Advanced Thermodynamics and Solid State Physics (3 credits).
- Persons without adequate coverage of these areas may be required to pursue and pass (at least 50% final marks) appropriate qualifying courses before admission into the M.Sc. or diploma programme;
- Candidates not meeting the grade or GPA requirements but who have sufficient work experience in a relevant area may also be admitted under special circumstances. As part of the selection process, the department reserves the right to interview applicants for further exploration of their qualifications, experience and interest. They may be further required to complete minimum pre-requisite courses based on their needs as directed by the Programme Coordinator or Department Head.

Course of Study

The program consists of a common core and 2 possible areas of specialization or streams: Medical Physics, and Movement Science & Rehabilitation. Students are required to complete 18 credits of core courses, 21 credits of elective courses, and a research project assigned 8 credits as outlined below. This results in a total of 47 program credits.

Each theoretical 3 credit course consists of 24 hours of lectures and 12 hours of tutorials. Field trips and/or laboratory work are allocated to the laboratory courses which are also weighted as 3 credits.

Full-time students will complete the program in four (4) semesters. Part-time study may be possible, and will be considered on an individual basis.

The full-time program will normally consist of three (3) semesters (inclusive of summer) of coursework and examinations followed by the research project performed during Semester I of the second academic year.
The part-time program would however involve six (6) semesters of coursework and examinations followed by the research project performed over a period of two (2) semesters. This will gives a total of 8 semesters.

Duration

Students enrolled in the MSc programme will be required to complete the degree in 16 months (full-time).

Modes of Delivery

A variety of delivery methods will be employed, which include face-to-face sessions, virtual seminars, tutorials, and field visits. In addition to timetabled lectures and laboratory sessions during weekday evenings, sessions may also be conducted on weekends and holidays in order to synchronise with lecturer availability. The delivery methods may be supported by distance learning and e-based course assignments as well as case studies and assignments in which group work and student centred learning approaches are fostered.
The programme will be delivered by international, regional and local lecturers.

Programme Content

The list below shows the programme's six [6] core modules, the seven [7] Elective courses in each area of specialization as well as the 8-credit Research Project course. The Core and Elective courses, together with the Research Project, total 47 credits.

CORE MODULES
(18 credits)
Physics
Physics of the Human Body (3 cr.)

Biomedicine
Human Anatomy & Physiology (3 cr.)
Analytical Tools
Biomedical Statistics and Informatics: MDPH 6150 (2 cr.)
Numerical Methods for Biomedical Applications (3 cr.)
Workplace: Safety and Protection (3 cr.)

Complementary Courses
Research Methods for Health Science: MEDC 6924 (4 cr.)

ELECTIVES
Two (2) Areas of Specialization – **choose one**
(21 credits each)

Medical Physics
Radiation Physics & Dosimetry I (3 cr.)
Radiation Biology (3 cr.)
Radiation Oncology (3 cr.)
Biomedical Imaging (3 cr.)
Nuclear and Atomic Physics (3 cr.)
Medical Physics Laboratory Course I (3 cr.)
Medical Physics Laboratory Course II (3 cr.)

Movement Science & Rehabilitation
Orthopaedic Biomechanics (3 cr.)
Human Motor Control (3 cr.)
Analysis of Human Movement (3 cr.)
Implant Materials & Technology (3 cr.)
Rehabilitation and Assistive Technologies (3 cr.)
Movement Analysis & Rehabilitation - Lab Course I (3 cr.)
Movement Analysis & Rehabilitation - Lab Course II (3 cr.)

RESEARCH PROJECT
Research Project (8 cr. – Submission December)

COURSE LISTING AND PROGRESSION
The curriculum for the Master's program consists of core courses supplemented by elective courses that provide greater depth in a specific area of interest. Assessment will consist of in-course assessments, practical / laboratories, written comprehensive exams and a Master's thesis, or an extended research paper.

Year 1 - Semester I
(9 Core Credits + 6 Elective Credits = 15 Credits)

Course Title	**Credits**
Physics of the Human Body	3
Human Anatomy & Physiology	3
Numerical Methods for Biomedical Applications	3
Necessary elective modules and credits based on specialization	
Medical Physics:	
Nuclear and Atomic Physics	3
Radiation Biology	3
Movement Science & Rehabilitation:	
Orthopaedic Biomechanics	3
Human Motor Control	3

Year 1 - Semester II
(4 Core Credits + 9 Elective Credits = 13 Credits)

Research Methodologies	4
Necessary elective modules and credits based on specialization	
Medical Physics:	
Radiation Oncology	3
Biomedical Imaging	3
Medical Physics Laboratory Course I	3
Movement Science & Rehabilitation:	
Analysis of Human Movement	3
Implant Materials & Technology	3
Movement Analysis & Rehab. Lab Course I	3

Year 1 – Summer
5 Core Credits + 6 Elective Credits = 11 Credits)

Biomedical Statistics and Informatics	2
Workplace: Safety and Protection	3
Necessary elective modules and credits based on specialization	
Medical Physics:	
Radiation Physics & Dosimetry I	3
Medical Physics Laboratory Course II	3
Movement Science & Rehabilitation:	
Rehabilitation and Assistive Technology	3
Movement Analysis & Rehab. Lab Course II	3

Year 2 - Semester I (8 Credits)

Research Project	8

[Duration: Start of semester (Aug.) - Dec.]
Focus: Experimental project work, Master's thesis submission, formal presentation.

COURSE DESCRIPTIONS (ONLINE ONLY)

MSc in Occupational and Environmental Safety and Health (OESH)

SEMESTER: 1
COURSE CODE: OESH 6000
COURSE TITLE: OESH AND PUBLIC POLICY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Understanding of the complex, dynamic and delicate relationship between business pursuits, public interests and public policy. For example, fundamentals of public policy-definition, goals and objectives of public policies (regulations, legislation). People, policy agenda, policy institutions, policy formulations, policy implementation and evaluation
ASSESSMENT

Coursework and in-course tests		50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 2
COURSE CODE: OESH 6010
COURSE TITLE: ADVANCED TOPICS IN OESH: MEASUREMENT METHODS AND VENTILATION
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Respiratory system; Dermal exposure; Threshold limit vales and permissible exposure limits; Instruments/equipment used in OESH, including outdoor indoor (air, dust), workplace (air, skin), source emission (both stationary and mobile sources) and noise pollution measuring techniques, in both real-time and with time-integration; Environmental and personal exposure measurements; Calibration, service and preventive maintenance; Survey preparations and performance; Field and Laboratory Analytical Methods practices; Laboratory accreditation; Certification of analysts (biological, chemical and physical measurements); General principles of ventilation, including principles of air flow, duct losses, acceleration of air and hood losses and exhaust systems; Dilution ventilation principles including dilution ventilation for; health, fire and explosion and mixtures; Exhaust Hoods-capture velocity, worker position effect and hood design factors; Air cleaning devices; Principles of exhaust system design; Acute heat disorders.
ASSESSMENT

Coursework	Personal and area sampling in the field, written reports:	50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 2
COURSE CODE: OESH 6030
COURSE TITLE: ADVANCED TOPICS IN OESH: OESH DISORDERS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Understanding of advanced concepts of occupational safety and hygiene. For example, Chemical hazards in industries; Hazardous substances in industries and their target organs; Respiratory disorders-pneumoconiosis; chronic obstructive pulmonary disease; Occupational Illness vs. Work-Related; HIV/Aids as a work place issue; ILO Code of Practice on HIV/Aids and the world of work; Policy and legislation for impacting HIV/Aids in the workplace; ILO Conventions (Health and Safety).
ASSESSMENT

Coursework	Written reports	50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 2
COURSE CODE: OESH 6040
COURSE TITLE: ADVANCED OESH MANAGEMENT SYSTEM
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Advanced exposure Assessment techniques, including Self Assessment of exposure; Exposure Assessment strategies and models, such as control banding; Delivery of occupational and environmental health services; Global warming and trans-boundary pollution transport; Hazardous waste management; Management of air quality and water resources; Basic land-use planning; Occupational and environmental audit systems; Disaster management.
ASSESSMENT

Coursework	Laboratory reports and in-course tests	50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 2
COURSE CODE: OESH 6050
COURSE TITLE: ADVANCED TOPICS IN OESH: ERGONOMICS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Advanced understanding of Ergonomics. For example, Work-Related Musculoskeletal Disorders; Evaluating Ergonomic Risk Factors; Application of Ergonomics to design of work space and tools; Office Ergonomics.
ASSESSMENT

Coursework	In course test and field work with written reports	50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 1
COURSE CODE: OESH 6100
COURSE TITLE: ADVANCED ENVIRONMENTAL HEALTH
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Advanced understanding of concepts and issues of environmental health. For example, Environmental toxicology and risk assessment; Population dynamics and geographical information systems; Environmental hazards; Indoor air quality; Ambient air quality; Soil pollution; Water pollution; Sanitation and wastewater treatment; Solid waste disposal and mining pollution; Environmental noise; Emissions control technologies for air; Environmental auditing and impact assessments; Environmental impact of tourism; National and regional guidelines, standards and regulations; International guidelines, standards and regulations;
ASSESSMENT

Coursework	Laboratory and field studies	50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 1
COURSE CODE: OESH 6200
COURSE TITLE: ADVANCED OCCUPATIONAL SAFETY AND HEALTH
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Develop a deep understanding of advanced concepts of occupational safety and hygiene. For example, OSH professionals and the resources available to assist them; contemporary methods of toxicology and risk assessment of workplace hazards; contemporary issues on chemical hazards in the workplace; measurement of chemical hazards in the workplace; measurement of physical hazards in the workplace; ergonomics; occupational epidemiology; national and regional guidelines, standards and regulations
International guidelines, standards and regulations
ASSESSMENT

Coursework	Laboratory	20%
	Field survey and report	30%
Final Examination	One 3 hour written paper	50%

SEMESTER: 1 and 2
COURSE CODE: OESH 6300
COURSE TITLE: SEMINAR
NUMBER OF CREDITS: 1
PREREQUISITE: NONE
COURSE DESCRIPTION: Students will attend seminars or technical presentation once a week and will be required to prepare and make presentations once per semester.

SEMESTER: 1
COURSE CODE: OESH 6600
COURSE TITLE: INDEPENDENT STUDY AND RESEARCH METHODS IN OESH
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: OESH area to be chosen in consultation with a supervisor; study must be on current issues and phenomena in OESH and is designed to prepare students for a productive research Project. Learning activities include: Critical and extensive literature review, use of library and electronic sources of information; Definition of a research question; Research goals and objectives, anticipated results of study and their significance; Research methodologies and ethics, including instrumentation where applicable; Results and their interpretation, discussion and conclusions; literature cited.
ASSESSMENT
Coursework Laboratory reports and in-course tests 50%
One research paper
50%

SEMESTER: 1
COURSE CODE: OESH 6700
COURSE TITLE: RESEARCH PROJECT
NUMBER OF CREDITS: 9
PREREQUISITE: OESH 6600 OR EQUIVALENT
COURSE DESCRIPTION: This course is designed to prepare students to carry out research which will be both relevant and beneficial to the health and safety industry. It involves an independent research project to be supervised by academic staff members/practitioners in the OESH field. Research topics are chosen in consultation with the supervisor, based on OESH issues and phenomena of current relevance. It is expected that the resulting findings would have a positive impact on the health and safety workplace environment in the country.

Chemistry Postgraduate Research Programme

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6160
COURSE TITLE: METAL-ORGANIC CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Transition metal coordination complexes and their structural motifs;Transition metal mediated organic transformations: Stotichiometric reagents; Catalysts; Carbon-hydrogen bond activation; Training in the use of the NMR Spectrometer: Running of ^{31} P, ^{1}H, ^{13}C and ^{19}F NMR spectra; NMR Spectroscopy in Inorganic Chemistry: Structure Determination of Organometallic Compounds (using NMR and other techniques); Elucidation of Fluxional processes using NMR.
ASSESSMENT METHODS:

Coursework	100%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6161
COURSE TITLE: PHYSICO-CHEMICAL PROPERTIES OF INORGANIC COMPLEXES
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Magnetochemistry of Inorganic complexes; the use and applications of nuclear magnetic resonance (NMR) spectroscopy in Inorganic Chemistry; the uses and applications of electronic spectroscopy in Inorganic Chemistry; the uses and applications of fluorescence spectroscopy.
ASSESSMENT

Coursework	100%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6260
COURSE TITLE: ADVANCED SPECTROSCOPY AND ORGANIC SYNTHESIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: NMR - understanding modern pulse NMR; Mass spectroscopy; IR and UV Spectroscopy; synthesis: retrosynthetic analysis and synthons; reagents for functional group protection and transformation; carbon-carbon bond forming reactions via electrophile/nucleophile (donor/acceptor) reactions, rearrangements, cycloadditions.
ASSESSMENT

Coursework		50%
Final Examination	One 3 hour written paper	50%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6460
COURSE TITLE: ADVANCED TOPICS IN ANALYTICAL CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Instrumental Techniques: Flow injection analysis - continuous FIA etc; Atomic Absorption Spectroscopy - Flame, Graphite Furnace etc.; Emission Spectroscopy-ICP, Optical; Gas Chromatography/Mass Spectroscopy; Chemometrics; Statistics: One-Way/Two-way ANVOA; MINITAB; T-test/F-test/Confidence Interval; Geographic Information Systems (GIS): Arch View; Modelling (GWLF); Enviromental Analytical Chemistry: Water/Wastewater Quality Management - Quality parameters and standards; Theory of Water/Wastewater treatment; unit operations and processes; Solid Waste Management; Forest and Soil Conservation; Environment Impact Assessment; Natural Resilience capacity of streams; Streeter and Phelphs model; Laboratory Management: Principles of Quality Assurance of chemical measurement; Guides for establishing a quality assurance programme for analytical chemistry laboratories.
ASSESSMENT

Course Work		15%
Final Examination	One 2 hour written paper	85%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6461
COURSE TITLE: ADVANCED TOPICS IN BIOANALYTICAL CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Protein Purification Methods: conventional methods, modern, affinity chromatography; Protein Separation and Quantitation: Electrophoresis, western blott, radial immunodiffusion; Antibodies: structure; purification and storage; labeling, immunoblotting; immunoassays; Enzyme Linded Immunoassay and Radioimmuno Assays Methods For Quantification of Biochemicals; Use of continuous flow systems incorporation bioreactors for the monitoring of analytes; Immobilization of biomolecules; Bioreactor designs; Biosensors; Controlled release of drugs: use of pH sensitive and temperature sensitive polymers, electroactive hydrogels and phospholipids and matrices for controlled release of drugs; release kinetics; Kinetics of Immobilized Enzyme Systems.
ASSESSMENT

Coursework		60%
Final Examination	One 3 hour written paper	40%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6560
COURSE TITLE: RESEARCH TECHNIQUES IN CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Chemical Information Sources and Information retrieval; Format and Style of a Report - ACS Style; Operation of basic chemical instrumentation (IR, UV, Polarimeter, NMR, GC and HPLC etc.); Selected Practical Techniques for the Chemistry; Computers in Chemistry - Chemical drawing and modelling package - spreadsheet package, word processing - basic computer literacy, operating in the Windows environment; (Statistical concepts and experiment design; Data treatment; Selected Practical Techniques: Inert atmosphere techniques, purification of solvents and reagents, Analysis of alkyl lithium and organomagnesium, vacuum distillation, cooling baths, crystallization techniques, chromatography: tic, column and HPLC, liq-iiq extraction, sublimation, special reaction techniques: liq Ammonia reactions, hydrogenation, ozonolysis etc.
ASSESSMENT

Coursework	100%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6561
COURSE TITLE: ADVANCED TOPICS IN ENVIRONMENTAL CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Introduction to the environment; energy and cycles of energy; matter and cycles of matter; human impact and pollution; analytical techniques in environmental chemistry
ASSESSMENT METHODS:

Coursework Essays, seminar presentations	40%
Written exam One 3-hour written paper	60%

SEMESTER: 1 and/or 2
COURSE CODE: CHEM 6562
COURSE TITLE: ADVANCED TOPICS IN POLYMER CHEMISTRY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Conducting Polymers, electroactive polymers, sol gel and hydrogels; Analytical application of conducting and electroactive and non-conducting polymers.
ASSESSMENT

Course Work	60%
Final Examination One 3 hour written paper	40%

MSc in Computer Science and Technology with Specializations in Mobile Computing and Cloud Technologies

SEMESTER: 2
COURSE CODE: COMP 6104
COURSE TITLE: ADVANCED COMPUTER NETWORKING
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE
This course covers various aspects of computer networking: Internet design principles, congestion/flow control, network topology, routing, network security, Web, wireless, online social networks, data centers and cloud computing. The objective of this course is to build upon the basic computer networking skills learned at the undergraduate level so that students can design and modify the underlying algorithms.
ASSESSMENT

Paper Review	20%
Term Project	30%
Final	50%

SEMESTER: 2
COURSE CODE: COMP 6300
COURSE TITLE: ADVANCED INTERNET TECHNOLOGIES
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE
This course covers the technologies, protocols and architectures of the Internet. A major focus of this course is the technology and the drive towards Service Oriented Architecture (SOA), web services and e-business. To achieve this, we will examine the extensible markup language (XML) and associated technologies as well as JSON and REST based technologies. This is followed by exploring the technology used in web services such as web services description language (WSDL), simple object access protocol (SOAP), universal description, discovery and integration (UDDI). With this background, we will look at the concept of semantic web as well as the technologies that are being used in it. Simultaneously, another aspect of the course will look at Java-script and AJAX (Asynchronous Java-script And XML) that are used to deliver modern web-based and mobile applications. In each segment, we will also discuss the business implications of each of the protocols and their effect on application design. The objective of this course is to provide students with the tools required to design and implement advanced web based information systems.
ASSESSMENT

Coursework	20%
Mid-Term	20%
Final	60%

SEMESTER: 1
COURSE CODE: COMP 6401
COURSE TITLE: ADVANCED ALGORITHMS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE
In this course we first review the topics covered at the undergraduate level (data structures, sorting algorithms, growth functions etc.). We then focus on performance evaluation of such algorithms, Network Flow algorithms, Graph Theory, Network Performance, Capacity Analysis, Optimization algorithms and Resource Allocation. This course introduces students to the more sophisticate algorithms being developed for today's technologies.
ASSESSMENT

Coursework	40%
Final Examination	60%

SEMESTER: 1
COURSE CODE: COMP 6501
COURSE TITLE: RESEARCH METHODS, ENTREPRENEURSHIP AND INTELLECTUAL PROPERTY
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course will introduce students to three non-technical but yet important topics, Research Methods (1 credit), Entrepreneurship (1 credit) and Intellectual Property (1 credit). The course will be taught by Faculty Members as well as invited Lecturers from industry. The objective is to provide students with the tools needed for starting a business as well as preparing them for work on their thesis.
ASSESSMENT METHODS:

Paper Reports	60%
Paper presentations	30%
Class Participation	10%

SEMESTER: 2
COURSE CODE: 6601
COURSE TITLE: DISTRIBUTED COMPUTER SYSTEMS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course explores the major issues that arise when designing and implementing distributed systems with a particular emphasis on how to deal with the shared state between separate processes within such a system. The material complements network-layer courses by building on the transport layer to provide higher level applications and services. The objective of this course is to provide the infrastructure needed for advanced information systems (database, wireless, web etc.).
ASSESSMENT

Homework	30%
Term Project	20%
Final	50%

SEMESTER: 2
COURSE CODE: COMP 6701
COURSE TITLE: E-COMMERCE AND M-COMMERCE SYSTEMS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course will introduce students to the underlying technologies required by electronic commerce infrastructures. Various authentication, encryption and access control methods will be taught. This will be a hands-on course in which students will be required to build various components of an e-commerce site.
ASSESSMENT

Project	60%
Final Examination	40%

SEMESTER: 2
COURSE CODE: COMP 6801
COURSE TITLE: NETWORK AND COMPUTER SECURITY
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course covers principles of computer systems and network security. We will discuss various attack techniques and how to defend against them. A major component of the course will be the project, which will focus on building reliable code, and understanding attacks. The objective of this course is to train students in the rapidly growing area of cyber-security.
ASSESSMENT METHODS:

Coursework	40%
Project	60%

SEMESTER: 2
COURSE CODE: COMP 6802
COURSE TITLE: DISTRIBUTED AND PARALLEL DATABASE SYSTEMS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course covers the principles and system organization of distributed and parallel databases. It focuses on issues of Database System Architectures, Database Design and Query Optimization in Distributed and Parallel Database Systems. Emphasis is placed on design, implementation and management of Enterprise Database Systems. The course explores several current Database technologies including Data Warehousing, XML Databases and Web-based integration as well as emerging issues such as Cloud Data Management.
ASSESSMENT

Paper Reviews	30%
Assignments	30%
Final	40%

SEMESTER: 1
COURSE CODE: COMP 6901
COURSE TITLE: SOFTWARE PROJECT ENGINEERING AND MANAGEMENT
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This course is designed to present students with an overview of advanced topics in Software Engineering. Students will be exposed to techniques that are gaining increasing attention in the industrial and research communities. Students will apply the software engineering techniques to homework assignments and mini-projects throughout the course. Students will also be exposed to Project Management techniques including proposals, monitoring and evaluation of large-scale software projects.
ASSESSMENT

Project	60%
Final Examination	40%

SEMESTER: 1
COURSE CODE: COMP 6905
COURSE TITLE: CLOUD TECHNOLOGIES
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
The course helps to understand the technologies and applications of cloud computing and its virtualization foundation used in servers, desktops, embedded devices and mobile devices. The objective is to train students for the growing area of cloud services.
ASSESSMENT

Assignments	60%
Project	40%

SEMESTER: 1
COURSE CODE: 6910
COURSE TITLE: WIRELESS NETWORKS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
This is a comprehensive course on wireless networks for graduate students. It surveys various wireless networking technologies and mechanisms with an emphasis on protocol design for efficient systems. Technologies covered range from personal area networks like Bluetooth to cellular wide area networks. We will cover, Bluetooth, WiFi, 3G, and 4G cellular in some detail, and also survey some other technologies like Sensor and Ad-Hoc Networks. Emphasis will be on protocol design aspects for various wireless environments and traffic types. The objective is to train those who seek employment in the cellular industry.
ASSESSMENT

Paper Review	20%
Term Project	20%
Final	60%

SEMESTER: 2
COURSE CODE: COMP 6915
COURSE TITLE: MOBILE APPLICATIONS
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE:
Today's applications are increasingly mobile. This course teaches students how to build mobile apps for Android and iOS, two of today's most popular platforms, and how to deploy them in the Android Marketplace and the App Store. Students learn how to write native apps for Android using Eclipse and the Android SDK, how to write native apps for iPhones, iPod touches, and iPads using Xcode and the iOS SDK, and how to write web apps for both platforms. This is course will be partially taught online. Students will follow the course online but UWI faculty will evaluate course projects. The objective of this course is to train students for the rapidly growing field of mobile app development.
ASSESSMENT

Project	100%

SEMESTER: 1
COURSE CODE: COMP 6920
COURSE TITLE: MOBILE COMPUTING
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE
As mobile phones are becoming ubiquitous computing devices, a huge number of applications are emerging. Shortly, mobile phones will become the main computing device we now use in their daily life. This graduate course covers the current trends in mobile computing systems. In particular, we will focus on the fundamental challenges of building mobile systems, as compared to traditional ones, mobile applications, enabling services and protocols, and future directions. This course covers the application layers of a mobile network environment whereas the Wireless Networks course covers the lower layers.
ASSESSMENT

Paper Review	20%
Term Project	30%
Final	50%

SEMESTER: 2
COURSE CODE 6925
COURSE TITLE: APPLIED OPERATIONS RESEARCH
CREDITS: 3
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONALE
The purpose of this course is to study the basic tools for quantitative methods for decision-making. The emphasis is on solution methods and strategies. The course introduces the student to a wide variety of tools used in the decision making process and demonstrates the application of these tools on real-world examples.
ASSESSMENT

Coursework	20%
Project	30%
Final Examination	50%

SEMESTER: 1 & 2
COURSE CODE: COMP 6950
COURSE TITLE: THESIS
CREDITS: 9
PRE-REQUISITES: NONE
COURSE DESCRIPTION & RATIONAL:
A research-oriented or a novel application oriented MSc thesis in an area under the student's specialization. The objective is to allow students to think independently and provide a unique contribution to their field.
ASSESSMENT

Term Project	100%

Biodiversity Conservation & Sustainable Development in the Caribbean

SEMESTER: 1
COURSE CODE: BIOL 5200/BIOL 6200
COURSE TITLE: CHARACTERISTICS OF BIODIVERSITY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will form part of the background information to the programme. It will include basic concepts of biodiversity from the molecular- to the ecosystem-scale. This will be placed in the context of the extinction crisis and international treaties such as the Convention on Biological Diversity that have been formulated to address this crisis. It will, in particular, highlight the importance of biodiversity in terms of ecosystem function, goods and services. The course will define biodiversity in terms of species richness and diversity indices and explore the cline in diversity across different latitudes. Within this concepts such as endemicity and keystone species will also be described. The molecular genetic component of the course will cover the concepts of molecular genetics, intra-specific variation, inter and intra-specific genetic diversity, processes of evolution and speciation. The course will then go on to describe the regional ecosystems including forest, savannah, riverine, wetland, mangrove and coastal-marine systems including coral reefs. Impacted ecosystems such as urban and agricultural landscapes will also be treated. In each case, these systems will be considered holistically in relation to their diversity, distribution, ecology and ecosystem function, including the goods and services they provide.
ASSESSMENT

Coursework	100%

SEMESTER: 2
COURSE CODE: BIOL 5201/BIOL 6201
COURSE TITLE: THREATS TO TROPICAL BIODIVERSITY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will examine the major threats to tropical biodiversity and ecosystems. It will highlight the major threats, as described in the CBD: habitat loss and degradation, over-exploitation, climate change, pollution and introduction of alien species. It will also examine the history of human intervention in tropical environments. In specific relation to loss of genetic diversity, issues including threats to genetic diversity, loss of populations, reductions in heterozygosity and their consequences, inbreeding depression and genetic bottlenecks will be considered. Using examples, and case studies, major threats will be considered in relation to the impacts being seen on some of the ecosystems described in BIOL6100. It will include a description of human altered terrestrial and coastal environments. Consideration will also be given to the issues of environmental stress including impacts of pollution and climate change on terrestrial and marine systems. Evidence for global warming, impacts on species and ecosystems and methods for the detection of climate change will be described.
ASSESSMENT
Coursework 100%

SEMESTER: 1
COURSE CODE: BIOL 5202/BIOL 6202
COURSE TITLE: ENVIRONMENTAL LAW AND MULTILATERAL ENVIRONMENTAL AGREEMENTS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will provide students with a background to the sources for existing environmental laws, and of the specific framework for regulation of the environment in the Caribbean region. It will examine the ways in which human behaviour with respect to the environment is regulated at the international level, with specific reference to key biodiversity-related MEAs. This will involve a brief review of the legal and institutional framework within which international law making on the environment takes place. The course will provide students with a basic understanding of the existing legal environmental regimes of selected Caribbean countries.
The course will then articulate this regional framework within its international context. The course will introduce students to some of the factors that surround and influence the negotiation and implementation of international environmental law. Key MEAs, including the Convention on Biological Diversity, the Biosafety Protocol, the UN Convention on Climate Change, Cartagena Convention, RAMSAR, CITES and Principle on Forests will be used as examples to illustrate the key issues. Students will also be introduced to key regional environmental agreements, including the Cartagena Convention, SPAW Protocol. Additionally, students will be introduced to key issues specific to biodiversity conservation including bio-piracy, liability and redress, access and benefits sharing, and existing legal models for management of cross-border resources including migratory species and cross-jurisdictional protected natural areas.
ASSESSMENT
Coursework 100%

SEMESTER: 3 (SUMMER)
COURSE CODE: BIOL 5203/BIOL 6203
COURSE TITLE: ENVIRONMENTAL ECONOMICS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: The course will begin by introducing basic economic principles and exploring the limits of human nature in dealing with environmental degradation. It will then consider environmental economics from several perspectives, examine various economic tools and discuss their limitations. Using examples, it will then apply these tools to everyday scenarios that illustrate the possibilities and limitations of economics in resolving environmental and natural resource issues.
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: BIOL 5204/BIOL 6204
COURSE TITLE: ENVIRONMENTAL IMPACT ASSESSMENT
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: The course provides a general overview of the variety of environmental assessment tools currently available and an introduction to Environmental Impact Assessment (EIA) including definition, goals, objectives and purpose of EIA, definition of key terms, history of Environmental Impact Assessment and the legislative, policy and institutional framework for EIA. It will describe the EIA process, with emphasis on biodiversity conservation and sustainable use; the development of the Terms of Reference (TOR) including screening, scoping and public participation; and the assessment of project impacts, including understanding the ecosystem, assessment of significant impacts of the project and impact management. It will then consider reporting Environmental Impact Statement (EIS) and Environmental Management Plans, review of the EIS, linked to the TOR; and follow up monitoring, auditing, adaptive management and enforcement. Special consideration will be given to public participation, EIA standards, EIA for island, and Strategic Environmental Assessments.
ASSESSMENT
Coursework 100%

SEMESTER: 1
COURSE CODE: BIOL 5205/BIOL 6205
COURSE TITLE: PRINCIPLES & PRACTICE OF GEOINFORMATICS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will provide an overview of the principles of geoinformatics including an introduction to geographic information systems, Global Positioning Systems and field survey techniques. Following an introduction to geoinformatics and definitions, the course will cover spatial data acquisition using GPS and field survey techniques, GIS data structures and capabilities. It will describe GIS and network analysis and spatial data analysis, and GIS functionality. Finally it will consider hardware and software systems and the design and implementation of GIS.
ASSESSMENT
Coursework 100%

SEMESTER: 1
COURSE CODE: BIOL 5206/BIOL 6206
COURSE TITLE: MANAGEMENT & ANALYSIS OF ENVIRONMENTAL DATA
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will provide practical training in data management and in statistical analysis of environmental data. Students will initially review fundamental univariate and bivariate statistical techniques, including basic parametric and non-parametric statistics. Students will then complete task sheets which, thereby, demonstrate an understanding of the application of appropriate tests to datasets. These sheets will be completed using R. The course will then progress to explore the use of multivariate statistical techniques to analyse detailed environmental datasets. Students will also be introduced to the use of Bayesian statistics, and biodiversity specific data analysis software including DISTANCE and Vortex.
ASSESSMENT
Coursework 100%

SEMESTER: 1
COURSE CODE: BIOL 5207/BIOL 6207
COURSE TITLE: SUSTAINABLE USE & DEVELOPMENT OF NATURAL RESOURCES
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course will address important tropical ecosystem based industries including forestry, wildlife, agriculture, fisheries, energy, the pharmaceutical industry and tourism. In order to be sustainable, these industries will have to adopt environmental activities as core to their business, rather than consider them as an externality. Topics covered in this course will include an analysis and determination of land capability and optimal land use. Social aspects of land use and land degradation, and participatory approaches in sustainable development, will be discussed. The need for the integration of soil and water conservation in farming systems, and integration of water needs in agriculture with industrial and potable supply requirements. Agro-ecosystems will be considered in relation to sustainable mono-cropping, multiple cropping and agro-forestry systems for tropical environments. Sustainable forestry and timber production will also be examined. Participants to the course will also be exposed to development and exploitation of biodiversity for renewable energy (bio-fuels) and carbon sequestration in the context of REDD+ and related discussions in the Climate Change arena. Finally, current issues of fishery management will be examined as countries try to achieve sustainability in tropical capture fisheries, including management of freshwater environments for fisheries production, the integration of aquaculture production systems into agricultural and water conservation practices.
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: BIOL 5208/BIOL 6208
COURSE TITLE: CONSERVATION & MANAGEMENT OF BIODIVERSITY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: The course will include development of priorities for species conservation, conservation of genes and genetic diversity, selection and design of protected areas, the application of island biogeography theory and SLOSS, population dynamics and population viability analysis to protected area design. Students will gain an understanding of the principles of protected area selection site management. The use of zoning schemes, particularly in relation to coastal zone management schemes will also be covered. The use of management plans will be discussed together with the assessment of management effectiveness. The course will also examine ex-situ conservation programmes and re-introductions of species as well as aspects of habitat restoration. The important role and participation of the public will also be considered with regard to the selection, design and management of protected areas as well as through the potential benefits of tourism and ecotourism.
ASSESSMENT
Coursework 100%

SEMESTER: 1
COURSE CODE: BIOL 5209/BIOL 6209
COURSE TITLE: POLLUTION & ECOTOXIOCOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course is designed to give students an understanding of the basic principles of pollution monitoring and ecotoxicology and how toxicants are distributed, taken up, assimilated and impact the environment.
The course will also distinguish between structural and functional endpoints and how these can highlight the potential impacts of industry on the natural environment. The course will also look are particular pollutants that are of concern to Trinidad, such as: pesticides, industrial effluents and heavy metals. Students will also be able to understand how environmental monitoring tools such as toxicology, environmental chemistry and ecology can be used together to understand the relationship between industry and ecology by using these tools to conduct Ecological Risk Assessments.
ASSESSMENT
Coursework 100%

SEMESTERS: 2
COURSE CODE: BIOL 5210/BIOL 6210
COURSE TITLE: FIELD PRACTICUM (SURINAME)
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course comprises the main practical portion of the programme. It will provide students with the opportunity to apply and test their understanding of concepts covered in the taught courses of the programme, as well as allow them to develop their practical skills techniques, provide a face to face setting for interaction with faculty and with other distance learners on the programme. The course will go over the appropriate collection and survey techniques for various biological taxonomic groups. Status surveys and other population ecological work will be covered. Socio-economic survey work will also be undertaken in the field. (Students are expected to fund their own expenses incurred during and for this field course).
ASSESSMENT
Coursework 100%

SEMESTERS: 3 (SUMMER)
COURSE CODE: BIOL 5210/BIOL 6210
COURSE TITLE: FIELD PRACTICUM (BELIZE)
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course comprises the main practical portion of the programme. It will provide students with the opportunity to apply and test their understanding of concepts covered in the taught courses of the programme, as well as allow them to develop their practical skills techniques, provide a face to face setting for interaction with faculty and with other distance learners on the programme. The course will go over the appropriate collection and survey techniques for various biological taxonomic groups. Status surveys and other population ecological work will be covered. Socio-economic survey work will also be undertaken in the field. (Students are expected to fund their own expenses incurred during and for this field course).
ASSESSMENT METHODS:
Coursework 100%

SEMESTER: 3 - 1
COURSE CODE: BIOL 6211
COURSE TITLE: RESEARCH PROJECT
NUMBER OF CREDITS: 12
PREREQUISITE: NONE
COURSE DESCRIPTION: The Research Project is a fundamental component of the M.Sc. programme and this is reflected, not only in the credit weighting, but by the fact that the M.Sc. runs for an extra 6 months so that the student may have the necessary time to complete the project to a high standard. Students will come to the Course Leader and/or University Focal Point during the first semester of the M.Sc. with potential ideas for their research project. A list of potential projects will be also be made available for those students who do not have a specific topic in mind. During the first two semesters, the student and Course Leader and/or University focal point will meet either face-to face or through a virtual platform (as determined by the Course Leader), at least twice, to further develop the research project idea, develop clear aims and objectives, and identify appropriate second supervisors. The research project may cover any feasible aspect of environmental management of tropical biodiversity. It may involve a pure research study toward a fundamental aspect of tropical biodiversity or address more applied issues in biodiversity conservation. It may involve field or laboratory based work or may be a desk study involving data analysis or interrogation of legal documents. It may support studies being undertaken by staff within UWI or the partner Universities of the MSc. Programme, or it may address an issue related to a student's employer. For students from outside of Trinidad, the project may be undertaken within Trinidad or in the student's home country. The project should, however, give the student a chance to further develop technical skills learnt during the field practicum and a more detailed understanding of some theoretical component of the course.
ASSESSMENT
Coursework 100%

SEMESTER: 3 (SUMMER)
COURSE CODE: BIOL 5212/6212
COURSE TITLE: TAXONOMY AND BIODIVERSITY INFORMATICS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course is a core course in the programme, providing an understanding of the description and classification of organisms which is fundamental for biodiversity conservation. It provides an overview of the status of taxonomy and various classification systems, as well as a summary of the speciation process, biogeography and the field of molecular systematics. Species are identified as the building block for taxonomic classification and species concepts are discussed in detail. During the course, students will learn of the role of natural history museums and herbaria together with their collections in conservation. Collection and preservation methods for various taxa are presented and their curation is discussed. Identification methods and tools, including taxonomic keys, are presented and used as part of the course. The course includes a bioinformatics component that focuses on the use of online databases, as well as those found at local institutions. These include biodiversity databases, molecular databases and natural history collection databases. By the end of the course, students learn to use various databases to derive biodiversity information. The use of database management software is also emphasized as a tool for the creation of new biodiversity databases.
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: BIOL 5213/6213
COURSE TITLE: ADVANCED GIS
NUMBER OF CREDITS: 3
PREREQUISITE: BIOL 5205/6205
COURSE DESCRIPTION: This course commences with a brief review of GIS fundamentals including its historical development, data sources, data structures, hardware and software environments. It will provide students with an advanced view of database development and management and image processing. Students will then review land cover preparation and develop an understanding of the range of available spatial statistical tools and sources for various types of spatial data. The students will then be introduced to Windows-based visual basic environments and spend some time developing their skills in developing GIS modules for these environments, as well as introduce them to the range of GIS platforms available for biodiversity problem-solving. The final third of the course will focus, through case studies, on the use of GIS to problem-solve in the fields of fisheries, threatened species management and climate change modelling. Students will then be presented with biodiversity problems which can be addressed through GIS, and asked to develop individual solutions for these GIS based problem sets.
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: BIOL 5214/6214
COURSE TITLE: ENVIRONMENTAL RESOURCES POLICY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This policy course provides an overview of the basic foundations for environmental resource policy, its evolution and the linkages with a wide scope of socio-economic and socio-ecological issues. It affords students the opportunity to understand the various concepts of environmentally and ecologically sustainable development processes emerging from social consciousness of environmental impacts on natural resources and their management. It provides a learning process for understanding the basic principles involved in setting environmental resource goals and articulating a vision for various environmental resource policies. Key natural resource issues are reviewed from the perspective of developing policy making processes using best practices. It provides students with a level of understanding of the relevant issues and techniques for scoping and developing environmental resource policies. Students are afforded the opportunity to prepare policy briefs for specific environmental and natural resource issues including a step-by-step policy making exercises and simulations of practical problems and issues involved in the policy making process. Overviews of carefully selected international environmental instruments and their nexus with natural resource management and environmental drivers facilitate an understanding of the globalization of environmental policy making. It provides opportunities for students to have basic understanding and appreciation for environmental resource governance models and how these impact policy.
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: BIOL 5215/6215
COURSE TITLE: SOCIO-ECOLOGY AND NATURAL RESOURCES MANAGEMENT
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Successful natural resources management requires the development of consensus of all stakeholders on the goals of such management and the activities to be undertaken to achieve such goals. The need for such a consensual approach is especially important in biodiversity management situations where indigenous, tribal and rural communities have traditionally used or hold rights to access and utilization of such resources. To enable the students to understand the context for these types of challenging resource management scenarios, the course begins by introducing current sociological thinking on the nature of, and relationships between, human values, beliefs, and attitudes to nature. It then reviews western scientific approaches to renewable resources management in the context of traditional economically driven resource production. The students will then review through case studies regional examples of natural resources use by rural, tribal indigenous peoples and compare and contrast the basis for these interactions with western, science-based natural resources management. Finally, the students will be introduced to the basic tools currently used by natural resource managers to assess impacts on management interventions on rural and indigenous peoples, and tools for integrating these communities in resource management decision making.
ASSESSMENT
Coursework 100%

Post Graduate Diploma, and Master of Science (MSc.) in Biotechnology

SEMESTER: 1
COURSE CODE: BIOT 6000 / 5000
COURSE TITLE: MOLECULAR BIOLOGY AND R-DNA TECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: Recombinant DNA technology is fundamental to molecular biotechnology and encompasses many scientific disciplines including molecular biology, microbiology, biochemistry, immunology, genetics, chemical engineering and cell biology. RDNA technology also generates a wide range of consumer products including crops, livestock, drugs, vaccines and diagnostic tools, and livestock. Topics covered under this course are, Gene Regulation, Recombinant DNA Technology, Gene synthesis, Sequencing, and Amplification of DNA, Manipulation of Gene Expression in Prokaryotes, Heterologous Protein Production in Eukaryotic cells, Directed Mutagenesis and Protein Engineering, Molecular Diagnostics, Therapeutic Agents, Large-Scale Production of Proteins from Recombinant Microorganisms, Transgenic Animals, Regulating use of Biotechnology. This course is a techniques-based course that seeks to provide students with the required knowledge which serves as a basis for experimental, applied and industrial biotechnology. The student, upon completion of this course, should acquire a comprehensive understanding and practical expertise in basic molecular biology and biotechnology techniques. This foundation is important for the understanding and practical experimentation of several more advanced techniques and their applications in many biology-related fields. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work and a final examination (50% for each component).
CONTACT HOURS:
- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:
Coursework 50 %
(Lab report:10%, Term paper & journal paper discussion: 20%, Two mid-sessional tests:20%)
Final Written Exam (three hour duration): 50 %

SEMESTER: 1
COURSE CODE: BIOT 6001 / 5001
COURSE TITLE: MICROBIAL AND ENVIRONMENTAL BIOTECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: This course examines current applications of microbial organisms for industrial and environmental applications. It also illustrates specific applications of biotechnology to solve environment related problems. The course provides a theoretical and working knowledge of the principles, techniques and current applications of microbial organisms for manufacturing components of food and consumer products, biologics and biomaterials using recombinant DNA and is organized following the steps in discovery and development of biologics. An introduction to microbial growth kinetics is included as well as discussions on generating products from genetically modified microorganisms. The second part of the course will introduce the applications of biotechnology to address important environmental issues. Applications: application of biotechnology to environmental quality evaluation, monitoring, remediation of contaminated environments and energy production, production of biofuels (biogas, bioethanol, biohydrogen), applications in the paper and plastic industry as well as in other industrial processes in order to promote processes minimizing environmental deterioration. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work and a final examination (50% for each component).
Upon successful completion of this course, students must be able to:
- illustrate the development of recombinant microorganisms for specific applications in science and industry.
- investigate the applications of recombinant and native microorganisms for synthesis and extraction of novel proteins and chemical compounds.
- evaluate the choice of techniques for experiments in Biotechnology.
- explain, illustrate and interpret the principles, mechanisms of bioremediation.
- evaluate the applicability of various tools in environmental biotechnology, their applicability and related developed technologies.

CONTACT HOURS:
- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:
Coursework 50 % (Lab report:10%, Term paper & journal paper discussion: 20%, Two mid-sessional tests:20%)
Final Written Exam (three hour duration): 50 %

SEMESTER: 2
COURSE CODE: BIOT 6002 / 5002
COURSE TITLE: ADVANCES IN PLANT GENETIC ENGINEERING AND PLANT BIOTECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology and R-DNA technology
COURSE DESCRIPTION: This course emphasizes the advancements that have taken place in plant transformation technologies and genetic engineering methodologies for introduction of beneficial traits into economically important plants. The topics include an advanced study of Plant cell and tissue culture; Molecular basis of plant organ differentiation; Micropropagation for virus elimination, Anther and microspore culture, dihaploid plants, in vitro fertilization, Embryo rescue and wide hybridization, Protoplast culture and fusion, Somaclonal variation- in vitro mutagenesis, in vitro germplasm, conservation; Production of secondary metabolites; Plant genetic transformation methods (direct and indirect); Molecular basis of transgenesis; Expression systems in plants; Transgene design- Promoters & Marker genes; Transcription factors in transgene expression; Molecular Markers; Analysis of transgenic plants; Plant genetic engineering for herbicide tolerance, Disease and pest resistance, Abiotic stress tolerance, Improving nutritional quality and yield; Biopharming; Plant based production of biofuels, bioplastics, industrial and therapeutic proteins. Limitations and environmental concerns and Marker free transgenic plants, avoidance of horizontal gene transfer; Recent developments in plant genetic engineering. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work and a final examination (50% for each component).

Upon successful completion of this course, students must be able to:

- analyse the importance of plant tissue culture and related techniques for specific applications in agriculture and industry.
- explain, illustrate and interpret the principle of transgenesis, design of components involved and mechanism of transgene integration and expression.
- assess the methods of plant transformation and discuss their mechanisms, advantages and limitations.
- justify the application of genetic engineering in the development of transgenic plants with novel traits.
- discuss the role of plant genetic engineering in addressing the current needs of the century, addressing global challenges in food production, energy, human health, industrial needs and environmental conservation.
- appraise the potential environmental concerns associated with transgenic crops and formulate solutions.
- summarize the current advances and emerging technologies in the field of plant biotechnology.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:

- Coursework 50 % (Lab report:10%, Term paper & journal paper discussion: 20%, Two mid-sessional tests: 20%)
- Final Written Exam (three hour duration): 50 %

SEMESTER: 1
COURSE CODE: BIOT 6003 / 5003
COURSE TITLE: MEDICAL AND VETERINARY BIOTECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: This course emphasizes the scientific developments that have taken place in the fields of medical and veterinary biotechnology. The information gathered from this course is essential to apply the biotechnology principles for specific actions towards human health care and animal production. The topics include, advanced study of Animal and human cell, tissue and organ culture and their medical applications; Genetic engineering of animal cells and their applications; Principles of tissue engineering; Stem cells and tissue engineering as research tools in drug discovery/screening and in regenerative medicine;Embryo Transfer in domestic animals and humans; Micromanipulation and *in- vitro* Fertilization; Animal cloning; Transgenic animals, transgenic animals in xenotransplantation; Organ transplantation; Risks and safety &biohazards.Fish Biotechnology. Sequencing human genomes; Physical mapping of human genome; Cloning of Human Disease Genes; Human Gene Therapy; Pharmaco-genetics; Nanobiotechnology in medicine; Applications of biotechnology towards human population growth. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussionsconducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- describe the techniques of animal and human cell culture, tissue engineering and other related technologies for specific applications in health, medicine and related industries.
- explain and illustrate the principle of animal cloning, development of transgenic animals and justify their importance in scientific research and human and veterinary medical research and technology.
- explain the advancements in human genomics and justify their relevance to human health and welfare.
- examine the relevance of biotechnology towards human welfare, population control and eugenics
- discuss the potential difficulties, risks and ethical concerns involved in biotechnological applications to humans and animals.
- summarize the current advancements and emerging technologies in medical and veterinary biotechnology.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:
Coursework 50 % (Lab report:10%, Term paper & journal paper discussion: 20%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 50 %

SEMESTER: 2
COURSE CODE: BIOT 6004 / 5004
COURSE TITLE: IMMUNOTECHNOLOGY, MOLECULAR THERAPIES AND DIAGNOSTICS
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology and R-DNA technology AND Medical and Veterinary Biotechnology
COURSE DESCRIPTION: This course emphasizes the scientific advancements that have taken place in the fields of immunotechnology and molecular therapies and their impacts in human medicine and health. The topics include, Natural immunity, acquired immunity; Monoclonal antibodies, genetics of immunoglobulins and antibody diversity, antigen presentation;*In vivo* regulation of immune responses, B and T cell activations, hypersensitivity, mucosal immunity;Introduction to transplantation immunology tolerance, tumor immunology and vaccines;Production of human monoclonal antibodies and their applications; T cell cloning;antibody phage display; Application of T cell cloning in vaccine development; Immunity to viruses, bacteria and parasites; Genetic control of immune response; Principles and strategy for developing vaccines;Application of molecular diagnostic techniques in disease identification;Current biotechnological developments in disease diagnosis. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussionsconducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- explain and illustrate the types of immunity and molecular and genetic basis of immunity.
- analyse the importance of immuno-regulation in relation to disease resistance.
- evaluate approaches for the immunological interventions for treatment of diseases.
- explain the advancements in disease diagnosis and pathogen detection.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:

- Coursework 60 % (Course work assignment:10%, Term paper: 10%, Lab report: 5%, Journal article discussion: 15%, Two mid-sessional tests: 20%
- Final Written Exam (three hour duration): 40 %

SEMESTER: 1
COURSE CODE: BIOT 6005 / 5005
COURSE TITLE: INDUSTRIAL BIOTECHNOLOGY AND BIOPROCESSING
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: This course investigates the application of biotechnology to industries including manufacturing of medicinal bioproducts, recombinant proteins, health products, biomaterials, enzymes and generation of alternative energy. The topics include Bioreactor design and operation, fermentation processes, Process optimization, Down-stream processing; Isolation and screening of industrially important microbes; Improvement of the strains; Effluent treatment processes; Recombinant Protein expression systems; development of products, ranging from pharmaceuticals, vitamins and amino acids; Enzyme catalysis and kinetics; Methods of protein modification; Peptide engineering; Metabolic engineering; Introduction to Nanobiotechnology; Nanomaterials and Nanobiomaterials; Characterization of Nanostructures, Nano Synthesis and Fabrication; Biofuels, Biomass conversion. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work and a final examination (50% for each component).

Upon successful completion of this course, students must be able to:

- investigate the status of biotechnology in industrial World.
- analyse the importance of industrial biotechnology to downstream processing.
- identify the novel biotechnological approaches to derive clean energy.
- explain the advancements that has taken place in protein engineering.
- summarize the developments in nanobiotechnology and their applications to human health and in the synthesis of novel industrial materials.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:

- Coursework 50 % (Lab report:5%, Term paper & journal paper discussion: 25%, Two mid-sessional tests: 20%)
- Final Written Exam (three hour duration): 50 %

SEMESTER: 2
COURSE CODE: BIOT 6006 / 5006
COURSE TITLE: BIOETHICS, BIOSAFETY AND INTELLECTUAL PROPERTY RIGHTS (IPR) IN BIOTECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: This course emphasizes the basic ethics to be considered and practiced in biotechnology research. Research ethical standards and procedures are considered as codes and guiding principles in biotechnology research. The study topics include Ethical concerns in biotechnology; Examination of integrity and misconduct in biotechnology research; Applications of Genetic engineering – safety and ethical considerations; Ethics in genetic testing and screening; Medical safety and biosafety of Biotechnology products; Environmental release of Genetically Modified Organisms (GMOs) on biodiversity and biosafety; Impact of GMOs on Agriculture and environment; GMO foods: ethics, benefits and risks, regulations and public acceptance, labelling; Legal implications and public concerns in human gene therapy; Bio-safety Regulations and IPR (Intellectual Property Rights) Requirement of a patentable invention; Rights/Protection and Remedies against infringement. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- analyse and compare the biosafety regulations and the policies of different countries including Trinidad and Tobago.
- explain the rules of manufacture, import and export of GMOs into or out of the country.
- summarize the existing regulations on in transgenic plants and associated research.
- assess the medical safety and biosafety of Biotechnology products to humans, animals and environment.
- describe the Intellectual Property Rights associated with scientific inventions in biotechnology.
- appraise the ethical, cultural, religious and sociological difficulties in accepting genetically modified products.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:
Coursework 60 % (Lab report:10%, Term paper: 15%, Journal article discussion: 15%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 40 %

SEMESTER: 1
COURSE CODE: BIOT 6007 / 5007
COURSE TITLE: BIOINFORMATICS
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular Biology/Principles of Molecular Biology or equivalent
COURSE DESCRIPTION: Bioinformatics course reveals the science of analyzing and deducing the structure and function of genes and proteins through computational methods and software and statistical tools. This is a fast developing field and therefore continuous updating and introduction new components are expected to take place frequently. This course covers, introduction to Bioinformatics-concepts; Biological databases including Protein and Gene Information Resources; DNA sequence analysis software tools, Pairwise alignment techniques, database searching, multiple sequence alignment, phylogenetics; ORFinder; Secondary structure prediction etc., Secondary database searching; Microarray data analyses; Structure prediction methods; Introduction to computational methods for protein structure prediction; Homology modeling, Computer aided drug design. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- explain and illustrate the various bioinformatic techniques for analyses of genes and proteins.
- select the right computational methods used for analyses to address problems in molecular biology and genomics.
- practice and apply various bioinformatic tools in biotechnology research and analysis.
- prepare students for more advanced bioinformatics courses involving method development.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Laboratory class: 5 hours fortnightly

ASSESSMENT:
Coursework 60 % (Coursework assignmentt:10%, Lab report and project: 20%, Journal paper discussion: 10%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 40 %

SEMESTER: 2
COURSE CODE: BIOT 6008 / 5008
COURSE TITLE: GENOMICS AND PROTEOMICS TECHNOLOGIES
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular biology and R-DNA technology or equivalent
COURSE DESCRIPTION: This course emphasizes the basic ethics to be considered and practiced in biotechnology research. Research ethical standards and procedures are considered as codes and guiding principles in biotechnology research. The study topics include Ethical concerns in biotechnology; Examination of integrity and misconduct in biotechnology research; Applications of Genetic engineering – safety and ethical considerations; Ethics in genetic testing and screening; Medical safety and biosafety of Biotechnology products; Environmental release of Genetically Modified Organisms (GMOs) on biodiversity and biosafety; Impact of GMOs on Agriculture and environment; GMO foods: ethics, benefits and risks, regulations and public acceptance, labelling; Legal implications and public concerns in human gene therapy; Bio-safety Regulations and IPR (Intellectual Property Rights) Requirement of a patentable invention; Rights/Protection and Remedies against infringement. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- investigate the advancements that has taken place in the post-genome era biology.
- explain various structural and functional genomic approaches used in contemporary research.
- describe a gene based on in-depth analysis of a genome.
- describe and practice the methods and to perform analysis of the genomics and proteomics data, and choose the relevant research tools.
- appraise the importance of genomics and proteomics and assess their applicability in multiple fields of science.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Group discussion and library: 5 hours fortnightly

ASSESSMENT:
Coursework 60 % (Coursework assignemnt:10%, Term paper: 15%, Journal article discussion: 15%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 40 %

SEMESTER: 2
COURSE CODE: BIOT 6010 / 5010
COURSE TITLE: PLANT BREEDING
NUMBER OF CREDITS: 3
PREREQUISITE: Advances in Plant Genetic engineering and Plant Biotechnology
COURSE DESCRIPTION: This course offers an introduction to principles of molecular biology methods and tools used for plant genetic improvement and conservation of biodiversity. The covered topics include review of basic molecular biology techniques and genomic approaches in plant breeding; molecular markers, Marker-assisted breeding (MAB), Linkage mapping, QTL analysis, Pedigree-based analysis; Management of agro-biodiversity; Targeted transgene expression, Targeted gene silencing and targeted mutagenesis for crop improvement; Current advancements in transgenesis in genetic improvement of plants; Molecular phylogeny; Horizontal gene transfer in nature and their risks; Genetic and evolutionary applications to problems of restoration and conservation of biodiversity and New approaches in conservation of biodiversity. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions (GD) conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- explain how the genomic approaches and molecular tools are used for plant breeding and crop improvement.
- assess the importance of molecular marker technology in contemporary plant breeding and explain their effects citing successful examples.
- formulate a conceptual marker assisted breeding programme for a major crop of the Caribbean and a most wanted trait.
- construct phylogenetic trees and conduct studies on Molecular phylogeny.
- apply genetic and molecular evolutionary principles for restoration and conservation of biodiversity.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Group discussion/Lab: 5 hours fortnightly

ASSESSMENT:
Coursework 60 % (Coursework assignemnt:10%, Term paper: 15%, Journal article discussion: 15%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 40 %

SEMESTER: 2
COURSE CODE: BIOT 6011 / 5011
COURSE TITLE: APPLIED BIOINFORMATICS
NUMBER OF CREDITS: 3
PREREQUISITE: Bioinformatics
COURSE DESCRIPTION: This advanced course aims to provide students with knowledge, critical understanding and practical experience of using computational methods and bioinformatic approaches to interpret output data and functional genomics, genomics, transcriptomic and proteomic technology platforms. The course coverage includes Genomic sequencing and mapping Techniques; Human Genome project; Sequence Databases; Biological Databases– Primary and Secondary; Genotype databases, molecular structure databases and genome databases; PERL and Bioinformatics: Basics of PERL; Hidden Markov Models; Modelling Protein sequence families; Protein Modeling and In silico Drug Design; Protein modeling and analysis; Modeling protein structures using High Throughput methods; Virtual Library design; Structural Mining: Protein Ligand work analysis; Study of drug-interactions, Docking; Intermediate and Advanced; Evolutionary analysis; Metabolomics, Working with Discovery Studio (Molecular Modeling). The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- apply data generated by different molecular techniques to appropriate bioinformatics analytical tools and interpret results.
- develop and apply bioinformatics approaches and skills to address research questions and problems of practical relevance.
- critically evaluate the approaches and technologies employed in functional genomics research.
- demonstratate operational procedures for the commonly used bioinformatics databases and bioinformatics software packages.
- set up and complete bioinformatics project by appropriate selection and utilization of bioinformatics tools.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Lab: 5 hours fortnightly

ASSESSMENT:
Coursework 60 % (Coursework assignemnt:10%, Lab project and report: 20%, Journal article discussion: 10%, Two mid-sessional tests: 20%)
Final Written Exam (three hour duration): 40 %

COURSE CODE: BIOT 6012 / 5012
COURSE TITLE: DIRECT READING AND SEMINAR
NUMBER OF CREDITS: 3
PREREQUISITE: N/A
COURSE DESCRIPTION: This advanced course aims to provide students with an opportunity to undertake directed reading on a selected topic of their interest or on a title/problem selected for further research (as M.Sc research project/M.Phil research project). The topics should be related to any of the courses listed in the post-graduate programme. The teaching and learning methods involve weekly tutorial/discussion with the assigned supervisor. Assessment involves 100% course work with submissions including, concept proposal, monthly reports, seminar presentation and final write up. Upon successful completion of this course, students must be able to:

- demonstrate an advanced level of reading on a given specific title in biotechnology. preparation and reporting
- critically analyze scientific information and literature, logically discuss and submit as a comprehensive document in a required size and structure.
- summarize and present on a topic relevant to a particular learned aspect of Biotechnology with clarity.
- demonstrate time management, scientific writing and oral presentation skills.

CONTACT HOURS:

- Tutorial/Discussion: 1 hours per week
- Lab: 5 hours fortnightly

ASSESSMENT:
Coursework 100% (Concept proposal: 20%, Monthly reports:20%, Seminar: 20%,
Submitted Paper/Write up: 40%

SEMESTER: 2
COURSE CODE: BIOT 6013 / 5013
COURSE TITLE: ENTREPRENEURSHIP IN BIOTECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: Molecular biology and R-DNA technology
COURSE DESCRIPTION: Successful biotechnology enterprise requires trained skilled professionals who are also knowledgeable with the complexities of biotechnology commercialization. This course builds a required basic foundation on biotechnology enterprise and entrepreneurship, providing a venue for learners to better understand the entire biotechnology enterprise and issues unique to the industry. The goal for this course is to give non-business students the tools necessary to be totally conversant in the financial and managerial aspects of science-based businesses particularly on biotechnology. The covered topics include Macro- and micro-economics of biotechnology businesses, Entrepreneurial models and skills in developing biotechnology industries from research to market, Market research, Proposal preparation for funding – financing biotechnology ideas, Team building and leadership, Production economics and management, Branding and marketing issues, Bioethics and analysis and approval and Intellectual Property and technology transfer. The teaching and learning methods include lectures/tutorials, group discussion, journal paper discussion and assignments/term papers. The teaching and learning methods involve lectures supplemented by laboratory sessions/virtual lab/group discussions conducted through blended learning modes. Assessment involves course work (60%) and a final examination (40%).

Upon successful completion of this course, students must be able to:

- formulate strategies for a viable biotechnology industry or enterprise.
- create financial and funding strategies for success under specific economic situations.
- demonstrate principles of human interrelationships to research, design and development activities.
- navigate through schematic steps in the development of a biotechnology derived product: from its inception as intellectual property, to scale-up, to the final product.
- investigate the marketing strategies specifically related to biotechnology products.
- analyse organizational problems arising from a legal and technology framework.
- explain the issues related to bioethics in the development of biotechnology products.
- compose a road map from an idea to a final product in biotechnology.

CONTACT HOURS:

- Lecture/tutorial: 2 hours per week
- Lab: 5 hours fortnightly

ASSESSMENT:

- Coursework 60 % (Project: 20%, Term Paper: 10%, Journal group discussion: 10%, Two mid-sessional tests: 20%
- Final Written Exam (three hour duration): 40%

SEMESTER: N/A
COURSE CODE: BIOT 6014
COURSE TITLE: RESEARCH PROJECT
NUMBER OF CREDITS: 12
PREREQUISITE: N/A
COURSE DESCRIPTION: The aim of the research project is to allow the student to synthesise and articulate several aspects of the taught programme within a single themed research topic. In addition, it will provide the opportunity for further detailed skills training in aspects of biotechnology, molecular diagnostics, molecular ecology etc., It will allow the student to pursue an individual study on a particular research topic or issue of interest to the student and will incorporate technical skills training specific to the individual student. As such, the research project will provide the opportunity to develop a specific set of practical and reporting skills that will be of use to the student in their future career. The teaching and learning methods involve weekly tutorial/discussions with the assigned supervisor. Assessment involves 100% course work with submissions including, concept proposal, monthly reports, seminar presentation and final write up.

Upon successful completion of this course, students must be able to:

- demonstrate an advanced knowledge and understanding of a specific practical problem or a technical aspect of biotechnology and recognize the underlying philosophies. preparation and reporting
- to analyze scientific information and literature critically on the specific topic.
- summarize and present on a topic relevant to a learned aspect of Biotechnology.
- choose and optimize appropriate research and experimental methodologies during study of the problem.
- demonstrate skills in time management, scientific writing and oral presentation.

COURSE CONTENT: The individual research project is required for the M.Sc. award. The project will be on a topic proposed by the student and agreed by the appropriate supervising faculty. The Research Project is a fundamental component of the M.Sc. programme and this is reflected, not only in the credit weighting, but by the fact that the M.Sc. runs for an extra 6 months (full-time) or 10 months (part-time) following completion of coursework so that the student may have the necessary time to complete the project at a high standard.
The project is an opportunity for the student to put into practice the concepts, tools and research methods learned during the programme, within a specific area of enquiry. The research project may cover any feasible aspect of Biotechnology. It may involve a pure research study toward any branch of biotechnology but limited to the available infrastructure and facility and time limits. Students are expected to consult with the Course Coordinator during the second semester with potential ideas for their research project. A list of potential projects will also be made available for those students who do not have a specific topic in mind at the beginning of the second semester. For students from outside of Trinidad, the project may be undertaken within Trinidad or in the student's home country. Each student will be assigned a supervisor from within the UWI and one external supervisor in case the research is done outside the campus. The outcome will be an extended research paper or report, as part of the degree requirements. The research project will be examined by two internal examiners and one external examiner.

The specifications for thesis structure were mentioned in the UWI-Sta. graduate studies website, http://sta.uwi.edu/admissions/postgrad/.

The submitted work has to be presented as a seminar (on 12th week) for a 45 min. duration followed by a 10 min discussion. The presentation and participation in discussion and time management will be assessed by the committee and audience.

CONTACT HOURS: Tutorial: 1 hour per week

ASSESSMENT: Coursework 100 %

- Research Concept proposal: 10%
- Monthly reports: 10%
- Research poster: 20%
- Research Presentation: 20%
- Research Paper/Thesis: 40%

Additional Courses tor the Programmes in Biotechnology

SEMESTER: 2
COURSE CODE: BIOL 6062
COURSE TITLE: BIOETHICS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: The course is designed to expose postgraduate students to a wide assay of topics from various disciplines. The field of bioethics is not dominated by a single discipline but rather it concerns cross disciplines, that is, they are both scientific and ethical. Hence this course provides the opportunity for sustained, cross-disciplinary work in the fields of biology, natural sciences, medicine, philosophy, sociology, demography and theology. It enables a student to pursue topics where life sciences and ethics converge. Some of the areas that postgraduates should have some working knowledge of and which shall be helpful while pursuing the course in bioethics include genetics, use of scientific technology, allocation of resources, philosophy of science, environmental studies and so on.
ASSESSMENT

Coursework	60%
Final Examination	40%

SEMESTER: 3 (SUMMER) I
COURSE CODE: BIOL 7063
COURSE TITLE: LIGHT MICROSCOPY & DIGITAL IMAGE PROCESSING
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: The course provides theoretical and practical background information, as well as hands-on experience, with a variety of advanced light microscopy and image processing techniques. Since individual supervision is provided during the integrated lecture and practical sessions, enrolment is limited to about six students whose research will benefit significantly from what the course has to offer. Students must consult with the lecturer prior to registering for BIOL7063
ASSESSMENT

Coursework	40%
Final Examination	60%

STATISTICS

SEMESTER: 1
COURSE CODE: STAT 6100
COURSE TITLE: APPLIED PROBABILITY THEORY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Foundations of Probability; Distributions of One and Several Discrete and Continuous Random Variables; Expectations, Moments, Moment Generating Functions and Characteristic Functions; Order Statistics; The Bivariate and Multivariate Normal Distributions; Sampling Distributions; Distributions of Quadratic Forms; Poisson Process; Markov Chains and Markov Processes; Convergence in Distribution and Convergence in Probability.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: STAT 6110
COURSE TITLE: APPLIED STATISTICAL INFERENCE
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Point and Interval Estimation; Maximum Likelihood Estimation; Hypothesis Testing; The Neyman-Pearson Theory; Likelihood Ratio Tests; The Elements of Bayesian Inference.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: 1
COURSE CODE: STAT 6120
COURSE TITLE: LINEAR STATISTICAL METHODS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Generalized Inverses of Matrices; Distribution of Linear and Quadratic Forms; Regression of Full Rank Models; Models of Less than Full Rank; Estimation and Tests of Hypotheses for Full Rank and Non-full Rank Models; Reduction of Sum of Squares; ANOVA for Balanced and Unbalanced Designs Components of Variance Models.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: ***NOT OFFERED IN 2015/2016***
COURSE CODE: STAT 6130
COURSE TITLE: SAMPLING THEORY AND TECHNIQUES
NUMBER OF CREDITS: 4
COURSE DESCRIPTION: Theory of Equal and Unequal Probability Sampling; Selected Topics from Simple Random Sampling, Stratified Sampling, Systematic Sampling and PPS Sampling; Ratio and Regression Estimation; Two-stage and k-stage Sub-sampling Procedures; Double Sampling Procedure; Repetitive Surveys; Non-sampling Errors.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: 2
COURSE CODE: STAT 6140
COURSE TITLE: EXPERIMENTAL DESIGN AND ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Designs for Eliminating One-way, Two-way, Three-way and Multi-way Heterogeneity; Fixed, Mixed and Random Effects Models; Incomplete Block Designs; Factorial and Fractional Factorial Designs; Responses Surface Methods; Confounded Designs; Analysis of Covariance.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: 2
COURSE CODE: STAT 6150
COURSE TITLE: STOCHASTIC PROCESSES AND APPLICATIONS
NUMBER OF CREDITS: 4
PREREQUISITE(S): STAT 6100
COURSE DESCRIPTION: Markov Chains; Markov processes with discrete states in continuous time; Queueing Theory; Renewal Theory; Branching Processes, Epidemic Theory.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: STAT 6160
COURSE TITLE: DATA ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Topics selected from Trimmed Means and Winsorised Means; Transformations; Assessment of Normality; Detection of Outliers; Robust Methods; Monte Carlo Methods; Jackknife and Bootstrap Techniques; Regression Diagnostics; Censored Data Analysis; Graphical Methods of Data Analysis; Use of Statistical Software; Generalised Linear Models and Categorical Data Analysis.
ASSESSMENT

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: 1
COURSE CODE: STAT 6170
COURSE TITLE: MULTIVARIATE ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Multivariate Distributions; Normal, Wishart, T and Others with Applications; Regression Correlation and General Linear Hypothesis in the Multivariate setting; MANOVA and MANOCOVA; Principal Component Analysis; Factor Analysis; Cluster Analysis; Multidimensional Scaling.
Assessment:

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: 2
COURSE CODE: STAT 6180
COURSE TITLE: ADVANCED TOPICS IN STATISTICS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: The Bootstrap; The E-M algorithm Markov Chain Monte Carlo Methods; Empirical Bayes Methods.
Assessment:

Coursework	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: STAT 6181
COURSE TITLE: COMPUTATIONAL STATISTICS I
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course is meant to cover the basics methods in computational statistics. Techniques such as bootstrap, jack-knife, MCMC with particular reference to both hierarchical Bayesian and Empirical Bayes will be covered. The theoretical underpinnings of the course will be covered in conjunction with relevant computational aspects. The course will be hands on and practical and will rely heavily on the statistical software R. Matlab will be utilized where there is a need for numerical computations. We will rely on both real data and simulated data for illustrating the main concepts in the course. Datasets from different subject areas will be utilized.The course is the first in a sequence of two computational statistics courses.
ASSESSMENT

Coursework	100%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: STAT 6182
COURSE TITLE: COMPUTATIONAL STATISTICS II
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course is meant to cover the techniques in statistics that are computational in nature that would not have ordinarily been covered by the other courses in the statistics masters program. The course covers topics such as spatial statistics, advanced Bayesian models and some data mining techniques. Both the theoretical underpinnings of the material and the application through computational aspects. The course will be hands on and practical and will rely heavily on the statistical software R. Matlab will be utilized where there is a need for numerical computations. We will rely on both real data and simulated data for illustrating the main concepts in the course. Datasets from different subject areas will be utilized.The course is the first in a sequence of two computational statistics courses. This course is presented to address these concerns.
ASSESSMENT

Coursework	100%

MATHEMATICS

SEMESTER: 2
COURSE CODE: MATH 6100
COURSE TITLE: ALGEBRA (GROUP THEORY AND APPLICATIONS)
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Group Theory; Commutators, Centralisers and Nomalisers; The Homomorphism Theorems; The Sylow Theorems; The Class Equation of a Group; Theory of p-groups; Solvable Groups; The Jordan-Holder Theorem; Simple Groups; Direct Product of Groups. Applications Groups and Symmetry; Group Actions on Sets; Stabilisers Symmetry Groups in Two Dimensions; Matrix Groups; Rotations of Regular Solids; Finite Rotation Groups in Three Dimensions; Polya-Burnside Theorem and applications;.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: 1
COURSE CODE: MATH 6110
COURSE TITLE: REAL ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Topological spaces [Neighbourhood system, topological subspaces]; Interior closure, Frontier [Including dense and perfect sets]; Compactness; Connectedness; Metric Spaces; Continuity and Homeomorphism; Lesbegue Integral
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: 1
COURSE CODE: MATH 6120
COURSE TITLE: DIFFERENTIAL EQUATIONS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Existence and uniqueness of solutions. Linear Systems. Stability of linear and weakly non-linear systems. Second-order Differential equations. The boundary value problem.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6130
COURSE TITLE: ALGEBRA (GROUP ACTIONS)
NUMBER OF CREDITS: 4
PREREQUISITE: MATH3430 or MATH6100
COURSE DESCRIPTION: Introduction to Finite Group Theory; Groups and Homomorphism; Group Actions on Sets; Groups of Even orders; Finite p-groups; Normal Series; Direct Products and the Structures of Finitely Generated Abelian Groups; Group Actions on Groups.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6140
COURSE TITLE: ADVANCED MATHEMATICAL METHODS NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: General Theory of Eigenvalues and Eigenfunctions, The Minimum Problem, Sequences of Eigenvalues and Eigenfunctions, Variational Properties, Eigenfunction Expansions, The Rayleigh-Ritz Approximation Method.

Green's Functions Inverses of Differential Operators, Examples of Green's Functions, The Neumann and Robin Functions, Source Functions for Parabolic Equations.

Cylindrical Eigenfunctions
Bessel Functions, Eigenfunctions for Finite Regions, The Fourier-Bessel Series, The Green's Function, Modified Bessell Functions.

Spherical Eigenfunctions
Legendre Functions, Eigenfunctions of the Spherical Surface, Eigenfunctions for the Solid Sphere.
Assessment:

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: 1
COURSE CODE: MATH 6150
COURSE TITLE: VISCOUS FLOWS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Equations of Viscous Flow Kinematics and Dynamics of Flow, Energy Considerations, Boundary Conditions, Dimensional Analysis, Reynolds Number.

Exact Solutions
Some Exact Solutions including Flow Generated by an Oscillating Plate, Helical Flow in an Annular Region, Hamell's Problem of Flow in a Wedged-Shape Region, Flow Generated by a Rotating Disc.

Axially Symmetric Rotary Flows
Flow between Parallel Discs, Flow between Coaxial Cones, Flow between Concentric Spheres - A Secondary Flow.

Flow Past a Sphere
Creeping Flow Past a Sphere, Ossen's Criticism, Matching Techniques.

Lubrication Theory
Physical Origin of Fluid-Film Lubrication, The Mathematical foundations of Lubrication Theory, Slider Bearing, Squeeze Films, Journal Bearings.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6160
COURSE TITLE: AN INTRODUCTION TO NON-NEWTONIAN FLUID MECHANICS
NUMBER OF CREDITS: 4
PREREQUISITE: MATH 6150
COURSE DESCRIPTION:
Principles of Continuum Mechanics
Basic Concepts, Material Derivative, Deformation Rates, Rivlin - Ericksen Tensors, Strain Tensors, Kinematics of Steady Shear Flows, Continuity Equation, Stress and Volume Force, Equations of Motion, Energy Equation.
Material Properties Occurring in Steady Shear Flows;
Flow Function, Normal Stress Functions.
Processes that are controlled by the Flow Function;
Rotational Viscometer, Pressure- Drag Flow in a Straight Channel, Radial Flow Between Two Parallel Planes, Pipe Flow, Helical Flow.
Effect of Normal Stress Differences
Cone-and Plate-Flow, Weissenberg Effect, Die-Swell, Axial Shear Flow.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6170
COURSE TITLE: ADVANCED DISCRETE MATHEMATICS (F-POLYNOMIALS OF GRAPHS)
NUMBER OF CREDITS: 4
PREREQUISITE: MATH 3290 and MATH 3400
COURSE DESCRIPTION: Review of Generating Functions and Solutions of Recurrence Relations using Generating Functions.
General F-polynomials of Graphs, Matching Polynomials, Circuit Polynomials, Tree Polynomials and Sub-graph Polynomials. Relationships with other Graph Polynomials.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6180
COURSE TITLE: PROBABILITY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Review of Distribution Theory; Poisson Process; Finite Markov Chains; Continuous time Markov Chains; Renewal Theory; Branching Process; Epidemic Theory.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: 2
COURSE CODE: MATH 6190
COURSE TITLE: NUMERICAL ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Review of Computer errors. Programming in MATLAB. Solution of non-linear equations.
Numerical Linear Algebra
LU and Cholesky factorizations. Pivoting. Norms and analysis of errors. Iterative methods. The matrix eigenvalue problem. The singular-value decomposition and pseudo-inverses.
Approximation of Functions
Polynomial interpolation. Hermite interpolation. Spline interpolation. Best approximation: Least squares and Chebyshev.
Trigonometric interpolation and the Fast Fourier Transform.
Numerical differentiation and integration
Gaussian and adaptive quadrature.
Numerical solution of ordinary differential equations
Existence and uniqueness of solutions. Runge-Kutta and multi-step methods. Local and global errors. Stability.
Boundary-value problems: Shooting methods. Finite-difference methods. Collocation.
Stiff equations.
Introduction to the numerical solution of partial differential equation
Elliptic, parabolic and hyperbolic partial differential equations.
ASSESSMENT

Coursework	25%
Final Examination: One 3 hour written paper	75%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6191
COURSE TITLE: ASYMPTOTIC & PERTURBATIONANALYSIS NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Introduction to asymptotic approximations; Regular and singular perturbation methods for ordinary and partial differential equations; Matched asymptotic expansions: Boundary layer theory, outer and inner solutions with matching principles, interior layers, corner layers; Introduction to Multiple Scales: Slowly varying coefficients, forced motion near resonance, Floquet theory, Wittaker's method; Boundary layers by multiple scales; Nonlinear oscillators; Bifurcation Theory: Hopf bifurcations, weakly non-linear analysis; Two-time and uniform expansions.
ASSESSMENT

Coursework	30%
Final Examination	70%
(Consisting of: One take home exam 35% and one 3 hour written paper 35%)	

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6192
COURSE TITLE: ADVANCED MATHEMATICAL MODELLING
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: Models from Newton's laws of motion: Planetary motion, energy conservation laws, resonance phenomena, surface area and minimal energy configurations; Lagrangian/Eulerian equations of motion: trajectories of particles, caustics; Linear stability analysis for oscillating systems, modelling of two-layer fluid systems, Rayleigh-Taylor instability; Heat flow problems: characteristic time of cooling, chemically reactive systems, convection-diffusion systems; Particle motion: Probability density functions, predicting particle positions, nearest neighbour interactions; Theory of Elasticity: Stress-strain relations, elastic and plastic deformation; Laws of interaction: Forces between charged particles, principle of superposition, electromagnetic forces, Faraday's law of magnetic induction; Interfaces and fronts: Modelling explosive systems with thin reaction zone kinetics - SHS, Frontal Polymerisation.
ASSESSMENT

Research Project (written report and oral presentation	40%
Final Examination: One 3 hour written paper	60%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6193
COURSE TITLE: NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
Computer literacy is expected. Prior knowledge of mathematical software packages such as MATLAB would be an asset.
COURSE DESCRIPTION: Preliminaries: classification of partial differential equations; Well-posedness; Spatial differences: central differences; Fourier analysis; Higher order difference approximations; One-sided differencing; Temporal errors: Concepts of stability and accuracy; analysis of dispersive and dissipative error; Mostly explicit difference schemes: Forward Euler in time, Central difference in space; Lax-Friedrichs; Leap-frog (2-2) and (2-4); Concept of artificial dissipation; Lax-Wendroff; MacCormack's scheme; Runge-Kutta time stepping; Systems of equations: Decoupling; disparate speeds; Implicit schemes: Backward Euler; Crank-Nicholson; compact 4_{th} order approximation for spatial derivatives; implicit schemes for systems; Semi-implicit schemes: Adams-Bashforth multi-step method; Parabolic equations and methods for their numerical solution; Numerical approximation of boundary conditions (for parabolic and hyperbolic equations): Extrapolating boundary conditions; one sided differences; linear systems; Two-dimensional problems: Operator splitting; Alternating directions implicit method; Anisotropic errors, 2-D boundary conditions.
ASSESSMENT

Coursework	40%
(4 Computer Lab Group Assignments)	
Final Examination: One 3 hour written paper	60%

SEMESTER: 2
COURSE CODE: MATH 6194
COURSE TITLE: DISCRETE MATHEMATICS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: In this course, the principles of basic Combinatorics, Graph Theory and Algebra will be developed to the more general setting of enumerative Combinatorics and Graph Theory. Students will be introduced to the notion of combinatorial identities via an exquisite blend of multinomial expansions, generating functions and recurrence relations. They will have the opportunity to utilize the Principle of Inclusion and Exclusion as well as their associated inversion formulas. More advanced properties and applications of counting numbers such as Stirling, Bell, Fibonacci and Catalan sequences will be discussed. Particular attention will be paid to the recurrence relations involved in counting systems. Generating functions will be utilized to solve the more significant graphical enumeration problems. Important results such as the enumeration of rooted and unrooted trees will be derived. A few important topics in Graph Theory that are not covered in the undergraduate course MATH 3400 (Graph Theory) will also be explored. Tutte's Theorem in planarity and the more recent developments by Thomassen leading to a proof of Kuratowski's Theorem will be incorporated. Fundamental ideas, such as the use of Kempe chains (used in proving the Four Colour Theorem) will also be introduced.
ASSESSMENT
Coursework: 40%
Final Examination: One 3-hour written paper 60%

SEMESTER: NOT OFFERED IN 2015/2016
COURSE CODE: MATH 6195
COURSE TITLE: FINITE ELEMENT ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: The main objective of this course is to clarify and explain the basic ideas on which finite element methods are founded. The focus throughout will be on the nature of the finite element method, how it works, why it makes sense, and how to use it to solve problems of interest.
Throughout the course, students will be required to develop and implement numerical algorithms. Special emphasis will be placed on the efficiency and accuracy of these methods for problem solving. As this course is a practical one, students will be evaluated by their performance in coursework assignments, computer lab exams and on a final research project.
Students taking this course must have a thorough understanding of undergraduate calculus and ordinary differential equations. A solid foundation in undergraduate matrix algebra will also be assumed. As students will be required to implement the algorithms on a computer, prior knowledge of elementary computer programming will be a definite asset, although this is not a prerequisite.
Algorithms will be presented during lectures in pseudo code format to facilitate the creation of well-structured programs in a variety of programming languages. The numerical software package Matlab will the chosen programming tool for in-course assignments. An introductory tutorial will be organized at the beginning of the course for students with no prior knowledge of Matlab.
ASSESSMENT
Coursework: 100%

SEMESTER: NOT OFFERED 2015/2016
COURSE CODE: MATH 6310
COURSE TITLE: COMPLEX ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COUSE DESCRIPTION: The course develops the properties of the complex number system, treated as a generalization of the real number system. We explore the parallel analysis that results, with a particular emphasis on differentiability, analyticity, contour integrals, Cauchy's theorem, Laurent series representation, and residue calculus.
Core topics include: complex numbers, analytic functions and their properties, derivatives, integrals, series representations, residues, and conformal mappings. Application of the calculus of residues and mapping techniques to the solution of common boundary value problems encountered in physics and engineering applications is a major part of the course.
Students are expected to have a strong background in advanced undergraduate calculus of real variables. An earlier or concurrent course in differential equations is an asset, but is not a prerequisite for this course.
ASSESSMENT
Coursework : 40%
(Two 15% Coursework examinations and
10% Assignments based on four assignments given during the semester)
Final Examination: One 3-hour written paper 60%

SEMESTER: NOT OFFERED 2015/2016
COURSE CODE: MATH 6620
COURSE TITLE: TOPOLOGY
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: This course serves as a broad introduction to the basic notions of General Topology, Metric spaces, Continuity and Homeomorphism, Compactness, connectedness and separation axioms. Students taking this course must therefore have a thorough understanding of undergraduate level real analysis.
ASSESSMENT
Coursework: 40%
(Two 15% Coursework examinations and
10% Assignments, based on four assignments given during the semester)
]Final Examination: One 3-hour written paper 60%

SEMESTER: NOT OFFERED 2015/2016
COURSE CODE: MATH 6630
COURSE TITLE: FUNCTIONAL ANALYSIS
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: This course aims at familiarizing the student with the basic concepts, principles and methods of functional analysis and its applications. The principles learnt from basic calculus and linear algebra will be developed further to the more general setting of abstract infinite-dimensional vector spaces. Students will therefore be expected to have a solid background in undergraduate calculus, real analysis, and liner algebra. Students will be introduced to the notion of vector spaces and the distance between vectors, as well as to continuous maps between such vector spaces. This interplay between the algebraic and analytic setting gives rise to many interesting and useful results, which have a wide range of applicability to diverse mathematical problems, such as from numerical analysis, differential and integral equations, optimization and approximation theory.
The first part of the course is devoted to a short introduction in the theory of metric spaces and to a detailed study of normed and Banach spaces and in particular to the analysis of linear operators acting upon them. The second part of the course deals with Hilbert spaces and linear operators upon them, since they play a fundamental role in applied mathematics. Finally, we look at some fundamental theorems for normed and Banach spaces such as the Hahn-Banach theorem for complex vector spaces and normed spaces and its application to bounded linear functionals; the uniform boundedness theorem, and the closed Graph theorem.
ASSESSMENT
Coursework: 40%
Two 15% Coursework examinations and
10% Assignments based on four assignments given during the semester
Final Examination: One 3-hour written paper 60%

SEMESTER: NOT OFFERED 2015/2016
COURSE CODE: MATH 6640
COURSE TITLE: THEORY OF INTEGRATION
NUMBER OF CREDITS: 4
PREREQUISITE: NONE
COURSE DESCRIPTION: In this course, we consider the limitations of the Riemann integral, and show that it is necessary to develop a precise mathematical notion of 'length' and 'area' in order to overcome these deficiencies. In so doing, we create a precise concept of measure, and use it to construct the more powerful Lebesgue integral. Finally we look at applications of measure and Lebesgue integration in modern probability theory.
Students will be expected to have a solid background in undergraduate calculus and real analysis.
ASSESSMENT
Coursework: 40%
Two 15% Coursework examinations and
10% Assignments based on four assignments given during the semester)
Final Examination: One 3-hour written paper 60%

PHYSICS

SEMESTER: 2 (NOT OFFERED IN 2014/2015)
COURSE CODE: PHYS 6294
COURSE TITLE: NOVEL MATERIALS
NUMBER OF CREDITS: 3
PREREQUISTE: BSc (Physics, Chemistry, Chemical Engineering and/or permission of HOD, Physics)
COURSE DESCRIPTION: Superconductivity phenomenon, magnetic properties of superconductors, theories of high T_C tsuperconductors, preparation techniques and composition features, applications of high T_C superconductors.

Fundamentals of nanotechnology, Nanotechnology in materials, ceramic nanomaterials, metal nanomaterials, polymeric nanomaterials, composite nanomaterials, synthesis of nanomaterials, nanotechnology in biomaterials, soft biomaterials, nanotubes, nanowires, applications of nanomaterials

Geometry of Nanoscale Carbon; Bonding, Dimensionality, Topology, Energetics, Fullerenes; Single and double walled Carbon Nanotubes, Synthesis of Single Wall Carbon Nanotubes; Diameter and Orientation Control and growth mechanisms, Selective Covalent Chemistry, applications of carbon nanotubes

Piezoelectric, Shape memory alloys and shape memory polymers, Magnetic shape memory alloys, pH-sensitive polymers, Temperature-responsive polymers, Halochromic materials, Chromogenic systems, Non-Newtonian fluid, applications of smart materials.
ASSESSMENT
Coursework: 30%
Research Project: 70%

SEMESTER: 2
COURSE CODE: PHYS 6492
COURSE TITLE: DIGITAL SYSTEM DESIGN
NUMBER OF CREDITS: 3
PREREQUISTE: BSc Physics with Minors in Electronics/Medical Physics and Bioengineering, BSc in Electrical and Computer Engineering, BSc in Computer Science / Math with PHYS2291 / PHYS3391 or permission of Head of Department.
COURSE DESCRIPTION: Various implementation technologies for digital systems and their comparison. Introduction to computer-aided design (CAD) tools for digital systems. Hardware description languages (HDLs). Custom and Semi-custom design flow. Xilinx's ISE Design Suite. Mentor Graphic's Design, Test and Verification Package, Matlab.

VHDL: Data objects. Classes and data types. Operators. Overloading. Entity and architecture declaration. Introduction to behavioral, dataflow and structural models. VHDL Statements: concurrent, sequential, assignment, process, conditional and case statements. Array and loops. Packages & libraries. Delays.

VHDL modeling and simulation of basic and advance combinational & sequential circuits. Design of Microcomputer: Basic components of a Microcomputer, Specifications, Architecture of a simple Microcomputer system, Design of a simple Microcomputer system using VHDL. Synthesis and optimization for cost, speed, power and chip recourse utilization tradeoffs.

Programmable logic devices: PROM (Programmable Read Only Memory), PAL (Programmable Array Logic), PLA (Programmable Logic Array), CPLD (Complex Programmable Logic Device) and FPGA (Field Programmable Gate Array). Xilinx's FPGA Design Flow. Digital system implementations using CPLDs and FPGAs. FPGA based implementation of various digital signal processing algorithms.
ASSESSMENT
Theory Coursework 30%
Four Laboratory reports (equal weighting) 20%
One Major Design Project 50%

SEMESTER: 2
COURSE CODE: PHYS 6295
COURSE TITLE: SOLAR ENERGY CONVERSION
NUMBER OF CREDIT: 3
PREREQUISITES: BSC PHYSICS OR PERMISSION FROM HEAD OF DEPARTMENT.
RENEWABLE ENERGY
Solar Energy; Photovoltaics; Wind Energy; Hydroelectricity; Geothermal Energy; Ocean Thermal Energy Conversion; Wave Energy; Hydrogen; Fuel Cells; Biomass.
SOLAR ENERGY
Solar energy utilization; Solar radiation – Basic concepts, Geometric effects, Atmospheric effects, Solar spectrum, Solar insolation, Air mass; Solar; spectra, Spectral Energy distribution, Planck's formula, Spectral distribution of the solar constant, Wien's law, Stefan Boltzmann law; Flat plate collectors, selective surfaces; Design, construction and operating principles of a solar collector; Optical characteristics - Optics of collectors, Fresnel equations, Overall transmittance and reflectance for two polarization states, multiple glazings; Heat transfer across building walls; Heat transfer; characteristics; Efficiency of glazing/absorber system; Angular dependence of Solar Absorptance; Transmittance-Absorptance product; Radiation; exchange between surfaces; Mathematical analysis of a solar collector as applied to a selected unit; Concentrating Solar Power (CSP); Solar Cooling
PHOTOVOLTAICS (PV)
Photoelectric effect; Semi-conductor Physics; Materials used for PV cells; Photovoltaic cell, module, array; PV characteristics, characteristic curves; Factors influencing performance of PV cells; PV energy systems: components–generator, charge controller, battery and inverter; PV design, including Electrical and Mechanical design; Categories of PV modules: Cell types, Encapsulation materials, Substrate and Frame structure; Thin Films; Quantum Dot Nanotechnology; PV Grid connection; Modeling techniques: RETScreen Analysis; Economic analysis and applications; Socio-economic impacts of renewable energy education, dissemination and applications.
ASSESSMENT
35 Hours of practical work, including Project. (Students must pass practical coursework).
Theory Coursework: 15%
Practical Coursework: 35%
(Practical experiments & Field Trip: 15%
Research Project 20%)
Final Examination: One 2 hour final paper 50%

Renewable Energy Technology

SEMESTER: 1
COURSE CODE: RENT 6001
COURSE TITLE: ENERGY ECONOMICS
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Students will receive basic insights into the field of energy economics. They will learn about the different markets supplying energy and the different sectors demanding energy. An understanding of the limitations of non-renewable energy sources and the problems of their substitution by renewable energy sources will be gained. The special aspects of grid based energy markets will be discussed. At the end of the course each student should be able to understand the basic concepts of the different energy markets and the possible contributions of the different energy sources to a sustainable energy supply.
ASSESSMENT

Coursework	50%
Final Exam	50%

SEMESTER: 1
COURSE CODE: RENT 6002
COURSE TITLE: SHAPING SUSTAINABLE ENERGY SYSTEMS
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Sustainable Development is the framework within which RenewableEnergy Management must be placed. The long-term goal of the MSc Renewable Energy Technology is to equip participants with the technical expertise so they can implement projects which promote self-sufficiency and sustainable development of the region.

In this course, students will learn to differentiate between the competing models of sustainable development and to identify the major requirements and barriers to sustainable development of the energy system.
ASSESSMENT

Coursework	50%
Final Exam	50%

SEMESTER: 2
COURSE CODE: RENT 6003
COURSE TITLE: PROGRAMME AND PROJECT MANAGEMENT
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: The course is aligned to International Standards with the concepts and terminology as prescribed by Project Management Institute (PMI) Guide to Project Management Body of Knowledge (PMBOK) Guide. It covers the five essential project management process groups of initiating, planning, executing, controlling and closing projects. Participants will gain an understanding of the tools and techniques that can be applied to each phase of a project.

In both public and private sectors, there is an increased focus on managing projects to achieve a product/service of requisite quality, and to deliver that product/service within the approved budget and schedule. This course will provide a broad overview of the concepts and practices used managing projects in today's business environment.
ASSESSMENT

Coursework	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE: RENT 6005
COURSE TITLE: WIND ENERGY I
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course explores the fundamental aspects of the wind resource, wind turbine aerodynamics and control, along with institutional and environmental aspects (including planning issues). An integral part of the course is a computer-based laboratory to provide hands-on experience in the design and optimisation of a wind farm. This course will also include a field trip to wind turbine site to allow the student to appreciate wind power in the real world.

Development of indigenous, renewable energy resources is critical in the drive to reduce energy cost and achieve energy security in the region. Wind power plays an important role in this movement since the wind resource in many parts of the Caribbean is favourable for wind energy development. Whether large, medium or small-scale, wind power is set to play a major part in the future energy mix of the Caribbean. Wind power technology is an interdisciplinary subject which must complement the other electricity generation methods.
ASSESSMENT

Coursework	50%
Final Exam	50%

SEMESTER: 1
COURSE CODE: RENT 6006
COURSE TITLE: BIOENERGY I
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Humans have used Bioenergy for thousands of years. It is still the most widely used form of renewable energy. In this course students will be introduced to the fundamental concepts of what biomass is, its role in nature and for human societies, in which way it is used sustainably, how it can be converted to energy and how certain biofuel technologies can help with waste management. Bioenergy encompasses many different sources including energy crops, agricultural waste, domestic waste and animal waste, all of which are plentiful across the Caribbean region. Case studies are presented that show current practices across the Caribbean.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6007
COURSE TITLE: ENERGY USE AND ENERGY AUDITING
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course is designed to enable students to assess the energy efficiency of small and medium premises, carry out energy audits and propose appropriate energy saving measures. The course comprises lectures, moderated working sessions and group exercises designed to allow the students to put the knowledge gained into practice.
The whole development of Renewable Energy stems from the need to develop renewable indigenous resources and to eliminate or reduce the use of fossil fuels in the generation of electricity. This thrust can be enhanced by the efficient use of energy. An initial step is the assessment of existing systems and the introduction of energy efficient schemes. This alone can significantly reduce the electricity demand, and this must be a first step towards self sufficiency and energy security
ASSESSMENT
Coursework 100%

SEMESTER: 2
COURSE CODE: RENT 6008
COURSE TITLE: ELECTRICAL INTEGRATION OF RENEWABLES
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: The integration of generators powered from renewable energy sources is fundamentally similar to that of fossil-fuelled generators and is based on the same principles; but, renewable energy sources are often intermittent and dispersed (large numbers of relatively small generators) and these factors must be considered. This module applies the well-established principles of electrical engineering to the subject of integrating generators powered from renewable energy sources into electrical power systems, small and large.

Electrical integration of renewable energy is often the overlooked, but is a crucial aspect of the renewable energy field. It is very common to convert energy from a renewable source into electricity. The same, of course, is true of energy from fossil fuels and the simple reason is that electricity is very convenient both to transport and to utilise. That said the design of the electrical system is rarely trivial. The proper integration of any electrical generator into an electrical power system requires knowledge of the well-established principles of electrical engineering. This course provides this very important aspect of the development of renewable energy.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6009
COURSE TITLE: HYDRO AND MARINE POWER
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: In this module the principles surrounding the generation of electricity from water will be examined. River, wave and ocean thermal resources are studied, as well as planning and environmental issues. Turbine and generator system design forms a major theme in this module as well as the thermal dynamics of ocean thermal technologies.

The Caribbean has unexplored potential for hydropower and various forms of marine power (wave and ocean thermal in particular). However there are few persons in the region with the necessary knowledge and skills to engage in the development of these resources. This course will provide the initial knowledge and skills base to help jump-start the development of the resources.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6010
COURSE TITLE: GEOTHERMAL ENERGY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course provides an overview of geothermal energy systems. An integral part of the course is the Field Trip where students gain first hand information about different methods of measuring resistivity using equipment such as the MiniSting or the SuperSting. Field trips to specific Geothermal sites would help reinforce student understanding of the dynamic interaction of hydrothermal systems.

Many of the Caribbean islands have significant geothermal energy potential but limited technical resources in terms of trained personnel. It is therefore necessary to train persons in this area to satisfy the demands of the region in developing the science and technology of geothermal energy. This course will provide initially the necessary knowledge and skills to engage in the development of geothermal energy.
Assessment
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6011
COURSE TITLE: ENERGY STORAGE
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: A major part of this course will involve investigation of the hydrogen economy and hydrogen fuel cells. Inter-island energy transportation through a Caribbean wide super grid will also be discussed as well as small-scale energy storage options.

In order for renewable energy to meet consumer demand, energy storage will become more important as grid penetration increases. Therefore this course will explore the functioning, properties, and application of physical-chemical energy storage systems.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6014
COURSE TITLE: BIOENERGY II
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Building on from knowledge gained in Bioenergy I, this module aims to cover in detail the production of energy from waste, of alcohols from micro-organisms and micro-algal systems and to cover in detail the topic of advanced conversion technologies such as pyrolysis and gasification and of special heat engines suited to the use of fuels derived from biomass/waste. A closer look at anaerobic biodigesters is performed, an area of potential benefit to the treatment of human and agricultural wastes. The principles underlying: alcohol production, energy extraction from waste, gasification, pyrolysis and the cycles of engines designed to run on fuels from biomass are covered in depth throughout this module. Students wishing to further specialize in this area will have the option of taking this course which further develops some of the topics in the first Bioenergy course and goes in-depth into the science of waste-to-energy production.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 2
COURSE CODE: RENT 6013
COURSE TITLE: WIND ENERGY II
CREDITS: 3
PREREQUISITE: RENT 6005
COURSE DESCRIPTION: Building on wind energy I, this module aims to cover in depth (a) the advanced statistics and modeling of the resource necessary for precise assessment, (b) the aerodynamics and mechanics necessary for the design and stressing of wind turbines. Small-scale systems, electrical aspects, noise generation and offshore systems are also covered. The highlight of this course will be a wind tunnel based laboratory investigating the loading of a small-scale wind turbine.

Students who wish to further specialize in Wind Energy technology will have the option of taking this course which expands and delves further into the technology, and modeling and setting up of a wind farm.
ASSESSMENT
Coursework 50%
Final Exam 50%

SEMESTER: 1
COURSE CODE: RENT 6004
COURSE TITLE: SOLAR ENERGY CONVERSION
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Solar Energy is the basis for other forms of renewable energy. This course therefore starts by briefly describing the main forms of renewable energy and then delves into solar energy radiation and utilisation. It describes the solar spectra and active and passive solar systems. The heat transfer characteristics are investigated and methods of estimating efficiency are outlined.

The course introduces photovoltaics (PV) and the science of the photoelectric effect. PV characteristics are defined and PV design, categories of PV modules, grid connection issues and economic analysis are explained.
ASSESSMENT

Coursework	50%
Final Exam	50%

SEMESTER: 2
COURSE CODE: RENT 6012
COURSE TITLE: ADVANCED SOLAR ENERGY
CREDITS: 3
PREREQUISITE: RENT 6004
COURSE DESCRIPTION: Building on Solar Energy Conversion, this module aims to cover in considerable depth (a) the semiconductor physics and technology involved in the design and manufacture of state of the art photovoltaic devices, (b) the design of photovoltaic components and systems, (c) advanced solar energy applications.

This will enable students to design simple PV systems, incorporating power tracking, and solar thermal systems. The module will also enable students to gain an understanding of the technology and economics of the manufacturing processes associated with the production of PV cells. One of the highlights of the course will be the design and analysis of a PV system by students via a software based laboratory.
Assessment

Course-work	50%
Final Exam	50%

SEMESTER: 2
COURSE CODE: RENT 6000
COURSE TITLE: RESEARCH PROJECT
CREDITS: 9
PREREQUISITE:
COURSE DESCRIPTION: The aim of the research project is to allow the student to synthesise and articulate several aspects of the taught programme within a single themed research topic. In addition, it will provide the opportunity for further detailed skills training in aspects of renewable energy technology. It will also allow the student to pursue an individual course of study on a particular research topic or issue of interest to the student and will incorporate technical skills training specific to the individual student. As such, the research project will provide the opportunity to develop a specific set of practical and reporting skills that will be invaluable to the student in his/her future career.

A Research Project is a fundamental component of the MSc programme and this is reflected, not only in the credit weighting, but by the fact that the research project runs for a six-month period so that the student may have the necessary time to produce a project of a high standard.
ASSESSMENT

Oral Presentation of Research Project	10%
Research Proposal and Methodology	30%
Research Thesis Report	60%

Biomedical Physics

Course codes will be provided once registration for the M.Sc. is possible.

SEMESTER: 1
COURSE CODE:
COURSE TITLE: PHYSICS OF THE HUMAN BODY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will show how physics is applied to improve the understanding of physical issues concerning the human body. Models will be used to aid in the quantitative analysis of biological systems using physical and engineering principles. Various examples will be used to depict these types of analyses and how the knowledge gained from them has led to advances in the biomedical physics and engineering. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Pre-testing at the start of the course i.e. a readiness assessment will be performed. Based on this assessment formative feedback will be provided within the first 2 weeks of the semester. Various methods of assessment will be used during the course.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: HUMAN ANATOMY & PHYSIOLOGY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will emphasize a systemic view of the functional anatomy of the human body, anatomical locations, structure and function of the various systems of the body, physiological functions of the main components of each major system of the human body, organ systems and associated diseases. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of anatomical models, multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: NUMERICAL METHODS FOR BIOMEDICAL APPLICATIONS
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: The development of powerful digital computers with fast processing speeds has encouraged the use of numerical methods and simulation in problem-solving by vastly increasing the range of mathematical calculations which can be conveniently performed. Numerical methods are techniques by which a variety of real-life problems are formulated so that they can be solved using arithmetic operations. The choice of the particular formula or algorithm or model has a marked influence not only on the computer programming but also on how the final results obtained are understood. As such, this course will give the student a thorough grounding in the use of computers, and the variety of computational tools and routines used in Pure and Applied Physics in order to both broaden and deepen our understanding of physics problems.
ASSESSMENT

Course-work	50%
Final Exam	50%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: WORKPLACE: SAFETY AND PROTECTION
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on electrical, chemical, biological safety and the safe use of ionizing radiation in the medical environment. Electrical safety is very important in the medical environment since patients not only undergo diagnostic or treatment procedures but may also be unattended, unconscious or anaesthetised and not respond normally to an electric current. Chemical safety protects human health and the environment by evaluating chemicals for potential risk and providing tools and guidance for the use of various chemicals. Biological safety involves protecting individuals and the environment from potentially harmful microorganisms and other biological agents through the use of risk assessment and the application of work practices, protective equipment, and exposure control. Concepts, principles and units of dose in radiological safety, principles and methods of radiation protection will also be addressed. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: RADIATION PHYSICS AND DOSIMETRY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on ionizing radiation as the basis for radiation therapy and for many diagnostic imaging studies. The various modes of interaction between ionizing radiations and matter, energy deposition by ionizing radiation in matter; concepts, quantities and units in radiological physics; principles and methods of radiation dosimetry will be addressed. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of multimedia and interactive presentations.
ASSESSMENT

Course-work	60%
Final Exam	40%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: RADIATION BIOLOGY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on effects of ionizing radiation on living things. The various consequences of the interaction between ionizing radiations and biological objects from energy deposition in water to cancer development and death will also be addressed. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: RADIATION ONCOLOGY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on radiation therapy and radiation carcinogenesis. The various types of radiation for tumor treatment, energy deposition by ionizing radiation in organs and tissues. Difference of response to radiation between tumors and normal tissues/organs. Principles and methods of modern and advance radiation therapy will also be addressed. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of multimedia and interactive presentations.
ASSESSMENT

Course-work	60%
Final Exam	40%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: BIOMEDICAL IMAGING
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on construction, practical utilization of equipment and principles for many diagnostic imaging studies. The course will include several visits to medical centre to gain practical knowledge of use the equipment and the concerns which determine implementation in various medical cases. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of multimedia and interactive presentations.
ASSESSMENT

Course-work	50%
Final Exam	50%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: NUCLEAR AND ATOMIC PHYSICS
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will focus on structure and properties of atoms and atomic nucleus as the basis for nuclear medicine and for many diagnostic imaging studies. Nuclear and sub-nuclear structures, nuclear reactions, the various modes of nuclear decay, as well as electromagnetic properties of elementary particles and nucleus; concepts, principles and quantities in nuclear and atomic physics with some application of quantum mechanics will be addressed.
ASSESSMENT

Course-work	50%
Final Exam	50%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: MEDICAL PHYSICS LABORATORY COURSE I
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Experimentation, observation and recording skills are very necessary for Biomedical Physicists. Medical Physics Laboratory I is a modern, lab-based physics course where all the Biomedical Physics students will be exposed to a variety of techniques, concepts and skills in the experimental sciences. These skills are needed for all the other modules of the specialization in Medical Physics and will be developed holistically through this module which focuses entirely on practical skills. This course is one of the seven courses in the Medical Physics elective providing the necessary background knowledge for the Biomedical Physics. Laboratory exercises will be mostly hands-on and team-based and will provide students with ample opportunities and methods for engaging with the course material.
ASSESSMENT

Course-work	100%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: MEDICAL PHYSICS LABORATORY COURSE II
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Experimentation, observation and working knowledge skills are very necessary for Biomedical Physicists. Medical Physics Laboratory Course II is a modern physics course where all the Medical Physics students will be exposed to a variety of techniques, associated with radiological diagnostic instruments, gain skills in measuring radiation fields, familiarise themselves with various imaging modalities and be able to compare the advantages and disadvantages of each. These skills are needed for all the other modules of the specialization in Medical Physics and will be developed holistically through this module which focuses entirely on practical skills. This course is one of the seven courses in the Medical Physics elective providing the necessary background knowledge for Biomedical Physics. Laboratory exercises will be mostly hands-on and team-based and will provide students with ample opportunities and methods for engaging with the course material.
Assessment

Course-work	100%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: ORTHOPAEDIC BIOMECHANICS
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: This course will address the use of mechanical parameters such as force, stress and strain, stiffness, and elasticity to understand the biological processes and mechanisms related to the structure and function of bone. The contributory factors involved in injuries of the lower extremity, upper extremity, and the axial skeleton will be considered. Additionally, biomechanical principles will be reviewed and a thorough treatment of the design, analysis, and development of bone-prosthetic systems in the case of fracture fixation, prosthetic implant design, and hip and knee arthroplasty will be provided.
Assessment
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: HUMAN MOTOR CONTROL
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Motor controls are the information processing activities carried out by our central nervous system that helps us organize, move and coordinate our movements and muscles. Movement is central to the existence of human life. It results from the intricate coordinated actions of nerves, muscles, tendons, bones, and other physiological components. In order to understand movement it is necessary to investigate the mechanisms underlying the interaction of these musculoskeletal components and the control strategies of the central nervous system during the performance motor tasks or the maintenance of posture in able-bodied individuals and in individuals with neuromotor pathologies. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: ANALYSIS OF HUMAN MOVEMENT
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Basic biomechanical and anatomical concepts of human movement will be applied to normal and abnormal movement patterns so that students develop the ability to scientifically analyze movements. Additionally this course will examine the techniques and instrumentation used to record, measure and analyze all body movements as mechanical systems so as to improve functional outcomes and the quality of life for individuals with a movement disorder at any age. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will use case studies, multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: IMPLANT MATERIALS & TECHNOLOGY
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: The success of any implant or medical device depends on the biomaterial used. Many synthetic materials (such as metals, polymers and composites) have been developed which have greatly contributed to the effectiveness of today's medical devices. This course aims to familiarize students with the various types of materials used in medical implants, biomechanical requirements of implant materials, tissue attachment mechanisms, concepts of biocompatibility, biological response and interactions between implantable materials and biological systems. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ the use of models, multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: REHABILITATION & ASSISTIVE TECHNOLOGIES
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Previous modules in this specialization have looked at the ability of the human body and its extremities to move and carry out the activities of daily living, motor control and motor learning. However, when impairment in the human motor control system arises due to traumatic accident or disease then assistive systems can be designed to interact with the human motor system so as to exchange information and help restore lost movement capability. Teaching will consist of lectures, seminars and tutorials in order to provide students with ample opportunities and methods for engaging with the course material. Presentation of lectures will employ a variety of models, multimedia and interactive presentations.
ASSESSMENT

Course-work	40%
Final Exam	60%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: MOVEMENT ANALYSIS & REHABILITATION - LABORATORY COURSE I
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Experimentation, observation and working knowledge skills are very necessary for Biomedical Physicists. Movement Analysis & Rehabilitation Engineering - Laboratory Course I is a modern physics course where all the Biomedical Physics students will be exposed to a variety of techniques, concepts and skills in medical diagnostics and treatment. These skills are needed for all the other modules of the specialization in Biomedical Physics and will concentrate on laboratory exercises, will be mostly hands-on and team-based, and field trips which will provide students with ample opportunities and methods for engaging with the course material and to question professionals in the field. This course is one of the seven courses in the Movement Analysis & Rehabilitation elective providing the necessary background knowledge for Biomedical Physicists.
ASSESSMENT

Course-work	100%

SEMESTER: 1
COURSE CODE:
COURSE TITLE: MOVEMENT ANALYSIS & REHABILITATION - LABORATORY COURSE II
CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Experimentation, observation and working knowledge skills are necessary for Biomedical Physicists. Movement Analysis & Rehabilitation - Laboratory Course II is a modern physics course designed to expose all Biomedical Physics students to a variety of techniques, concepts and skills in medical diagnostics and treatment. These skills are needed for all the other modules of the specialization in Medical Physics and will be developed holistically through this module which focuses entirely on practical skills. This course is one of the seven courses in the Movement Analysis & Rehabilitation elective. It will concentrate on laboratory exercises, will be mostly hands-on and team-based, and field trips which will provide students with ample opportunities and methods for engaging with the course material and to question professionals in the field.
ASSESSMENT

Course-work	100%

SEMESTER: 2
COURSE CODE:
COURSE TITLE: RESEARCH PROJECT
CREDITS: 8
PREREQUISITE:
COURSE DESCRIPTION: Each student will agree to investigate, with the guidance of a supervisor, a current problem from their area of specialization: Medical Physics or Movement Analysis & Rehabilitation which will incorporate a substantive research component. In some cases the supervisors may suggest topics however students are welcome to suggest their own topics based on their interests during the course or from existing issues at their workplaces. The student will then concentrate on acquiring, organising and analysing the project's data so as to present their findings in both oral and written form.
ASSESSMENT

Literature review	10%
Project proposal	20%
Conduct of experimental work/Progress	10%
Final presentation	15%
Project thesis	45%