Faculty of Engineering
POSTGRADUATE

UWI
ST. AUGUSTINE
CAMPUS



REGULATIONS & SYLLABUSES

2026/2027

TABLE OF CONTENTS

HOW TO USE THIS HANDBOOK **3**

ACADEMIC CALENDAR 2026/2027 ..... **3**

LEGAL NOTICE – PROGRAMME & COURSES **4**

DISCLAIMER – PROGRAMMES & COURSES **4**

DISCLAIMER – PRIZES & AWARDS **4**

IMPLEMENTATION OF THE POSTGRADUATE GPA SYSTEM **5**

VISION STATEMENT **9**

MISSION STATEMENT **9**

A HISTORICAL NOTE **11**

STAFF LISTING **12**

SECTION 1 - POSTGRADUATE STUDIES IN THE FACULTY OF ENGINEERING **25**

DEPARTMENT OF CHEMICAL ENGINEERING 30
- Programmes in Chemical & Process Engineering 31
- Programmes in Food Science and Technology 34
- Programmes in Petroleum Studies 37
- MPhil Programmes 44
- PhD Programmes 44

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING 45
- Programmes in Construction Management 46
- Programmes in Coastal Engineering & Management 50
- Programmes in Civil and Environmental Engineering 52
- MSc Programmes 54
- PROGRAMME IN SUSTAINABLE SOLID WASTE ENGINEERING AND MANAGEMENT 57
- MPhil/PhD in Civil Engineering 58
- Principal Areas of Research 58

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING 59
- Programmes in Electrical and Computer Engineering 60

DEPARTMENT OF GEOMATICS ENGINEERING & LAND MANAGEMENT 66
- MPhil in Surveying & Land Information 66
- MPhil in Geoinformatics 66
- MPhil in Urban and Regional Planning 66
- PhD in Surveying & Land Information 67
- PhD in Geoinformatics 67
- PhD in Urban and Regional Planning 67

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING 74
- MPhil/PhD in Mechanical Engineering 74
- MPhil/PhD in Manufacturing Engineering 74
- MPhil/PhD in Industrial Engineering 74
- MSc in Engineering Management (EM) 76
- MSc in Engineering Asset Management (EAM) 78
- MSc in Manufacturing Engineering & Management (MEM) 79

OFFICE OF THE DEAN 83
- MSc in Project Management 83
- MPhil/PhD Degrees in Project Management 85

SECTION 2 – REGULATIONS 86
Regulations for Postgraduate Diplomas and Degrees 86
Regulations for Research Degrees 86
Regulations for MPhil Qualifying Examinations 87
Guidelines for Postgraduate Programmes 88
MSc/MASc/Diploma 88
STUDENT LIFE AND DEVELOPMENT DEPARTMENT (SLDD) 89
STUDENT EXCHANGE & STUDY ABROAD 91
THE CAMPUS LIBRARIES 92
UNIVERSTY REGULATIONS FOR STAFF AND STUDENTS ON PLAGIARISM 96
SECTION 3 - COURSE DESCRIPTIONS 97
Chemical Engineering 97
Food Science and Technology 101
Petroleum Engineering and Reservoir Engineering 103
Construction Management 107
Coastal Engineering and Management 109
Civil & Environmental Engineering 111
Electrical and Computer Engineering and Artificial Intelligence 114
MSc Urban & Regional Planning 126
Postgraduate Diploma in Land Administration 129
Postgraduate Diploma/MSc in Geoinformatics 131
Agricultural Engineering (Biosystems Engineering) 133
Project Management Core Courses 145
Project Management Electives 147

HOW TO USE THIS HANDBOOK

The Faculty Handbooks (also known as Faculty Booklets) are available on the Campus website in PDF format at **http://sta.uwi.edu/faculty-booklet-archive**. The Handbooks include:

- Relevant **Faculty Regulations** – e.g. Admission Criteria, Exemptions, Progression, GPA, Leave of Absence, etc.
- Relevant **University Regulations** including the Plagiarism Regulations and Declaration Forms
- Other Information on **Co-Curricular** courses, **Language** courses and **Support for Students** with physical and other disabilities or impairments.
- **Programme Descriptions and Course Listings** which include the 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** which may include details such as prerequisites and methods of assessment.

Students should note the following:
The Regulations and Syllabuses contained in the Faculty Handbooks should be read in conjunction with University Regulations as follows:

- The Undergraduate Regulations and Syllabuses should be read in conjunction with the University Regulations contained in the **Undergraduate Handbook** and the **University's Assessment Regulations for First Degrees Undergraduate Diplomas and Certificates (with effect from August** 2020 **and for the time being in force)**.
- The Postgraduate Regulations and Syllabuses should be read in conjunction with the University Regulations contained on the **Postgraduate Admissions website** and the **Board for Graduate Studies and Research Regulations for Graduate Certificates, Diplomas and Degrees (with effect from August 2018 and for the time being in force)**.

Progress through a programme of study at the University is governed by Faculty Regulations *and* University Regulations, which should be read in conjunction with each other. Should there be a conflict between Faculty Regulations and University Regulations, **University Regulations shall prevail, where appropriate**.

ACADEMIC CALENDAR 2026/2027

Get important dates such as the beginning and end of each semester, matriculation, examinations, graduation and ELPT. Also, take note of deadlines for the payment of fees, registration, and applications for overrides, leave of absence, admissions, and scholarships & bursaries.

To download the latest calendar, visit https://sta.uwi.edu/registration/academiccalendar.asp

LEGAL NOTICE – PROGRAMME & COURSES

1. Notwithstanding the contents of Faculty Handbooks, course outlines or any other course materials provided by the University, the University reserves the right at any time to withdraw, alter or modify its programmes or courses and/or vary its modes or methods of teaching, delivery and assessment of its programmes or courses, as deemed necessary in the following circumstances:

   (a) As a result of any changes imposed by national laws, legislation, regulations, governmental orders or accreditation conditions made from time to time.
   (b) In response to the occurrence of a force majeure event, including but not limited to, war (whether declared or not), riots, civil disorder, epidemics, pandemics, quarantines, earthquakes, fire, explosions, storms, floods or other adverse weather conditions, strikes, lockouts or other industrial action, confiscation or any other action or authority by governmental or regulatory agencies or acts of God.
   (c) In the event of an emergency where there is risk to life and property.
   (d) Where the exigencies of the circumstances require such action to be taken by the University.

2. Whilst it is anticipated that teaching, delivery and assessment of the University's programmes and courses during the Academic Year will be conducted primarily in person, the University reserves the right to implement virtual/online/electronic modes and methods of teaching, delivery and assessment or hybrid teaching and learning, if deemed necessary due to public health regulations, governmental order, health and safety protocols and/or any other possible threats to life, health and safety.

DISCLAIMER – PROGRAMMES & COURSES

Notwithstanding the contents of Faculty Handbooks, course outlines or any other course materials provided by the University, the University reserves the right at any time to withdraw, modify or not offer a programme or course as it deems necessary.

DISCLAIMER – PRIZES & AWARDS

In the case where Faculty/Student Prizes or Awards may be listed in the Faculty Handbooks, the University does not bind itself to award any or all of the listed prizes/awards contained therein or at its stated value and reserves the right to modify or altogether withdraw certain prizes/awards as described in either or both the electronic and printed versions of the Faculty Handbooks.

IMPLEMENTATION OF THE POSTGRADUATE GPA SYSTEM

Information for both NEW and CONTINUING students
First published August 2021. Updated October 2021.

As part of continued efforts to align the standards of The UWI more closely with international norms and best practice, a Grade Point Average (GPA) system was introduced with effect from the 2021/2022 academic year.

Will the new PG GPA apply to all postgraduate students and programmes?

No. It applies **ONLY** to students who were admitted and commenced **TAUGHT** postgraduate programmes (see exclusions below) **in or after** the **2021/2022 academic year**, referred to below as "New (GPA) Students". Taught postgraduate programmes refer to postgraduate certificates and diplomas, masters and professional doctorates, with some exclusions (see below).

It does **NOT** apply to **ANY** students admitted to postgraduate programmes (taught or research) **prior** to the **2021/2022 academic year**, referred to below as "Continuing (non-GPA) Students".

*Please remember that each student is bound by the regulations in force **on the date of admission to their programme**, as stated in their Faculty's Regulations Handbook published in that year. To find your applicable handbook, visit* http://sta.uwi.edu/faculty-booklet-archive

Excluded Programmes

The new PG GPA system does **NOT** apply to students pursuing the following:

i. Research degrees (MPhil and PhD degrees) – all campuses
ii. Doctor of Medicine (DM) programme – all campuses
iii. Diploma in Family Medicine and Diploma in Emergency Medicine (DM) – all campuses
iv. Master of Fine Arts (MFA) – St. Augustine Campus

Exemptions & Variations

Exemption/variations within the application of the new PG GPA system will be applied to the following areas and programmes in the Faculty of Humanities and Education:

i. The Master's in Fine Arts (MFA) in Creative Writing – ***Exemption***
ii. The MA Spanish (Research Paper – SPAN 6009) – ***Variation***
iii. The Diploma in Education (Practicum Paper – EDTP 5002) – ***Variation***
iv. The Master's in Education – ***Variation***

How will Continuing (non-GPA) Students be affected?

Continuing students at the St. Augustine Campus need to be aware of the introduction of new Course Registration Numbers (CRN) to be used by new students only (see Changes to the Registration Process below). Otherwise, there are no changes for continuing students.

How will New (GPA) Students be affected?

- GPA is a representation of student performance on transcripts.
- Whether you pass a course or not, the quality points earned still count towards your GPA, meaning that all your efforts are considered.
- Quality points are earned even if students do not reach the threshold of a pass with coursework and/or final exam.
- If a student fails a single course twice, an automatic Required to Withdraw (RTW) will no longer apply.
- A student is not required to earn a 'Distinction' for their research projects in order to receive an overall 'Distinction'.
- An additional award category of 'Merit' has been introduced along with 'Pass' and 'Distinction' (see Award of Degrees below).
- It allows more efficient performance tracking, for both students and faculty.
- It provides a measurement of academic performance that makes for easy comparison by other international universities for the purposes of transfer and admission.

What does the PG GPA look like?

The introduction of the PG GPA follows the successful introduction of the GPA system at the undergraduate student level in 2003/2004. The grade bands for the PG GPA system are almost identical to those for the undergraduate GPA, except for the introduction of a new band – FCW/FWE, which is described below.

GRADE	Grade Point	% Range	Grade Definition	Grade Descriptor
A+	4.30	90 - 100	Exceptional	Demonstrates exceptional performance and achievement in all aspects of the course. Exceptional application of theoretical and technical knowledge that demonstrates achievement of the learning outcomes. Goes beyond the material in the course and displays exceptional aptitude in solving complex issues identified. Achieves the highest level of critical, compelling, coherent and concise argument or solutions within the course.
A	4.00	80 - 89	Outstanding	Demonstrates outstanding integration of a full range of appropriate principles, theories, evidence and techniques. Displays innovative and/or insightful responses. Goes beyond the material with outstanding conceptualisation which is original, innovative and/or insightful. Applies outstanding critical thinking skills.
A-	3.70	75 - 79	Excellent	Demonstrates excellent breadth of knowledge, skills and competencies and presents these in appropriate forms using a wide range of resources. Demonstrates excellent evidence of original thought, strong analytical and critical abilities; excellent organisational, rhetorical and presentational skills.
B+	3.30	70 - 74	Very Good	Demonstrates evidence of very good critical and analytical thinking in most aspects of the course. Very good knowledge that is comprehensive, accurate and relevant. Very good insight into the material and very good use of a range of appropriate resources. Consistently applies very good theoretical and technical knowledge to achieve the desired learning outcomes.
B	3.00	65 - 69	Good	Demonstrates good knowledge, rhetorical and organisational skills. Good insight into the material and a good use of a range of appropriate resources. Good integration of a range of principles, techniques, theories and evidence.
B-	2.70	60 - 64	Satisfactory	Displays satisfactory evidence of the application of theoretical and technical knowledge to achieve the desired learning outcomes. Demonstrates sound organisational and rhetorical skills.
C+	2.30	55 - 59	Fair	Demonstrates fair breadth and depth of knowledge of main components of the subject. Fair evidence of being able to assemble some of the appropriate principles, theories, evidence and techniques and to apply some critical thinking.

C	2.00	50 - 54	Acceptable	Demonstrates acceptable application of theoretical and technical knowledge to achieve the minimum learning outcomes required in the course. Displays acceptable evidence of critical thinking and the ability to link theory to application.
FCW/FWE	1.70	40 - 49		Fail Exam/Fail Coursework
F1	1.70	40 - 49	Unsatisfactory	Demonstrates unsatisfactory application of theoretical and technical knowledge and understanding of the subject. Displays unsatisfactory ability to put theory into practice; weak theoretical and reflective insight. Unsatisfactory critical thinking, organisational and rhetorical skills.
F2	1.30	30 - 39	Weak	Weak overall performance with very limited knowledge and understanding of the subject. Little evidence of theoretical and reflective insights. Weak organisational and rhetorical skills.
F3	0.00	0 - 29	Poor	Overall poor or minimal evidence of knowledge and understanding of the subject. Displays little ability to put theory into practice; lacks theoretical and reflective insights. Incomplete breadth and depth of knowledge on substantive elements of the subject. Little or no evidence of critical engagement with the material. Responses are affected by irrelevant sources of information, poor organisational and rhetorical skills.

Changes to the Registration Process

As the GPA system is phased in, we will have two categories of students (new GPA and continuing/legacy (non-GPA) registering for the same courses. The difference will be reflected in the course registration number (CRN) for each course.

When registering for courses, you will see two sets of CRN codes – one for continuing (non-GPA) students, and another for new students registering under the GPA system. All other course information is the same. Only the CRNs are different.

Please pay careful attention and use the codes that correspond with your status as either a new or continuing student. The Banner registration system has been set up to deal with this duality, and once grades are input via the Banner Software, GPA is calculated automatically.

For more on the registration process and to see the updated CRN codes and instructions, download the Online Registration Guide.

Award of Degrees

New students entering participating taught programmes in the 2021/2022 academic year as detailed above will be assessed and awarded degrees based on the Postgraduate GPA grading scale as follows:

GPA	CATEGORY
≥3.70	Distinction
3.30 – 3.69	Merit
2.00 – 3.29	Pass
< 2.00	Fail

Please note that

- the award of degree is based on the overall programme GPA.
- research projects will be considered similarly to other courses, so for a student who does not earn a 'Distinction' in their research project, it is still possible to be awarded a 'Distinction' in their overall programme once their programme GPA is ≥3.70.
- if a student fails or repeats a course, they will still qualify for a 'Distinction' if their overall programme GPA is ≥3.70.
- special requirements apply for the award of 'High Commendation' to professional doctorates (see regulation 14).

Continuing students and new students entering **programmes that are currently excluded** will be assessed and awarded according to the non-GPA systems included in this booklet for students' convenience.

Where can I get help or find out more?

- Visit https://www.uwi.edu/postgradgpa/ to learn more and find answers to frequently asked questions about the postgraduate GPA system.
- To see the full regulations governing the PG GPA, download the GPA Regulations for Graduate Certificates, Diplomas, Taught Masters and Professional Doctorate Programmes.
- For answers to specific questions, contact the Office for Graduate Studies & Research online.

VISION STATEMENT

To be recognised as a world class Faculty of Engineering.

MISSION STATEMENT

To provide internationally recognised degrees in Engineering and to engage in impactful research and innovation.

MESSAGE FROM THE DEAN



I extend a warm welcome on behalf of the Faculty of Engineering at The University of the West Indies, St. Augustine Campus. The Faculty of Engineering (FoE) seeks to equip the next generation of graduate engineering students with the necessary higher-level skills and knowledge to effectively address the evolving demands of society. This is achieved through the provision of unparalleled educational programmes, facilitated by esteemed professionals, within a dynamic learning environment, practical laboratory and field experiences, as well as valuable internship opportunities, to enhance professional development. This handbook offers comprehensive details regarding our postgraduate programme offerings.

The FoE provides a diverse spectrum of postgraduate programmes, including Postgraduate Diplomas (PGD), Master of Science (MSc), Master of Applied Science (MASc), Master of Philosophy (MPhil), and Doctor of Philosophy (PhD). These programmes are designed to enhance students' knowledge, professionalism, and preparedness for the evolving demands of industry and society. The FoE fosters a robust and innovative research environment, serving as a foundation for these programmes. The strong ties we maintain with our industry partners and local and regional government agencies facilitate our community's ability to provide consultation on relevant issues to address real-world challenges. The FoE comprises a dedicated and proficient team of academic, administrative, technical, and support personnel. Our collective group is deeply committed to guiding students in their pursuit of knowledge and learning, aiming to deliver an educational experience that aligns with an increasingly interconnected global society. I take this opportunity to wish you well in your studies in the Faculty of Engineering.

Professor Bheshem Ramlal
Dean, Faculty of Engineering, St. Augustine Campus

A HISTORICAL NOTE

The University of the West Indies was founded in 1948 at Mona, Jamaica as a College in special relationship with the University of London, to serve the British territories in the Caribbean area. It achieved full University status by Royal Charter in 1962, thereby becoming a degree-granting institution in its own right.

A second campus of the University was established in 1960 when the Imperial College of Tropical Agriculture (ICTA) at St. Augustine, Trinidad was incorporated into the University College. On August 25, 1959, a Plan of Operation was signed which provided for a United Nations Special Fund allocation and a Government counterpart contribution for the establishment of a Faculty of Engineering. The then Vice-Chancellor and Principal of the University College, Nobel Laureate Sir Arthur Lewis had the overall responsibility of securing funding for the financing of the Engineering buildings and for expediting the final decision to locate the Faculty of Engineering at St. Augustine.

The initial layout comprised five (5) blocks with a total of 5,400 square metres of floor space of which the laboratories occupied 3,030 square metres.

Construction commenced in 1961 and was completed by the end of 1962. During the 1961/62 Academic Year (the first year of teaching), the Faculty was housed in temporary accommodation on the campus. The formal opening of the new buildings of the Faculty took place on February 1, 1963.

Initially, undergraduate and graduate research degrees were offered in the main branches of Engineering - Chemical, Civil, Electrical and Mechanical. The Faculty steadily grew over the years with a major expansion of both physical infrastructure and academic programmes in the 1980s with additional disciplines at the BSc level and several specialist MSc degrees. Floor space now occupies close to 53,181 square metres of classrooms, laboratories and offices, with expansion continuing almost on a yearly basis.

The semester system was introduced on a phased basis in 1990 at the undergraduate level, followed by the MSc programmes later.

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SECTION 1 - POSTGRADUATE STUDIES IN THE FACULTY OF ENGINEERING

1.1 Introduction

1.1.1 It is generally accepted that a Bachelor's degree is the first step in the learning process that a professional person should continue throughout his/her career.

1.1.2 A first degree is an indication of a basic ability to understand and apply the concepts underlying that discipline. It does not indicate competence as a practitioner of the associated profession. That can only come with experience and training within the profession itself.

1.2 Furthering Knowledge - MPhil, PhD

1.2.1 One important element of any profession is that one should be devoted to furthering the knowledge and understanding contained within the concepts that define the discipline.

1.2.2 The task of furthering the frontiers of knowledge normally falls upon those in academic fields and specifically upon those undertaking postgraduate studies towards research degrees.

1.2.3 It is therefore critical to both industry and the University that graduates pursue research studies; this is reflected in continuing active enrolment for the MPhil and PhD research degree programmes.

1.2.4 The Faculty of Engineering offers MPhil and PhD research degrees in the following subjects: -

i. Agricultural Engineering
ii. Chemical Engineering
iii. Civil Engineering
iv. Construction Engineering
v. Construction Engineering & Management
vi. Construction Management
vii. Electrical & Computer Engineering
viii. Food Science & Technology
ix. Geoinformatics
x. Geoscience
xi. Industrial Engineering
xii. Mechanical Engineering
xiii. Petroleum Engineering
xiv. Petroleum Geoscience
xv. Project Management
xvi. Surveying & Land Information
xvii. Urban and Regional Planning

1.2.5 It should be noted that these research degrees are not normally considered to be qualifications for professional practice in the broader sense, as they may not necessarily allow for registration as a professional engineer.

1.2.6 As a consequence, the Faculty of Engineering may allow suitably qualified non-engineering graduates, who obtained their degrees at the Honours level, to register for higher degrees by research.

1.2.7 However, such students may be required to take a qualifying examination within the Department concerned, on topics that would enhance the student's academic competence in the area of the proposed research.

1.2.8 Applicants wishing to register for the PhD who do not already have a Master's degree by research will be required to register for the MPhil first and may be allowed to upgrade their registration to the PhD upon satisfying the appropriate regulations.

1.2.9 Candidates who have obtained a Master of Science (MSc) degree with distinction maybe allowed to register for the PhD provided a substantial part of the MSc project has been carried out in the relevant area.

1.3 In Career Training - Diploma, MSc, MASc

1.3.1 It has often been demonstrated that the emphasis of the work undertaken by professional engineers changes as their careers progress. Normally their work becomes either more specifically technical within a closely defined subject area, or it becomes more oriented towards management responsibilities rather than technical ones. Sometimes it involves both.

1.3.2 As a result, professionals often require retraining or further training during the course of their careers. For this purpose, it is important to industry that there is a wide ranging and active programme of postgraduate studies available at the University.

1.3.3 To this end, the Faculty of Engineering offers a range of MSc, MASc and Postgraduate Diploma courses which are primarily taught courses. The details of these are included in this booklet.

1.3.4 The Faculty of Engineering currently offers the following **Postgraduate Diploma** programmes through examination by written papers and a project:

i. Coastal Engineering & Management
ii. Construction Management
iii. Civil Engineering
iv. Civil with Environmental Engineering
v. Land Administration
vi. Petroleum Engineering & Management
vii. Geoinformatics

1.3.5 The Faculty of Engineering currently offers the following **MSc degree programmes** through examination by written papers and a project:

i. Chemical & Process Engineering
ii. Chemical & Process Engineering with Management
iii. Chemical & Process Engineering with Environmental Engineering
iv. Civil Engineering
v. Civil with Environmental Engineering
vi. Coastal Engineering & Management
vii. Construction Management
viii. Electrical & Computer Engineering (MASc)
ix. Engineering Asset Management
x. Engineering Management
xi. Food Science & Technology
xii. Geoinformatics
xiii. Manufacturing Engineering & Management
xiv. Petroleum Engineering
xv. Petroleum Engineering & Management
xvi. Project Management
xvii. Reservoir Engineering
xviii. Urban and Regional Planning

1.3.6 Normally, entry to such programmes is available to those who have a Lower Second Class Honours degree or its equivalent in the specified subject area or in a related area with a record of experience in the subject area.

1.3.7 Students with Third Class or Pass degrees or equivalent in the relevant field of study shall only be accepted for admission to an MSc/Diploma programme provided they have obtained at least two years' experience in the field and have a satisfactory confidential reference from their employer.

1.4 Course of Study – MSc/MASc/Diploma

1.4.1 The courses of advanced study for a postgraduate Diploma or a Master's degree by examination by written papers include, in addition to the courses of instruction, supervised research development or industry-oriented work culminating in the submission of a Project Report. Guidelines for submission of Project Reports are indicated under the relevant programmes.

1.4.2 Full-time MSc/MASc/Diploma students must normally submit their Project Reports nine (9) months after completion of the written examinations, while part-time MSc/MASc/Diploma students are required to do so within twelve (12) months.

- Candidates who fail to submit their Reports in good time shall be removed from the Register of Postgraduate Students.

- Candidates are required to pass both written examinations and coursework of the MSc/MASc/Diploma programmes at the first attempt. Candidates failing the coursework or written examination at the first attempt may be allowed a second attempt at the examination on the recommendation of the Board of Examiners.

- 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 otherwise decides. 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.

1.4.3 A proportion of the marks which make up the final result of a particular course examined by a written Paper may be derived from the candidate's performance in course work assignments, in course tests, etc. All such assignments must be completed and submitted to the examiners before the date of the written examination.

1.4.4 Candidates whose work is at any time reported by their Supervisors to be unsatisfactory or who do not satisfy the Examiners on Courses or Project Reports that form part of the postgraduate programme may be removed from the Register of Postgraduate Students.

1.4.5 Such students shall not normally be readmitted for at least two years thereafter. Students readmitted to MSc/MASc/Diploma programmes shall be eligible for credits for those courses passed creditably during their previous registration, provided that not more than five years have elapsed since the applicants withdrew from the University and that the course content has not changed significantly in the interval.

1.5 Completion Time – MPhil/PhD

1.5.1 A candidate for the MPhil degree shall submit a thesis for examination within three (3) calendar years of initial registration for full-time studies, or five (5) calendar years for part-time studies.

1.5.2 A candidate for the PhD degree shall submit a thesis for examination within five (5) calendar years of initial registration for full-time studies, or seven (7) calendar years for part-time studies.

1.6 Research Seminars

1.6.1 All students registered for an MPhil degree must satisfactorily complete at least two (2) research seminars, prior to submission of the MPhil thesis. Students registered for the PhD degree must satisfactorily complete three (3) such seminars. Assessment of the students' seminars must be included in their Progress Reports.

1.6.2 This seminar is assessed normally by the Supervisor of the student's studies and is reported as being satisfactory or unsatisfactory on the student's annual Progress Report. It is intended to:

i. provide a forum for the critical appraisal of the objectives, methodology, direction and progress of the research being undertaken.

ii. create a wider awareness in the University community of the research activities within the Faculty.

iii. provide additional means of monitoring the progress of postgraduate students doing research theses.

iv. create and foster an appropriate research culture within the Faculty.

1.7 Procedural Guidelines for the Upgrading of an MPhil to PhD

1.7.1 Postgraduate students who are registered for the MPhil Degree and who are contemplating the upgrading of their registration status to that of the PhD are required to do so within two (2) or three (3) years of first registration.

1.7.2 The following are the procedural guidelines for upgrading of one's registration status:

i. The student should consult with his Supervisor (s) on this matter.

ii. The student will apply through his Supervisor (s) to the Head of Department, formally seeking upgrading, copying both the Assistant Registrar (Graduate Studies and Research) and the Chairman, Faculty Sub-committee on Graduate Studies.

iii. The Head of Department, if in agreement, consults with the Supervisor and Chairman, Faculty Sub-Committee on Graduate Studies and Research and establishes an Upgrading Assessment Committee.

iv. The Upgrading Assessment Committee should normally comprise the Supervisor(s) plus two Independent Assessors.

v. Assessors should be chosen on the basis of their knowledge and experience at the appropriate level in the area of the student's research and may be drawn from outside of The University of the West Indies.

The Chairman, Faculty Sub-Committee requests from the student, a copy of his Proposal for upgrading for each of the Assessors, and a mutually agreed date is set for the oral presentation by the student of his:

(i) Report on work done under MPhil registration, and
(ii) Research proposal to upgrade the work to PhD.

vi. The Chairman, Faculty Sub-Committee chairs the oral presentation by the student of his Research proposal and later receives from each Assessor, a report with a recommendation regarding the requested upgrading.

vii. The Chairman, Faculty Sub-Committee reviews the Reports and forwards a recommendation on upgrading to the Campus Committee on Higher Degrees, through the Faculty Board.

1.8 Theses and Project Reports

1.8.1 The form of presentation of Theses and Project Reports must conform to the University's General Regulations governing Higher Degrees. Students should consult the University Library on this matter as well as the University's publication "Theses and Research Papers."

1.8.2 The maximum length of Theses/Project Reports shall be as follows: -

- PhD - 500 pages including Appendices.
- MPhil - 250 pages including Appendices.
- MSc/MASc/Diploma Project Reports - 125 pages including Appendices.
- PG Diploma Project Reports - 100 pages including Appendices.

1.8.3 Essential, elements/components/constituents of the proposed MSc Project Report should include the following:

- Introduction
- Background
- Motivation
- Scope and limitations
- Underlying principles/literature review/theory and fundamentals
- Methods/approach adopted/used and why
- Results
- Discussion of results/review of methodology
- Conclusions and recommendations
- Closure/comment on the significance of the findings from work, its contribution to knowledge in the area, and the lessons that should be learned from the project experience

The above items are listed in typical sequence. The sequence itself is not fixed and may be adjusted to some extent as appropriate to each particular case.

1.9 Prizes

The Faculty prides itself on its strong tradition of nurturing top-class graduates who have gone on to accomplish themselves as regional and international industry professionals or in degree programmes in other universities. Student motivation plays a significant role in this regard. The Faculty of Engineering thanks the following industry stakeholders and individuals who have partnered with us to recognize and reward our students/graduates who have excelled in their respective programmes during the 2026/2027 Academic Year.

- AAlpha Engineering & Design (2012) Ltd
- Angostura Limited
- Arawak and Company Limited
- Associated Brands Industries Limited
- Association of Professional Engineers of Trinidad & Tobago APETT
- BP Trinidad & Tobago (bpTT)
- Caribbean ICT Research Programme (CIRP)
- Coastal Dynamics Ltd
- Coosal's Construction Company Ltd
- Construction Services and Supplies Limited (CSSL)
- Danny's Enterprise Co. Limited
- Delta Logistics
- Department of Chemical Engineering
- Department of Mechanical & Manufacturing Engineering
- Dr Aaron Chadee
- Dr Charisse Griffith-Charles
- Dr Saheeda Mujaffar
- Dr Trevor Townsend Prize
- Fine Choice Meats Limited
- GeoOrbis Geospatial Technologies
- GISCAD
- IDC Imbert Prize
- IEEE Trinidad and Tobago Section Prize
- Institute of Surveyors of Trinidad and Tobago
- IStructE CRG Engineering Advocacy Award
- Kee-Chanona Limited - Thomas Chanona Prize
- Kiss Baking Company Limited
- KS & P Limited
- KVR Energy Limited
- L & S Surveying Services Limited
- Lauriston Lewis Associates Ltd Bill Massiah/Percy Phillips Memorial
- Madam Nai Wah Chow
- Mr Amit Seeram
- National Energy Corporation of Trinidad and Tobago
- Nu-Iron Unlimited
- PLIPDECO
- POWERGEN
- Process Management Limited, a Puffer Sweiven Company
- Prof Clement Imbert
- Professor Bheshem Ramlal
- Professor Edwin Ekwue
- Project Management Institute (PMI) Southern Caribbean Chapter
- Proman Trinidad & Tobago (Proman Limited)
- PROMASERV
- Raymond & Pierre
- Society of Caribbean Industrial Engineers (SCIE)
- Telecommunications Authority of Trinidad and Tobago (TATT)
- Teleios Systems Limited
- The Asset Maintenance & Reliability Consultants Company (AMREC)
- The Baksh Family of Engineers
- The Geographic Information Systems Society of Trinidad and Tobago
- The Geological Society of Trinidad & Tobago
- The Institution of Engineering and Technology (IET)
- The Society of Petroleum Engineers Trinidad and Tobago Section (SPETT)
- Trinidad & Tobago Electricity Commission (T&TEC)
- Trinidad & Tobago National Petroleum Marketing Company Limited
- Trinidad and Tobago Network Information Centre (TTNIC)
- Trinidad and Tobago Society of Planners
- UNIPET
- Virtana Inc

DEPARTMENT OF CHEMICAL ENGINEERING

Research

The Department of Chemical Engineering is part of the Faculty of Engineering with a commitment to providing national and regional service to the process industries. These industries include the full spectrum available in the Caribbean including petroleum and petrochemicals, bauxite, sugar and food-processing. The Groups of Food Science & Technology and Petroleum Studies are included in the Department of Chemical Engineering along with the Chemical and Process Engineering Group, each with specific remits to serve their respective industries.

The Department recognises the need to promote industrial linkages, applied research, fundamental research and the continuing education of persons in the relevant disciplines. The research efforts are essentially geared to the solving of problems relevant to the entire Caribbean region.

Research in the Department of Chemical Engineering is aimed at the development of the indigenous resources of the Caribbean region. The broad areas of research in the Department are as follows:

Chemical and Process Engineering Group

- Energy Studies: Hydrogen, Renewable and Sustainable Energy
- Corrosion Studies
- Membrane Technology
- Flow Assurance and Computational Fluid Dynamics
- Bio-fluid mechanics and Cardiovascular Technology.
- Supercritical Fluid and solvent Extraction
- Carbon Dioxide Capture and Utilisation
- Process Control and Optimisation
- Life Cycle Sustainability Assessments
- Waste Valorisation and Resource Circular Process systems

Food Science and Technology Group

- Food Preservation, Processing and Packaging
- Food Microbiology, Sanitation and Quality Assurance
- Food Product Development
- Nutrition, Health and Wellness
- Postharvest Technology
- Good Agricultural Practices to facilitate Agro processing
- Good Manufacturing Practices and HACCP
- Food Regulations and Compliance
- Culinary Development and Innovation for the Food Service Industry
- Techno-economic Studies for the Food and Beverage Industry

Petroleum Studies Group

- Geochemistry, Mineralogy and Petrology
- Rock Mechanics, Rock Preparation and Thin Sections
- Unconventional Reservoirs: Heavy Oil, Shale Oil, Tar Sands and Gas Hydrates
- Sedimentology, Stratigraphy and Sequence stratigraphy
- Seismic Studies
- Biostratigraphy and Environmental Paleontology
- Oil and Gas PVT and Phase Behaviour Studies
- Carbon Dioxide Sequestration, EOR and CERM
- Reservoir Characterisation with Nano-Particle Technology Application
- Drilling Technology and Wellbore Stability

The Department offers programmes of study by research leading to the MPhil and PhD degrees in Chemical Engineering.

Programmes in Chemical & Process Engineering

MSc (Eng) in Chemical and Process Engineering
MSc (Eng) in Chemical and Process Engineering with Management
MSc (Eng) in Chemical and Process Engineering with Environmental Engineering
MPhil in Chemical Engineering
PhD in Chemical Engineering

NOTE: The MSc Programmes are accredited by the Institution of Chemical Engineers (IChemE) of London en route to CEng.

THE AIMS AND OBJECTIVES
Technical deepening and broadening beyond the level covered by the BSc Honours Degree:
(a) To allow students to engage in creative and innovative development of engineering technology.
(b) To gain experience in team-working while broadening the knowledge base through research and experimentation.
(c) To meet the full requisites of UK SPEC for eventual registration of our graduates as Chartered Engineers.

OBJECTIVES BY PROGRAMME
MSc in Chemical and Process Engineering
1. Enrich the undergraduate experience through advanced courses and industrial projects.
2. Provide a solid foundation and understanding of the fundamental principles of mathematics, science, and engineering.
3. Provide students with experience in learning and applying tools (e.g., computer skills) to solve theoretical and open-ended chemical engineering problems.

MSc in Chemical and Process Engineering with Management
1. Enrich the undergraduate experience through advanced courses in Management and industrial projects.
2. Provide training at postgraduate level in specialised Financial and management through teaching and solving problems.

MSc in Chemical and Process Engineering with Environmental Engineering
1. To alert students to major environmental concerns at global and regional level.
2. To train students in the planning and design of engineering works related to the preservation and improvement of the environment.

MPhil and PhD Programmes
1. Generate innovative knowledge applied to the solution of engineering problems, in line with new economic and environmental demands.
2. Lead research processes aimed at improving engineering.
3. Develop and transfer methods, techniques and methodologies, tools aimed at strengthening engineering processes in the industry.

STRUCTURE OF PROGRAMMES
Offered Part-time only.

DURATION OF STUDY
A minimum of 36 months (two years of courses + one year research project).

NO. OF CREDITS REQUIRED:
40 Credits

ENTRY REQUIREMENTS
Admission of Applicants with an Honours Degree
The minimum requirement for admission to the taught Master's programme is normally a Lower Second Class Honours degree in Chemical and Process Engineering.

Final approval of applications is subject to the Department's approval. The minimum admission requirement for MPhil and PhD programmes is normally an Upper Second Class Honours degree or its equivalent.

Further information on direct admission to MPhil and PhD programmes is available in Section 1 Regulations 6 - 8 of the Regulations for Graduate Diplomas and Degrees.

Admission of Applicants with a Pass Degree

The admission of applicants with a Pass degree requires a statement from the Department on the suitability of the applicant to pursue graduate studies at the University of the West Indies. Candidates admitted with a Pass degree may be required to register for such supplementary courses as the Department stipulates.

Course Listing

SEMESTER 1

Course Code	Course Title	Credits
CHNG 6001	Advanced Process Dynamics & Controls	C4
CHNG 6102	Advanced Chemical Reaction Engineering	E4
MENG 6506	Project Management	C3
CHNG 6206	Research Methods for Chemical Engineers	C3
CHNG 6003	Process Synthesis, Analysis & Optimisation	C4
CHNG 6302	Chemical Engineering MSc Project Part 1: Project Proposal (Literature Review & Theory where applicable) Part 2: (Experimental; Practical; Computational)	C9

SEMESTER 2

Course Code	Course Title	Credits
CHNG 6101	Advanced Chemical Engineering Thermodynamics	C3
CHNG 6002	Numerical Methods & Computing	C4
CHNG 6302*	Chemical Engineering MSc Project Part 1: Project Proposal (Literature Review & Theory where applicable) Part 2: (Experimental; Practical; Computational)	C9

Together with two (2) optional courses to be chosen from one (1) of the three (3) streams:

Chemical & Process Engineering Stream

Course code	Course title	Credits
CHNG 6201	Biochemical Engineering II	E3
CHNG 6203	Petroleum Processing Technology	E3
CHNG 6204	Utilities Engineering	E3
CHNG 6303	Desalination	C3
PENG 6007	Reservoir Engineering	E4
PENG 6012	Natural Gas Engineering	E4
PENG 6015	Production Engineering	E4

Management Stream

Course Code	Course Title	Credits
MENG 6402	Human Resource Management I	E3
MENG 6405	Total Quality Management	E3
MENG 6502	Financial Management	E3

Environmental Engineering Stream

Course Code	Course Title	Credits
ENGR 6005	Pollution Prevention, Cleaner Production & Industrial Waste Abatement	E3
ENGR 6006	Water & Wastewater Engineering	E3
ENGR 6007	Air Pollution Control	E3
ENGR 6018	Energy & The Environment	E3

In addition, existing graduate courses in the Faculty can be taken but approval has to be obtained from the Department and Faculty prior to doing so.

*CHNG 6302: the student needs to complete ALL courses and receive authorisation from the Coordinator before he/she can register for this course

Programmes in Food Science and Technology

- ***MSc in Food Science and Technology***
- ***MPhil in Food Science and Technology***
- ***PhD in Food Science and Technology***

AIMS OF THE PROGRAMMES

a. To accommodate the useful application of knowledge and practices to the developmental needs of the food and beverage industry in the region, to the real world of commerce, and to the public need.

b. To foster scholastic achievement in graduates through quality education to produce critical and creative thinkers who are highly motivated, civic-minded, and entrepreneurial in mind-set.
c. To pursue cutting-edge research by both theoretical and applied methods, thus producing individuals who are innovative and can solve real-world problems in the food and beverage industry, in related government, research and private institutions, and in developmental and other agencies.

OBJECTIVES OF THE PROGRAMMES

MSc in Food Science and Technology

1. To effectively perform technical and operational management roles in the agri-processing and food and beverage sectors;
2. To acquire the technical knowledge and practical skills required to successfully start his/her own agri-food business; and
3. To demonstrate the ability to apply knowledge and understanding to real life situations in food-related businesses, systems and processes.

MPhil and PhD in Food Science and Technology.

The overall objectives of the programmes are that research graduates:

1. Can generate new or innovative knowledge applied to the solution of complex food science and technology challenges taking into account business, environmental and social constraints.
2. Are able to develop and lead specialised research projects in an interdisciplinary research environment, aimed at improving food products, processes and systems.
3. Have acquired discipline specific and transferable skill sets to either influence or bring about change in the workplace or profession.

MSc in Food Science and Technology

ENTRY REQUIREMENTS

The Regulations for the MSc in Food Science and Technology are the same as the General Regulations for the MSc (Eng) in the Faculty of Engineering, except that candidates applying for registration should normally have:

A Bachelor's Degree in Food Science and Technology, Natural Science or Nutrition (with Mathematics and/or Statistics and Chemistry at the Preliminary and Introductory Level) or Agriculture, or Chemical Engineering or Agricultural Engineering;

Candidates for registration in this programme must first hold a degree in any of the following subjects:

- Food Science
- Food Technology
- Food Science and Technology
- Chemistry or Applied Chemistry
- Natural Sciences
- Chemical, Biochemical or Agricultural Engineering
- Agriculture
- Nutrition
- Home Economics with a major in Nutrition or Food Technology

Admission of Applicants with an Honours Degree
The minimum requirement for admission to the taught Master's programme is normally a Lower Second Class Honours degree in Chemical and Process Engineering.

Final approval of applications is subject to the Department's approval. The minimum admission requirement for MPhil and PhD programmes is normally an Upper Second Class Honours degree or its equivalent.

Further information on direct admission to MPhil and PhD programmes is available in Section 1 Regulations 6 – 8 of the Regulations for Graduate Diplomas and Degrees.

Admission of Applicants with a Pass Degree
The admission of applicants with a Pass degree requires a statement from the Department on the suitability of the applicant to pursue graduate studies at The University of the West Indies. Candidates admitted with a Pass degree may be required to register for such supplementary courses as the Department stipulates.

DURATION OF STUDY
Full-time: Maximum – 3 years
Part-time: Maximum – 5 years

STRUCTURE OF PROGRAMMES
Offered part-time and full-time
a. Part-time students: - must normally submit their Project Reports nine (9) months from date of registration.
b. Full-time students: - must normally submit their Project Reports nine (9) months from date of registration.

Candidates who fail to submit their Reports in good time shall be removed from the Register of Postgraduate students.

MSC PROGRAMME - COURSE OF STUDY
Following the pattern established by the Institute of Food Technologists (IFT) in the United States of America and the Institute of Food Science & Technology (IFST) in the United Kingdom, students will be required to pursue an appropriate course of study as determined by the School for Graduate Studies and Research, UWI, St. Augustine and the Food Science and Technology Unit, Department of Chemical Engineering.

Total No. of Credits Required: 41
No. of course credits - 32

*MENG 6508 is now compulsory for all students.

Students should demonstrate proficiency in Food Science & Technology by satisfactory completion of at least 32 credits of coursework. *Students who have completed all taught courses must register for Research Project FOST6020 credits

Course Listing

Course Code	Course Title	Credits
SEMESTER 1		
FOST 6002	Food Packaging	2
FOST 6003	Food Chemistry	3
FOST 6005	Food Microbiology	4
FOST 6006	Food Quality Assurance	4
FOST 6007	Preservation and Processing of Meat and Poultry	3

SEMESTER 2		
FOST 6000	Fundamentals of Food Process Engineering	4
FOST 6001	Sanitation in Food Processing	3
FOST 6004	Food Processing Laboratories	3
FOST 6008	Preservation and Processing of Fruits and Vegetables	3
MENG 6508	Research Methods	3
FOST 6019	Research Project	6
FOST 6020	Research Project	9

MPhil in Food Science and Technology

The Regulations for the MPhil in Food Science and Technology are the same as the Faculty Regulations General Regulations for the MPhil except that candidates applying for registration should normally have either:

a. A Bachelor's Degree in Food Science and Technology or related discipline, **OR**
b. A Master's Degree in Food Science and Technology, or related discipline.

PhD in Food Science and Technology

The Regulations for the PhD in Food Science and Technology are the same as the University and Faculty of Engineering regulations for the degree of Doctor of Philosophy except that candidates applying for registration should normally have either:

a. A Master of Philosophy Degree in Food Science and Technology or related discipline of The University of the West Indies, **OR**
b. An equivalent academic or professional qualification acceptable to the Faculty of Engineering or a Master of Science in Food Science and Technology with a Distinction.

Other Information

The Food Science and Technology Group is equipped with science laboratories that include a semi-commercial processing hall containing a range of small-scale equipment suitably instrumented for the systematic study of operations involved in the food and beverage industry; a food microbiology laboratory, a quality assurance laboratory, a food research laboratory with specialised analytical equipment, and a sensory evaluation facility.

Areas of current research include food analysis, food safety and risk assessment, food preference and sensory studies, food fermentations, milk, meat, fish and seafood, fruit and vegetable microbiology and processing, food dehydration, root crop processing and innovative food product and packaging development.

The Group maintains links with the food processing industry and other relevant stakeholders, particularly in the areas of food product development, good manufacturing practices and food regulations. Staff are also involved in scientific and technical societies, in particular, the Institute of Food Technologists (USA), the Canadian Institute of Food Science & Technology and the Institute of Food Science & Technology (UK). Staff members also have numerous contacts with overseas institutions which they visit, and in which they sometimes conduct research. Many linkages exist with national and international development agencies. Industry internships are NORMALLY offered to students who have been successful in ALL courses (subject to vacancies in industry). Furthermore, cash Prizes from industry sponsors are awarded to students obtaining the highest mark in some courses.

Graduates of this programme have found employment in the food and beverage industry, mainly in research and development, quality assurance and production management. Some individuals are engaged in research and innovation in government and industry-sponsored research organisations. Other graduates are academic staff within universities. Many opportunities also arise within the food service establishments and pharmaceutical industries, in teaching, in libraries and information centres, and within overseas institutions and development agencies.

Programmes in Petroleum Studies

- ***MSc in Petroleum Engineering***
- ***MSc in Petroleum Engineering and Management***
- ***MSc in Reservoir Engineering***

THE SUBJECT

Petroleum Engineering involves the application of earth and physical sciences to the evaluation and exploitation of natural hydrocarbon resources. The dominant problems of the petroleum engineer are those of flow and equilibrium in porous media, in vertical and horizontal well bores, surface pipelines and in primary process equipment. The complexity of the hydrocarbon fluids, and geological strata involved reservoirs and production systems flow raises problems requiring sophisticated numerical techniques for their solution. This extends to engineered solutions in drilling and production engineering while in the field.

COOPERATION WITH INDUSTRY AND GOVERNMENT

We have strong links with both industry and government which includes the exchange of ideas, expertise, supervision and h financial support for both academic and students. Visiting lecturers from these entities make an important contribution to the more specialised teaching aspects of the MSc programme. The interaction between industry and government is evident in the following ways.

- Lectures in some courses are given by personnel from industry and government.
- Seminars are given by engineers and managers from energy companies.
- Direct recruitment from the course; there are several past students now in technical and management positions in industry and government.
- Industry and government support through student scholarships and secondment.
- Project topics are often proposed and partly supervised by industry.
- Industry supervised site visits/field trips.

SOCIETY OF PETROLEUM ENGINEERS (SPE)

There is a strong interaction with the Society of Petroleum Engineers which is, a professional, international and learned society focused on petroleum engineering. The aim of the SPE is to disseminate knowledge ranging from engineering fundamentals to practical field experience. Over the years, the SPE has been supportive to Petroleum Engineering at The UWI through bursary awards, and welcoming students to their meetings and conferences.

MSc in Petroleum Engineering

Accredited by the Energy Institute (EI) of London en route to CEng (September 2023 to August 2026)

OVERVIEW

The Petroleum Engineering MSc Programme consists of eight (8) taught courses, a Research Methods course and an independent project. It is a conversion programme from other engineering and science-based degree foundations into the specialties of Petroleum Engineering.

THE AIMS AND OBJECTIVES

To provide the necessary background for employment in the oil and gas sector, or additional qualifications for those already working in the industry, as well as provide a springboard for entry into academic research degrees.

REGULATIONS AND ENTRY REQUIREMENTS

1. The Regulations for the MSc (Eng) in Petroleum Engineering, Reservoir Engineering, and Petroleum Engineering & Management are the same as the General Regulations for the MSc (Eng) in the Faculty of Engineering, except that the candidates applying for registration should have at least:
    a. A Second-Class Honours degree in Engineering/Natural Sciences (Physics & Chemistry majors)/Earth Sciences; **OR**
    b. An equivalent qualification, in respect of either Engineering and/or Engineering Management.

2. A candidate applying for registration with a Pass degree may be considered for entry provided the candidate has acceptable industrial experience.

STRUCTURE OF PROGRAMME: OFFERED BOTH PART-TIME AND FULL-TIME

a. Part-time students: - Normally required to complete the written examinations within two (2) years of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within twelve (12) months.
b. Full-time students: - Normally required to complete the written examinations within one (1) year of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within nine (9) months.

NB: The normal load for a part-time student is half that of a full-time student.

DURATION OF STUDY

This is dependent on whether the student is part-time or full-time.

a. Part-time students: Maximum of five (5) years.
b. Full-time students: Maximum of three (3) years.

CREDITS

Total number of credits required: 44

Number of course credits - 32

Number of project credits - 12 (Research Methods - 3 credits and Research Project - 9 credits)

CREDITS FOR DIPLOMA COURSES TOWARDS THE MSC DEGREE

Holders of the Postgraduate Diploma in Petroleum Engineering, or Petroleum Engineering and Management will be granted credit for courses completed in the programme if they are subsequently admitted to the MSc degree, provided that not more than five (5) years have elapsed since the date on which such courses were passed.

EXAMINATION

As follows:

a. Evaluation in all courses will normally be by coursework and final examination. Candidates will be required to pass both the coursework and examination components.
b. MSc Petroleum Project - evaluation will be on a submitted report. Candidates may also be orally examined.

SHORT COURSES AND SEMINARS

The programme in Petroleum Engineering and Management also includes short courses and seminars on topics of interest to supervisors, engineers and managers in the petroleum industry. These are on subjects of topical interest and are organised frequently in response to identified needs and problems. For further details on these short courses or general advice on the programme, you are invited to contact the Head, Department of Chemical Engineering.

COURSE LISTING

An MSc (Eng) candidate in Petroleum Engineering will be required to pursue a course of study approved by the Board of the Faculty of Engineering. Such a course of study will normally be made up of a Research Methods course, an independent project and the eight (8) following courses:

Course Code	Course Title	Credits
PENG 6000	Petroleum Geoscience	4
PENG 6002	Drilling Engineering & Completions	4
PENG 6005	Reservoir Evaluation	4
PENG 6007	Reservoir Engineering	4
PENG 6010	Improved Oil Recovery	4
PENG 6012	Natural Gas Engineering	4
PENG 6015	Production Engineering	4
PENG 6025	Group Field Project	4

Each candidate will also be required to undertake PENG 6023 – Research Methods and PENG 6024 – Research Project.

Notes

1. Students should register for PENG 6023 or Faculty Equivalent and PENG 6024.
2. There may be field work on a Saturday or Sunday.

MSc in Petroleum Engineering and Management

Accredited by the Energy Institute (EI) of London en route to CEng (September 2023 to August 2026)

OVERVIEW

Petroleum Engineering and Management provides the option to study the management and commercial aspects of the petroleum industry. Decision-making, contractual negotiations and arrangements; financial implications and manpower management must be well understood and executed at various stages. Programme duration for part-time/full-time candidates as well as aims and objectives follow in accordance with the MSc in Petroleum Engineering programme.

REGULATIONS AND ENTRY REQUIREMENTS

1. The Regulations for the MSc (Eng) in Petroleum Engineering, Reservoir Engineering, and Petroleum Engineering & Management are the same as the General Regulations for the MSc (Eng) in the Faculty of Engineering, except that the candidates applying for registration should have at least:
    a. A Second-Class Honours degree in Engineering/Natural Sciences (Physics & Chemistry majors)/Earth Sciences; **OR**
    b. An equivalent qualification, in respect of either Engineering and/or Engineering Management.

2. A candidate applying for registration with a Pass degree may be considered for entry provided the candidate has acceptable industrial experience.

STRUCTURE OF PROGRAMME: OFFERED BOTH PART-TIME AND FULL-TIME

a. Part-time students: - Normally required to complete the written examinations within two (2) years of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within twelve (12) months.
b. Full-time students: - Normally required to complete the written examinations within one (1) year of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within nine (9) months.

NB: The normal load for a part-time student is half that of a full-time student.

DURATION OF STUDY

This is dependent on whether the student is part-time or full-time.

a. Part-time students: Maximum of five (5) years.
b. Full-time students: Maximum of three (3) years.

CREDITS

Total number of credits required: 44

Number of course credits - 30 (two compulsory 3-credit courses and six 4-credit courses)
Number of project credits - 12 (Research Methods - 3 credits and Research Project - 9 credits)

EXAMINATION

As follows:
Evaluation in all courses will normally be by coursework and final examination. Candidates will be required to pass both the coursework and examination components.
MSc Petroleum Project - evaluation will be on the report. Candidates may also be orally examined on the Project Report.

COURSE LISTING

An MSc candidate in Petroleum Engineering and Management will be required to pursue a course of study approved by the Board of the Faculty of Engineering. Such a course of study will normally be made up of eight (8) of the following courses (two of which are compulsory) a Research Methods course and an Independent Project.

Compulsory 3 credits courses:

Course Code	Course Title	Credits
MENG 6402	Human Resource Management	3
MENG 6502	Financial Management	3

Electives - any six (6) of the following four (4) credits courses:

Course Code	Course Title	Credits
PENG 6002**	Drilling Engineering & Completions	4
PENG 6005**	Reservoir Evaluation	4
PENG 6007**	Reservoir Engineering	4
PENG 6009	Strategic Petroleum Management & Organisations	4
PENG 6010**	Improved Oil Recovery	4
PENG 6011	Petroleum Economics, Law & Contract Administration	4
PENG 6012**	Natural Gas Engineering	4
PENG 6015**	Production Engineering	4
PENG 6021	Production Planning & Control	4

***Currently offered in the MSc. Petroleum Engineering Programme*

Each candidate will also be required to undertake:

Course Code	Course Title	Credits
PENG 6023	Research Methods	3
followed by		
PENG 6024	Research Project	9

The objectives and learning outcomes for the Project Report will be similar to Project Report PENG6024 currently offered in the MSc Petroleum Engineering Programme. The primary difference is that the emphasis of the former project will be around the theme of management in the petroleum industry.

MSc in Reservoir Engineering

Accredited by the Energy Institute (EI) of London en route to CEng (September 2023 to August 2026)

OVERVIEW

Reservoir Engineering is a subset of petroleum engineering where understanding of the reservoir is studied in more detail. Reservoir Engineers seek to economically optimise the exploitation of the reservoir. Programme duration for part-time/full-time candidates as well as aims and objectives follows in accordance with the MSc in Petroleum Engineering programme.

REGULATIONS AND ENTRY REQUIREMENTS

1. The Regulations for the MSc (Eng) in Petroleum Engineering, Reservoir Engineering, and Petroleum Engineering & Management are the same as the General Regulations for the MSc (Eng) in the Faculty of Engineering, except that the candidates applying for registration should have at least:
    a. A Second-Class Honours degree in Engineering/Natural Sciences (Physics & Chemistry majors)/Earth Sciences; **OR**
    b. An equivalent qualification, in respect of either Engineering and/or Engineering Management.

2. A candidate applying for registration with a Pass degree may be considered for entry provided the candidate has acceptable industrial experience.

STRUCTURE OF PROGRAMME: OFFERED BOTH PART-TIME AND FULL-TIME

a. Part-time students: - Normally required to complete the written examinations within two (2) years of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within twelve (12) months.

b. Full-time students: - Normally required to complete the written examinations within one (1) year of registration - Project should be started at the commencement of the semester following the completion of the written examinations and completed within nine (9) months.

NB: The normal load for a part-time student is half that of a full-time student.

DURATION OF STUDY

a. This is dependent on whether the student is part-time or full-time.Part-time students: Maximum of five (5) years.
b. Full-time students: Maximum of three (3) years.

CREDITS

Total number of credits required: 44

Number of course credits - 32

Number of project credits - 12 (Research Methods - 3 credits and Research Project - 9 credits)

Credits for Diploma Courses towards the MSc Degree

Holders of the Postgraduate Diploma in Petroleum Engineering, or Petroleum Engineering and Management will be granted credit for courses completed in the programme if they are subsequently admitted to the MSc degree, provided that not more than five (5) years have elapsed since the date on which such courses were passed.

EXAMINATION

As follows:

a. Evaluation in all courses will normally be by coursework and final examination. Candidates will be required to pass both the coursework and examination components.
b. MSc Petroleum Project - evaluation will be on a submitted report. Candidates may also be orally examined.

COURSE LISTING

An MSc (Eng) candidate in Reservoir Engineering will be required to pursue a course of study approved by the Board of the Faculty of Engineering. Such a course of study will normally be made up of eight (8) of the following courses, a Research Methods course and an independent project.

Course Code	Course Title	Credits
PENG 6000*	Petroleum Geoscience	4
PENG 6006	Advanced Well Test Analysis	4
PENG 6007*	Reservoir Engineering	4
PENG 6008	Advanced Reservoir Engineering	4
PENG 6010*	Improved Oil Recovery	4
PENG 6012*	Natural Gas Engineering	4
PENG 6025*	Group Field Project	4
PENG 6028	Formation Evaluation	4

**Currently offered in the Petroleum Engineering MSc.*

Each candidate will also be required to undertake PENG 6023 - Research Methods followed by PENG 6024 - Research Project.

Postgraduate Diploma in Petroleum Engineering & Management

Candidates may select one of the two options below.

i. Pursue three (3) of the courses listed below and undertake PENG 6023 - Research Methods and PENG 6024 - Research Project

OR

ii. Pursue six (6) of the following courses:

Course Code	Course Title	Credits
PENG 6002	Drilling Engineering & Completions	4
PENG 6006	Advanced Well Test Analysis	4
PENG 6007	Reservoir Engineering	4
PENG 6008	Advanced Reservoir Engineering	4
PENG 6009	Strategic Petroleum Management & Organisations	4
PENG 6010	Improved Oil Recovery	4
PENG 6011	Petroleum Economics, Law & Contract Administration	4
PENG 6012	Natural Gas Engineering	4
PENG 6015	Production Engineering	4
PENG 6021	Production Planning and Control	4

MPhil Programmes

MPhil in Petroleum Engineering
MPhil in Petroleum Geoscience
MPhil in Geoscience

THE AIMS AND OBJECTIVES

- To provide innovative solutions to problems associated with Petroleum Engineering and Geoscience, taking economic, technological, environmental and social constraints into consideration.
- To continue to be at the forefront of research aimed at improving the principles, techniques and skills applied to Petroleum Engineering and Geoscience.
- To develop, maintain, and transfer skills, methodologies, learning and critical thinking tools towards the continued improvement in the field of Petroleum Engineering and Geoscience.

REGULATIONS AND ENTRY REQUIREMENTS

The Regulations for the MPhil in Petroleum Engineering, Petroleum Geoscience or Geoscience are the same as the General Regulations for MPhil, except that candidates applying for registration should normally have either:

a) a Bachelor's degree in Petroleum Engineering OR a Diploma in Petroleum Engineering with a Pass with Credit (at least 60%) of The University of the West Indies **OR** an equivalent qualification for MPhil in Petroleum Engineering

b) a Bachelor's degree in Petroleum Geoscience, Geoscience, Earth Sciences or Geology **OR** an equivalent qualification for MPhil in Petroleum Geoscience or Geoscience.

Graduates in the fields of Geology/Geophysics and Engineering (other than Petroleum Engineering) may be required to do qualifying examinations to become eligible for entry into the programme unless such a graduate possesses adequate and practical experience in industry, in which case only Departmental examinations will be required.

PhD Programmes

PhD in Petroleum Engineering
PhD in Petroleum Geoscience
PhD in Geoscience

The aims and objectives follow in accordance with the MPhil Programmes.

REGULATIONS AND ENTRY REQUIREMENTS

1. The appropriate University and Faculty of Engineering Regulations for the degree of Doctor of Philosophy shall apply.
2. Candidates applying should normally have either:
   a) a Master's degree in Petroleum Engineering of The University of the West Indies or an approved University, **OR** an equivalent qualification for PhD in Petroleum Engineering
   b) a Master's degree in Petroleum Geoscience, Geoscience, Earth Sciences, Geology or Geophysics of The University of the West Indies or an approved University **OR** an equivalent qualification for PhD in Petroleum Geoscience or Geoscience.

A candidate may be required to do qualifying examinations to become eligible for entry into the programme unless such a candidate possesses adequate and practical experience in industry, in which case only Departmental examinations will be required.

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

Research

Civil Engineering is intimately concerned with what is called the 'Built Environment'. In this regard, it is directed at the provision of facilities that can be used beneficially by the community. Clearly, such facilities condition the process of social and economic development and to a large extent, mirror them. The civil engineering industry is therefore of strategic national and regional importance in the Caribbean. An important aspect of research in the Department is the role of the construction sector in the local national economies.

Because civil engineering works are essentially 'resource hungry' they consume large quantities of materials in their creation, there is a considerable potential for cost savings in the use of materials for construction. One way of achieving this is through more imaginative use of traditional materials. Another is to develop entirely new materials from indigenous sources. Materials research is therefore an area accorded high priority by the Department.

Other areas of priority take account of the special conditions under which civil engineering works are carried out in the Caribbean. This is true of the organisation and management of labour, the techniques of construction, operation, and maintenance of facilities, no less than of the design of systems and the specification of materials. Additional focus is also placed on Hazard Resistant Construction and Coastal Engineering.

The research interests of the Department are thus related directly to the critical needs and interests of the wider community. Towards this end, it seeks to cultivate links with organisations and interest groups outside the University. Research funded by the National Institute of Higher Education Research, Science and Technology (NIHERST), TANTEAK, IDRC and the EU are typical examples. Funds are also obtained from international sources such as the British Council. The facilities provided are good and constantly being improved. There are eight laboratories: Structures, Concrete, Fluid Mechanics, Environmental Engineering, Soil Mechanics, Highway Materials, Geology and Transportation, to which has recently been added a new computing facility.

The main areas of research can be listed as follows:

- Civil Engineering Economics
- Civil Engineering Project Management
- Coastal Engineering and Management
- Computer-aided Engineering & Design
- Disaster Mitigation & Management
- Environmental Engineering
- Materials Engineering
- The Analysis & Design of Foundations
- The Analysis & Design of Hydraulic Systems
- The Analysis & Design of Structures
- Transport Engineering
- Other areas of research related to the Construction programme is indicated in Section 3.5.4.

The Department offers programmes of study by research leading to the MPhil and PhD degrees in Civil Engineering in all its areas of specialty.

Programmes in Construction Management

OVERVIEW
The practice of civil engineering involves a series of decisions having to be made on choices from a diverse and complex set of alternatives. Such choices are often interrelated and are usually urgent. These decisions have to be made throughout the life of a project from the basis of the initial conception through the design phase, and material and procedure selection to the construction and commissioning of the completed structure. At any stage, the effectiveness of the whole process can be compromised by poor decision-making.

As a result, a heavy demand is placed upon both the managerial and technical skills of the engineers involved. There has been a continuing tendency for civil engineering projects to become both increasingly large and increasingly complex. This has naturally resulted in the technical and managerial functions not only becoming more difficult but also becoming more important. As a result, there is a continuing need to provide training programmes that upgrade the skills and capabilities of engineers and other construction professionals in modern engineering and managerial techniques. An important secondary objective of the MSc/Diploma programme is to provide this service.

By allowing a wider perspective of engineering technology and economy to be taken, it is anticipated that the quality of engineering management should thereby improve. Emphasis is placed upon the publication and presentation of the results of this research to the widest possible national and international audience. Clearly the spin-off benefits of this programme include enhancing the initiative, creativity and purposeful thinking that are generated in those who participate.

THE AIMS AND OBJECTIVES
To provide instruction in a range of engineering, economic and managerial subjects that should enable engineers and construction professionals to be better able to deal with the problems that can occur on a construction project.

To improve the decision-making capabilities of engineers and other construction professionals in the region, with a view to improving the efficiency and effectiveness of the whole construction process.

To equip engineers and construction professionals to apply modern knowledge effectively in the real, competitive world of industry, and hence to assist the nations of the regions in their bid for modernisation and development.

To foster the advancement of knowledge through the promotion of research into the problems and opportunities that face the construction sector.

Postgraduate Diploma in Construction Management

REGULATIONS AND ENTRY REQUIREMENTS
Before registration as a student of the University proceeding to the Postgraduate Diploma in Construction Management, a candidate must have a minimum of one year's appropriate practical experience or equivalent as well as the following:

i. A first degree or equivalent qualification in Civil, Structural, Construction, Building or Architectural Engineering;
OR
ii. A first degree or equivalent qualification in Architecture or Quantity Surveying or Surveying & Land Information;
OR
iii. An equivalent qualification acceptable to the Faculty of Engineering.

Any candidate for the Diploma may be required to sit an entrance examination and/or complete an introductory/qualifying course before being granted permission to read for the Diploma. In addition, candidates seeking admission under (ii) or (iii) may be restricted to certain subject areas in the Course of Study.

STRUCTURE OF PROGRAMMES
This programme is offered both as part-time and full-time.

DURATION OF STUDY
Full-time: Not less than one (1) academic year
Part-time: Not less than two (2) academic years

NUMBER OF CREDITS REQUIRED
The Postgraduate Diploma requires 29 credits. The candidate must pass six (6) core courses and one (1) elective course listed below.

COURSE LISTING - CONSTRUCTION MANAGEMENT

CORE COURSES

SEMESTER 1

Course Code	Course Title	Credits
COEM 6003	Organization & Management of Construction	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6013	Materials Technology	E4
OR		
COEM 6016	Natural Hazards Management	E4

SEMESTER 2

COEM 6025	Practical Team Project	E5
COEM 6005	Construction Project Management	E4

ELECTIVES

SEMESTER 2

Course Code	Course Title	Credits
COEM 6015	Maintenance & Facilities Management	E4

MSc in Construction Management

MSC (NON-TECHNICAL)
This degree is accredited as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired an Accredited CEng (Partial) BEng (Hons) undergraduate first degree.

See www.jbm.org.uk for further information.

REGULATIONS AND ENTRY REQUIREMENTS
Candidates applying for registration should normally have a minimum of one year's appropriate practical experience or equivalent as well as either:

i. A first degree or equivalent qualification in Civil, Structural, Construction, Building or Architectural Engineering;

OR

ii. A first degree or equivalent qualification in Architecture or Quantity Surveying or Surveying and Land Information;

OR

iii. An equivalent qualification acceptable to the Faculty of Engineering.

STRUCTURE OF PROGRAMME
This programme is offered both as part-time and full-time.

DURATION OF STUDY
Full-Time: Not less than one (1) academic year
Part-Time: Not less than two (2) academic years

NUMBER OF CREDITS REQUIRED

The MSc in construction management requires 41 credits. The candidate must pass seven (7) core courses and one (1) elective course. In addition, they have to successfully complete an Independent Research Project (COEM 6018) of nine (9) credit values. The courses, codes, titles, and the corresponding number of credits are listed below.

COURSE LISTING - MSC IN CONSTRUCTION MANAGEMENT

CORE COURSES

SEMESTER 1

Course Code	Course Title	Credits
COEM 6003	Organization & Management of Construction	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6013	Materials Technology	E4
OR		
COEM 6016	Natural Hazards Management	E4

SEMESTER 2

COEM 6005	Construction Project Management	E4
COEM 6020	Research Methods	C3
COEM 6025	Practical Team Project	E5

ELECTIVES

SEMESTER 2

Course Code	Course Title	Credits
COEM 6015	Maintenance & Facilities Management	E4

OTHER INFORMATION

1. For the MSc, after completing all taught components of the courses, students are required to complete the Independent Research Project (COEM 6018) that has a nine (9) credit value.
2. Students will normally be expected to complete their Independent Research Projects within 12 months of finishing the examinations.
3. *Full-time* students will normally be required to complete all required core and elective courses within two (2) consecutive semesters.
4. *Part-time* students will normally be required to complete all required core and elective courses within four (4) semesters.
5. Students having completed the requirements for the Postgraduate Diploma in Construction Management within the specified period have obtained 29 or more credits and completed the Practical Team Project (COEM 6025) may be granted a Postgraduate Diploma upon request.
6. Candidates pursuing the Postgraduate Diploma can request to use the credits they earned to transfer to the MSc programme in Construction Management, if they wish to do so. Upon the approval of the transfer, these students need to complete all the requirements of the MSc programme as stated above in order to obtain the MSc Construction Management degree.

SHORT COURSES AND SEMINARS

1. The Programme in Construction Management may also include Short Courses and/or Seminars on topics of interest to the sector. These are on subjects of topical interest and are organised at various times in response to identified needs and problems.
2. Details of Short Courses and Seminars will be advertised widely and notified to appropriate individuals as and when details are finalised.
3. For further details of the courses and the programme syllabus, or general advice on the programme, please contact the Head, Department of Civil & Environmental Engineering, or the Leader of the Programme.

MPhil, PhD in Construction Engineering & Management and Construction Management

The Construction Engineering & Management programme also offers programmes of study by research leading to the MPhil and PhD Degrees in Construction Engineering & Management and Construction Management.

REGULATIONS AND ENTRY REQUIREMENTS
(Please see the latest version of Regulations for Graduate Certificates, Diplomas and Degrees" by Board for Graduate Studies and Research, UWI)

The regulations for the MPhil in Construction Engineering & Management or Construction Management would require:

1. A minimum GPA of 3.0 or honours degree (Upper Second Class) or its equivalent (unless the Campus Committee in any particular case otherwise decides) in one of the construction-related professions, e.g., Civil Engineering, Building Engineering, Architecture, Quantity Surveying, Planning, Land Surveying, etc.;
2. At least one (1) year of relevant industrial experience;
3. Before completion must have passed a course in Research Methods or equivalent

For the PhD in Construction Management or Construction Engineering & Management programme, the applicant must possess:

1. Approved graduate degrees awarded primarily for research;
2. Taught Master's 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;
3. Approval of upgrade application;
4. Such other qualifications and experience as the Board for Graduate Studies and Research may approve;
5. At least one (1) year of relevant industrial experience.

A candidate may be required to sit an entrance examination and/or complete introductory/qualifying courses before being allowed to read for the MPhil or PhD degree.

THE PRINCIPAL AREAS OF RESEARCH
The Principal areas of research are as follows (but not limited to):

- Advanced Construction Materials
- Building Information (BIM) in the Architecture, Engineering, and Construction Industry
- Caribbean Construction Firms and/or Finance
- Construction Management and Administration
- Green Technology Application in Construction
- Information and Communication Technology (ICT) in Construction Engineering and Management
- Infrastructure Technology in Construction Management
- Management of Quality in Construction
- Marine and Offshore Structure Construction
- Project and/or Resource Management
- Rehabilitation, Retrofitting, and Repairing of Existing Construction
- Service-Life Prediction Modeling and Life-Cycle Costing
- Sustainable Construction

Programmes in Coastal Engineering & Management

Integrated coastal zone management in the wider Caribbean is recognised as the approach for ensuring the survival and sustainable development of the coastal resources of the region. The Coastal Zone Manager needs to have a pool of knowledge and skills that support reliable decision-making for the preservation, enhancement and sustainable development of the coastal zone.

The Graduate Programme in Coastal Engineering and Management in the Department of Civil & Environmental Engineering has two (2) degree offerings:

i. **Postgraduate Diploma in Coastal Engineering and Management, and**
ii. **MSc in Coastal Engineering and Management**

AIMS OF THE PROGRAMME

To provide advanced and specialised knowledge in the field of coastal engineering and management associated with the natural and man-made coastal zone infrastructure.
To equip the graduate with the knowledge of coastal processes and coastal engineering techniques required for the assessment of coastal defence systems and the design of coastal engineering schemes, with particular emphasis on Caribbean conditions.
To produce a graduate capable of developing coastal management plans and management systems.
To produce a graduate capable of implementing and managing new research initiatives.

COURSE DELIVERY

The course is designed to be delivered in a blended format with weekly synchronous sessions, asynchronous activities, group activities, field trips and group design exercises. All course notes are available on the My-eLearning platform, which facilitates ease of delivery.

REGULATIONS AND ENTRY REQUIREMENTS

A first degree (lower second-class honours minimum) from an approved University in the Natural Sciences, Planning, Civil Engineering, Environmental Engineering, Surveying, Land Information, **OR**
An accredited BTech or HND/Associate Degree in Civil Engineering plus five (5) years related postgraduate experience.

Postgraduate Diploma in Coastal Engineering and Management

STRUCTURE OF PROGRAMME

Offered both Part-time and Full-time; Blended Delivery

DURATION OF STUDY (FOR TAUGHT COMPONENT):

Minimum of two (2) semesters or a maximum of four (4) semesters

NUMBER OF CREDITS REQUIRED: 28

COURSE LISTING

SEMESTER 1		
Course Code	**Course Title**	**Credits**
CZEM 6100	Coastal Processes & Hazards	E4
CZEM 6101	Coastal Geomorphology	E4
CZEM 6130	Principles of Coastal Defence, Management and Environmental Assessment	E4
COEM 6016	Natural Hazards Management	E4
SEMESTER 2		
CZEM 6102	Coastal Zone Metrics	C4
COEM6106	Design of Coastal Structures	C4
CZEM 6112	Coastal Zone Modelling	C4

MSc in Coastal Engineering & Management

STRUCTURE OF PROGRAMME
Offered Part-time and Full-time; Blended Delivery

DURATION OF STUDY (FOR TAUGHT COMPONENT):
Minimum of two (2) semesters or a maximum of four (4) semesters

NUMBER OF CREDITS REQUIRED: 40

COURSE LISTING

SEMESTER 1		
Course Code	**Course Title**	**Credits**
CZEM 6100	Coastal Processes & Hazards	E4
CZEM 6101	Coastal Geomorphology	E4
CZEM 6130	Principles of Coastal Defence, Management and Environmental Assessment	E4
COEM 6016	Natural Hazards Management	E4
SEMESTER 2		
CZEM 6102	Coastal Zone Metrics	C4
CZEM 6106	Design of Coastal Structures	C4
CZEM 6112	Coastal Zone Modelling	C4
COEM 6020	Research Methods	C3
SEMESTER 3		
CZEM 6108	Research Project	C9

SEMESTER 1			
MODULE		**PART-TIME**	**FULL-TIME**
CZEM 6100	Coastal Processes and Hazards	Year 1	Year 1
CZEM 6130	Principles of Coastal Defence, Management and Environmental Assessment	Year 2	Year 1
CZEM 6101	Coastal Geomorphology	Year 1	Year 1
COEM 6016	Natural Hazards Management	Year 2	Year 1
SEMESTER 2			
CZEM 6102	Coastal Zone Metrics	Year 1	Year 1
CZEM6106	Design of Coastal Structures	Year 2	Year 1
CZEM 6112	Coastal Zone Modelling	Year 1	Year 1
COEM 6020	Research methods *(MSc Students only)*	Year 2	Year 1
SEMESTER 3			
CZEM 6180	Research Project *(MSc Students only)*	Year 2	Year 1

Programmes in Civil and Environmental Engineering

Postgraduate Diploma in Civil Engineering

STRUCTURE OF PROGRAMME
Offered both Part-time and Full-time

DURATION OF STUDY (FOR TAUGHT COMPONENT):
Minimum of two (2) semesters or a maximum of four (4) semesters

NUMBER OF CREDITS REQUIRED: 31

CORE SUBJECTS

SEMESTER 1

Course Code	Course Title	Credits
CIEN 6001	Advanced Structural Engineering	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6012	Geotechnics in Construction	E4

SEMESTER 2

CIEN 6005	Civil Engineering Design Project	C9
COEM 6020	Research Methods	E3

OPTIONAL SUBJECTS

Course Code	Course Title	Credits
CIEN 6002	Road Network Conservation	C3
CZEM 6106	Design of Coastal Structures	C4
CIEN 6012	Advanced Transportation Engineering	C4
COEM 6005	Construction Project Management	E4
COEM 6013	Materials Technology	E4
COEM 6015	Maintenance and Facilities Management	E4
COEM 6016	Natural Hazards Management	E4
CIEN 6030	Performance Based Seismic Design	E4

In addition to the listed courses, the Department may approve any other course as an optional subject.

Postgraduate Diploma in Civil with Environmental Engineering

STRUCTURE OF PROGRAMME
Offered both Part-time and Full-time

DURATION OF STUDY (FOR TAUGHT COMPONENT):
Minimum of two (2) semesters or a maximum of four (4) semesters

NUMBER OF CREDITS REQUIRED: 31

CORE COURSES

SEMESTER 1

Course Code	Course Title	Credits
CIEN 6000	Advanced Environmental Engineering	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6012	Geotechnics in Construction	E4

SEMESTER 2

CIEN 6005	Civil Engineering Design Project	C9
COEM 6020	Research Methods	E3

OPTIONAL SUBJECTS

Course Code	Course Title	Credits
CIEN 6002	Road Network Conservation	C3
CZEM 6106	Design of Coastal Structures	C4
CIEN 6012	Advanced Transportation Engineering	C4
COEM 6005	Construction Project Management	E4
COEM 6013	Materials Technology	E4
COEM 6015	Maintenance and Facilities	E4
COEM 6016	Natural Hazards Management	E4

In addition to the listed courses, the Department can approve any other course as an optional subject.

MSc Programmes

This degree is accredited as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired an Accredited CEng (Partial) BEng (Hons) or an Accredited IEng (Full) BEng/BSc (Hons) undergraduate first degree.

See www.jbm.org.uk for further information.

There are two (2) degrees offered in this programme:

(i) MSc in Civil Engineering
(ii) MSc in Civil with Environmental Engineering

THE AIMS AND OBJECTIVES

a) To extend existing engineering and science knowledge beyond the level covered at the BSc Honours Degree level and to move to a professional, Master's output.
b) To widen existing engineering and science knowledge and to include areas not covered in the BSc Honours Degree level.
c) To develop the skills required for team-working (and, for CEng, leadership), social and business awareness, through further studies, such as law, finance, management, risk assessment and environmental issues.
d) To gain experience of team-working, ideally with cross-disciplinary elements, integrating topics covered in the BSc level and centred on real professional and business issues.

REGULATIONS AND ENTRY REQUIREMENTS

There are four routes offered for admission to the programmes:

1. **Route 1** provides for 4 continuous years of study leading to the award of the BSc Honours and the MSc Degrees. Applicants must have successfully completed the 3-year BSc Honours Degree programme in three (3) years, attaining a minimum of 55 % weighted average across the three (3) years (GPA of 2.5).

2. **Route 2** provides for successful completion of the BSc Honours Degree and pursuit of the MSc Degree after one (1) year of Initial Professional Development in civil engineering practice. This would give the student an opportunity to better understand the learning outcomes of BSc Honours Degree before proceeding to the MSc.

3. **Route 3** provides for successful completion of an unaccredited BEng or BSc in Civil Engineering or related engineering degree and pursuit of the MSc Degree after one (1) year of Initial Professional Development in civil engineering practice. Acceptance is subject to a successful Academic Assessment with the Institution of Civil Engineers (ICE) at the Incorporated Engineer (IEng) level [https://www.ice.org.uk/my-ice/my-membership/aqp].

4. **Route 4** provides for successful completion of a BASc in Civil Engineering and pursuit of the MSc Degree after successful completion of final year BSc courses (CVNG 3005 - Foundation Engineering and CVNG 3002 - Structural Analysis with a B+). Additionally, the candidate must have two (2) year of Initial Professional Development in civil engineering practice.

An MSc candidate in Civil Engineering must normally have a BSc Civil Engineering Honours Degree and those for the MSc Civil with Environmental Engineering Degree must normally have a BSc Civil with Environmental Engineering Honours Degree, or an equivalent qualification.

A candidate for any MSc degree must normally pass a course in Research Methodology.

STRUCTURE OF PROGRAMMES - OFFERED PART-TIME

It is an evening programme with lectures and tutorials being delivered face-to-face between 4:00 pm and 8:00 pm on weekdays.

Duration of Study

Minimum of three (3) semesters or a maximum of six (6) semesters.

Students failing to complete all course requirements for the MSc programme within the specified period but have obtained 28 or more credits may be granted a Post Graduate Diploma in Civil Engineering or Civil with Environmental Engineering upon request. Students who are awarded the post graduate diploma shall not be able to apply any of these credits for earning the MSc in Civil Engineering and /or MSc in Civil with Environmental Engineering.

CREDITS

Credits for the postgraduate diploma shall comprise the following:

1. Twenty-eight (28) credits from the core courses; AND
2. At least three (3) or four (4) other credits from the list of optional courses (or any other course approved by the Head of Department)

No. of Credits required: 40 or 41

The credits required to complete the programme are dependent on the electives chosen. The Semester 1 workload is 16 credits, Semester 2 has 15 or 16 credits and Semester 3 (May to July) has 9 credits.

MSc in Civil Engineering – Course Listing

Candidates are required to select one (1) optional subject in Semester 2.

CORE COURSES

SEMESTER 1

Course Code	Course Title	Credits
CIEN 6001	Advanced Structural Engineering	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6012	Geotechnics in Construction	E4

SEMESTER 2

CIEN 6005	Civil Engineering Design Project	C9
COEM 6020	Research Methods	E3

OPTIONAL SUBJECTS

Course Code	Course Title	Credits
CIEN 6002	Road Network Conservation	C3
CZEM 6106	Design of Coastal Structures	C4
CIEN 6012	Advanced Transportation Engineering	C4
COEM 6005	Construction Project Management	E4
COEM 6013	Materials Technology	E4
COEM 6015	Maintenance and Facilities Management	E4
COEM 6016	Natural Hazards Management	E4
CIEN 6030	Performance Based Seismic Design	E4

In addition to the listed courses, the Department may approve any other course as an optional subject.

SEMESTER 3 (May-July)

Course Code	Course Title	Credits
COEM 6018	Research Project	C9

MSc in Civil with Environmental Engineering - Course Listing

Candidates are required to select one (1) optional subject in Semester 2.

CORE COURSES

SEMESTER 1

Course Code	Course Title	Credits
CIEN 6000	Advanced Environmental Engineering	E4
COEM 6006	Construction Accounting & Finance	E4
COEM 6009	Contracts Management & Construction Law	E4
COEM 6012	Geotechnics in Construction	E4

SEMESTER 2

Course Code	Course Title	Credits
CIEN 6005	Civil Engineering Design Project	C9
COEM 6020	Research Methods	E3

OPTIONAL SUBJECTS

Course Code	Course Title	Credits
CIEN 6002	Road Network Conservation	C3
CZEM 6106	Design of Coastal Structures	C4
CIEN 6012	Advanced Transportation Engineering	C4
COEM 6005	Construction Project Management	E4
COEM 6013	Materials Technology	E4
COEM 6015	Maintenance and Facilities	E4
COEM 6016	Natural Hazards Management	E4

In addition to the listed courses, the Department can approve any other course as an optional subject.

SEMESTER 3 (May-July)

Course Code	Course Title	Credits
COEM 6018	Research Project	C9

PROGRAMME IN SUSTAINABLE SOLID WASTE ENGINEERING AND MANAGEMENT

The programme responds directly to the Caribbean's urgent need for strengthened capacity to confront the triple planetary crisis of climate change, pollution, and biodiversity loss. At present, the solid waste sector is largely staffed by individuals without formal training, resulting in uneven expertise and a dependence on informal, on-the-job learning. This situation has regional consequences: opportunities for improvement are missed, inefficient practices persist, and efforts to mobilize communities toward zero-waste behaviours remain fragmented and unsustainable. Decision-making therefore tends to rely on past experience rather than data-driven analysis.

The Programme offers a Postgraduate Certificate in Technologies for Sustainable Solid Waste Engineering and Management in the Department of Civil & Environmental Engineering.

AIMS OF THE PROGRAMME

- To build capacity for the modernization of approaches in the solid waste sector;
- To provide opportunities for persons to specialize in particular aspects of the field in the shortest
- possible time;
- To provide persons with background to undertake research in many aspects of solid waste management.

PROGRAMME DELIVERY

The programme is designed to be delivered in a blended format with weekly synchronous sessions, asynchronous activities, group activities, field trips and group design exercises. All course notes are available on the My-eLearning platform, which facilitates ease of delivery.

Postgraduate Certificate in Technologies for Sustainable Solid Waste Engineering and Management

REGULATIONS AND ENTRY REQUIREMENTS

- A Bachelor's degree in Science or Engineering from a fully accredited college or university, with a GPA $\geq$ 2.0 or a Pass degree; OR
- A Bachelor's degree from a fully accredited college or university, with a GPA $\geq$ 2.0 OR
- A Pass degree, with Sector Experience $\geq$ 5 years, AND successful completion of a qualifying test
- and Interview administered by the Department before the start of the programme; OR
- Not a holder of any formal degree, with Sector Experience $\geq$ 5 years, two (2) years of which have been at a middle to upper-level management position, AND successful completion of a qualifying test and interview administered by the Department before the start of the programme.

STRUCTURE OF PROGRAMME

Offered both Part-time and Full-time; Blended Delivery

DURATION OF STUDY (FOR TAUGHT COMPONENT):

Minimum of one (1) semester or a maximum of four (4) semesters

NUMBER OF CREDITS REQUIRED: 16

COURSE LISTING

Semester 1

Course Code	Course Title	Credits
CIEN 4001	Fundamentals of Sustainable Solid Waste Management	C4
CIEN 4002	Sustainable Solid Waste Handling	C4
CIEN 4003	Technologies for Treatment and Recovery of Solid Waste	C4
CIEN 4004	Sustainable Landfill Design, Operation and Monitoring	C4

MPhil/PhD in Civil Engineering

The Department of Civil and Environmental Engineering offers programmes of study by research leading to the **MPhil** and **PhD degrees** in **Civil Engineering**. These programmes are designed for candidates seeking advanced research-based training in a range of sub-disciplines within Civil Engineering, equipping them for leadership roles in academia, industry, and research institutions.

Regulations and Entry Requirements

(Please refer to the latest version of the "Regulations for Graduate Certificates, Diplomas and Degrees" by the Board for Graduate Studies and Research, The University of the West Indies.)

MPhil in Civil Engineering

Applicants for the MPhil programme in Civil Engineering should meet the following requirements:

- A minimum GPA of 3.0 or an Honours degree (Upper Second Class) or its equivalent (unless otherwise approved by the Campus Committee) in Civil Engineering or a closely related discipline such as Structural Engineering, Environmental Engineering, Geotechnical Engineering, or Water Resources Engineering.
- At least one (1) year of relevant industrial or professional experience.
- Successful completion of a Research Methods course or its equivalent before the completion of the degree.

PhD in Civil Engineering

Applicants for the PhD in Civil Engineering must possess:

- An approved graduate degree primarily awarded for research in Civil Engineering or a related field;
- OR a taught Master's degree from The University of the West Indies or another approved university, provided that the programme included a research component of at least 25% of the total credit weighting, and the applicant achieved at least a B+ average or its equivalent;
- Approval of an upgrade application from MPhil to PhD where applicable;
- At least one (1) year of relevant industrial or professional experience;
- Such other qualifications and experience as the Board for Graduate Studies and Research may approve.

Applicants may be required to pass an entrance examination and/or complete qualifying courses before being formally admitted to the MPhil or PhD programme.

Principal Areas of Research

The programme supports a broad range of research areas within Civil Engineering, including but not limited to:

- Advanced Materials in Civil Engineering
- Coastal and Offshore Engineering
- Construction Engineering and Management
- Environmental Engineering and Sustainable Infrastructure
- Geotechnical Engineering and Soil-Structure Interaction
- Hydraulics and Water Resources Engineering
- Structural Health Monitoring and Assessment
- Structural Engineering and Earthquake Engineering
- Sustainable Urban Infrastructure
- Traffic and Transportation Systems
- Wastewater and Water Treatment Technologies

The MPhil and PhD in Civil Engineering provide opportunities for students to contribute original research and practical solutions to pressing engineering challenges in the Caribbean and globally.

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

General

The Department of Electrical and Computer Engineering (http://sta.uwi.edu/eng/electrical) offers taught postgraduate programmes leading to the award of a Master of Applied Science (MASc) and a Postgraduate Diploma in Electrical & Computer Engineering and Artificial Intelligence.

The Department also offers programmes of study and research leading to MPhil and PhD degrees in Electrical & Computer Engineering. Departmental research activities are conducted in the extended areas: Communication Systems, Computer Systems Engineering, Control Systems, Electronic Systems and Energy Systems.

Subject Areas for Study and Research

COMMUNICATION SYSTEMS (MASC, PG DIPLOMA, MPHIL AND PHD)

Research in the Communication Systems Group is primarily focused around three application spaces: biomedical engineering, emergency communications and inclusive connectivity. Keen focus areas in biomedical engineering include the application of artificial intelligence and communications to body-centric communication networks (BCC), stochastic fading bioimpedance and channel estimation for organic communications in health, wellness, and agriculture; biomedical sensors using microwave and mmWave systems; internet of bio-things and nano-communication technologies, and related simulations on multiple platforms. Research in generative AI focusses on applications and policy in medical agriculture, cybersecurity, digital twins, and engineering education areas. Research activity in emergency communications is focused on the efficacy of the communications function in disaster management (preparation, response, mitigation) and investigation of approaches to improve such in different context; alongside a range of analytical studies including models for communication links in emergency management simulation. Action research in inclusive connectivity is interdisciplinary, covering the intersection of technology, policy, regulation and development studies, with an emphasis on appropriate technologies and the enabling environment for affordable and accessible telecommunications for all. Other research in the Communication Systems Group addresses the performance evaluation of multiservice traffic over heterogeneous access networks, queue management, infinitesimal perturbation analysis in stochastic flow models and of fluid queues under various conditions, network and application performance studies of wired and wireless high-speed, multiservice networks, as well as cognitive, semantic related technologies for productivity enhancement. The Communication Systems group is regularly represented in consultations, working groups and other forms of advisory capacities on the national, regional and international levels in communications.

COMPUTER SYSTEMS (MPHIL AND PHD)

Research in Computer Systems Engineering is carried out in the areas of computer architecture and organisation, advanced computer architecture, microprocessor and microcontroller-based hardware and software design, design of application specific parallel architectures, embedded systems, supercomputer technologies, image processing and artificial intelligence and robotics.

CONTROL SYSTEMS (MASC, PG DIPLOMA, MPHIL AND PHD)

Automation, control, and instrumentation theory is necessary to measurement and product quality control. Control Systems plays a vital role in regulating machines and processes to close tolerances. The Control Systems Group conducts research in artificial intelligent and multi-agent systems, focusing on their decision making, reasoning capability, the feedback loop's controllability and stability. Their work involves developing algorithms and methodologies to enhance the robustness and adaptability of any autonomous system. This research contributes to advancements in various industries, from manufacturing to robotics, ensuring that complex systems operate reliably and meet stringent performance standards.

ELECTRONIC SYSTEMS (MPHIL AND PHD)

Research in this area involves the design and testing of new analogue circuit configurations using operational amplifiers and linear integrated circuits. Other areas under investigation include the design and application of a new form of transconductance amplifier, the use of current feedback techniques in small and large signal design and the evaluation of current conveyors and their comparison with operational amplifiers in the design of voltage amplifiers, filters, multiphase oscillators and gyrators.

ENERGY SYSTEMS (MASC, PG DIPLOMA, MPHIL AND PHD)
Research in Energy Systems is related to real operating and planning problems encountered in the industry. Emphasis is placed on special problems related to peculiarities of small, isolated systems as obtained in all the Caribbean countries. The Energy Systems Group conducts research in electricity generation, with renewable and conventional sources, and its transmission and distribution. Current research activities include consideration of the effects of large loads, such as arc furnaces, on the system operation and the life span of equipment; simulation of various electromechanical and electromagnetic transient phenomena; introduction of wind energy systems to a grid; linear and non-linear optimisation problems as applied to power systems and design and simulation of power electronic drives. The Group additionally conducts research in the application of power electronics to electrical drive systems.

Research is being conducted in the electronic control of machines and drives where induction motors are being controlled using rotor field-oriented control and digital signal processing methods. Electro-magnetic interference and radio frequency interference problems are being studied as well as power factor correction in the presence of harmonics.

INTEGRATED SYSTEMS (MASC, PG DIPLOMA)
The Electronic Systems and Computer Engineering Systems groups conduct research in the development and application of Integrated Systems involving the complex interaction of electronic and computer sub-systems in real-world applications. This combination is becoming increasingly important and has encouraged the Department to introduce a major in Integrated Systems. Research in this area involves the design and testing of new analogue circuit configurations using operational amplifiers and linear integrated circuits. Other areas under investigation include the design and application of a new form of transconductance amplifier, the use of current feedback techniques in small and large signal design and the evaluation of current conveyors and their comparison with operational amplifiers in the design of voltage amplifiers, filters, multiphase oscillators and gyrators.

These areas of research are combined in areas of computer architecture & organisation, advanced computer architecture, microprocessor/microcontroller-based hardware & software design, design of application specific parallel architectures, embedded systems, supercomputer technologies, image processing, artificial intelligence and robotics.

Programmes in Electrical and Computer Engineering

The Department offers three (3) Master's level programmes: **Master of Applied Science (MASc) in Electrical Computer Engineering; Master of Applied Science in Artificial Intelligence (with postgraduate exit diploma)** and the **Postgraduate Diploma in Electrical and Computer Engineering. (PLEASE NOTE THAT THE MASTER OF APPLIED SCIENCE IN ARTIFICIAL INTELLIGENCE, IS THE ONLY MASTER'S PROGRAMME BEING OFFERED FOR ACADEMIC YEAR 2026/2027)**

The MASc and Diploma in Electrical and Computer Engineering are offered with Majors in four (4) subject areas: Communication Systems, Control Systems, Energy Systems and Integrated Systems.

Entry Requirements

For MASc in Artificial Intelligence:

1. Postgraduate Certificate in Artificial Intelligence
2. A BSc (Hons) in Engineering, Computer Science, the Natural Sciences, Mathematics, Statistics, or a closely related field with a cumulative GPA OF 2.5 or higher.]
3. Other such qualifications deemed equivalent to any of the above (1, 2, 3) by the Faculty.

The minimum requirements for entry into the other MASc. and Postgraduate Diploma Programmes are:

1. BSc (Hons) in Electrical and/or Computer Engineering
2. BSc (Hons) in Mechanical Engineering
3. BSc (Hons) in Applied Physics majoring in Electronics
4. Other such qualifications deemed equivalent to any of the above (1, 2, 3) by the Faculty.

Only candidates with qualifications under categories 1 or 2 above or equivalent are eligible for entry into the MASc Energy Systems option.

Candidates with a BSc Third Class (Hons) Degree in Electrical and Computer Engineering may be considered eligible for entry into the taught postgraduate programmes, subject to an evaluation of the BSc degree and relevant post-degree industrial experience.

All students who seek entry under categories 2, 3 and 4 may be required to pursue qualifying courses as determined by the Head of Department and undertake examinations in these courses. Normally, the qualifying courses will not exceed twelve (12) credits. For further information all students should consult the Board for Graduate Studies and Research Regulations for Graduate Diplomas and Degrees at: https://sta.uwi.edu/research/documents-library.

Credit Requirements

Postgraduate Diploma in Electrical and Computer Engineering

The Diploma will be awarded to students who pass twenty-one (21) credits of courses approved by the Department. Students will be required to select a major subject area and must register for five (5) courses listed as core for that major and the compulsory course ECNG 6709 - Business Management. The remaining credits may be obtained from any of the other postgraduate courses offered by the Department or from other Departments within the Faculty and approved by the Head of Department.

Candidates pursuing the Postgraduate Diploma may transfer to the MASc programme in Electrical and Computer Engineering by seeking approval from the Head of Department. Students are only allowed to transfer a maximum of eighteen (18) credits from the Postgraduate Diploma to the MASc in Electrical and Computer Engineering programme.

Master of Applied Science in Electrical and Computer Engineering

AIMS AND OBJECTIVES

The overall aim of the primary taught postgraduate award, the Master of Applied Science (MASc), is to provide advanced exposure to the breadth and depth of Electrical and Computer Systems and technologies, as well as pertinent Engineering Practice, thereby enabling graduates to demonstrate technical and commercial leadership. This is accomplished by improving business management and general research skills and facilitating the development of subject-specific skills and knowledge levels using existing and emerging technologies. Through this Programme, the Department also aims to make a significant contribution to the pool of professional and technological resources available locally and regionally to support associated industry, teaching and research in locally and regionally-relevant Electrical & Computer Engineering-based areas.

The Learning Objectives of the Master of Applied Science (MASc) in Electrical & Computer Engineering programme are to:

1. Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology.
2. Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.
3. Provide technical and commercial leadership.
4. Demonstrate effective interpersonal skills.

Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.

The MASc in Electrical and Computer Engineering will be awarded to students who obtain a minimum of 36 credits as follows:

Taught Courses	24 credits
Progress Report	4 credits
MASc Project	8 credits

Twenty-four (24) credits must comprise five courses from any of the majors, two compulsory courses (ECNG 6709 and ECNG 6710) and an elective.

Candidates must pass both the written examination and the course work component with at least a 50% mark to be credited with a Pass

DURATION OF STUDY

Both the Diploma and MASc programmes are offered in full-time and part-time modes. Part-time students are normally expected to complete the requirements of taught courses in four (4) semesters. Full-time students are normally expected to complete the requirements of taught courses in two (2) semesters. Students must successfully complete taught courses (24 credits) before they proceed to the project stage.

MASc students having satisfied the requirements for the Postgraduate Diploma in Electrical and Computer Engineering within the specified period may be granted the Postgraduate Diploma upon request.

MASC PROJECT

The MASc Project must be conducted in the area of the selected major.

a) Students who have completed the taught course requirements and are approved to proceed to the project phase MUST register for the following courses:
ECNG 6021 MASc Research I – 4 credits, MUST PASS to continue to
ECNG 6022 MASc Research II – 0 credits, followed by
ECNG 6023 MASc Project – 8 credits

Students can register for these courses in any semester. ECNG 6022 registration is only required if the student requires more than one semester to complete the research project [refer to (c) below]. **Students are not allowed to register for ECNG 6021, ECNG 6022 and ECNG 6023 simultaneously.**

b) Project Selection
Prior to registration in ECNG 6021, proposals for MASc projects must be submitted to the Department via the Postgraduate Portal for approval. Students should consult the MASc Project Guide or the Department website for further details.

Students, who have made substantial progress in their work in ECNG 6021, can take up an accelerated path **with approval from their supervisor** and hence can register for ECNG 6022 and ECNG 6023 in the second semester of the project phase.

c) Examination of Project Components
First and second examiners for each student project will be appointed by the Head of Department upon recommendation from the Postgraduate Coordinator immediately following the submission and approval of the project proposal.

ECNG 6021 will be examined by way of an interim report submitted by the student and examined by the first and second examiners. ECNG 6023 will be examined by way of a final report submitted by the student and examined by the first and second examiners. Evaluation of ECNG 6023 may include a demonstration, report presentation and oral examination led by a panel comprising the first examiner, second examiner and a moderator if deemed necessary by supervisor(s).

Students who fail ECNG 6021 on the first attempt will be deemed to have failed the programme and will be asked to withdraw. As recognition of the work completed in the MASc Programme, these students may request a Postgraduate Diploma Degree. Students who fail ECNG 6023 will be allowed one final opportunity to pass the course.

d) Students who wish to pursue their ECNG 6023 – MASc Project during Semester III (summer period), must seek approval from their supervisor before registering for their project.

e) Students who wish to pursue their ECNG 6023 – MASc Project during Semester III (summer period), must seek approval from their supervisor before registering for their project.

COURSE LISTING FOR THE MASC AND DIPLOMA PROGRAMMES

PREREQUISITE COURSES

Each major has a list of prerequisite BSc level courses. Prerequisites may be waived based on qualification and experience. Otherwise, candidates will be required to complete the relevant prerequisites as qualifying or departmental courses, as determined by the Head of Department. Students may opt to register for electives other than those listed for the selected major.

COMPULSORY COURSES (FOR ALL MAJORS)

Course Code	Course Title
ECNG 6710	Research Methods
ECNG 6709	Business Management

COMPULSORY COURSE (FOR ALL DIPLOMAS)

Course Code	Course Title
ECNG 6709	Business Management

PREREQUISITE COURSES:

ECNG 3021 or equivalent undergraduate course of study.

MAJOR IN COMMUNICATION SYSTEMS

CORE COURSES:

Course Code	Course Title
ECNG 6700	Stochastic Processes
ECNG 6701	Data Communication Networks
ECNG 6703	Principles of Communication
ECNG 6704	Performance Engineering of Computer Communication Systems
ECNG 6708	Transmission Systems

PREREQUISITE COURSES:

Course Code	Course Title
ECNG 3001	Communication Systems II
ECNG 3002	Data Communication Systems
ECNG 3003	Telecommunication Networks

MAJOR IN CONTROL SYSTEMS

CORE COURSES:

Course Code	Course Title
ECNG 6600	Real Time Systems
ECNG 6603	Modern Control Strategies
ECNG 6604	Linear Control Systems
ECNG 6605	Distributed Computer Control
ECNG 6711	Adaptive Control

PREREQUISITE COURSES:

Course Code	Course Title
ECNG 3004	Control and Instrumentation II
ECNG 3032	Control and Instrumentation I

MAJOR IN ENERGY SYSTEMS

CORE COURSES:

Course Code	Course Title
ECNG 6500	Computer Aided Power Systems Analysis
ECNG 6503	Advanced Power System Protection
ECNG 6504	Electrical Drives & Industrial Power Systems
ECNG 6505	Surge Phenomena & Insulation Coordination
ECNG 6509	Switchgear & Transformer Technology

PREREQUISITE COURSES:

Course Code	Course Title
ECNG 3008	Power Electronic Circuits
ECNG 3010	Electrical Machines & Drive Systems
ECNG 3012	Power Systems Analysis
ECNG 3015	Industrial & Commercial Electrical Systems

Major in Integrated Systems
CORE COURSES:

Course Code	Course Title
ECNG 6600	Real Time Systems
ECNG 6601	Digital Electronic Systems
ECNG 6605	Distributed Computer Control
ECNG 6613	Database Systems Principles and Design
ECNG 6614	Multiprocessor Systems

PREREQUISITE COURSES:

Course Code	Course Title
ECNG 3006	Microprocessor Systems: Design and Applications

Master of Applied Science in Artificial Intelligence

CORE COURSES:

Course Code	Course Title
ECNG 6100	Fundamental Mathematics for Artificial Intelligence (3 credits)
ECNG 6101	Data Engineering (3 credits)
ECNG 6102	Machine Learning Engineering (3 credits)
ECNG 6103	Artificial Intelligence: Philosophy, Policy, Societal Impacts and Ethics (3 credits)
ECNG 6104	Artificial Intelligence for Commercial Problems (3 credits)
ECNG 6107	MASc AI Research Project I (3 credits)
ECNG 6108	MASc AI Research Project II (6 credits)
ECNG 6617	Artificial Intelligence Systems (3 credits)

ELECTIVES:

Course Code	Course Title
ECNG 6105	Intelligent Systems & Control (3 credits)
ECNG 6106	Automated Reasoning and Planning Systems (3 credits)
ECNG 6600	Real-time Systems (3 credits)
ECNG 6613	Database Systems Principles and Design (3 credits)
ECNG 6614	Multiprocessor Systems (3 credits)
ECNG 6617	Artificial Intelligence Systems (3 credits)
ECNG 6619	Visual Media Processing I (3 credits)
ECNG 6700	Stochastic Processes, Detection and Estimation (3 credits)
ECNG 6701	Data Communication Networks (3 credits)
ECNG 6709	Business Management (3 credits)
ECNG 6710	Research Methods (3 credits)

MPhil and PhD Degrees in Electrical and Computer Engineering

- A BSc (Hons) in Engineering, Computer Science, the Natural Sciences, Statistics, or a closely related field. A cumulative GPA of 2.5 or higher.
- MSc in Engineering, Computer Science, the Natural Sciences, Statistics, or a closely related field.
- MASc in Artificial Intelligence
- Any other equivalent qualifications approved by the Department

The Department also offers programmes of study and research leading to the MPhil and PhD degrees in Electrical and Computer Engineering Departmental research activities are conducted in the extended areas: Communication Systems, Computer Systems Engineering, Control Systems, Electronic Systems and Energy Systems. A Research Methods course approved by the Department must be completed for MPhil and PhD Research Degrees. Starting this upcoming academic year 2026/2027, semester I, the Department would be offering MPhil and PhD degrees in Artificial Intelligence. The entry requirement for the MPhil in AI would be as follows:

- A BSc (Hons) in Engineering, Computer Science, the Natural Sciences, Statistics, or a closely related field. A cumulative GPA of 2.5 or higher.
- MSc in Engineering, Computer Science, the Natural Sciences, Statistics, or a closely related field.
- MASc in Artificial Intelligence
- Any other equivalent qualifications approved by the Department

The entry requirements for the PhD in AI are as follows:

- MSc in Engineering, Computer Science, the Natural Sciences, Statistics, or a closely related field.
- MASc in Artificial Intelligence
- MPhil in Artificial Intelligence
- Any other equivalent qualifications approved by the Department

TIME LIMITS FOR REGISTRATION

MPhil

The minimum period of registration for an MPhil candidate is two years full-time and maximum three years. For a part-time candidate, the minimum registration period is four years and the maximum five years.

Students enrolled for the MPhil degree must satisfactorily complete at least two research seminars prior to submission of the MPhil thesis.

PhD

The minimum period of registration for a PhD candidate is three years full-time and maximum five years. For a part-time candidate, the minimum registration period is five years and the maximum seven years.

Students enrolled for the PhD degree must satisfactorily complete at least three research seminars prior to submission of the PhD thesis.

For further information, please refer to the Regulations for Graduate Diplomas and Degrees**.**

DEPARTMENT OF GEOMATICS ENGINEERING & LAND MANAGEMENT

Research
The Department has **ten (10)** academic staff members involved with three taught postgraduate programmes in addition to MPhil and PhD research degrees. The taught programmes are MSc Geoinformatics, MSc Urban and Regional Planning, and Post Graduate Diploma in Land Administration.

The Department's research expertise is established in the ability to understand, capture, and visualise spatio-temporal phenomena and processes to provide reliable management options for decision-makers to achieve sustainable development.

These objectives are achieved by using surveying, mapping, monitoring, modelling and spatial analysis tools and techniques. Cutting edge technology is being utilised in the research such as global positioning systems, satellite remote sensing and GIS. The other side of the approach is in the field of physical planning and development associated with policy planning, strategic and development planning, coastal zone planning and development control.

Priority areas and new themes of research have been identified with focus on geomatics engineering, geodesy, land administration, spatial analysis, geoinformatics, spatial and settlements planning, the environment, and ecosystems. The following are some topics of immediate concern:

- Mapping and modelling of land cover/use dynamics for the sustainable management of the environment and natural resources.
- Extraction of spatial information from aerial and satellite Imagery and LIDAR.
- Coastal zone management and modelling coastal changes for sustainable development.
- Comparative analysis of planning statutes and administrative structures in the Caribbean.
- Design for sustainable development of urban and other settlement areas, environmental planning and policy planning.
- Urban structure and urban form in the Caribbean.
- Climate change adaptation for coastal cities in the Caribbean.
- Community and participatory planning.
- Non-structural measures for hazard mitigation.
- Formulation and definition of national datums.
- Geohazards; flooding and landslides, developing plans for areas exposed to natural and human-made hazards.
- Global climate change, climate change and food security, sea level change.
- Land tenure rights and practices including family land in specific jurisdictions.
- Quality assurance of geospatial data and the development of standards for spatial data dissemination.
- Relevant theory and methodology for Caribbean Planning and Resource Management.

Resources for research include automated field and GPS data recording and computation systems, photogrammetric and satellite image processing and analysis tools, GIS and mapping hardware and software, in addition to state-of-the-art computing and digital services facilities.

MPhil in Surveying & Land Information
MPhil in Geoinformatics
MPhil in Urban and Regional Planning

REGULATIONS
The Regulations for the MPhil in Surveying and Land Information, MPhil in Urban and Regional Planning,
and MPhil in Geoinformatics are the same as the General Regulations for the MPhil, except that candidates applying for registration should normally have either:

(a) A Bachelor's degree with Second Class Honours in Surveying & Land Information/Geomatics;
OR
(b) An equivalent qualification suited to the fields of Urban & Regional Planning or Geoinformatics.

PhD in Surveying & Land Information
PhD in Geoinformatics
PhD in Urban and Regional Planning

REGULATIONS

The Regulations for the PhD in Surveying and Land Information, Geoinformatics and in Urban and Regional Planning are the same as the University and Faculty of Engineering regulations for the Degree of Doctor of Philosophy except that candidates applying should normally have either:

(a) An MPhil Degree in Surveying and Land Information/Geomatics, Geoinformatics or Urban and Regional Planning of The University of the West Indies;
OR
(b) A Master's Degree by Research in Geomatics, Urban & Regional Planning or Geoinformatics of an approved University.

MPhil/PhD Degree in Geoinformatics

The aim of the MPhil and PhD in Geoinformatics programme is to meet the growing needs of the Caribbean region for high-level critical thinkers who will be able to undertake research and development necessary to support sustainable development efforts of the region. The study programme for MPhil/PhD in Geoinformatics provides students with the knowledge and understanding for:

- Critical assessment and understanding of the manipulation and analysis of spatial information.
- A systematic approach to analysing and solving spatial problems using a range of appropriate strategies and specific techniques.
- Understanding of the main issues surrounding data requirements, quality, analysis, and management of spatial data embedded economic, political, social and legal structures create social barriers affecting their wider use.
- Understanding of design, management, and logistical Issues in Enterprise GIS development.

MPhil/PhD Degree in Urban and Regional Planning

Urban and regional planning is the profession that deals with the understanding and management of land use in the hierarchy of urban and regional settlements and the spatial relations of human activities. It is an interdisciplinary science that deals with the physical, environment, social, economic, and cultural aspects of human settlements in both urban and rural areas. The study programme for MPhil/PhD in Urban and Regional Planning provides students with the knowledge and understanding of:

- Comparative international theory and practice of urban and regional planning.
- Caribbean urban history and settlements structures.
- The Caribbean's natural resource base as islands and implications for economic development in sectors such as industry, tourism, agriculture, forestry, and sustainable development.
- The legal and administrative structure governing Caribbean urban and regional planning and management including development planning and the regulation of land use and built development.
- The manipulation and analysis of spatial data and information as part of research and policy formulation.

Postgraduate Diploma/MSc in Urban and Regional Planning

INTRODUCTION

The MSC Urban and Regional Planning Programme is driven by the need to produce a cadre of planning professionals with a tailored education and training in Caribbean planning issues, which are distinct from other regions of the world by virtue of population dynamics, economic evolution, social problems, and unique physical environment. The programme focuses on the evolution of theoretical perspectives on physical planning, especially with a developing country planning epistemology, it aims to equip the graduate with knowledge associated with policy planning, strategic and development planning, physical planning and design, as well as development control in areas of development relevant to the Caribbean region.

AIMS AND OBJECTIVES

Aims

a. To provide general and specialised knowledge in the field of physical planning with respect to theory, methodology, analysis, and applications.
b. To equip the graduate with the knowledge for a profession in the field of urban and regional planning, associated with policy planning, strategic and development planning, physical planning and urban design, coastal zone planning, environmental planning, as well as development control.
c. To produce a graduate capable of developing appropriate plans for communities and settlements, open areas, coastal zones, protected areas, areas exposed to natural and man-made hazards, and other areas where development occurs, or areas which are subjected to protection, conservation, or any other special treatment.
d. To produce a graduate capable of managing the implementation and monitoring of policies and plans.

Objectives

(i) The core courses are intended to fulfil the following objectives:
- To provide students with full understanding of planning as a discipline, the philosophical basis of planning, and the major theoretical and analytic developments in the field.
- To cover the methods and procedures for making plans for physical development, be it for the public or private sector, at the national, regional, local or site level.
- To equip students with a reflective and insightful understanding of the social and environmental conditions of human settlements and spatial development and change.
- To equip students with an understanding and knowledge of implementing policies, strategic and development plans, physical and urban design plans, as well as development control measures.

(ii) To understand and evaluate the impact of development.
- The electives provide the basis for students to acquire a measure of skills mix, as well as the background for further work, research and development.

Learning Outcomes

As a result of the course content and instruction graduates should be able to:
- Demonstrate the ability to respond effectively to unfamiliar problems in unfamiliar contexts.
- Formulate and propose incisive and innovative policies, strategies, and courses of action as responses to a variety of planning problems, transforming existing systems and not simply function within an ineffective one.
- Synthesise and Integrate data from various sources and to identify the contexts in which the various data types are appropriate.
- Describe the genesis and function of planning in society.
- Apply the history and theory of planning in relation to social and economic structures, including, but not limited to, such characteristics as income, race, ethnicity, and gender.
- Understand the ethics of professional practice and behaviour, including the relationship to clients and the public, and the role of citizens in a democratic society.
- Interpret case laws relevant to the field of urban and regional planning and application of these laws to realistic hypothetical situations.
- Conceptualise problems from complex, real-world situations so that the problems are meaningful to clients and are research worthy.
- Apply statistical and other analytic techniques, as well as computer methods, to define planning problems, generate alternatives, and evaluate their consequences. Use census data to inform policy formulation.
- Effectively and fluently communicate a wide variety of planning information, ideas, principles, arguments and proposals through well-prepared written, graphic, oral and electronic means, and demonstrate effectively and fluently written, numeric, oral, IT and information literacy skills.
- Work effectively as members and leaders of planning teams, and to apply an understanding of interpersonal and group dynamics to assure effective group action.
- Interpret case laws relevant to the field of urban and regional planning and application of these laws to realistic hypothetical situations.
- Exhibit an excellent level of understanding of the complexities of planning issues and problems especially the complexities of planning within the Caribbean context, with regards to space, ecology, resources and susceptibility to natural disasters.
- Demonstrate originality and flair in the treatment and exposition of the subject matter, making excellent connections between the different areas of the curriculum
- Work very well individually and in groups, demonstrating high levels of initiative, autonomy and leadership

- Exhibit a sensibility in formulating interventions that reflect an understanding of place-specific socioeconomic, political, and cultural circumstances.

The programme offers a wide range of courses that allows the student to pursue individual specialisations, progress to employment within the field and to embark on advanced study within planning, including MPhil/PhD research.

ENTRY REQUIREMENTS

Applicants for the MSc Urban and Regional Planning should have**:**

(i) at least a Second-Class Bachelor's Degree in a related area from a recognised institution, or

(ii) a combination of maturity, training and professional experience acceptable to the Faculty. A typical applicant would have a previous degree gained in Urban and/or Regional Planning, Surveying/Geomatics, Natural Sciences, Engineering, Geography, Architecture, Sociology, Economics, Political Science, Management and Law.

QUALIFYING STUDENT

An applicant not considered suitable for direct admission may be admitted as a qualifying student, up to one year. The structure of study will be designed to suit the needs of the individual student.

TRANSFER OF CREDITS

Up to six (6) credit hours of coursework taken prior to enrolment in the Master's programme, whether at this university or another, may be counted towards the Master's degree, if the Head of Department formally approves acceptance of these courses. Prior to the approval, the advice from the Programme Coordinator should be sought.

STRUCTURE OF PROGRAMME

Offered part-time and full-time

(a) Part-time students: - Normally required to complete the coursework and written examinations within six (6) semesters of registration. Project should be started at the commencement of the semester following the completion of the written examinations and completed within nine (9) months.

(b) Full-time students: - Normally required to complete the coursework and written examinations within three (3) semesters of registration. Project should be started at the commencement of the semester following the completion of the written examinations and completed within six (6) months.

NB The normal load for a part-time student is half that of a full-time student.

DURATION OF STUDY

Part-time students: Must normally complete the programme within ten (10) semesters.
Full-time students: Must normally complete the programme within eight (8) semesters.

NO. OF CREDITS REQUIRED: 39

Core courses	18 credits
Elective courses	9 credits
Research Project	12 credits

EXAMINATION

(a) Evaluation may take one of the following modes: (1) coursework only, normally applied for studio work, (2) combination of coursework and final examination, and (3) final examination. In the case of combination, candidates will be required to pass both the coursework and examination.

(b) In MSc Research Project evaluation will be on the report. Candidates may also be orally examined. They will in addition be required to present at least one acceptable seminar.

(c) A full-time candidate who fails not more than two courses, or a part-time candidate who fails not more than one course in a semester may be allowed to repeat such courses if the Board of Higher Degrees so decides.

(d) A full-time candidate who fails more than two courses, or a part-time candidate who fails more than one course in a semester, will normally be required to withdraw from the programme.

AWARD OF DEGREE

The MSc in Urban & Regional Planning will be awarded on successful completion of all courses and the Research Project.

COURSE LISTING - MSC URBAN & REGIONAL PLANNING

CORE COURSES

Course Code	Course Title	Credits
PLAN 6000	Philosophy & Principles of Planning	3
PLAN 6001	Planning Practice Law and Ethics in the Caribbean	3
PLAN 6002	Graphic and Design Studio	3
PLAN 6003	Design for Development	3
PLAN 6004	Planning Analysis and Evaluation	3
PLAN 6024	Research Methods	3
PLAN 6030	Research Project (MSc Urban and Regional Planning Only)	12

ELECTIVE COURSES:

Course Code	Course Title	Credits
PLAN 6005	Urban Design	3
PLAN 6006	Sustainable Housing and Settlements Planning	3
PLAN 6007	Community and Participatory Planning	3
PLAN 6008	Tourism Planning	3
PLAN 6009	Transportation Planning	3
PLAN 6011	Planning in the Coastal Zone	3
PLAN 6012	Professional Planning Internship	3
PLAN 6014	SIDS Resource Management	3
PLAN 6025	Independent Study in Urban and Regional Planning	3
TOUR 6040	Sustainable Tourism Management	3
TOUR 6002	Tourism Destination Management	3
TOUR 6003	Tourism Policy and Strategy	3
GINF 6100	Principle of Geoinformatics	3

Postgraduate Diploma in Land Administration

This programme was developed to address the reform of the policies, procedures, statutes, and institutions involved in Land Administration and Management throughout the Caribbean. This programme is a response to the need to maintain and strengthen the human resources employed in land administration and land management in key institutions of the state, and private quasi-state sectors.

AIMS AND OBJECTIVES

a. Provide specialised training in Land Administration Management to key public, quasi-state and private sector professionals.
b. To enhance the existing process of reform in Land Administration in the public sector.
c. To enhance the Department's capability in offering training in the broader area of Land Studies and Land Management in keeping with the Department's strategic plan.

LEARNING OUTCOMES

The graduate of the programme will be able to:

1. Synthesise the form and function of optimum land administration systems.
2. Evaluate existing components of a land administration system and recommend reform.
3. Research innovative concepts in land administration and apply them to specific environments with specific needs.

ENTRY REQUIREMENTS

The main condition for entry would be a relevant first degree and relevant industrial experience or maturity and professional experience acceptable to the Faculty. Present entry requirements for either MSc Planning and Development or MSc Geoinformatics would also be acceptable. The target groups are:

a. Public officials nominated by sponsoring institution.
b. Professionals: Surveyors, engineers, planners, geographers, agriculturalists, natural and social scientists interested in the area of Land Administration and Management.
c. Individuals interested in upgrading their skills on a course-by-course basis.

STRUCTURE OF PROGRAMME
The programme will be delivered in six (6) short intensive instructional periods each approximately one week of whole day lectures, tutorial demonstrations and lab/field exercises. There will be a full-time, three-week period when students will work on their special projects towards the end of the cycle.

DURATION OF STUDY
Twelve (12) months.

COURSE LISTING
Students are required to complete the following courses:

Course Code	Course Title	Credits
LAND 5000	Introduction to Land Administration	E3
LAND 5002	Land Economy & Property Management	E3
LAND 5003	Land Law	E3
LAND 5004	Land Information Management	E3
LAND 5006	Special Project	C6
LAND 5007	Cadastral Systems	E3
PLAN 6014	Small Island Developing States (SIDS) Resource Management	E3

ASSESSMENT AND AWARD OF DIPLOMA
With the exception of LAND 5006 Special Project, which shall be assessed as a 100% coursework, all other courses shall be assessed as follows:

- Final examination: 60%
- Assessed assignments: 40%

Students are required to complete 18 credits of core taught courses and 6 credits of project for a total of 24 credits.

Diplomas shall be awarded upon completion of all courses and the final project.

Postgraduate Diploma/MSc in Geoinformatics

Introduction
Geoinformatics is a nascent multidisciplinary field in which graduates must be prepared to apply knowledge in new contexts, work cooperatively and communicate effectively.

THE AIMS AND OBJECTIVES
Aims
The goal of the MSc/PGDip Geoinformatics programmes is to provide high-quality professional graduate instructions in Geoinformatics that leads to productive careers and long-life learning.

Objectives
The graduate with an MSc/PGDip in Geoinformatics will be able to:

- Explain the principles, theories, tools and techniques of Geoinformatics.
- Apply specialised knowledge of Geoinformatics to a wide range of disciplines.
- Use the skills required to work individually or as a member of a team.
- Apply creative and critical thinking in solving applications in multidisciplinary areas using Geoinformatics.
- Formulate and effectively communicate professional opinions on topical issues.

In addition to the above, the graduate with an MSc in Geoinformatics will be able to develop research capabilities to contribute to the further academic and professional development of Geoinformatics.

ENTRY REQUIREMENTS

Applicants for the MSc or the PGDip in Geoinformatics programmes should have one of the following:

(a) A Second-Class Honours BSc degree in Surveying and Land Information /Geomatics, or a degree in a related area from a recognised institution.
(b) A Second-Class Honours BSc degree in Engineering, Natural Science, Agriculture or Geography, which includes Mathematics and Computer Science at levels equivalent to the respective courses in (a).
(c) An equivalent qualification acceptable to the Faculty of Engineering.
(d) A PGDip in Geoinformatics (for MSc Geoinformatics only). (Note: Additional requirements for admission may be placed by the Graduate School).

A graduate student in these programmes is also expected to have a strong mathematical/analytical background and ability to use specialised software applications within this context.

DURATION OF STUDY AND AWARD OF DEGREE

The programme is geared towards full-time study. It is expected that full-time students will complete the PGDip in 9 months and the MSc programme in 18 months. Part-time is expected to take two (2) calendar years for the PGDip programme and two and a half (2 1/2) calendar years for the MSc programme. Upon completion of all course requirements, a candidate will be awarded a PGDip in Geoinformatics. With the additional completion of the research thesis, a candidate will be awarded the Master's degree in Geoinformatics.

STRUCTURE OF PROGRAMME

Offered both part-time and full-time

COURSE OF STUDY

Students registered for the Postgraduate Diploma in Geoinformatics are expected to complete 26 credits of core courses and six credits of elective courses, while students registered for the MSc in Geoinformatics are expected to complete 38 credits of core courses and six credits of elective courses.

COURSE LISTING

CORE COURSES

The core courses for the PGDip/MSc Geoinformatics programmes are as follows:

Course Code	Course Title	Credits
GINF 6100	Principles of Geoinformatics	3
GINF 6015	Extraction and Management of Information from Geo-images	4
GINF 6020	Spatial Databases	4
GINF 6021	GIS and Society	4
GINF 6022	Spatial Analysis and Modelling	4
GINF 6023	Enterprise GIS Design and Development	4
GINF 6024	Research Methodology	3
GINF 6006	Research Project (MSc Geoinformatics only)	12

ELECTIVE COURSES

There are several courses available in the Department of Surveying and Land Information and other departments that may be selected to cover the elective courses that students are allowed to take. Elective courses may be taken in consultation with the Programme Coordinator or the Head of Department.

Course Code	Course Title	Credits
GINF 6009	Applications of GIS in Natural Resource Management	4
GINF 6010	Applications of GIS in Urban Development	4
GINF 6007	Issues and Application of Remote Sensing	4
GINF 6030	Independent Study in Geoinformatics	3
GINF 6025	Professional Internship	3
PLAN 6011	Planning in the Coastal Zone	3
PLAN 6014	SIDS Resource Management	3
PLAN 6006	Sustainable Housing and Settlements Planning	3
PLAN 6007	Community and Participatory Planning	3
PLAN 6008	Tourism Planning	3
PLAN 6009	Transportation Planning	3
COMP 6100	Computer Communications Network	3
COMP 6150	Distributed Computing	3
ECNG 6613	Database Systems, Principles & Design	3

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

RESEARCH
The Department offers the facilities to carry out research leading to the MPhil and PhD Degrees in a wide range of important areas: Mechanical, Industrial, Manufacturing Engineering

Research students register for the MPhil degree in the first instance and then, subject to the Faculty and University's Regulations, may upgrade to the PhD degree. Students who already have a Master's degree obtained through a substantial research project, may register directly for the PhD. A research student works in his chosen field of research under the guidance of a supervisor who has substantial expertise and experience in the field.

Persons interested in pursuing research leading to the MPhil or PhD degrees in Agricultural, Industrial, Mechanical or Production / Manufacturing Engineering & Management are invited to contact the Head of Department to discuss their research interests and for further information on research opportunities within the Department. The Department may be able to provide some financial support for specific research projects.

A sample of recent Research Theses and Projects are listed as follows:

i. Modelling of RF Propagation in Rectangular Confined Spaces
ii. Determinants of the Open Innovation Model for Trinidad and Tobago: A Case Study of the Food and Beverage Cluster
iii. Multi-criteria maintenance optimization for improving the performance of Offshore Production Systems
iv. A study of Fused Deposition Modeling (FDM) Process for part quality improvement" Multi-Objective Optimization Approach
v. Development of an innovation management framework for the Caribbean manufacturing sector
vi. The Characterisation of Tensile Fracture and Crack Propagation Forces in Trinidad Soils of varying Peat Content during Tillage Operations
vii. A Quasi-Analytical Approach to the Statistical Moments Associated with Large Ocean Waves
viii. An investigation into the Feasibility of Applying Cognitive Function Synthesis to Robot Navigation
ix. An Exergy Analysis of a Hydrocarbon Processing Unit.
x. Heat Transfer Mechanism in Biological Fibrous Materials.
xi. Osmotic and Air-drying Behaviour of Fruit and Fish.
xii. A Reliability Centred Maintenance Programme.
xiii. Strategic Remodelling of the Quality Systems of the Laboratories at the Caribbean Epidemiology Centre (CEC).

MPhil/PhD in Mechanical Engineering
MPhil/PhD in Manufacturing Engineering
MPhil/PhD in Industrial Engineering

BACKGROUND
Research degree programmes that lead to the award of a Master of Philosophy (MPhil) or a Doctor of Philosophy (PhD) in Mechanical Engineering, Manufacturing Engineering, or Industrial Engineering are offered by the Department.

THE AIMS AND OBJECTIVES
The objectives of the MPhil/PhD programmes in Mechanical/Manufacturing/Industrial Engineering by research are:

a. To provide training at the postgraduate level in specialised Mechanical/Manufacturing/Industrial Engineering subject areas through teaching which equips our graduates to solve engineering problems through research.
b. To assist in the transfer of new, emerging, and advanced technologies to the businesses of the Region through the mechanism of research projects.
c. To develop and augment the region's pool of expertise in Mechanical/Manufacturing/Industrial Engineering.

ENTRY REQUIREMENTS

a. At least a BSc Upper Second Class Honours Degree in Industrial, Mechanical, Manufacturing or Electrical Engineering or equivalent. Only in exceptional circumstances will candidates with Lower Second-Class Honours or Pass degrees be considered.

DEGREE STRUCTURE FOR MPHIL AND PHD

The Degree structure comprises the following:

i. An MPhil or PhD Thesis
ii. Relevant Courses (three (3) for MPhil, four (4) for PhD)
iii. Research Seminar (two (2) for MPhil and three (3) for PhD)

RESEARCH THESIS

These being Research Degrees, students will be expected to produce a satisfactory Thesis (MPhil or PhD) as stipulated in the University's regulations.

DURATION OF STUDY

Students are expected to complete the MPhil programme in accordance with the relevant University Regulations.

DEPARTMENTAL COURSES

Depending upon their academic background, students will be required to take three (MPhil) or four (PhD) courses. These courses will be used to direct the students' approach towards the research topic; strengthening their knowledge base in their area of interest and to research methodology in general.

A. Compulsory Course

Course Code	Course Title
MENG 6508	Research Methods

B. Elective Courses in Production Engineering and Management/Industrial Engineering

Course Code	Course Title
IENG 6000	Total Quality Management
IENG 6001	Expert Systems (COMP 2800 OR IENG 3004)*
IENG 6002	Distributed Information Systems & Databases (IENG 3013)*
IENG 6003	Computer Integrated Manufacturing Systems
IENG 6004	Occupational Biomechanics
IENG 6005	Industrial Ergonomics
IENG 6006	Occupational Safety & Health
IENG 6007	Industrial Automation
IENG 6009	Robotic Technology & Applications
IENG 6010	Operations Research in Manufacturing I (IENG 3007)*
IENG 6011	Operations Research in Manufacturing II (IENG 3007)*
IENG 6012	Operations Research in Services (IENG 3007)*
IENG 6013	Directed Readings
MATH 3530	Mathematics III (MATH 2240)*
MENG 6506	Project Management

C. Mechanical/Manufacturing/Production Engineering and Management Engineering Courses:

Course Code	Course Title
MENG 6200	Production Technology (MENG 2008)*
MENG 6201	Machine Tool Technology
MENG 6202	Applied Materials Technology
MENG 6300	Applied Ergonomics
MENG 6301	Computer Applications in Manufacturing
MENG 6302	Design of Plant & Services
MENG 6303	Computer Control Systems
MENG 6400	Production Planning & Control
MENG 6401	Advanced Production Management
MENG 6402	Human Resource Management I
MENG 6404	Maintenance Engineering & Management
MENG 6500	Industrial Marketing
MENG 6502	Financial Management
MENG 6504	Technology & Product Development
MENG 6505	Health, Safety & The Environment
MENG 6506	Project Management for Mechanical Engineers
MENG 6508	Research Methods
MENG 6509	Introduction to Operations Research

The above courses build upon the foundations laid at the undergraduate level and are thus vertically integrated with the undergraduate programme.

MSc in Engineering Management (EM)

All taught MSc programmes in the Department of Mechanical and Manufacturing Engineering are accredited to CEng (Chartered Engineer) level by the Institution of the Mechanical Engineers (UK). Therefore, these programmes fully satisfy the engineering education requirements for Chartered Engineer at (CEng) level.

THE AIMS AND OBJECTIVES

To provide advanced education and training for graduates in Engineering, Science and other related areas to meet current and future needs of manufacturing and allied industries.

MSc in Engineering Management (EM)

The overall objective of the Engineering Management (EM) programme is to provide advanced education and training in management for graduates in Engineering, and related areas to meet current and future needs of manufacturing and allied industries. The specific objective of this programme of study is to allow graduates in Engineering and Science to strengthen and enhance their capabilities in managing engineering functions.

On completion, the graduates of the EM programme will be able to:

- Contribute to organisational efforts to achieve customer satisfaction
- Create effective work environments using Human Resource Concepts
- Develop and implement work design practices to enhance human performance
- Ensure compliance with health, safety, and environmental regulations
- Implement work methods to ensure quality of products and services
- Use Operations Research models for making optimal decisions
- Formulate and implement projects for change management and enhancement of organizational performance
- Ensure proper use of funds in compliance with financial policies
- Formulate and implement maintenance policies and programs for optimal use of physical assets

EM Output:

A competent engineering manager capable of effective management of the engineering functions in the organization.

REGULATIONS

1. The General Regulations of the University and Faculty of Engineering Regulations for MSc Degrees shall apply.

2. Candidates are required to pass both coursework and written examinations in each course offered.

ENTRY REQUIREMENTS

The requirements for admission to the MSc in Engineering Management Programme are as follows:

i. BSc in Engineering or an equivalent. Candidates with other qualifications will be considered if they have at least ten (10) years industrial experience in the area of Engineering Management. Qualifying examinations may also be prescribed for such candidates.

ii. Normally, at least one (1) year of industrial experience is desirable.

STRUCTURE OF PROGRAMME

Duration of Study

Part-time students: Normally expected to complete the examination requirements within four (4) semesters and complete the Project in accordance with the relevant University Regulations.

The Programme consists of twelve (12) compulsory courses, and a Final Project. Each course is taught over one (1) semester and carries three (3) credits, and the Final Project carries nine (9) credits. MENG 6508 Research Methods is a compulsory course for all MSc programmes in the Department.

Course Listing

COMPULSORY COURSES

Course Code	Course Title
MENG 6202	Applied Materials Technology
MENG 6300	Applied Ergonomics
MENG 6301	Computer Applications in Manufacturing
MENG 6302	Design of Plant & Services
MENG 6402	Human Resource Management I
MENG 6404	Maintenance Engineering & Management
MENG 6500	Industrial Marketing
MENG 6502	Financial Management
MENG 6505	Health, Safety & The Environment
MENG 6506	Project Management
MENG 6508	Research Methods
MENG 6509	Introduction to Operations Research
MENG 6600	Final Project (**On successful completion of the 12 taught courses**)

OTHER INFORMATION

Requirements for Award of MSc

Candidates are required to obtain a total of 36 credits in coursework and complete an industry-oriented project, MENG 6600, equivalent to nine (9) credits.

Who Should Enrol?

The programmes would be most useful to Engineers and Managers holding responsibilities for Planning, Design and Development, Production/Operations, Plant Maintenance, and Projects in Manufacturing and Service Industries.
Graduates in Engineering or a related field wishing to pursue careers in Production/Operations Management may also apply.

MSc in Engineering Asset Management (EAM)

The purpose of the EAM programme is to provide the industry with competent Engineers capable of the acquisition, installation, reliable operation, maintenance, and disposal of the physical assets in these industries. This programme is designed to meet the University's Strategic Plan to provide the industry with trained personnel in Asset Integrity Management to support their growth and competitiveness.

The MSc programme in EAM stresses University/Industry linkages. The students are generally professionals from industry and the lectures are supplemented with real life case studies and short courses presented by experienced industry SME's. Students' projects will normally be provided and sponsored by companies in which joint advisory committees of Faculty members and corporate managers provide guidance. Students are required to perform all aspects of the project work, from project formulation to final presentation of results, with application strategies, to both the company and the University.

The programme content includes both a strong theoretical base and a range of practical skills relevant to Asset Integrity Management. Students become more industry ready and are made more familiar with the industry's systems, on completion of the course.

The programme is delivered on a part-time basis, over four semesters covering twelve (12), 3-credit courses. A Final research/application Project equivalent to nine (9) credits is mandatory on completion of all taught courses.

Output: A competent Asset Integrity Manager/Engineer capable of managing the acquisition, reliable operation, maintenance and disposal of physical assets to meet organisational objectives and strategies. The graduates would be provided with in-depth theoretical and practical knowledge and skills required to:

- Develop, deploy, and evaluate strategic plans for physical assets in creating and sustaining a competitive edge;
- Formulate reliable maintenance objectives to support corporate / operations objectives and strategies;
- Develop and implement maintenance plans and programs to achieve maintenance objectives;
- Prepare, implement and audit annual budgetary control systems;
- Select and implement effective Reliability and Maintenance technologies such as RCM, TPM, FMECA, Ishikawa diagram, RCA etc.;
- Design and deploy organisational structures, processes, and procedures for managing physical assets;
- Develop and implement work Planning and Scheduling systems to optimise the use of Human and all other resources;
- Develop implementation, measurement and reporting systems including KPI's for assessment of performance of assets and operations;
- Formulate and execute strategic, long and medium-term plans for improvement in Asset Integrity performance;
- Apply analytical and optimisation systems and models such as Weibull analysis to support decision making processes;
- Plan and control major plant Shutdowns, Overhauls and Turnarounds;
- Select and use Computerised Maintenance Management Systems effectively and
- Improve Asset Reliability and Maintainability systems with optimal Asset Integrity Management Accounting strategies, using Key Performance Indicators (KPI's) on a continuous basis. This will ensure optimal trending, sustainability and then continuous improvement, so that industries can maintain and improve their Asset Integrity capabilities and thus their competitive edge.

REGULATIONS

1. The General Regulations of the University and Faculty of Engineering Regulations for MSc Degrees shall apply.
2. Candidates are required to pass both coursework assignments and written examination(s) in each course offered, in order to obtain a pass in that course.

ENTRY REQUIREMENTS

The requirements for admission to the Programme are as follows:

a. BSc in Engineering or a related degree. Candidates with other qualifications will be considered if they have at least ten (10) years industrial experience in the area of Engineering Asset Management. Qualifying examinations may also be prescribed for such candidates.
b. Normally, at least one (1) year of relevant industrial experience is desirable.

STRUCTURE OF PROGRAMME
OFFERED PART-TIME Duration of Study
Part-time students: Normally expected to complete the examination requirements within four (4) semesters and complete the Project in accordance with the relevant University Regulations.

The programme consists of twelve (12) courses and a Final Project. Each course is taught over one (1) semester and carries three (3) credits, and the Final Project carries nine (9) credits.

MENG 6508 Research Methods is a compulsory course for all MSc programmes in the department.

Course Listing
The structure and the courses for each type will consist of the following courses:

COMPULSORY COURSES

Course Code	Course Title
MENG 6402	Human Resource Management I
MENG 6505	Health, Safety and the Environment
MENG 6506	Project Management
MENG 6508	Research Methods
MENG 6700	Strategic Asset Management
MENG 6701	Asset Maintenance Technologies
MENG 6702	Work Planning and Scheduling
MENG 6703	Condition Monitoring and Diagnostics
MENG 6704	Maintenance Analysis and Optimisation
MENG 6705	Maintainability Engineering & Management
MENG 6706	Asset Reliability Management
MENG 6707	Asset Performance Management
MENG 6600	Final Project (**On successful completion of the 12 taught courses**)

OTHER INFORMATION
Requirements for Award of the MSc Degree
Candidates are required to obtain a total of 36 credits, as given in the part-time programme structure and courses mentioned above, in coursework and complete an industry-oriented project, MENG 6600, equivalent to nine (9) credits.

Who Should Enrol?
The Programmes would be most useful to Engineers and Managers holding responsibilities for Asset Integrity Management, Plant and Project Maintenance, Equipment Reliability, Availability and Operational Efficiencies and Industrial Projects in Engineering, Manufacturing and Service Industries.

Note: Graduates in the field of Engineering and/or Sciences wishing to pursue careers in Engineering Asset Integrity Management, may also apply.

MSc in Manufacturing Engineering & Management (MEM)

PURPOSE & OBJECTIVES OF THE UWI MEM PROGRAMME
The overall objective of the programme is to provide advanced education and training for graduates in Mechanical Engineering and similar graduates of CEng/IEng accredited degrees, to meet current and future needs of manufacturing and allied industries. Furthermore, the purpose of this programme is to allow graduates in Mechanical Engineering and equivalent domains to strengthen and enhance their technical, professional and managerial skills and capabilities in the areas of manufacturing engineering and manufacturing management.

It also seeks to provide Mechanical Engineering Graduates and equivalent Graduates with a deeper understanding of the knowledge required for designing products and manufacturing systems with the intention to improve effectiveness, promote innovativeness and enhance competitiveness of the Caribbean manufacturing sector. In this regard the specific objectives of the program are:

- To provide graduate students with the advanced and specialised knowledge in the areas of Manufacturing Engineering and Management with a focus on the conventional and computer integrated manufacturing (CIM) fields.
- To prepare graduates with the knowledge of product design processes and rapid product development approaches required to support the local and regional economy with a particular emphasis on integration of computer-aided design (CAD), computer-aided engineering (CAE) and computer-aided manufacturing (CAM) tools and techniques.
- To produce graduates capable of developing lean management plans and material control policies that minimise overall costs of setup, ordering and inventories.
- To produce graduates capable of implementing and managing contemporary quality tools in the local and regional manufacturing industry.
    i. To use incremental-iterative methods to solve nonlinear manufacturing problems arising from large deformations and/or nonlinear material properties.
    ii. To choose shape and/or sizing parameters appropriately in product design.

MEM Output: A competent Manufacturing Engineer capable of combining technical, professional and managerial skills and capabilities.

THE LEARNING OUTCOMES

On completion of the programme, the graduates will be able to:

i. Apply systematic approach for appropriate design and evaluation of manufacturing planning and control (MPC) systems, in the context of local and regional manufacturing.
ii. Identify various elements of CIM and evaluation of their interactions for introduction of automated systems in the context of Caribbean industry.
iii. Apply an integrated modelling approach to design innovative product models by deploying total quality tools/techniques and project management skills to arrive at an innovative product design that fulfils the Caribbean industry requirements.
iv. Use the principles of rapid prototyping (RP) and CNC programming skills for effective operation and utilisation of the manufacturing resources in the local industry.
v. Formulate and analyse a range of manufacturing systems and present the same through industry-based design projects and validation through simulation experiments.
vi. Formulate and analyse a range of manufacturing problems using appropriate finite element models with due consideration being placed on validation.
vii. Develop the ability to prepare a project proposal from its conception to implementation, closeout, and ex-post evaluation.
viii. Understand how to monitor, control, and improve the quality of products and processes in industries, using the statistical methods and other quality improvement tools and techniques.
ix. Successfully manage the Health and Safety aspect of an Industrial Enterprise as well as manage the Environmental activities in an Industrial Facility to make the facility competitive and sustainable.
x. Outline the Environmental Aspects and logistics of locating a Plant and analyse the manufacturing processes of a manufacturing Facility.
xi. Present data appropriately and deal with errors in a systematic manner

REGULATIONS AND ENTRY REQUIREMENTS

A. The General Regulations of the University, the Faculty of Engineering and the Department of Mechanical and Manufacturing Engineering for MSc Degrees shall apply.

B. The requirements for admission to the programme are as follows:

- a BSc Degree in Mechanical, Manufacturing, Production, Industrial Engineering, or an equivalent with at least a Lower Second-Class degree.
- at least one (1) year of industrial experience is desirable. This may be waived for Recent Graduates with a First or Upper Second-Class Honours degree, who wish to complete the programme on a Full-Time basis.
- applicants with Third Class or Pass degrees require at least three (3) years industrial experience.

A graduate student in this Programme is also expected to have a strong mathematical and analytical background and ability to use specialised software applications within this context.

STRUCTURE OF PROGRAMME
OFFERED PART-TIME .

DURATION OF STUDY
Part-time students: Normally expected to complete the examination requirements within four (4) semesters and complete the Project in accordance with the relevant University Regulations.

NO. OF CREDITS REQUIRED: 45

Six (6) Compulsory Courses	18 credits
Four (4) Optional Courses	12 credits
Final Project	9 credits

OTHER INFORMATION
The programme consists of a set of six (6) compulsory courses and four (4) optional courses, two (2) courses from each Subject Groups A & B (12 credits) and complete an industry-oriented project, MENG 6600 (9 credits). All courses are three (3) credits unless otherwise specified.

The programme stresses university-industry linkages. Student projects will normally be provided and sponsored by companies in which a joint advisory committee of Faculty members and corporate personnel will provide guidance.

Course Listing

COMPULSORY COURSES:

Course Code	Course Title
MENG 6200	Production Technology
MENG 6207	Computer Integrated Manufacturing
MENG 6306	Advanced CAD/CAM for Product Realization
MENG 6400	Production Planning & Control
MENG 6504	Technology and Product Development
MENG 6505	Health, Safety & The Environment
MENG 6508	Research Methods
MENG 6600	Final Project

OPTIONAL COURSES:
Group A: Manufacturing Engineering
Two (2) courses to be chosen from the following:

Course Code	Course Title
MENG 6203	Robotic Technology & Applications
MENG 6302	Design of Plant & Services
MENG 6305	Finite Elements Analysis in Manufacturing
MENG 6307	Design & Simulation of manufacturing Systems
MENG 6701	Asset Maintenance Technologies

Group B: Manufacturing Management
One (1) course to be chosen from the following:

Course Code	Course Title
MENG 6405	Total Quality Management
MENG 6506	Project Management
MENG 6700	Strategic Asset Management

REQUIREMENTS FOR AWARD OF MSC

Candidates are required to obtain a total of thirty (30) credits from six (6) Compulsory courses (18 credits) and four (4) Optional courses, two courses from each Subject Groups A & B (12 credits) and complete an industry-oriented project, MENG 6600 (9 credits).

REGULATIONS

The General Regulations of the University and Faculty of Engineering for MSc Degrees shall apply.

OFFICE OF THE DEAN

MSc in Project Management

This is a Campus programme involving the Faculty of Engineering, Faculty of Social Sciences (Department of Management Studies) and the Institute of Business. It is taught through the Department of Civil & Environmental Engineering and is academically managed by a Campus-based team, led by the Dean of the Faculty. This MSc is a two-year evening programme. The Degree will be awarded following the normal University requirements for taught Master's Programmes.

The MSc is designed to specifically meet the growing industry demands. Graduates will develop methodological approaches to the management of financial aspects of projects and programmes, as well as learn about the strategic management of people in the organisation.

THE AIMS AND OBJECTIVES

To train and produce Graduates who will be able to:

- Solve real-world management problems associated with the project cycle;
- Exercise sound management judgment through practical application of Project Management concepts and skills;
- Apply management principles to business situations;
- Develop and communicate project financial and performance objectives;
- Accurately develop Master Plans for projects and programmes, including tasks, budget and resource requirements;
- Effectively monitor, control and report project costs, the scheduled and quality/performance levels needed to meet agreed milestones and required levels of earned value; and
- Provide effective leadership and promote a true environment that will help motivate team members and resolve conflicts.

ENTRY REQUIREMENTS

A first degree in Project Management, Information Technology, Planning, Agriculture, Accounting, Engineering, Management Sciences, Economics, Architecture, Quantity Surveying, Land Surveying or Construction Management from an approved University. Applicants must possess sufficient related work experience that would assist candidates in becoming eligible for registration in related professional associations and institutions. Candidates with a distinctive first degree in other areas will be entertained on a case-by-case basis.

STRUCTURE OF PROGRAMME

Offered Evening only

The programme will be an evening programme with lectures and tutorials being delivered between 4.00 pm and 8.00 pm on weekdays and will involve an interactive approach to learning, embracing real-life problems and experiences. Group discussions and pursuit of topics and assignments will be an essential feature of the delivery format.

PROGRAMME DELIVERY AND ACADEMIC SUPERVISION

The Programme Coordinator is responsible for Delivery of the programme.

DURATION OF STUDY:

A minimum of four (4) semesters or a maximum of six (6) semesters.

NO. OF CREDITS REQUIRED: 45

Eight (8) core courses to be done over the first two semesters	24 credits
Four (4) elective courses over the third and fourth semesters	12 credits
One (1) compulsory Research Project to be done over the third and fourth semesters	9 credits

Compulsory Courses

SEMESTER 1		
Course Code	**Course Title**	**Credits**
PRMG 6001	Project Leadership & Organisational Behaviour	3
PRMG 6003	Project & Programme Management	3
PRMG 6004	Project Accounting & Finance	3
PRMG 6015	Contract Management & Contract Law for Project Managers	3
SEMESTER 2		
PRMG 6002	Project Management Information Systems	3
PRMG 6007	Procurement Management, Logistics & Contracting	3
PRMG 6010	Risk Management for Project Managers	3
PRMG 6019	Research Methods for Project Managers	3
PROJECT		
PRMG 6014	Project Management Research Project/Internship Project	9

Candidates will be required to deliver seminar presentations for three (3) of the eight (8) core courses.

Electives

The following is a list of the Elective Courses from which the student is required to complete four (4) by the end of the fourth semester. Courses may also be selected from other graduate programmes. When registering for other graduate programme courses (i.e. courses not listed below), students may need to request an override. If the online request for an override is not permitted, students must then seek approval from the Programme Coordinator.

Course Code	Course Title	Credits
COEM 6016	Natural Hazards Management	3
IENG 6006	Occupational Safety & Health	3
MENG 6405	Total Quality Management	3
MENG 6505	Health, Safety & The Environment	3
PRMG 6005	Marketing Management & Business Communication	3
PRMG 6008	Project Estimating & Cost Management	3
PRMG 6009	Managing Information Technology Projects (PRMG 6002)	3
PRMG 6011	Advanced Project Management	3
PRMG 6012	Value Engineering & Management	3
PRMG 6013	International Project Management	3
GINF 6100	Principles in Geoinformatics	3
PRMG 6017	Project Management for Small & Medium Size Organisations	3
PRMG 6018	Financial Risk Management & Regulatory Compliance (Banks and Financial Institution)	3

Designated courses are already delivered within the Campus Units involved.

Project Management Research Project

This project-based course carries nine (9) credits and provides the student with the opportunity to integrate knowledge and skills learned throughout the programme. It should normally be taken as the last course in the delivery of the programme. Conceptual work on the Project will begin at the end of the first semester, and the project should be completed by the end of the fourth semester. Students develop, design and present a project plan; justify the project; work to satisfy performance, schedule and budget requirements; adjust for unplanned occurrences; and provide status reports.

As an alternative, the student may opt to pursue an internship project, within the mainstream of their area of specialisation, that is approved by the Academic Unit involved.

MPhil/PhD Degrees in Project Management

Regulations:

MPHIL IN PROJECT MANAGEMENT

The Regulations for the MPhil in Project Management are the same as the General Regulations for the MPhil, except that the candidates applying for registration should normally have either:

a. A Bachelor's degree with Second Class Honours in Project Management, Civil Engineering, Construction Engineering and Management

OR

b. An equivalent qualification in the field of Management Studies.

PHD IN PROJECT MANAGEMENT

The Regulations for the PhD in Project Management are the same as the University and Faculty of Engineering regulations for the Degree of Doctor of Philosophy except that Candidates applying should normally have either:

a. An MPhil Degree in Project Management

OR

b. An MSc in Project Management awarded at the level of Distinction.

THE AIM AND OBJECTIVES

Technical deepening and broadening beyond the level covered by the taught MSc degree in Project and Programme Management by research into the specific problem that arise in a wide range of industries and sectors in the economy:

i. To immerse the student in first-hand contact with the many challenges in project and programme management.

ii. To expose the student to advanced theoretical and applied analysis in the field of project and programme management.

iii. To provide the student with the intellectual environment to be able to conceptualise real challenges into a problem format, then apply rigorous analysis within the context of the project management discipline to be able to produce a theoretical formulation to problem solutions.

iv. To provide the context within which the student can generate new innovative and novel solutions to real problems encountered by project management practitioners.

FOR FURTHER INFORMATION, CONTACT

The Project Management Office
Email: STA-Project.Management@sta.uwi.edu
Tel: 1 (868) 662-2002; Ext. 83838/83169

SECTION 2 – REGULATIONS

Regulations for Postgraduate Diplomas and Degrees

Please see the Board of Graduate Studies and Research, Regulations Policy for Degrees and Diplomas.

Regulations for Research Degrees

GENERAL REGULATIONS

A candidate for the MPhil degree is required to read courses totalling a minimum of six (6) credits. A candidate for the PhD degree is required to read courses totalling a minimum of nine (9) credits. Candidates are required to pass both the coursework and the written examinations before submitting the thesis.

Where graduate students write undergraduate examinations for graduate credit, or where they are writing qualifying or departmental examinations, they must pass both components of the course (i.e. coursework and written examination) in accordance with the University's marking scheme before proceeding to graduate work.

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 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.

Master of Philosophy

The MPhil Degree shall be awarded on the basis of an examination by thesis and the appropriate University Regulations for the Master's Degree shall apply.

Candidates applying for registration should normally be holders of a Bachelor's Degree in Engineering or other appropriate field of at least the standard of at least an Upper Second Class Honours Degree of The University of the West Indies. Holders of lower class Degrees or a General Bachelor's Degree must normally pass qualifying examinations.

Doctor of Philosophy

The appropriate University and Faculty of Engineering Regulations for the Degree of Doctor of Philosophy shall apply.

Attendance at the oral examination for the PhD Degree in the Faculty of Engineering shall be open to the academic and professional community. A minimum of seven days' notice shall be given before the examination.

Regulations for MPhil Qualifying Examinations

GENERAL REGULATIONS

Any person wishing to proceed to MPhil in the Faculty of Engineering must take a qualifying examination unless:

a. He/she possesses at least an Upper Second Class Honours Degree or equivalent in the area in which he/she is working or in a related area;

OR

b. He/she has been appointed to the post of Assistant Lecturer or higher in the Faculty;

OR

c. The Board for Graduate Studies and Research exempts him/her on the recommendation of the Faculty Sub-committee of the Board for Graduate Studies and Research.

The qualifying examination shall consist of at least two (2) papers lasting three (3) hours each.

Normally, one of the papers shall be taken from the BSc (Eng) Degree Examination or be of equivalent standard and one will be specific paper in the specialist area of interest.

There shall be a Moderator appointed by the Dean on the recommendation of the Head of Department from among persons not working in the Department(s) involved in the research.

The Head of the Department will assign the responsibility for the preparation of the question papers and the marking of the scripts.

The Moderator mentioned in the Regulations above shall be required to examine the question papers before the examination and to examine the scripts after they have been marked. He may, if he wishes, require an oral examination. In order for the candidate to pass, the Examiners must certify to the Board for Graduate Studies and Research that the candidate has reached at least a standard equivalent to Second Class Honours in the papers examined and the Moderator must give his approval of the examination.

All part-time postgraduate students may be required to attend such postgraduate seminars as may be arranged by the department in the Faculty of Engineering during the academic year.

Not less than five (5) calendar years (unless the Faculty relaxes this requirement if it can be shown that the candidate's employment is such that his normal work is the same as the research work for his degree) after passing the qualifying examination a part-time student for the MPhil will present a dissertation and may also be orally examined on the general field of study or on the dissertation.

A part-time student for the PhD will submit a thesis and be orally examined in the general field of study and on the thesis not less than seven (7) calendar years (unless the Faculty relaxes this requirement if it can be shown that the candidate's employment is such that his normal work is the same as the research work for his degree) after registration for the degree.

The award to a part-time student of the postgraduate degree, be it Master's or PhD Degree, will be subject to the conditions of award to full-time postgraduate students.

For part-time students, an MPhil thesis must be submitted normally not later than five (5) years after the date of registration. Similarly, a PhD thesis must be submitted not later than seven (7) years after the date of registration.

Guidelines for Postgraduate Programmes

MSc/MASc/Diploma

The following are the approved guidelines for the conduct of Graduate Programme in the Faculty of Engineering.

Registration
A full-time candidate will not normally be permitted to register for more than 18 credits per semester, and a part-time candidate for not more than 9 credits. A full-time student should complete all the course requirements (including project) within two (2) years, a part-time student within four (4) years.

Total Number of Credits in Master's Programme
The total number of credits should normally be set at 45 in accordance with the recommendations of the Board for Graduate Studies.

Value of a Course Credit
A course credit is defined as one (1) contact hour per week OR one (1) 2-hour lab per week OR one (1) hour supervised research per week.

Performance of Students:
Qualifying candidates may normally be allowed one (1) attempt at the original examination for any one course.
Master's/Diploma candidates may normally not have more than two (2) attempts at an examination for any one course.
To maintain registration, candidates should normally pass a minimum of 50% of the course load in each semester.

University Regulations state that candidates may not have more than two (2) attempts at an examination.

Oral Examination
Students may be orally examined at the discretion of the Department, subject to the approval of The Office of Graduate Studies and Research.

MARKING SYSTEM
Examination of Project Report
Examiners must observe the University guidelines for report marking. Marks awarded for each section should be indicated in the report together with brief comments. Where this is not done, the report will be sent back to the examiner for re-examination.

Procedure for Examination Reports
The Faculty will continue to submit all project reports to External Examiners in cases where the projects constitute more than 25% of the programme credit ratings. Project Reports are to be submitted simultaneously to all examiners. For a student to pass (i.e. average project mark is ≥ 50%) all examiners should normally concur. Where there is no-agreement among examiners, the Board of Examiners will decide on the appropriate action to be taken. For programmes with less than 25% project credit rating, the use of an external examiner could be avoided.

Withdrawal
A candidate required to withdraw will not be considered for readmission within two (2) years of their withdrawal, but within five (5) years after withdrawal. The candidate will retain credits for courses already successfully completed. Candidates who voluntarily withdraw may be allowed to re-enter at the next available opportunity. In this case, all credits previously accumulated will be retained by the candidate (normally for up to five (5) years thereafter, at the discretion of the department).
No extensions will be granted to students beyond three (3) years full-time and six (6) years of part-time.

NOTE: For additional information on postgraduate regulations please see the Regulations for Graduate Diplomas and Degrees.

STUDENT LIFE AND DEVELOPMENT DEPARTMENT (SLDD)

DIVISION OF STUDENT SERVICES AND DEVELOPMENT (DSSD)

THE SLDD IS THE FIRST AND MOST IMPORTANT ***STOP*** FOR HIGH QUALITY ACADEMIC SUPPORT AND PERSONAL DEVELOPMENT.

WHO CAN ACCESS THE SERVICES OF SLDD?
Any student can use SLDD services through self-referral or referrals by faculties, departments, friends, or family. SLDD supports all students, including full-time, part-time, postgraduate, undergraduate, mature, international, regional, student athletes, and students with disabilities or medical conditions.

GENERAL SUPPORT FOR ALL STUDENTS

- Peer-Pairing
- Referral to Counselling
- Access to a Safe Space for relaxing and restoration

ACADEMIC SUPPORT – FOR ALL STUDENTS

- Time Management
- Examination Strategies
- Workload Management
- Study Skills - one on one sessions
- Educational Assessment/Screening – Lucid Adult Dyslexia Screening (LADS) & Learning and Study Strategies Inventory (LASSI)
- Peer Tutoring – one on one sessions

INTERNATIONAL AND REGIONAL STUDENT SUPPORT

- Assistance with Immigration matters – renewal of landing stamps
- Liaising with faculties and departments in The UWI and the Immigration Division regarding immigration matters

POSTGRADUATE AND MATURE STUDENT SUPPORT

- Opportunities for student employment such as peer tutoring, and special examination invigilation
- Liaising with faculties and departments on any postgraduate and mature students matters

DISABILITY SUPPORT/STUDENTS WITH MEDICAL CONDITIONS SUPPORT (TEMPORARY AND PERMANENT)

- Loans of aids and devices such as laptops, digital voice recorders, wheelchairs, walking canes and crutches
- Special accommodations in the classroom and for examination
- Liaison with faculties, departments, deans, heads of departments, and lecturers
- Special parking accommodations - Accessible Parking Permits
- Student Support Group
- Assistive Technology Lab at the Alma Jordan Library- special software (JAWS)

No student at The UWI will be discriminated against based on special needs. Early sharing of needs helps us serve students better.

HOW DO I REGISTER AT SLDD?

- Complete the registration form available at the SLDD office or online at https://sta.uwi.edu/dssd/student-life-and-development
- Submit the completed form physically to the office or via email to sta-sldd@sta.uwi.edu
- Schedule an appointment to meet with the Manager or a Student Support staff member
- An assessment will be conducted to determine the required service
- Students with disabilities and medical conditions must submit a medical report from a qualified medical professional to the Health Services Unit for verification, using the Disability Assessment Questionnaire: Academic Accommodations form. This form can be collected at the SLDD's office or via email request
- Once verified, the document must be submitted to SLDD to be sent for approval by the Chair, Examinations

FOR MORE INFORMATION OR ASSISTANCE, CONTACT:

Mrs Amanda Best-Noel, Manager (Ag.), Student Life and Development Department
Email: sta-sldd@sta.uwi.edu or amanda.best-noel@uwi.edu
Address: Heart Ease Building, Wooding Drive, St. Augustine Campus
Tel: 662-2002 Ext. 83866, 83921, 83923, 84254, 84103 OR Direct line 645-7526
Hours: Monday to Friday | 8:30 am - 4:30 pm
SLDD Website: sta.uwi.edu/dssd/student-life-and-development
Facebook: www.facebook.com/UWI-Student-Life-Development-Department-SLDD-948337438614375

Please reach out to SLDD anytime for more information or assistance!

STUDENT EXCHANGE & STUDY ABROAD

INTERNATIONAL OFFICE - OFFICE OF INSTITUTIONAL ADVANCEMENT AND INTERNATIONALISATION (OIAI)

The St. Augustine Campus has a range of partnership agreements managed through the International Office, OIAI that facilitates exchanges by UWI students as well as students from our international partners to spend time at each other's campuses. The Office also enables student mobility with institutions where we do not have such formal partnerships.

The UWI Student Exchange programme will allow you to study at one of our many international partners around the world, including in North America, Europe, South America, Africa, Asia and the Caribbean in addition to other UWI Campuses. This type of international immersion has many educational and personal benefits. Students who have participated in the past have all spoken about the tremendous experiences and learnings not only in the classroom, but also from the people and places that they were able to interact with. They have become more independent in their thinking, self-sufficient and confident. They have also been able to make new friends, learn new languages and experience the world first-hand as true global citizens. A number of options for student mobilities are available to undergraduate and postgraduate students, including:

- Incoming and Outgoing Student Exchange – from one semester to one year duration.
- Incoming and Outgoing Study Abroad (fee paying) – from one semester to one year duration.
- Visiting Students – for postgraduate students doing research on invitation by overseas institution.
- Incoming and Outgoing Study Tours
- Students on internships/practicums

Funding is available to assist students with some of these exchange opportunities.

For further information on funding as well as Student Exchange and Student Mobility, please visit our website: sta.uwi.edu/internationaloffice/ or contact:

Alviann Thompson
Outbound Mobility Coordinator, Academic Agreements & EU Projects
International Office
The University of the West Indies, St. Augustine Campus
Trinidad and Tobago, West Indies
Email: alviann.thompson@uwi.edu or sta-outgoing.mobility@sta.uwi.edu
Phone: 1 (868) 662-2002 ext. 85010 / Direct: +1 (868) 224-3708

Chawntel Mc Call
Inbound Mobility Coordinator & Study Tours
International Office
The University of the West Indies, St. Augustine Campus
Trinidad & Tobago, West Indies
Email: chawntel.mccall@uwi.edu or sta-incoming.mobility@sta.uwi.edu
Phone: +1 (868) 662-2002 ext. 82682/ 82681/ Direct: +1 (868) 224-3708

Olivia Ramkissoon
Director (Ag.), International Office
International Office
The University of the West Indies, St. Augustine Campus
Trinidad & Tobago, West Indies
Email: olivia.ramkissoon@uwi.edu or internationaloffice@sta.uwi.edu
Direct: +1 (868) 224-3739 ext. 82680

THE CAMPUS LIBRARIES

THE UNIVERSITY OF THE WEST INDIES
ST. AUGUSTINE CAMPUS

The Campus Libraries

The UWI, St. Augustine Campus Libraries are the repository and gateway to information supporting the teaching, learning, and research needs of the University community. There is currently an integrated digital network of nine libraries:

- The Alma Jordan Library
- The Medical Sciences Library
- The Norman Girvan Library
- The School of Education Library
- The Republic Bank Library and Information Resource Centre, Arthur Lok Jack Graduate School of Business
- The UWI-ROYTEC Allan Mackenzie Library
- The Eric Williams Memorial Library
- The UWI Seismic Research Centre Library
- National Herbarium of Trinidad and Tobago Library

Items in the collections of eight of these libraries can be discovered in a single catalogue. This is integrated into a single virtual library space (UWILinC) which provides a single point of access to the print and digital information resources of all five campuses of the University.

Other UWI libraries not currently networked include: the Department of Creative and Festival Arts Library, the Centre for Language Learning Library, and The Patience-Theunissen Memorial Library of the Seminary of St. John Vianney, and the Uganda Martyrs.

Each Library's website (https://libraries.sta.uwi.edu/) is the gateway to its comprehensive electronic, print and multimedia information resources in all disciplines. From there, students can access state-of-the-art, scholarly, full-text databases on and off campus.

Each Faculty handbook includes the relevant library's services, resources and contact information.

The Alma Jordan Library (AJL):

The AJL, previously known as the Main Library, officially opened at its present location in January 1970 and covers a total area of 9,000 square metres. It is organised into subject divisions: Engineering; Food and Agriculture/Science and Technology; Humanities; and Social Sciences/Sport/Law. Other divisions which provide services to users include Circulation and Access Services, and the West Indiana & Special Collections (WISC).

The AJL has a wide collection of electronic resources covering all disciplines. These include:

- 294 databases (https://libraries.sta.uwi.edu/apps/index.php/DatabaseSearch/index)
- 106,333 electronic journal titles (https://sfxhosted.exlibrisgroup.com/uwi/az/sta)
- 256,584 electronic books (https://libguides.uwi.edu/ebooks)

In addition, it has some 317,335 books, as well as a vast array of multimedia materials in many formats including:

- 2,449 audio-visual items
- 1,147 cartographic items
- 6,112 photographs
- 2,160 multimedia items and
- 22,784 microfilms

Preserving West Indian Documentary Heritage

Documentary heritage is a cornerstone of all democratic societies and, as such, is an essential resource for supporting economic, social and cultural domains, as well as for fostering innovation. The AJL possesses historical materials dating as far back as the 1600s. WISC's mission is to acquire, preserve, and provide access to material emanating from the West Indies, produced by West Indians, and on the West Indies as well as the West Indian diaspora.

WISC's collections contain materials in different formats, ranging from maps, microforms, newspapers, theses, photographs, recordings, and over 169 special collections (https://archivespace.sta.uwi.edu/), some of which have been recognised for their importance. The Memory of the World Register lists documentary heritage endorsed by the Director-General of UNESCO as having global significance and outstanding universal value. Three of these award-winning collections reside at WISC, alongside four others listed on the local and regional registers:

- The Earl Lovelace Collection – Inclusion in the Memory of the World – Latin America and the Caribbean Register in 2025.
- The Sam Selvon Collection – Inclusion in the Memory of the World – Latin America and the Caribbean Register in 2012.
- The Jackie Hinkson Sketchpad Collection – Inclusion in the Memory of the World Local Register in 2010.
- The Carlilse Chang Collection – Inclusion in the Memory of the World Local Register in 2010.
- The C.L.R. James Collection - Inclusion in the Memory of the World Register in 2005.
- The Eric Williams Collection - Inclusion in the Memory of the World Register in 1999.
- The Derek Walcott Collection - Inclusion in the Memory of the World Register in 1997.

Opening Hours at The AJL:

Semester I and Semester II:	Monday to Friday 8:30 a.m. to 7:00 p.m.	Saturday 8:30 a.m. to 5:00 p.m.
24/7 (during each semester):	Monday to Friday 7:15 p.m. to 5:45 a.m.	Saturday 5:15 p.m. to 5:45 a.m.
Summer/Vacation:	Mondays 8:30 a.m. to 6:30 pm	Tuesday to Friday 8:30 am to 5:00 pm

Library Services at The AJL (https://libraries.sta.uwi.edu/ajl/index.php/services):
The AJL provides a wide range of services to support teaching and research. These include, but are not limited to the following:

- Online Chat Service: "Ask-a-Librarian", an online chat service, provides users with immediate responses to questions in real-time with library staff. It is available from the AJL and the Medical Sciences Library websites. Users can also submit queries and find answers in the Frequently Asked Questions at: http://uwi-sta.libanswers.com
- Faculty Liaison Services: Liaison Librarians provide formal communication between members of faculty and The AJL. A faculty member should liaise directly with his/her Liaison Librarian or with the Head of User Services regarding required services.
- Booklists: Members of faculty must submit booklists to the Acquisition and Continuing Resources Unit of the Library six (6) months before the course is scheduled to be taught. These booklists should contain full bibliographic information on the essential texts and reading lists.
- Borrowing: Members of faculty, senior administrative and professional staff can borrow up to nineteen items. Research Assistants may check out material on behalf of a faculty member with written authorization.
- Collection Development: Members of faculty are encouraged to collaborate with liaison librarians to select resources in their discipline.
- Course and Syllabus Changes, New Courses and Degree Programmes: When amending existing or developing new course offerings or programmes, members of faculty must liaise with their Faculty Liaison Librarian to ensure that an adequate print and electronic resource base is established to support research and teaching. Formal certification in this regard is required.
- Current Awareness Services: The AJL can, on request, provide members of faculty with information about the latest research material published in their areas of research or interest.
- Dissertation/Thesis Checking: Liaison librarians can assist users in mastering the appropriate citation style for their discipline. In addition, the Library provides training in the use of citation management software (Endnote) that can create references and bibliographies. When a thesis/dissertation is completed and accepted, the Library's Bindery Unit will bind personal copies at a cost.

- Gifts & Donations: The AJL welcomes gifts of library materials which will enrich the collection and support the teaching and research programmes of The UWI. In particular, it welcomes donations of manuscripts and other materials of significance to research on the Caribbean. It does not generally accept the temporary deposit of material.
- Information Literacy: Throughout the academic year the Library offers research skills training for undergraduates, postgraduates and members of faculty. Seminars can be tailored to any subject discipline. Members of faculty are also encouraged to use and promote the Library's information literacy training materials (LibGuides) via the myeLearning platform.
- Interlibrary Loans/Document Delivery: The Interlibrary Loan/Document Delivery service provides access to information resources that are not available in The AJL. The Library currently bears the cost of this service. https://libraries.sta.uwi.edu/ajl/index.php/how-to/get-material-we-don-t-own
- New Course Proposals: The Campus Libraries can assist members of faculty in locating course materials for new or revised courses or programmes.
- Off-Campus Access to Electronic Resources: Members of faculty can access subscription databases on and off campus via The AJL's website. https://intranet.sauwi.uwi.tt/wireless/
- Research Guides: Research guides can be accessed on The AJL's website. These guides cover areas ranging from the different citation styles, navigating discipline specific e-resources databases, effective search strategies, etc. https://libguides.uwi.edu/sta
- Reference Services: The staff of the Library is available on demand to assist members of faculty in locating information resources needed for research purposes.
- Print and Electronic Reserve Collection: In addition to essential booklist items, traditional reserves may include personal copies of lecturers' books, copies of chapters of books (small percentages of the entire work), photocopies of print journal articles, course readers, etc. Items to be placed in the Temporary Reserve Collection should arrive at The AJL three (3) months in advance of the beginning of each semester. Electronic Reserves (E-reserves) allow Lecturers to make course readings and other recommended materials available to authorized UWI students online. Faculty can incorporate material from a variety of sources including but not limited to, content from the Campus Libraries licensed databases, documents that they themselves have produced, or have obtained permission to use or convert into digital format. Reserve materials are removed or returned to normal circulation at the end of each semester. Electronic Reserves (E-reserves) allow members of faculty to make course readings and other recommended materials available online to authorized University of the West Indies students 24/7. E-reserves are available on and off Campus.
- Past Examination Papers (https://libraries.sta.uwi.edu/apps/index.php/PastPaperSearch/index): The AJL maintains an open access repository of past examination papers (except papers with MCQ, MTF, and TF). The online repository is searchable by course code and title. Dating from 2000, the Library's archive maximises student access and ensures the long-term preservation of past examination papers. Papers are supplied by the Examinations Section.

Research Support

https://uwi-sta.libanswers.com/https://uwischolar.sta.uwi.edu/https://journals.sta.uwi.edu/The following internal platforms facilitate external access to UWI academics and their open access and unpublished output and datasets:

- ***UWISpace*** (http://uwispace.sta.uwi.edu/dspace/):
  This institutional repository was established by The UWI Libraries to support the dissemination of knowledge by providing open access to the digitally preserved intellectual output of the University. The repository contains over 32,000 items including UWI theses.

- ***UWIScholar*** (https://uwischolar.sta.uwi.edu/):
  UWIScholar is an online platform developed by the AJL to showcase the research and expertise of researchers across The UWI Campuses. It creates a researcher profile capturing information such as bio data, research activities and interests, publications, courses taught, public service, consultancies, education & training, grants & funding, awards, affiliations and links to social media accounts. All research ethics are completed through the UWIScholar platform.

- ***Open Journal System (OJS)*** (http://journals.sta.uwi.edu/):
  Hosted at The AJL, this platform facilitates the online delivery of electronic journals produced by Faculties, Academic Departments, and Schools of The UWI. The system allows for the submission of articles, blind reviewing and publishing to the World Wide Web in an entirely paper free environment.

- The Alma Jordan Library, in collaboration with the St. Augustine Centre for Innovation and Entrepreneurship (STACIE) and the Intellectual Property Office of the Ministry of the Attorney General and Legal Affairs, provides an **Intellectual Property Help Desk Service** (libraries.sta.uwi.edu/ajl/index.php/services/ip-help-desk) to help support researchers.

For further information on these resources and services, please refer to your Library's website or contact your Faculty Liaison Librarian:

Section	Contact Person	Extension	Email Address
Office of the Campus Librarian	Dr. Karen Eccles	82009	karen.eccles@uwi.edu campuslibrarian@uwi.edu
Circulation & Access Services	Dr. Simone Primus Help Desk	82336 82132 84030	simone.primus@uwi.edu cas@sta.uwi.edu
West Indiana & Special Collections Division	Dr. Lorraine Nero Ms. Aisha Baptiste	83506 83361 83365	lorraine.nero@uwi.edu aisha.baptiste@uwi.edu wimail@uwi.edu
Acquisitions & Continuing Resources	Ms. Sharon Premchand Ms. Portia Bowen-Chang	83601 82126	sharon.premchand@uwi.edu portia.bowen-chang@uwi.edu acqmail@uwi.edu
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UNIVERSTY REGULATIONS FOR STAFF AND STUDENTS ON PLAGIARISM

Plagiarism is frowned upon in the University and as such penalties will be applied to any person found guilty of plagiarism. The University Regulations on Plagiarism Graduate Diplomas and Degrees approved by the Board for Graduate Studies and Research in May 2013 defines plagiarism as follows:

Definition of Plagiarism

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.

Both staff and students are advised to read and comply with the University Regulations on Plagiarism Graduate Diplomas and Degrees which also cover, among other things:

- Evidence of Plagiarism
- Student Certification
- Electronic Vetting for Plagiarism by the University
- Level 1 Plagiarism in Work which does not Constitute a Thesis or Major Project Report
- Level 1 Plagiarism in Theses and Major Project Reports
- Level 1 Plagiarism: Appeals
- Level 2 Plagiarism
- Clearance on a Charge of Level 2 Plagiarism
- Level 2 Plagiarism: Appeal to the Senate
- Delegation by Dean or Head of Department
- Supervisor's Conflict of Interest

SECTION 3 - COURSE DESCRIPTIONS

Chemical Engineering

SEMESTER: 1
COURSE CODE: CHNG 6001
COURSE TITLE: ADVANCED PROCESS DYNAMICS & CONTROLS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Analysis and design of advanced control systems, control systems with multiple loops, feed forward and cascade control, design of control systems for multivariable processes, synthesis of alternative control configurations for multiple-input, multiple-output (MIMO) processes, interaction of control loops, plant-wide control, application of artificial intelligence in process control, fuzzy logic and neural networks, modeling and simulation using HYSYS and MATLAB.

SEMESTER: 1
COURSE CODE: CHNG 6002
COURSE TITLE: NUMERICAL METHODS & COMPUTING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Solution of linear and non-linear equations, solving sets of equations, interpolating polynomials, numerical differentiation and numerical integration, numerical solution of ordinary differential equations, boundary-value problems, numerical solution of elliptic, parabolic and hyperbolic differential equations, applications in heat transfer, fluid mechanics and reactor design.

SEMESTER: 1
COURSE CODE: CHNG 6003
COURSE TITLE: PROCESS SYNTHESIS, ANALYSIS & OPTIMISATION
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Process design principles: heuristics, shortcut methods. Synthesis of process flow diagrams: reactors, separators, recycle, process control. Process optimisation: basic concepts, standard techniques, advanced techniques (topological optimisation, parametric optimisation). Pinch technology: basic concepts, heat exchanger network design, mass exchange networks. Analysis of process performance: input/output models, reliability.

SEMESTER: 1
COURSE CODE: MENG 6506
COURSE TITLE: PROJECT MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Project identification in context of investment programme at national and sectorial level, pre-investment studies, detailed project preparation, development and evaluational project organisation, project analysis and evaluation (technical, economic, financial, social and environmental). Project implementation (procurement/contracts programming and control); ex-post evaluation.

SEMESTER: 1
COURSE CODE: CHNG6206
COURSE TITLE: RESEARCH METHODS FOR CHEMICAL ENGINEERS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: The disciplines of engineering are all described as the application of science to realistic systems which benefit human being. Engineering research is therefore based on the principles of scientific research which, in turn, are based on the scientific method, in which observations (experiments), theories, calculations and models are derived from the existing body of scientific knowledge and verified independently by others who are experts in the field. In order to emphasise this concept, this course is addressed to Novice researchers in a number of different methods of approach for each research question.

SEMESTER: 2
COURSE CODE: ENGR 6018
COURSE TITLE: ENERGY & THE ENVIRONMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Energy conservation, principles and definitions of renewable energy and sustainable energy practice, reducing the impact of energy use through renewable energy, solar thermal conversion: principles and practice, solar photovoltaic: introduction, principles and practice, wind turbines: characterising the wind, wind turbine principles, hydro-power principles, biomass characterisation and direct use of biomass, hydrogen, and fuel cells. Global case studies: discussion and application in the Caribbean area.

SEMESTER: 2
COURSE CODE: CHNG 6101
COURSE TITLE: ADVANCED CHEMICAL ENGINEERING THERMODYNAMICS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Review of classical thermodynamics. Applications to phase equilibrium: equation of state approach and mixed equation of state/activity coefficient model approach. Applications to reaction equilibrium. Application to process problems: equilibrium flash calculations, distillation problems, multiphase reaction equilibrium, reactive distillation.

SEMESTER: 2
COURSE CODE: CHNG 6102
COURSE TITLE: ADVANCED CHEMICAL REACTION ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Flow models and reactor performance. Heterogeneous catalysis: kinetics of solid catalysed gaseous reactions. Catalyst types, characterisation, manufacture, and industrial applications. Biochemical kinetics and applications. Polymerisation kinetics and reactors. Gas/solid non-catalytic reactions, kinetics, and applications. Gas/liquid reactions and industrial applications. Reactor modelling. Fixed-bed catalytic reactors, tower, and bubble (tank) reactors, fluidised bed reactors. Survey/analysis of existing reactors.

SEMESTER: 2
COURSE CODE: CHNG 6201
COURSE TITLE: BIOCHEMICAL ENGINEERING II
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Application and analysis of advanced biological systems, biochemical engineering for graduate level students, selected bioprocesses - bioremediation, introduction to bio-process control - use of biosensors, design and implementation of bioprocesses, advances in biochemical engineering, bioprocess laboratory project/research paper, management of bio-processes.

SEMESTER: 2
COURSE CODE: CHNG 6203
COURSE TITLE: PETROLEUM PROCESSING TECHNOLOGY
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Structure of the international petroleum industry. Analysis and test methods for crude petroleum including condensate and natural gas. Processing structure of petroleum refineries for the manufacture of fuel products. Lubricants and petrochemical precursors. Processing of petrochemical feedstocks - oxidation, hydrogenation, chlorination, nitration, polymerisation, sulphonation and esterification, alkylation, synthesis of CO-H2 mixtures. Refinery fuel products and lubricants specifications and test methods. Crude topping, distillate fractionation and vacuum distillation - heaters, heat exchange equipment and distillation towers. Conversion processes - cracking and reforming. Treatment processes - desulphurisation, dewaxing, etc. Factors affecting investment decisions in petroleum processing, scheduling. Process economics.

SEMESTER: 2
COURSE CODE: CHNG 6204
COURSE TITLE: UTILITY ENGINEERING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Introduction to plant operation, plant start up prime movers, steam engines, steam turbines, internal combustion engines, gas turbines, air compression C.S.A.B. - 52 lubrication. Heating and air-conditioning systems and accessories, refrigeration systems. ASME Code Section 1, calculations of cylindrical components, tubing, piping, stayed and unstayed surfaces, openings and compensation, safety valves. Water treatment impurities, internal and external treatment, analytical methods, industrial waste treatment, gas turbines, types, components, applications. Fuels, furnaces, design, ash handling, fluid gas treatment, draft, fan types, fan control, draft calculations, steam turbines, principles of operation, construction, control, maintenance, commissioning, condensing equipment, alternators, pressure vessels and components inspection, safety, hazards. Operation and maintenance, piping, support, expansion, methods of connecting. Pumps, types, construction compressors, types, accessories, operation, maintenance, applications.

SEMESTER: 2
COURSE CODE: ENGR 6005
COURSE TITLE: POLLUTION PREVENTION, CLEANER PRODUCTION & INDUSTRIAL WASTE ABATEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Preventative environmental strategies vs. end-of-pipe treatment, environmentally friendly product design, low-waste production technologies, efficient use of energy and raw materials, optimisation of existing technologies, operational safety, integrated approach to waste minimisation. In plant survey. Waste minimisation through volume and strength reduction process modification, separation, and segregation, recycle and reuse technology. Characterisation of liquid, solid and gaseous wastes from important industries of the country or region. Treatment of wastes from different industries - case studies. Combined treatment plant for small-scale industries.

SEMESTER: 2
COURSE CODE: ENGR 6006
COURSE TITLE: WATER & WASTEWATER ENGINEERING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Water quality and beneficial uses. Water quality criteria and drinking water guidelines and standards. Water quality indices. Physicochemical processes for water and wastewater treatment, sedimentation, flotation, chemical coagulation and flocculation, filtration, ion exchange, adsorption, precipitation, disinfection, aeration, membrane processes, water demand and distribution. Wastewater quantities, wastewater collection system and characteristics of municipal wastewater. Preliminary, primary, secondary, and tertiary treatment of wastewater. Reactor kinetics, reactor types and their analyses. Aerobic and anaerobic process design. Activated sludge and its modification, trickling filer, rotating biological contractors, suspended, and attached growth anaerobic systems. Stabilisation ponds, aerated lagoons, etc. Sludge treatment and disposal. Treated effluent disposal in inland waters and marine environment. On-site waste treatment.

SEMESTER: 2
COURSE CODE: ENGR 6007
COURSE TITLE: AIR POLLUTION CONTROL
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Introduction/sources of air pollution, air pollution, effects, air pollution control laws and regulations, air pollution control philosophies, air pollution measurements, emission estimates, meteorology for air pollution control engineers, air pollutant concentration models, general ideas in air pollution control, the nature of particulate pollutants, control of primary particulates, control of volatile organic compounds (VOCs), control of sulphur oxides, control of nitrogen oxides, the motor vehicle problem, air pollution and the global climate. Control devices and strategies.

SEMESTER: 2
COURSE CODE: CHNG 6303
COURSE TITLE: DESALINATION
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Water source selection, pretreatment consideration: chemical treatment, degasification and deaeration, filtration. Evaporation: Single and multiple effect evaporators; Single and multiple effect evaporation - vapor compression. Membrane techniques: Reverses osmosis, Selection of membranes, Fouling and biofouling, modelling of systems using ROSA. Post treatment considerations: Remineralisation and aeration, Waste Disposal.

SEMESTER: 2
COURSE CODE: MENG 6402
COURSE TITLE: HUMAN RESOURCE MANAGEMENT I
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Formal and informal organisation, the bureaucratic model, the organisational environment, modern organisation theory, the individual in the organisation, SKAO, theories of motivation and leadership industrial relations, IRA, RSBA, communication in organisations, performance appraisal systems.

SEMESTER: 2
COURSE CODE: MENG 6405
COURSE TITLE: TOTAL QUALITY MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Philosophy and principles of total quality management, customer satisfaction, quality systems, quality tools, continuous improvement, employee involvement and empowerment, supplier partnerships, benchmarking, quality function deployment, statistical process control, Taguchi's quality engineering, experimental design.

SEMESTER: 2
COURSE CODE: MENG 6502
COURSE TITLE: FINANCIAL MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Analysis of financial statements, financial forecasting and planning, risk, return and valuation, capital budgeting, financial structure and leverage, cost of capital, financing mix decisions, current asset management, cash, marketable securities, accounts receivables, inventory and short-term financing, long-term financing, common stock, debt, preferred stock, term loans and leasing, dividend policy.

SEMESTER: 3
COURSE CODE: ENGR 6701
COURSE TITLE: MANAGEMENT & LEADERSHIP SEMINARS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Active participation in seminars and discussions on topics including Project management, case studies in human resource management, business processes and marketing, new venture and product development, supply chain management, HSE and other related areas.

Food Science and Technology

SEMESTER: 2
COURSE CODE: FOST 6000
COURSE TITLE: FUNDAMENTALS OF FOOD PROCESS ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The basic engineering concepts of fluid flow, heat transfer and mass transfer in food processing operations and quantitative problem-solving in unit operations likely to be encountered in the food industry. Topics include Material and Energy Balances, Fluid flow in pipes and pressure drop, Bernoulli equation, Modes of heat transfer, heat exchangers, Pasteurisation, Canning and Sterilisation, Process time calculations, Psychrometry, Drying kinetics, Refrigeration and freezing systems.

SEMESTER: 2
COURSE CODE: FOST 6001
COURSE TITLE: SANITATION IN FOOD PROCESSING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Principles and practices of food plant sanitation. The Food Code and Food Standards. Site & location selection for food processing facilities. Cleaning and sanitation. Control and evaluation of microbial, insect and rodent contamination. Pest Control. Hygienic design and construction of buildings and equipment. Ancillary facilities. Organisation of a sanitation control programme. Personal and personnel hygiene. Water and air. Food allergens. Waste & wastewater treatment and disposal. GMPs, SOPs, SSOPs and HACCP public health regulations

SEMESTER: 1
COURSE CODE: FOST 6002
COURSE TITLE: FOOD PACKAGING
NO. OF CREDITS: 2
PREREQUISITES: NONE
SYLLABUS: Formulation of materials. Basic uses of packaging materials. Packaging design. Physical and chemical properties of packaging materials. Advantages and limitations of packaging materials. Test methods. Shipping forms.

SEMESTER: 1
COURSE CODE: FOST 6003
COURSE TITLE: FOOD CHEMISTRY
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Food chemistry is an interdisciplinary subject which deals with the chemical, physical and functional properties of food constituents and the chemical changes these constituents undergo during handling, processing and storage including those that limit food shelf life. Topics include: Chemistry and physics of the major food constituents. Composition and structure of foods. Chemical reactions involved in food processing, storage and handling.

SEMESTER: 2
COURSE CODE: FOST 6004
COURSE TITLE: FOOD PROCESSING LABORATORIES
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Laboratory exercises in the preservation and processing of meat, poultry, seafood, dairy products and fruits, vegetables, root crops and tubers. Processes will include thermal processing (canning), batch and high temperature short time (HTST) pasteurisation of milk, fruit juices and beverages. Production of soya products such as soy milk and tofu. Production of jams, jellies, and marmalades. Oven, spray, drum and freeze drying. Meat curing and smoking. Production of fermented foods, e.g., yoghurt.

SEMESTER: 1
COURSE CODE: FOST 6005
COURSE TITLE: FOOD MICROBIOLOGY
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introductory microbiology. Microorganisms important in food microbiology. Principles of contamination, preservation, and food spoilage. Food safety management and associated standards e.g., HACCP. Epidemiological investigations. Microorganisms in the production of foods. Food intoxications and infections. Fermentations and biotechnology. Genetic foods advantages and challenges. Microbiology in food plant sanitation. Methods for detection, enumeration and identification of spoilage and pathogenic microorganisms. Food safety and risk assessment. Laboratory practicals in microbiological procedures, the production of microbially- produced foods, their evaluation and associated reporting procedures.

SEMESTER: 1
COURSE CODE: FOST 6006
COURSE TITLE: FOOD QUALITY ASSURANCE
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Responsibilities and organisation of the quality assurance department. Quality management, systems and procedures. Quality standards. Quality attributes- colour, flavour, kinesthetics, shape, size and defects. Sensory Evaluation. Statistical methods. Sampling and Inspection. Recording and reporting. Grades and standards. Control charts. Production control. Food analysis - methods and instrumentation. Laboratory practicals in the evaluation of quality attributes and associated reporting procedures.

SEMESTER: 1
COURSE CODE: FOST 6007
COURSE TITLE: PRESERVATION AND PROCESSING OF MEAT AND POULTRY
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: The study and applications of the principles and techniques involved in processing meat and poultry. The manufacture of further processed products. Structure, physical and chemical composition of muscle and major organs. Meat quality. Pre- and post-slaughter handling practices and their effects on meat quality. Meat packaging.

SEMESTER: 2
COURSE CODE2: FOST 6008
COURSE TITLE: PRESERVATION AND PROCESSING FRUITS AND VEGETABLES
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Effect of post-harvest handling on the processing quality of fruits and vegetables. Unit operations of thermal processing, dehydration, refrigeration and freezing. Juices and beverages- their preparation and preservation. Processing of miscellaneous vegetables. Jams, jellies, and marmalades. Preserves, candied and crystallised products. Pickles and sauces. By-product utilisation.

SEMESTER: 1 & 2
COURSE CODE: FOST 6019/FOST 6020
COURSE TITLE: FOOD SCIENCE MSC RESEARCH PROJECT
NO. OF CREDITS: 6
PREREQUISITES: NONE
SYLLABUS: To undertake relevant research in the areas of food quality, food safety and risk assessment, food fermentations, food packaging, food dehydration, root crops, cocoa and underutilised fruits and vegetables.

SEMESTER: 2
COURSE CODE: MENG 6508
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Introduction to research methods. Research process from conceptualisation to analysis and conclusions. Types of research, defining a research topic, originality and thinking of research, identifying issues and objectives for research, developing research methodology, literature review, finding research material, data collection, referencing and citation, executing the research, hypothesis testing, data analysis, reporting the findings of the research, dealing with supervisors.

Petroleum Engineering and Reservoir Engineering

SEMESTER:
COURSE CODE: PENG 6000
COURSE TITLE: PETROLEUM GEOSCIENCE
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introduction to Geology, Earth Structure, Plate Tectonics, Geological Time, and History; Minerals and Rocks; Rock Forming Processes with Environments of Deposition; Sedimentary basins; Structural Geology and Hydrocarbon Traps; Origin, Migration and Accumulation of Petroleum; Composition of Hydrocarbons and Reservoir Characteristics. The petroleum reservoir; Geophysical exploration techniques. Mapping - Surface and Subsurface; Geological Laboratory. Field Trip. Petroleum Engineering vocabulary; Units. Pressures. Routine core analysis, laboratory procedures. Characteristics of reservoir rocks; pore space representation. Porosity; saturation; Volumetric representation of hydrocarbon in place. Permeability, Darcy and non-Darcy Flow; linear and radial flow; datum correction; Saturation effects; capillary pressure, relative permeability essentials.

SEMESTER:
COURSE CODE: PENG 6002
COURSE TITLE: DRILLING ENGINEERING & COMPLETIONS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Rotary drilling rigs. Rig components, Drilling bits and bottom-hole assemblies; Coring. Drilling fluid systems. Mud engineering; Subsurface control and safety; Blowout prevention and wellhead equipment; Bore hold stability; Pressure losses; Rig hydraulics; Deviated drilling; Directional drilling; Horizontal well drilling; Hole problems and solutions; Fishing and stuck pipe; Drill string and casing string design; Solids removal; Pore pressure prediction and fracture hydraulics; completion techniques; Casing strings and setting depths. Subsea completions; Computer modelling; AFE; Offshore drilling and equipment. Drilling Safety. Drilling practice in Trinidad. Well completion design. Casing, Tubing & Wellhead Equipment; Packers; Downhole Tubulars; Subsurface control and safety; Cementing; Perforating; Completion/Workover fluids; Sand control; wireline operations; Coiled Tubing; Stimulation; Horizontal wells; Workover Programmes; Case studies.

SEMESTER:
COURSE CODE: PENG 6005
COURSE TITLE: RESERVOIR EVALUATION
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Well logging: Logging methods and interpretation techniques; Conditions around the wellbore, effects on measurements of mud filtrate invasion, formation contents etc. The terminology of well logging, Sw, Sxo, Rt, Rxo etc. Formation and fluid properties; The physical principles involved in geophysical well logging: electrical logs; sonic log; radioactivity logs; dipmeter log. The Archie Equations in clean formations. Discussion of the uncertainties involved. Estimation of porosity in different lithologies. Cross-plots for porosity and lithology, uncertainties. Estimation of water saturation. Gas effects. Differentiation between gas and oil hydrocarbon saturation. Effects of shaliness and modified equations. Shale estimation. Computed logs; Local field examples. Well testing: Principles of Pressure Transient Test Analysis; Diffusivity Equation; Analysis of Buildup and Drawdown Tests; Multi-rate testing; Type-curve Analysis; Determination of skin; wellbore storage, drainage radius and stabilisation time; Gas well-testing; Real gas potential application; Other well tests. Gas well-testing; computer logging packages. Local field examples.

SEMESTER:
COURSE CODE: PENG 6006
COURSE TITLE: ADVANCED WELL TEST ANALYSIS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Diffusivity equation; Constant rate and constant pressure; Solutions; Effects of total skin and wellbore storage; Type-curve analysis; Varying wellbore storage; Determination of average pressure; Radius of drainage and stabilisation time; Multiphase flow; Real gas potential application; Multi-rate, interference, pulse and vertical permeability testing; Layered systems; Fractured reservoirs; Faults; Channel sands; Use of pressure and its time derivative in type curve matching; Gas well-testing; Real gas potential application; gas flow tests with non-Darcy flow; extended well testing. Computerised methods of analysis. Local field examples.

SEMESTER:
COURSE CODE: PENG 6007
COURSE TITLE: RESERVOIR ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Hydrocarbon Composition; Properties of reservoir rocks and fluids; Phase behaviour; Vapour-liquid Equilibria; Oil and gas reservoirs; Drive mechanisms; Pore Volume Compressibility; Reservoir mechanics: PVT Analysis, General material balance; Natural water influx.

SEMESTER:
COURSE CODE: PENG 6008
COURSE TITLE: ADVANCED RESERVOIR ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: PENG 6007
SYLLABUS: Dry gas, gas-condensate and oil reservoirs; Material balance and applications; Tarner's method; Natural water influx; Immiscible flooding; Reservoir simulation - single and multi-phase; Compositional simulators; Computer simulation exercises.

SEMESTER:
COURSE CODE: PENG 6009
COURSE TITLE: STRATEGIC PETROLEUM MANAGEMENT & ORGANISATIONS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The nature and role of strategy in petroleum operations; Involvement of strategy in organisations; Structuring change; Leadership styles; Life cycles; Range of strategic planning and organisational behaviour; Learning and Development; Communicating strategy; Corporate cultures; Analysis of the corporate environment; Response to challenges.

SEMESTER:
COURSE CODE: PENG 6010
COURSE TITLE: IMPROVED OIL RECOVERY
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Microscopic Displacement; Macroscopic Displacement; Waterflooding; Problems of waterflooding. Models - Buckley Leverett Stiles. Miscible and Immiscible Fluid Displacements; Carbon dioxide flooding; Ternary Diagrams; Minimum Miscible Pressure; Enhanced Oil Recovery Methods; Thermal methods of oil recovery; Steam flood models- Marx, Langenheim, Boberg and Lantz; Heavy oil problems relevant to Trinidad. Well completion types for thermal processes; Other IOR processes. Screening Criteria; Reservoir simulation - single and multi-phase; Computer exercises.

SEMESTER:
COURSE CODE: PENG 6011
COURSE TITLE: PETROLEUM ECONOMICS, LAW & CONTRACT ADMINISTRATION
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: World energy supply/demand; Oil pricing; Petroleum leasing/contracts; Petroleum taxation; Comparison of petroleum natural gas; Managing petroleum resources; Petroleum act and regulations; Petroleum taxes act; Income tax in aid of industry act; Contractual arrangements; Drilling contracts; Natural gas contracts; Service (rental) contracts; Services contracts; Oil sales/purchase contracts.

SEMESTER:
COURSE CODE: PENG 6012
COURSE TITLE: NATURAL GAS ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Properties of Natural Gas Systems; Gas Volumes; Reserve estimates; Pressure Transient Testing of Gas Wells; Deliverability Testing of Gas Wells; Gas Flow Measurement; Compression of Natural Gas; Gas Conditioning and Processing; Uses of natural gas; LNG; Field Development/Management; Gas Transmission/Pipeline Design Considerations; Offshore Operations; Gas Contracts.

SEMESTER:
COURSE CODE: PENG 6015
COURSE TITLE: PRODUCTION ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Productivity Index (PI) and the Inflow Performance Relationships (IPR) for oil and gas wells. Single and multiphase flow; tubing sizing; Nodal analysis; Natural and artificial lift methods and equipment; Typical production profiles (plateau and exponential decline). Control and instrumentation; Pressure and rate measurement; Production logging; Surface operations; Wellhead systems; Surface facilities - onshore, offshore. Design and operation of crude oil separation, Emulsion breaking; liquid recovery. Gas production. Sand control; Wax and asphaltine problems, Hydrate prevention; Stimulation – acidisation and fracturing. HSE in production. Local field examples.

SEMESTER:
COURSE CODE: PENG 6016
COURSE TITLE: PETROLEUM ECONOMICS & MANAGEMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: World energy supply/demand; Oil pricing; Petroleum taxation systems and comparisons; Cash flow, profit and profitability; Uncertainty and risk; Incremental investments; Contractual arrangements; Economic issues in natural gas; Managing petroleum resources.

SEMESTER:
COURSE CODE: PENG 6017
COURSE TITLE: SELECTED TOPICS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: A series of lectures on topics of relevance to petroleum engineering but not covered in other courses.
Assessment: Coursework only.

SEMESTER:
COURSE CODE: PENG 6021
COURSE TITLE: PETROLEUM PRODUCTION PLANNING & CONTROL
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Decision theory; Forecasting techniques in petroleum production operations; Processing and capacity planning; Inventory management; Material requirement planning; Sequencing and line balancing; Scheduling operations; Resource allocation; Project management techniques.

SEMESTER:
COURSE CODE: PENG 6023
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Introduction to research methods. Research process from conceptualisation to analysis and conclusions. Types of research, defining a research topic, originality and thinking of research, identifying issues and objectives for research, developing research methodology, literature review, finding research material, data collection, referencing and citation, executing the research, hypothesis testing, data analysis, reporting the findings of the research, dealing with supervisors.

SEMESTER:
COURSE CODE: PENG 6024
COURSE TITLE: PROJECT
NO. OF CREDITS: 9
PREREQUISITES: NONE
SYLLABUS: Each candidate will also be required to submit a Project Report of an individual analysis of a problem.

SEMESTER:
COURSE CODE: PENG 6017
COURSE TITLE: SELECTED TOPICS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: A series of lectures on topics of relevance to petroleum engineering but not covered in other courses.

SEMESTER:
COURSE CODE: PENG 6025
COURSE TITLE: GROUP FIELD PROJECT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The group field design project is a reservoir evaluation/development exercise of part of a licence block and the preparation of recommendations for development of a gas and/or oil field through to abandonment carried out by groups of three/six students. Active participation by all the group members is essential. The initial data are made available at the start of the semester. The group projects will be assessed initially by presentation to section staff, and selected groups may make further presentations to an invited audience from the industry.

COURSE CODE: PENG 6026
COURSE TITLE: DIRECTED READING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: An in-depth critical review by the student of the current literature in a special topic of importance to Petroleum Engineering. The student will prepare a report and present the findings at a seminar.

COURSE CODE: PENG 6028
COURSE TITLE: FORMATION EVALUATION
NO. OF CREDITS: 4
PREREQUISITES: NONE
Syllabus: Well logging: Logging methods and interpretation techniques; Conditions around the wellbore, effects on measurements of mud filtrate invasion, formation contents etc. The terminology of well logging, Sw, Sxo, Rt, Rxo etc. Formation and fluid properties; The physical principles involved in geophysical well logging: electrical logs; sonic log; radioactivity logs; dipmeter log. The Archie Equations in clean formations. Discussion of the uncertainties involved. Estimation of porosity in different lithologies. Cross-plots for porosity and lithology, uncertainties. Estimation of water saturation. Gas effects. Differentiation between gas and oil hydrocarbon saturation. Effects of shaliness and modified equations. Shale estimation. Computed logs; Local field examples. Integration of wireline logging data with basic core data to assess formation lithology, porosity and permeability. Core analysis and laboratory measurements of saturation and rock properties such as porosity, permeability, relative permeability, wettability, capillary pressure, and their application to reservoir studies, six lab sessions using the latest well logging software and one lab session on experimental measurement of reservoir rock properties.

Construction Management

SEMESTER: 2+
COURSE CODE: COEM 6018
COURSE TITLE: THE INDEPENDENT RESEARCH PROJECT
NO. OF CREDITS: 9
PREREQUISITES: SUCCESSFUL COMPLETION OF ALL REQUIRED CORE AND OPTIONAL COURSES
SYLLABUS: The research project takes the form of an investigation into a topic of significance to the construction sector and is intended to ensure the capacity of the student to apply skills acquired within the prescribed courses. It is executed under the direction of one or more supervisors approved by the Department and is examined by the submission of a written report, which is required to conform to the general standards for MSc projects within the Faculty of Engineering. The project shall be formally assigned as soon as practicable after the results of the written examinations are available, and in any case not normally later than July 1 in any year. The project shall normally be completed within three (3) months of being assigned, i.e., by the end of September of the year in question. Any project not completed at the end of December of the year of assignment shall require formal approval of extension of time.

SEMESTER: 1
COURSE CODE: COEM 6003
COURSE TITLE: ORGANISATION & MANAGEMENT OF CONSTRUCTION
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The functions of managers; planning, organising, controlling, and leading. The role of managers; interpersonal, informational, and decision-making. The evolution of management thought, from the Industrial Revolution to now. Professional ethics and the engineer/manager. Problem-solving and decision-making. Initiative and creativity. Information Technology (IT) and management information systems (MIS), and the role of computers in information management. The management of quality; TQM and ISO 9000.

SEMESTER: 1
COURSE CODE: COEM 6005
COURSE TITLE: CONSTRUCTION PROJECT MANAGEMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: This course addresses the culture, principles and techniques of project and programme management. The following are covered: What is a project? What is project management? The project life cycles for different industries, project context: planning the project (project selection - tools and techniques), scope management defining the project. Project planning, work breakdown structures, Gantt Chart, PERT Chart, CPM, preparing the master plan, project budgeting, responsibility matrix, communication plan, project criterion for success, project control (project baseline, status reporting, control cycle, monitoring and control tools, resource grading, change control, resource leveling, variance reporting tools, project audit). Implementation, project finalization and close-out. Project cost, risk, and quality management. What is programme management, benefits of programme management, programme management organisation/programme planning, benefits management, stakeholder management, programme management processes, effective project, and programme teams. The project support office, audit, applications of project management software, e-business programme management.

SEMESTER: 1
COURSE CODE: COEM 6006
COURSE TITLE: CONSTRUCTION ACCOUNTING & FINANCE
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introduction to accounting: the nature and purpose of financing accounting, business entity, chart of accounts, recording accounting transactions, the accounting cycle, profit and loss statement, balance sheet, accounting ratios, accounting controls. Introduction to Management Accounting: cost classification, methods of costing, job costing and contract costing, integrated accounts. Introduction to Financial Management: project financing, budgeting, financial planning, and cost control. Construction claims, performance of construction contracts.

SEMESTER: 1
COURSE CODE: COEM 6009
COURSE TITLE: CONTRACT MANAGEMENT & CONSTRUCTION LAW
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: An introduction to the different legal systems. The impact of law on the delivery of engineering goods and services; Law and the construction sector. The making of law and the courts; litigation. The elements of contract law and relation with the construction sector. Types of contracts; Different procurement systems; Standard form building contracts (specifications codes of practice; Standards, statutes and local government regulations); The elements of the Law of Tort, disputes and conflict resolution methods; Professional associations, codes of ethics, professional liability; Construction claims; Different forms of business organisations; Business law and the company act; Health and safety legislation; Environmental law; Introduction to intellectual property; Confidentiality of information; Warranties and indemnity. Introduction to international law.

SEMESTER: 1
COURSE CODE: COEM 6013
COURSE TITLE: MATERIALS TECHNOLOGY
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Factors affecting the choice and use of materials in construction. The general properties and behaviour of the major types of construction materials. Factors affecting the production of the construction materials in major use in the Caribbean. Specifications, standards, and testing of materials. Methods of improving the properties and performance of materials. Major-project patterns in the Caribbean (e.g., marine projects) and the resultant demands for materials performance. Materials procurement, handling, storage, and extraction control.

SEMESTER: 2
COURSE CODE: COEM 6015
COURSE TITLE: MAINTENANCE & FACILITIES MANAGEMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Maintenance awareness. Planned maintenance, maintenance management systems. Maintenance of facilities. Maintenance policy - housing, offices, industries - private and public sector projects. Maintenance surveys, repairs, rehabilitation of structures. Corrosion in construction, building defects, deterioration, repair procedures. Performance audit, reliability, performance evaluation. Maintenance financing, budget. Planning considerations, upgrading, recycling, reuse. Maintenance manuals, checklists, information systems.

SEMESTER: 1
COURSE CODE: COEM 6016
COURSE TITLE: NATURAL HAZARDS MANAGEMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The course deals with the genesis and nature of natural hazards, their physical and theoretical basis as well as their operation and propagation. It deals with their economic and social impact; vulnerability of structures; policy and legislation; planning response; engineering and physical response; the development of site-specific disaster plans; international, regional, and local response agencies; evacuation and evacuation drills and simulations; search and rescue; recovery, emergency relief shelter management and risk analysis.

SEMESTER: 2
COURSE CODE: COEM 6020
COURSE TITLE: RESEARCH METHODS
NUMBER OF CREDITS: 3
SYLLABUS: The topics covered in the unit will include Principles of research, information sources, research design, research methodology, data collection, data analysis, presenting research proposals and writing research reports.

SEMESTER: 2
COURSE CODE: COEM 6025
COURSE TITLE: PRACTICAL TEAM PROJECT
NUMBER OF CREDITS: 5
SYLLABUS: The projects are based upon real schemes and involve information gathering, planning, organisation, coordination, detailed assessment of ideas, reporting and presentation.

Coastal Engineering and Management

SEMESTER: 1
COURSE CODE: CZEM 6100
COURSE TITLE: COASTAL PROCESSES & HAZARDS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Description and calculation procedures for tides; currents (Caribbean), storm surges; global wind systems, hurricanes, linear wave theory, wave transformation and attenuation processes, random waves, short- and long-term wave statistics, design wave specification, wave prediction from wind records, wave-induced longshore currents; coastal sediment transport, sediment budgets, assessing site functionality and vulnerability to coastal disasters.

SEMESTER: 1
COURSE CODE: CZEM 6101
COURSE TITLE: COASTAL GEOMORPHOLOGY
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Coastal classification and morphology, volcanic coasts, reefs, corals, estuaries and wetlands, continental shelf; coastal morphodynamics, coastal inlets, morphodynamics and shoreface processes; geotechnical investigations; slope and embankment stability; soil liquefaction, stabilisation, compaction, bearing capacity and settlement.

SEMESTER: 1
COURSE CODE: CZEM 6130
COURSE TITLE: PRINCIPLES OF COASTAL DEFENCE MANAGEMENT AND ENVIRONMENTAL ASSESSMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: The functional performance of coastal defence techniques including artificial headlands, offshore breakwaters, groynes, beach nourishment, sea walls and revetments, managed retreat. Identification of their environmental impacts and opportunities. Introduction to shoreline management plans and coastal zone plan development. Objectives of EIA, legal context, scope of impacts of coastal developments, watershed impacts; mitigation and remedial measures, control measures, consequences of infringement, monitoring and management.

SEMESTER: 2
COURSE CODE: CZEM 6102
COURSE TITLE: COASTAL ZONE METRICS
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Descriptive statistics; nearshore and upland sampling, measurements and monitoring techniques for storms, beach profiling, tidal, wind and wave measurements, currents, and sediments; aqueous sampling techniques; coastal resources, hazards, classification and configuration, coastal hazard vulnerability tools; database development; spatial techniques and web-based solutions

SEMESTER: 2
COURSE CODE: CZEM 6106
COURSE TITLE: DESIGN OF COASTAL STRUCTURES
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Deterministic and probabilistic design methods for coastal applications.
The structural performance of coastal structures: Design wave loading; design methods for jetties, breakwaters, sea walls, revetments, and beach renourishment. Design for enhancement of capacity in response to climate change and sea level rise.

SEMESTER: 2
COURSE CODE: COEM 6020
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Principles of research, information sources, research design, research methodology, data collection, data analysis, presenting research proposals, writing research reports.

SEMESTER: 2
COURSE CODE: CZEM 6112
COURSE TITLE: COASTAL ZONE MODELLING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introduction to modelling concepts, types and time scales including process-based numerical models and scaled physical models, behaviour-based numerical models, Geomorphological analysis and parametric equilibrium models. Concepts of computational fluid dynamics; Navier Stokes equations, numerical solution techniques, practical application of models. Wave model types and applicability. Coastal morphodynamic model types and applications. Circulation models. Physical models. Case studies; wave and current models and morphodynamic models.

SEMESTER: 3
COURSE CODE: CZEM 6180
COURSE TITLE: RESEARCH PROJECT
NO. OF CREDITS: 9
PREREQUISITES: NONE
SYLLABUS: INDICATIVE SYLLABUS
The material covered will reflect the student's own requirements. In general, all projects will demand: - problem identification and definition of objectives; - planning and execution within time and cost constraints; - information search and its interpretation; - evaluation resulting in the making of conclusions.

The project may be suggested by a member of staff, by the individual student or an industrial concern. Industry generated projects must be approved by academic staff as being suitable before being accepted.

Project allocation procedures provide each student to: - select a preferred area, based upon a taught programme or upon previous experience; - discuss projects with prospective supervisors; - agree on a particular project, supervisor, and outline project terms of reference.

Each project will be supervised by a member of academic staff who will monitor progress, offer guidance, and encourage the student to take the active lead role in researching and the development of the project. The need to plan the objective and outcomes against a time scale will be stressed.

Civil & Environmental Engineering

(TO BE READ IN CONJUNCTION WITH SYLLABUSES FROM OTHER DEPARTMENTS AND PROGRAMMES WHERE APPLICABLE)

SEMESTER: 1
COURSE CODE: CIEN 6000
COURSE TITLE: ADVANCED ENVIRONMENTAL ENGINEERING SYSTEMS DESIGN
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Water supply and treatment systems; Wastewater collection and treatment; Solid waste management; urban drainage systems; Air and noise pollution prevention and mitigation in built environment.

SEMESTER: 1
COURSE CODE: CIEN 6001
COURSE TITLE: ADVANCED STRUCTURAL ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Flexibility and stiffness methods; numerical methods in Structural Engineering, non-linear analysis; computer aided analysis and design.

SEMESTER: 2
COURSE CODE: CIEN 6002
COURSE TITLE: ROAD NETWORK CONSERVATION
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Road networks, classes, function, and configuration; Pavement Maintenance Management Systems; Roadway characteristics, vehicle fleet costs and performance; Maintenance and rehabilitation strategies and policies; Pavement design and performance prediction models; Road pricing, sustainable maintenance budgeting and financing, optimisation and programme development.

SEMESTER: 2
COURSE CODE: CIEN 6005
COURSE TITLE: PROJECT: CIVIL ENGINEERING DESIGN IV
NO. OF CREDITS: 9
PREREQUISITES: COMPLETION OF ALL REQUIRED CORE AND OPTIONAL COURSES
SYLLABUS: This course is a capstone project designed to generate a learning atmosphere that is close as possible to the experience of working on the design of a real engineering project. The project work engenders a sense of leadership in the student and draws on the first three years of learning in the programme. The emphasis is on self-learning, creativity, design, understanding, project team-working and communication skills, as well as engineering judgment and problem solving. The projects are interdisciplinary, with the involvement of students from other departments, experienced practicing professional engineers in addition to the UWI supervisors and tutors, as well as other Engineering Departments in the Faculty. Students may also pursue internship/industry projects that are approved by the Department. This course applies to the Civil Engineering programme.

SEMESTER: 2
COURSE CODE: CIEN 6030
COURSE TITLE: PERFORMANCE BASED SEISMIC DESIGN
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introduction to the principles of Performance Based Earthquake Engineering and Consequence-Based Earthquake Engineering; The Seismic Rehabilitation Design Process and Objectives; Capacity Spectrum NSP Analysis; Coefficient Method NSP Analysis; Acceptance Criteria for Systems analysed by Linear Methods and Nonlinear Methods; Retrofit and Management Strategies and Systems; SAC-FEMA Reliability Analysis Method; Vulnerability Analysis Methods; Software for Pushover Analysis and NDP Analysis; Regional Seismic Risk Assessment; Introduction to HAZUS.

SEMESTER: 2
COURSE CODE: CIEN 6012
COURSE TITLE: ADVANCED TRANSPORTATION ENGINEERING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Transport policy development & evaluation; transportation systems operations and management; application of mathematical programming methods to transportation networks; advanced traffic engineering & traffic studies; application and use of traffic simulation software; design, implementation, and evaluation of traffic management plans; travel demand modelling and forecasting; advances in intelligent transportation systems**.**

Sustainable Solid Waste Engineering and Management

SEMESTER: 1
COURSE CODE: CIEN 4001
COURSE TITLE: FUNDAMENTALS OF SUSTAINABLE SOLID WASTE MANAGEMENT
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Introduction to Solid Waste Management Definitions of waste and Integrated SWM; population growth, urbanization, and waste-generation drivers; pollution and health impacts; sustainability and system paradigms. Circular Economy in SWM Principles of circular economy; material-flow loops; implementation in SWM; Caribbean case studies. Waste Characterization Techniques Classification of waste sources: residential, commercial, industrial, hospital; sociodemographic factors and per-capita generation; physical, chemical, and biological properties. Conventional SWM Systems Collection methods; treatment and disposal (dumps, landfills, incineration, composting); hazardous and toxic waste protocols; hospital-waste handling. Quantitative Assessment Tools; Life-cycle assessment; carbon-footprint analysis; cost-benefit modeling; material flow analyses; data sources and software. AI Fundamentals and Data Management Introduction to AI and machine learning; data collection, management, and cleaning; smart-infrastructure basics. AI Applications and Governance in the Caribbean Routing optimization; sensor networks; predictive analytics; digital-readiness assessment; policy and governance considerations. Integrated SWM Strategies and SDG Alignment Multi-criteria decision analysis; stakeholder engagement; financing models; mapping strategies to SDG 11, 12, 13.

SEMESTER: 1
COURSE CODE: CIEN 4002
COURSE TITLE: SUSTAINABLE SOLID WASTE HANDLING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Segregation of Waste and Temporary Storage at Source Objectives of segregation; Streams classification; The 4Rs; Feasibility studies (technical, environmental, financial); Pros and cons of on-site storage; Socio-cultural considerations. Collection, Transport, and Transfer Systems Regulatory frameworks for MSW collection; Transportation-problem formulation; Vogel's Approximation Method; KPIs for fleet performance and emissions. AI-Driven Route Optimization for Solid Waste Collection Python environment setup; Heuristics vs. metaheuristics primer; OR-Tools quick start; Implementing and comparing solution quality on ≥ 20 node networks. The Recovery of Waste: Reuse and Recycling Recovery drivers; Social-entrepreneurship models; Material-life-cycle analysis; Case studies of post-industrial and post-consumer recovery. Treatment Technologies MSW treatment regulations; Physical, chemical, biological, and thermal processes; Techno-economic comparison for Caribbean settings; Open-burn consequences. Final Disposal Landfills vs. dumps vs. sea disposal; Design features for leachate and gas control; Health and environmental impacts. Cost Analysis of Waste-Management Systems Cost-benefit framework; Direct/indirect cost drivers; Scenario-based budgeting; Sensitivity analysis. Waste Management in Emergency Situations Risk identification; Response-system construction; Resource planning; Public-education strategies; Drills and reporting; Post-event clean-up protocols.

SEMESTER: 1
COURSE CODE: CIEN 4003
COURSE TITLE: TECHNOLOGIES FOR TREATMENT AND RECOVERY OF SOLID WASTE
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Techniques for promoting separation at source and for food-waste recovery: Impact of at-source separation on retrieval costs; main factors influencing participation; case studies in the Caribbean; integration of AI-driven image recognition and decision-support systems for food-waste sorting. Different types of facilities and methods: Classification facilities; separation facilities; electronic separation; gravity-based separation; particle size separation. Technologies for recycling waste: Recovery and recycling of inorganic waste (paper, glass, plastics, aluminium); aerobic (composting) and anaerobic digestion; sludge treatment and valorisation. Production of intermediate products: Biochemical and thermochemical conversions for biofuels and bioenergy; hydrogen from synthesis gas; carbon-fibre production from waste feedstocks. Waste-to-energy conversion technologies: Thermal systems (incineration, pyrolysis, plasma); anaerobic digesters and biogas energy recovery.

SEMESTER: 1
COURSE CODE: CIEN 4004
COURSE TITLE: SUSTAINABLE LANDFILL DESIGN, OPERATION AND MONITORING
NO. OF CREDITS: 4
PREREQUISITES: NONE
SYLLABUS: Landfill: Definition and purpose for the waste; Principles to minimize adverse impacts; Guidelines for the location of landfills; Use of models, for example DRASTIC, to evaluate the threat of pollution of aquifers. Leachate and gas generation: Characteristics of the leachate; Factors that determine its composition; Methods to estimate the volume of the generated leachate; Phases of a landfill and changes in the composition of the leachate; Process control of the generation of biogas; Estimation of the biogas generated; Other emissions and their characteristics. Infrastructure of a landfill: Construction of the cells; Landfill linings and final covers; Design for the control of migration of leachates and gases; Materials available for linings and final covers; Leachate collection system; Rainwater control system. Operations of a landfill: Equipment used in landfilling; Operations of a landfill; Environmental control; Health and safety. Closure and post-closure of landfills: Development of a closure plan; Design of the final cover; Control of emissions; Rainwater management; Environmental monitoring network; Maintenance after closing; Managing conversion of landfills to MRF and transfer stations. Special topics: Renovation of open dumps to minimize environmental impacts; Options for utilization of biogas.

Electrical and Computer Engineering and Artificial Intelligence

SEMESTER: 1 & 2
COURSE CODE: ECNG 6021
COURSE TITLE: MASC RESEARCH I
NO. OF CREDITS: 4
COURSE DESCRIPTION: This course represents the first phase of the MASc. Project. Students are expected to identify their project area and proceed to fully engage their research. A 4-credit weighting has been applied to underscore the effort expected in the timely and effective management of the research project. Grading and assessment will be based on the submission of a report.

SEMESTER: 1 & 2
COURSE CODE: ECNG 6022
COURSE TITLE: MASC RESEARCH II
NO. OF CREDITS: 0
COURSE DESCRIPTION: This course is offered on a PASS/FAIL basis only. During the semester of registration in ECNG 6022 MASc. Research II, it is expected that students would complete their MASc research activity but not yet completed their final report. Assessment will be based on the submission of a report.

SEMESTER: 1 & 2
COURSE CODE: ECNG 6023
COURSE TITLE: MASC PROJECT
NO. OF CREDITS: 8
COURSE DESCRIPTION: Students registered for the ECNG 6023 MASc. Project are expected to complete their final report for submission no later than three (3) weeks prior to the start of the relevant end-of-semester examinations. ECNG 6023 will be examined by way of a final report submitted by the student and examined by the first and second examiners. Evaluation of ECNG 6023 may include a demonstration, report presentation and oral examination led by a panel comprising the first examiner, second examiner and a moderator.

SEMESTER: 1
COURSE CODE: ECNG 6100
COURSE TITLE: FUNDAMENTAL MATHEMATICS FOR ARTIFICIAL INTELLIGENCE
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course presents 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 taken from various engineering disciplines. The course is project-based and provides the foundational mathematical knowledge necessary for the MASc in AI. Students will then learn techniques for formulating and solving major classes of optimization problems such as linear optimization, nonlinear optimization, discrete optimization, and stochastic optimization. The course will look specifically at optimization in contexts such as machine learning and deep learning, including loss function minimization, hyperparameter tuning, feature selection, and model compression. Students will apply these quantitative techniques for decision-making and optimization to real-world engineering problems and case studies. Upon completion, students will have a practical toolkit of optimization strategies for building effective data-driven solutions and data-driven decision-making across many fields.

SEMESTER: 1
COURSE CODE: ECNG 6101
COURSE TITLE: DATA ENGINEERING
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course provides an introduction to data engineering, the role of data engineers inclusive of sensor dynamics, SCADA systems and embedded data systems with the end-to-end data pipeline development lifecycle. Students will gain foundational knowledge in designing, building, and maintaining scalable data pipelines for diverse data sources, including real-time and batch processing of IoT and sensor data. Core data storage technologies, such as relational databases, NoSQL databases, and data lakes, will be discussed, along with big data processing techniques using distributed computing frameworks. Students will learn how to ensure data quality, governance, and security challenges specific to engineering systems, including compliance with industry standards. The course also covers data visualization techniques to effectively communicate insights. Real-world case studies and hands-on coding assignments will give students practical experience with tools and best practices, preparing them for careers in data engineering, IoT, SCADA, and AI-driven industries. This course is 100% coursework assessed separated into three 20% individual assignments and one 40% individual project.

SEMESTER: 1
COURSE CODE: ECNG 6102
COURSE TITLE: MACHINE LEARNING ENGINEERING
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course provides an introduction to machine learning engineering, the role of machine learning engineers, and the end-to-end machine learning development lifecycle. Students will gain mathematical and programming foundations covering statistics, Machine Learning (ML) languages and popular ML software frameworks. Core Machine learning techniques will be covered for both supervised and unsupervised learning and deep learning. Students will learn the entire development process from data preprocessing and infrastructure to model training, evaluation, optimization, product deployment, monitoring, and testing. Throughout the course, real-world case studies and examples will demonstrate how machine learning is applied in industry. Coding assignments and projects will give hands-on experience taking an ML model from conception to production deployment. Upon completion, students will have strong foundations in machine learning engineering concepts, techniques, and tools to build, deploy, and manage ML systems. This course provides preparation for careers in machine learning engineering, data science, and artificial intelligence.

SEMESTER: 2
COURSE CODE: ECNG 6103
COURSE TITLE: ARTIFICIAL INTELLIGENCE: PHILOSOPHY, POLICY, SOCIETAL IMPACTS AND ETHICS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course delivers Artificial Intelligence (AI) from philosophical, ethical, policy, and societal perspectives. It presents the foundational concepts of intelligence, consciousness, and agency, critically examining debates such as dualism versus physicalism and the implications of the Turing Test. The curriculum addresses ethical frameworks including utilitarianism, deontology, and virtue ethics, as they apply to the real-world AI scenarios, highlighting issues of bias, fairness, discrimination, privacy, and surveillance. Policy discussions will encompass national and international AI strategies, governance models, and regulatory frameworks, including intellectual property rights, liability, and data protection laws. The course also examines the societal impacts of AI across various sectors, focusing on the future work, societal inequalities, and sustainable development goals. Through assessments like philosophical essays, ethical analyses, comparative studies, and governance proposals, students will develop the skills to critically analyze AI technologies and construct informed policy recommendations.

SEMESTER: 2
COURSE CODE: ECNG 6104
COURSE TITLE: ARTIFICIAL INTELLIGENCE FOR COMMERCIAL PROBLEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course explores the practical application of Artificial Intelligence (AI) in commercial settings, focusing on how AI can be used to address real-world business problems. Students will learn to analyze business challenges, apply data-driven decision-making, and design AI solutions that align with commercial objectives. The course covers various AI algorithms, techniques for evaluating and selecting appropriate models, and strategies for deploying AI solutions in business contexts. Students will also engage with key ethical and legal considerations, such as fairness, accountability, and transparency in AI applications. Through projects and case studies, students will develop the skills to communicate AI-driven insights effectively to both technical and non-technical audiences, ensuring that AI solutions deliver tangible business value. Assessments will include problem identification reports, algorithm evaluation, solution design proposals, and presentations of actionable business recommendations.

SEMESTER: 1, 2 & SUMMER
COURSE CODE: ECNG 6107
COURSE TITLE: MASC AI RESEARCH PROJECT I
NO. OF CREDITS: 3
COURSE DESCRIPTION: This 3-credit course requires students to use the knowledge and research skills acquired earlier in the programme to complete an individual-based design simulation testing or design implementation testing project. Students would be supervised by a department's subject matter expert and must prepare a progress report. This report and presentation components are pass/fail and are evaluated by the supervisor and an independent examiner. On successful completion of this course the student transitions to MASc AI Research II.

SEMESTER: 1, 2 & SUMMER
COURSE CODE: ECNG 6108
COURSE TITLE: MASC AI RESEARCH PROJECT II
NO. OF CREDITS: 6
COURSE DESCRIPTION: This 6-credit course is the progression of ECNG 6108 and requires students to use the knowledge and research skills acquired earlier in the programme. It serves as the capstone research project course for students specializing in AI and builds on the literature review and previous work completed in ECNG 6107. This course provides students with projects that demand advanced problem-solving skills and require them to apply a comprehensive knowledge base spanning all fields of AI. By engaging in these projects, students are encouraged to cultivate their analytical and innovative abilities, preparing them t excel in their future engineering endeavors.

SEMESTER: 1
COURSE CODE: ECNG 6105
COURSE TITLE: INTELLIGENT SYSTEMS & CONTROL
NO. OF CREDITS: 3
COURSE DESCRIPTION: This graduate-level course provides an introduction to intelligent systems and how they intersect with control theory and applications. Students will learn about key technologies like artificial intelligence, cognitive theory and machine learning that enable intelligent systems. Course topics cover fundamentals of intelligent systems; cognitive systems for perception, reasoning, and decision-making; autonomous robots and vehicles including navigation, coordination, and perception; control techniques leveraging neural networks and fuzzy logic; intelligent agents and collective intelligence; and state-of-the-art applications in automation, robotics and reinforcement learning. Through projects, and writing assignments, students will gain conceptual knowledge and practical skills relevant for advanced research and industry positions involving intelligent systems and control across electrical, computer, and software engineering.

SEMESTER: 2
COURSE CODE: ECNG 6106
COURSE TITLE: AUTOMATED REASONING AND PLANNING SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: Automated planning and reasoning techniques enable intelligent computer agents to make decisions and take actions in complex, uncertain environments. This graduate-level course provides a comprehensive introduction to the mathematical foundations, algorithms, and practical applications for automated planning and reasoning. The first half of the course covers formal representations and search algorithms for automated planning problems, including classical and hierarchical planning approaches. Students will learn techniques like heuristic search, mathematical optimization, multi-agent systems, and reinforcement learning for generating goal-driven behavior. The second half focuses on knowledge representation and automated reasoning capabilities, using logics, ontologies, and constraints. Reasoning methods like theorem proving, model checking, and constraint satisfaction will be applied to tasks including verification, inference, and decision making. Current real-world application areas such as autonomous robots, software agents, manufacturing systems, vehicle routing, and natural language dialogue will be emphasized throughout the course. Students will synthesize concepts from the course to implement planning and reasoning solutions for complex engineering problems. The course is 100% coursework with 3 assignments and a final group design project.

SEMESTER: 1
COURSE CODE: ECNG 6500
COURSE TITLE: COMPUTER-AIDED POWER SYSTEM ANALYSIS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to revisit fundamental concepts and develop understanding of fundamental techniques employed for power systems analysis. At the end of this course, students will be able to: model the components of power systems; statistically assess power systems and their components; apply the per-unit system to evaluate power system analyses; understand the power transfer problem; calculate symmetrical and asymmetrical fault studies; apply numerical techniques to the solution of large networks and apply computer-based applications for power systems analysis.

SEMESTER:
COURSE CODE: ECNG 6501
COURSE TITLE: POWER SYSTEM DYNAMICS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats with the study and analysis of the dynamic behaviour of electric power systems in response to small and large disturbances. The basic aim is to provide students with the knowledge involved in the operation, planning, and design of electric power systems from the point of view of stability. Additionally, students will learn about modelling and simulation of power systems, especially the synchronous machine and its control systems. This course is designed to provide an adequate background for a career in the electric utilities or in the energy-based industries.

SEMESTER:
COURSE CODE: ECNG 6502
COURSE TITLE: POWER SYSTEM OPERATION & PLANNING
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to cover a variety of matters that relate to power system operation and planning. It treats with economic and security methods in power systems; control of interconnected systems; reliability analysis of power systems; system planning and expansion.

SEMESTER: 1
COURSE CODE: ECNG 6503
COURSE TITLE: ADVANCED POWER SYSTEM PROTECTION
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to review the fundamental protection equipment used in a power system, introduce students to their applications and the special considerations of the power system. The problem of improper coordination and proper grading of the power system are also analysed. At the end of this course, students will be able to: understand and apply power system protection equipment; analyse mathematically the operation of comparators; apply current transformers and digital transducers; perform coordination studies on the power system; differentiate between distance protection and power swings; compare the application of digital techniques in power system protection.

SEMESTER: 1
COURSE CODE: ECNG 6504
COURSE TITLE: ELECTRICAL DRIVES & INDUSTRIAL POWER SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course deals with the utilisation of electric power in electric systems. At the end of this course, students will be able to: define the components requires for system development; describe and understand the effects of three phase short-circuit faults and unbalanced faults on the choice of circuit breaker and for specifying cables and transformers; understand and apply the basic techniques in the analysis of the performance of induction motors, d.c. motors and synchronous motors; describe and understand the main numerical methods available for the determination of system parameters and their modification in order to achieve optimal efficiency and performance.

SEMESTER: 2
COURSE CODE: ECNG 6505
COURSE TITLE: SURGE PHENOMENA & INSULATION COORDINATION
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course presents the fundamental types of overvoltages that can be encountered in electric networks, their typical scenarios, and methods of analysis. At the end of this course, students will be able to: identify different types of sources of dielectric stress in the power system; understand the concepts of insulation coordination, insulation levels and related concepts; understand and use mathematical techniques to simulate and study the behaviours of electric networks under transient conditions; analyse the response of the electric network to different types of surges; understand the concepts of wave propagation, calculation of line parameters and their frequency; understand and apply the concepts of different techniques for the mitigation of overvoltages.

SEMESTER:
COURSE CODE: ECNG 6506
COURSE TITLE: OPTIMISATION TECHNIQUES
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to cover a variety of techniques applicable to optimisation. In particular, it treats with linear programming matters including simplex and revised simplex methods, duality, sensitivity analysis as well as dynamic programming, integer programming methods and network planning techniques. It also covers PERT/CPM; dynamic optimisation methods and applications to engineering systems.

SEMESTER:
COURSE CODE: ECNG 6507
COURSE TITLE: ENERGY ECONOMICS & PLANNING
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to expose students to aspects of finance, economics, system design, economic operation and short term and long-term generation planning in the context of electric energy systems. At the end of this course, students will be able to: define and analyse the problem of load forecasting; describe the different resources needed for system development; understand and apply the basic techniques used in the analysis of long term and short term generation planning; describe and understand the various financial and computer methods available for arriving at an optimal long term, least cost utility development; characterise the basic principles used to model economic load dispatch; understand and describe the rules and basis for cost allocation and classification in arriving at rates and tariffs.

SEMESTER:
COURSE CODE: ECNG 6508
COURSE TITLE: POWER SYSTEM INSTRUMENTATION
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course covers a variety of topics that relate to power systems instrumentation. In particular, it treats with signal processing and conditioning; transducers; metering technology (volts, amperes, watts, vars, frequency, etc.); application of P techniques in instrumentation; thermal measurements (flow pressure, temperature, etc.); networking of instruments; application of computers to measurement and display; transient data recorders and maintenance of power system instruments.

SEMESTER: 2
COURSE CODE: ECNG 6509
COURSE TITLE: SWITCHGEAR & TRANSFORMER TECHNOLOGY
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course reviews the physics of the electric AC arc and its application to circuit breaking. At the end of this course, students will be able to: understand and apply circuit breakers and power transformers; analyse mathematically the operation of circuit breakers and transformers; apply engineering analysis in the selection of circuit breakers and transformers; recognise the importance of the circuit breaker and the transformer in the efficient operation of the power system; understand the difference between the various types of arc media; understand the maintenance requirements of the circuit breaker and transformer.

SEMESTER:
COURSE CODE: ECNG 6510
COURSE TITLE: POWER SYSTEMS MONITORING & CONTROL
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is designed to cover a variety of systems and techniques applicable to power systems monitoring and control. In particular, it treats with SCADA systems, networking applied to power systems; on-line load flow and security analysis; state estimation techniques and automatic load frequency control. The course contextualises these themes in explorations of modern trends in power system monitoring and control.

SEMESTER: 2
COURSE CODE: ECNG 6600
COURSE TITLE: REAL TIME SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course provides students with an understanding of Real Time Systems (RTS) theory and the practical issues involved when applying RTS principles to digital control systems. At the end of this course, students will be able to: identify and discuss the real-time characteristics of an application; utilise available techniques to (a) translate application-based specifications into periodic/deadline specifications, (b) map ideal priority levels onto available OS priorities and (c) alleviate constraints due to hardware and interprocess communications; produce schedules for cyclic executive, ideal DM, RM or EDF systems and demonstrate their validity by applying utilisation and response-time based criteria; identify the real-time specific features of a real time OS and contrast it with ideal/open real-time OS; produce a graphical representation of a RTS using UML and related techniques; analyse a RTS in terms of its reliability and fault tolerance; propose a solution for a real-time scenario involving hardware control and implement the solution using a real-time OS kernel.

SEMESTER: 2
COURSE CODE: ECNG 6601
COURSE TITLE: DIGITAL ELECTRONIC SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course presents the methods and design considerations for the implementation of digital systems on FPGAs. At the end of this course, students will be able to: discuss the timing issues in digital systems; explain the rationale for the techniques employed in implementing digital systems on FPGAs; use VHDL in designing Intellectual Property (IP) Core Modules; design a digital system; understand Functional Verification of Digital Systems; use effectively Xilinx ISE, Modelsim and a Functional Verification Tool in FPGA-based design projects.

SEMESTER:
COURSE CODE: ECNG 6602
COURSE TITLE: DIGITAL ELECTRONIC DESIGN
NO. OF CREDITS: 3
COURSE DESCRIPTION: This digital design course focuses on digital electronic design using regionally accessible technology, most particularly, Field Programmable Gate Arrays (FPGA) and Programmable Array Logic (PAL)devices. The course covers logic design tools, design considerations and applications of IP cores in signal/image processing and digital communications. It also treats with the use of formal specification, formal hardware verification and reconfigurable computing. Students will develop a variety of relevant skills through supervised lab sessions, classroom discussions, audio-visual presentations, unsupervised lab activities, research, project execution, report preparations and presentations.

SEMESTER: 2
COURSE CODE: ECNG 6603
COURSE TITLE: MODERN CONTROL STRATEGIES
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course aims to provide hands-on immersion in advanced control systems design. Topics that will be covered include State Space methods; Optimal Control; Linear Quadratic Regulation (LQR); Linear Quadratic Gaussion (LQG) methods; State Estimation; Optimal State Estimators and Kalman filters; Stochastic Control; Model Reference Adaptive Control (MRAC); Self Tuning Regulators; Intelligent Control Systems and Neuro-Fuzzy Control.

SEMESTER: 1
COURSE CODE: ECNG 6604
COURSE TITLE: LINEAR CONTROL SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats with the design of advanced control systems that utilise advanced analog or discrete multivariable controllers. Topics that will be covered include mathematical representation of dynamic systems; matrix theory review: eigenvalues and eigenvectors, generalised eigenvectors, Jordan form, functions of a square matrix; concept of state-space description of dynamic systems; controllability and observability; feedback control and state estimation; canonical decomposition of state-space systems; system stability; non-linear systems and their state-space representation; stability analysis; optimal control.

SEMESTER: 1
COURSE CODE: ECNG 6605
COURSE TITLE: DISTRIBUTED COMPUTER CONTROL
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course introduces the fundamental concepts and theoretical issues in modern distributed computer-controlled systems. At the end of this course, students will be able to: define terms and concepts used in distributed computer controlled systems, distributed operating systems and distributed database systems; distinguish between the different hardware/software architectural models used in the design of distributed systems; recognise the constraints placed on distributed system designs by ancillary issues and propose appropriate strategies/counter-measures; relate industrial practice and standards to the theory of distributed systems; appraise the choice of physical architecture/software infrastructure components for a distributed system application.

SEMESTER:
COURSE CODE: ECNG 6606
COURSE TITLE: OPTICAL COMPONENTS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course identifies key components used in optical systems: fiber, sources, detectors, amplifiers, modulators, etc. It presents the theoretical foundation for the physical phenomena utilised in the operation of the optical devices and then investigates the performance limitations imposed by these physical processes. Ideal and real characteristics of the optical devices are related to performance specifications represented in commercial data sheets. Case studies treat cost analysis for system design.

SEMESTER:
COURSE CODE: ECNG 6607
COURSE TITLE: OPTICAL APPLICATIONS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats the design and performance analysis of systems derived from a range of optical applications. Optical applications are drawn from Communications and Instrumentation. At the end of this course, students will have an appreciation for the description of light in terms of its degrees of freedom (amplitude, phase, frequency, polarisation and propagation direction) and the physical processes used to manipulate these parameters for communications, sensing and beam-positioning. Students should be able to evaluate the performance of a range of systems and offer reasonable component selection criteria for the design of such systems. Cost analysis is treated.

SEMESTER:
COURSE CODE: ECNG 6608
COURSE TITLE: DIGITAL INTEGRATED CIRCUITS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course on digital integrated circuits presents an introduction to Integrated Circuit (IC) fabrication techniques and provides a comparative study of logic families. It reviews the structure of memory elements and focuses heavily on VLSI design using stick diagram, and other relevant techniques.

SEMESTER:
COURSE CODE: ECNG 6609
COURSE TITLE: ANALOGUE ELECTRONIC SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This graduate course offers an advanced treatment of the analysis and design of discrete analog electronic building blocks. In particular, the course treats with these aspects as they relate to current sources as well as voltage sources and references. It analyses amplifier characteristics and implementations such as the differential amplifier and op-amp circuits. It also treats special function circuits, both integrated and discrete; high power audio amplifier techniques; switch mode power supply design and high frequency amplifier design.

SEMESTER:
COURSE CODE: ECNG 6610
COURSE TITLE: DIGITAL SYSTEM HARDWARE ORGANISATION & DESIGN
NO. OF CREDITS: 3
COURSE DESCRIPTION: This graduate course focuses on the architecture of representative processors. It includes coverage of hardware programming languages; machine organisation; hardware realisation; micro-programming; intersystem communication; interrupt and memory mapped I/O; communication and error control; large memory systems and high-speed computer arithmetic realisations.

SEMESTER:
COURSE CODE: ECNG 6611
COURSE TITLE: SOFTWARE ENGINEERING II
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course opens with a review of design methodologies, modularity and decomposition. It then treats with programme design; design quality; programme implementation and testing; system testing; performance testing and documentation and maintenance. The course covers parallel programming and treats with practical aspects such as phased development; changing schedules and requirements; productivity and updating documentation.

SEMESTER:
COURSE CODE: ECNG 6612
COURSE TITLE: OPERATING SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats with a variety of topics that relate to operating systems. In particular, it includes coverage of Communicating Sequential Process (CSP): symbolic description of processors, traces, communication channels, pipes, etc. with analysis of properties such as synchronisation, parallelism, deadlock and livelock and data flow, etc. It distinguishes between centralised and distributed systems and compares the behaviour of centralised operating systems vs. distributed operating systems. It treats with synchronisation as well as deadlock and livelock analysis using CS; layered protocol and the client server model; ISO OSI model, layers, interfaces, and protocols; Remote Procedure calls and Distributed File Systems, message transport over network, RPC GEN tools and programming for operating system development. The course recognises UNIX as an industrialised standard platform.

SEMESTER: 2
COURSE CODE: ECNG 6613
COURSE TITLE: DATABASE SYSTEMS PRINCIPLES & DESIGN
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course introduces the principles and application associated with database systems. These principles will be used to design and develop software to meet specific requirements and quality standards within the framework of time and cost. At the end of this course, students will be able to: design a DBMS for information processing of a given system; understand the concepts, tools and technologies related to information systems; design and develop PL/SQL programs for existing databases for information extraction and decision making.

SEMESTER: 1
COURSE CODE: ECNG 6614
COURSE TITLE: MULTIPROCESSOR SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course is an introduction to parallel processing techniques. It covers parallel processing languages and algorithms as well as introduction topics relating to synchronous multiprocessing.

SEMESTER:
COURSE CODE: ECNG 6616
COURSE TITLE: COMPUTER GRAPHICS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course introduces theory and practice techniques, which will enable the student to create, manipulate, display and analyse digital data, using either a compiled (C/C++) or an interpreted (MATLAB, Tcl) language and appropriate software packages/libraries. At the end of this course, students should be capable of implementing display/processing algorithms for digital data, by using appropriate theory/techniques drawn from the fields of Information Visualisation, Computer Graphics, Digital Image Processing, Machine and Computer Vision.

SEMESTER:
COURSE CODE: ECNG 6617
COURSE TITLE: ARTIFICIAL INTELLIGENCE SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course provides a comprehensive overview of deep learning techniques for natural language processing and text generation. Students will gain theoretical and practical knowledge of the foundational concepts, classical models, neural architectures, and latest state-of-the-art systems in this rapidly advancing field. The course emphasizes hands-on experience with building and evaluating deep neural models like LSTMs, Transformers, variational autoencoders and generative adversarial networks. Students will learn text generation skills such as beam search, nucleus sampling and metric-based assessment of fluency, coherence and diversity. Additionally, students will analyze the societal impacts, ethical considerations and future directions of AI text generation models. Upon completion, students will possess the advanced theoretical and practical abilities to critically analyze, build and evaluate automated text generation systems while considering larger economic, social and ethical contexts. Assessment includes an individual design project, group research manuscripts and presentations.

SEMESTER: 1
COURSE CODE: ECNG 6619
COURSE TITLE: VISUAL MEDIA PROCESSING I
NUMBER OF CREDITS: 3
COURSE DESCRIPTION: This optional post-graduate/final-year course targets students who wish to understand the scope and limitations of digital visual media. It introduces common standards and explains the tradeoffs inherent in utilising these standards in different application domains, such as cinema post-production, machine vision, and visual consumer electronics. At the end of this course, students will be able to identify, analyse, recommend, and justify use of image processing tools in applications. Topics include image filtering, image content analysis, image compression, and motion estimation in image sequences.

SEMESTER:
COURSE CODE: ECNG 6620
COURSE TITLE: VISUAL MEDIA PROCESSING II
NUMBER OF CREDITS: 3
PRE-REQUISITE: ECNG 6619 VISUAL MEDIA PROCESSING I
COURSE DESCRIPTION: This optional post-graduate/final-year course targets students who wish to investigate and/or manipulate digital visual media in their capstone project. Students will explore the tradeoffs inherent in utilising industrial standards in image and video communication (e.g., JPEG, MPEG-2, MPEG4) in different application domains, such as cinema post-production, machine vision, and visual consumer electronics. At the end of this course students will be able to use, design and exploit image processing tools for creation/ manipulation of visual media.

SEMESTER: 1
COURSE CODE: ECNG 6700
COURSE TITLE: STOCHASTIC PROCESSES, DETECTION AND ESTIMATION
NO. OF CREDITS: 3
COURSE DESCRIPTION: In ECNG 6700 the theory and application of statistical signal processing is explored, providing the foundation for analysis and design within numerous domains including engineering, education, finance, economics, and pure sciences. Both analytical and computer-aided tools are leveraged for implementing statistical signal processing algorithms enabling learner experimentation with statistical signal processing for real-world non-deterministic problems. The course also provides experiential development to model the behaviour of and to describe the performance of non-deterministic systems. By extension, the course provides students with opportunities to expand and adapt contemporary techniques for use in application spaces of interest, including techniques for the analysis of more complex real-life systems and sub-systems. The course is assessed through 60% final exam and 40% coursework.

SEMESTER: 2
COURSE CODE: ECNG 6701
COURSE TITLE: DATA COMMUNICATION NETWORKS
NO. OF CREDITS: 3
COURSE DESCRIPTION: ECNG 6701 covers the design and evaluation of networks which support multi-service traffic. ECNG 6701 presents a structured process accounting for user requirements, system design, and validation, taking account of user-defined service metrics, as well as other contextual factors such as mobility, security, and availability objectives. For proposed designs, issues such as logical addressing, routing, security, and network management will also be considered. Students are exposed to contemporary and emerging networking protocols and technologies as well as computer-aided techniques employing protocol analysers and simulation tools as the basis to synthesise and evaluate logical network designs. These will serve as the basis for further analysis and optimisation of communications networks and protocols. The course is assessed through 100% coursework.

SEMESTER:
COURSE CODE: ECNG 6702
COURSE TITLE: PRINCIPLES OF SWITCHING
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats switched networks for telecommunications applications. It includes coverage of teletraffic analysis; digital circuit switching; integrated digital networks; packet switching and signaling and control in digital telephone networks. The course contextualises these topics in explorations of new developments in digital telephone networks.

SEMESTER: 1
COURSE CODE: ECNG 6703
COURSE TITLE: PRINCIPLES OF COMMUNICATION
NO. OF CREDITS: 3
COURSE DESCRIPTION: ECNG 6703 is a foundation MASc Communication Systems course. It explores digital communication techniques employed at the physical layer for the reliable and efficient transfer of information over a communications channel subject to Additive White Gaussian Noise (AWGN). The course steps through the functional elements that comprise a digital communications link: source encoding, channel encoding and modulation, as the context in which the requirements for optimal performance are examined. Computer-aided analysis is used to reinforce the theoretical treatment of system behaviour and performance. The course is assessed through a mix of formative and summative exercises. The formative exercises comprise a 20% simulation-based student portfolio, a 15% research project, and a 15% analysis project. A 50% final examination provides summative assessment.

SEMESTER: 2
COURSE CODE: ECNG 6704
COURSE TITLE: PERFORMANCE ENGINEERING OF COMPUTER COMMUNICATION SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: In this course, the performance of multi-service communication networks will be investigated using analytic and simulation-based methods. The requirements of various classes of applications will be mapped to performance metrics such as throughput, delay, jitter, and packet loss rate. Passive and active techniques for quantifying these metrics will be explored. From an empirical standpoint, input analysis performed on the real-world traffic will be used to drive simulation models which in turn will be used to predict the performance for a wider range of scenarios. However, prediction will also be performed using analytic means by assuming input distributions and using tools such as discrete-time and continuous-time Markov chains, queuing models, and models for networks of queues. Performance predictions and knowledge of quality-of-service (QoS) architectures will be used to inform strategies for the improvement of network performance.

SEMESTER:
COURSE CODE: ECNG 6705
COURSE TITLE: APPLIED PROBABILITY
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course treats a variety of topics relating to applied probability. In particular, it treats with modeling, quantification and analysis of uncertainty; formulation and solution in sample space; random variables, transform techniques, simple random processes and their probability distributions; Markov processes; Limit theorems; Elements of statistical interference, and decision-making under uncertainty; and Interpretations. The course includes a rich portfolio of applications and lecture demonstrations.

SEMESTER: 1
COURSE CODE: ECNG 6706
COURSE TITLE: ANTENNAS & RADIATION
NO. OF CREDITS: 3
COURSE DESCRIPTION: ECNG 6706 is an elective MASc Communications Systems course. Performance analysis and design of wireless communications systems are investigated, with focus upon the transceiver front-end, waveguides, propagation channels and antennas. Analytical and simulation techniques, and consideration of practical issues such as spectrum management, EMC, and RF safety feature strongly in the course. Contemporary and emerging standards and technologies are investigated through examination of the role of transceiver and antenna systems and supporting signal processing techniques. Students are exposed to software-defined radio which serves as the basis to implement advanced communications techniques such as dynamic spectrum access and MIMO systems. The course is assessed through 100% coursework, comprising of various individual and group-based problem-based analysis and design.

SEMESTER:
COURSE CODE: ECNG 6707
COURSE TITLE: MULTIMEDIA COMMUNICATION SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course recognises that multimedia communication technologies have propelled the development and the popularity of the World Wide Web as a means of communication, and as a source of information and entertainment. Image, audio and video compression and coding techniques facilitate the proper functioning of multimedia applications by reducing load requirements on networks while network protocols play a complementary role by ensuring that data is transmitted efficiently with little compromise in quality. With these technologies industries across the region can be assisted in becoming more integrated as they are able to increase interaction and make their services more easily accessible to each other and to citizens. The resulting boost in productivity will stimulate growth, as well as help increase the international competitiveness in these sectors. This course will examine fundamental concepts and technologies necessary to multimedia communications.

SEMESTER: 2
COURSE CODE: ECNG 6708
COURSE TITLE: TRANSMISSION SYSTEMS
NO. OF CREDITS: 3
COURSE DESCRIPTION: In this course, the design of transmission systems employed in communication networks for the delivery of data, voice and video traffic will be performed. To drive this design process, requirements specifications for the physical layer, which include coverage, capacity, and error-performance objectives will be developed, taking into account a logical network design and pertinent geographical information. In both the wired and wireless domains, contemporary transmission, and access technologies, as well as their governing standards, will be considered. Suitable simulation tools will be used to validate the design.

SEMESTER: 1
COURSE CODE: ECNG 6709
COURSE TITLE: BUSINESS MANAGEMENT
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course introduces students to the rudiments and the operations of managing business organisations in a real-world scenario. The course provides students with a working knowledge of the foundation elements of successful planning, operation and control of industries and businesses as they relate to the functioning in today's business and operational environment. The areas of study will cover leadership and management or organisations; the legal and regulatory framework of business; ethics and professional practice; managerial finance and accounting; and sustainable economic development.

SEMESTER: 2
COURSE CODE: ECNG 6710
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
COURSE DESCRIPTION: This course introduces the concepts of research methods in detail, from conceptualisation to conclusion. Major topics include principle qualitative methods of research, statistical methods of data estimation, testing.

SEMESTER: 1
COURSE CODE: ECNG 6711
COURSE TITLE: ADAPTIVE CONTROL
NO. OF CREDITS: 3
COURSE DESCRIPTION: In many situations in industrial applications, dynamical models of operating control systems are subjected to unknown parameters that result from either imperfect modeling or abrupt changes in the system dynamics. Systems with such uncertainties are prone to explosive instabilities and inaccuracies which must be anticipated and prevented by feedback control. This course is a complimentary basic course in adaptive control of systems subject to unknown parameters. Practical aspects such as implementation and applications are presented with working examples. A part of the course will be devoted to identification theory and modeling in discrete time. After learning the material of the course, the student should have a good perspective of adaptive techniques, an active knowledge of the key approaches, and a good sense of when adaptive techniques can be used and when other methods are more appropriate.

MSc Urban & Regional Planning

SEMESTER: 1
COURSE CODE: PLAN 6000
COURSE TITLE: PHILOSOPHY & PRINCIPLES OF PLANNING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: The material covered in this course is related to the context and environment of the Caribbean and illustrated by case studies from the region and other similar societies as far as available. The content covered by this course includes Garden cities, Anglo-American and European tradition, Third World urbanisation and planning, Planning in the Caribbean SIDS, Sustainable development and sustainable planning, National urban strategies, growth centre and secondary cities, Self- Help; architecture of the poor, Globalisation and impacts on planning, Impacts of ICTS.

SEMESTER: 1
COURSE CODE: PLAN 6001
COURSE TITLE: PLANNING PRACTICE LAW & ETHICS IN THE CARIBBEAN
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course examines planning law and the effectiveness of institutions involved in physical planning and development and to determine the need for institutional reform given the goals and objectives of planning. The evolution of Caribbean legislation; Public and private property rights and policy instruments; Constitutional powers and responsibility of the government for the provision of land and environmental resources, utilities, transport, social services and public health; Planning-related legislation such as the Public Health Ordinance, Municipal Corporations Act, the Housing Act, Slum Clearance and Housing Act; Public decision making in the Caribbean-the roles of government, political parties, interest groups, entrepreneurs and individuals; decision making and the judicial review of public decision and appellate tribunals.

SEMESTER: 1
COURSE CODE: PLAN 6004
COURSE TITLE: PLANNING ANALYSIS & EVALUATION
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course deals with tools and techniques of Data Collection and Analysis; encompassing Survey techniques; Site analysis and processing of development applications; Settlement Planning; Sampling; Probability analysis; Project analysis; Planning evaluation tools; Goal achievement matrices; Multiple criteria evaluation; Planning balance sheets; Time value of money; Internal Rate of Return; NPV; Demographic Projections.

SEMESTER: 1
COURSE CODE: PLAN 6002
COURSE TITLE: GRAPHIC & DESIGN STUDIO
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course offers a practical, problem-solving approach that involves students in varied planning projects, and introduces students to various graphic methods used to aid in design. It is intended to give students an introduction to graphics and spatial data analysis and presentation, including the use of digital techniques. It will be done in a studio context and will include a range of graphic and design problems and techniques, such as AutoCAD, sketchup, cartography, and other graphic software used in planning.

SEMESTER: 2
COURSE CODE: PLAN 6003
COURSE TITLE: DESIGN FOR DEVELOPMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course is designed around a studio project which aims at highlighting the physical aspects of urban development and its relationship to the economic, social and environmental features of human settlements development. The content of this course includes the following topics: Existing urban centres and towns, Re-development and renewal, Development of coherent communities into the real neighbourhoods and diverse districts, public spaces. Conservation of natural environments and the preservation of the built legacy, Urban places framed by architecture and landscape design rooted in local history, climate, ecology and building practice, Infrastructure and amenity design and standards, including local traffic distribution, transportation and related land-use controls, Re-establishment of the relationship between the art of building and the making of community, through citizen-based participatory planning and design.

SEMESTER: 2
COURSE CODE: PLAN 6014
COURSE TITLE: SMALL ISLAND DEVELOPING STATES (SIDS) RESOURCE MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course is aimed at giving the student an appreciation of the critical issues in land use and natural resources management, and to foster a solution-oriented approach to the management of these vital resources. The content of this course includes: The concept of ecosystems, Debates on development and the environment, Challenges of rural environments, The Brown Agenda, Land Use and integrated water resources management, Natural Hazards, Policy framework, Institutional strengthening, The human face of land use planning and natural resource management, The green agenda and protected areas, Coastal development.

SEMESTER: 1
COURSE CODE: PLAN 6011
COURSE TITLE: PLANNING IN THE COASTAL ZONE
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: The course is designed to enhance the student's understanding of the challenges in planning for coastal areas in the Caribbean given the concentration of development on lands along the coast. It will cover the importance of the coast, coastal issues, governing the coast and coastal zone management approaches, drawing on case studies from the Caribbean Region. The content of this course includes the following: Stress from development and conflict, Development constraints: pollution, natural hazards, global climate change etc., Development potential in the coastal zone, The integrated planning framework, Legislative and administrative framework, Institutional environment and stakeholders, Land use optimisation, Planning process/planning methodology, Industry norms and standards.

SEMESTER: 2
COURSE CODE: PLAN 6007
COURSE TITLE: COMMUNITY & PARTICIPATORY PLANNING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course deals with the history, role and functions of both community and participatory planning, including the growing role of the public and stakeholder interests in the planning process. The evolution of planning in the Anglo-American and international experience, the specific process and tools of public consultation and participation in the development of and regulatory functions, the problems associated with community planning and participation in the planning process, Tools and techniques used in community planning exercises which include Community mapping, Needs assessment, Strategic planning and lobbying, Community Visioning.

SEMESTER: 1
COURSE CODE: PLAN 6009
COURSE TITLE: TRANSPORTATION PLANNING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course introduces transportation planning, and its relationship to land-use planning, it will acquaint students with the profession of transportation planning and the types and activities that transport planners are required to conduct. Urban transportation planning and its relationship to land-use planning, including procedures for traffic impact analysis of urban development sites, analysis framework for long-range planning, data collection procedures, basic demand forecasting, assessment of alternative transport plans and impact on the environment and land development at the regional scale.

SEMESTER: 1
COURSE CODE: PLAN 6006
COURSE TITLE: SUSTAINABLE HOUSING & SETTLEMENTS PLANNING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course aims at demonstrating the ways in which human settlements planning is undertaken, whether this is for small towns, villages, neighbourhoods or extensive urban areas, with the focus being on sustainability of these developments. Housing Demand Analysis; Housing Finance; Housing Infrastructure; Construction; residential environment and community development, with the associated issues of fostering employment opportunities, responding to social and educational needs, commercial and recreational facilities demand transportation, infrastructure, and environmental concerns.

SEMESTER: INACTIVE
COURSE CODE: PLAN 6005
COURSE TITLE: URBAN DESIGN
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: Cultural basis for design, new approaches: smart cities, sustainable cities, new urbanism. The competing goals and objectives in urban design, Users versus providers of the built environment, urban structure, public space, safety and security in urban design. Elements and components: neighbourhood, block, street, individual building. Guidelines and standards.

SEMESTER: 2
COURSE CODE: PLAN 6008
COURSE TITLE: TOURISM PLANNING
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course introduces the land-use, infrastructure, coastal and environmental impacts and needs of the tourism industry, this will be done at the macro, national, and regional planning levels as well as the more detailed project site and community levels.

SEMESTER: 2
COURSE CODE: PLAN 6024
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Preparation and methods of research. Problem definition: research objectives, quantitative and qualitative methods, data collection and analysis, field surveys, preparation of questionnaires, literature reviews, testing hypotheses, case studies, historical and policy analysis, report preparation.

SEMESTERS: I & II
COURSE CODE: PLAN 6025
COURSE TITLE: INDEPENDENT STUDY IN URBAN AND REGIONAL PLANNING
NO. OF CREDITS: 3
PREREQUISITES: Must have completed all core courses in the programme.
SYLLABUS: A special topic involving a specialised area of urban and regional planning not normally available through taught courses will be made available to the students. The course will be evaluated by a combination of the following: a technical report, design project, or a major research paper which may include a seminar presentation.

SEMESTER: NOT APPLICABLE
COURSE CODE: PLAN 6030
COURSE TITLE: MSC RESEARCH PROJECT
NO. OF CREDITS: 12
PREREQUISITES:
SYLLABUS: The research project is expected to be the result of a comprehensive investigation and independent analysis of a topic that is germane to the area of interest to the student. The goal of the research should be to study a specific area or phenomenon and to provide a contribution of new knowledge to the field of study or produce a new interpretation of existing information.

Postgraduate Diploma in Land Administration

SEMESTER:
COURSE CODE: LAND 5000
COURSE TITLE: INTRODUCTION TO LAND ADMINISTRATION
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course introduces the concepts of land administration including the legislative provisions and policy concepts relating to land, its transfer and control. Land settlement in the Caribbean is covered including evolution of policy frameworks. State lands and their management, land policy formulation, information needs are also introduced with land administration and land management concepts in general.

SEMESTER:
COURSE CODE: LAND 5002
COURSE TITLE: LAND ECONOMY & PROPERTY MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course gives an overview of the land economy of the Caribbean. It introduces the nature of real property, land rent theory, locational theory, the role of the State in the land economy, land and property taxation, the real estate industry and the finance sector, land and property speculation, and the relationship between formal and informal economy. Also covered are property and real estate management, and project and programme financing and management. The project cycle is also investigated including management formulation and appraisal, project evaluation, public good vs. economic good, time value of money, internal rate of return, net present value and discounting and shadow pricing.

SEMESTER:
COURSE CODE: LAND 5003
COURSE TITLE: LAND LAW
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course introduces Caribbean legal systems including introduction to case laws. Discussed are sources of land law including equity and statutes. Covered are doctrines of estates, reception of English law in the Caribbean and its evolution, the meaning of 'law', estates and interests including freehold, leasehold, absolute, co-ownership, joint tenancies, tenancies in common, profits-a-prendre. Also covered are easements, restrictive covenants, adverse possession, prescription, contracts for sale of land, the doctrine of part performance, pre-contract enquiries and inspection. An investigation of title of unregistered land, forms of deed and other documents, registration of deeds and other documents, and registration of title including the Torrens system.

SEMESTER:
COURSE CODE: LAND 5004
COURSE TITLE: LAND INFORMATION MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course examines the concept of systems, information systems, geographic systems, and land information systems. It discusses data in LIS, their acquisition, input, pre-processing, verification, structures, management, manipulation, analysis, output and quality. Hardware and software considerations are investigated including project specification and national systems, their design and development.

SEMESTER:
COURSE CODE: LAND 5006
COURSE TITLE: SPECIAL PROJECT
NO. OF CREDITS: 6
PREREQUISITES:
SYLLABUS: Students will be expected to do a Special Project of approximately 10,000 - 15,000 words. The topic will be chosen in collaboration with the agencies sending students to make it relevant to their work situation.

SEMESTER:
COURSE CODE: LAND 5007
COURSE TITLE: CADASTRAL SYSTEMS
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course examines the importance of cadastral systems to land administration. The cadastral system as a foundational element of the land information system is discussed. The evolution of cadastral systems to their current role in the socio-economic development of a country is covered along with aspects of establishment, maintenance reform and re-engineering of systems.

SEMESTER:
COURSE CODE: PLAN 6014
COURSE TITLE: SMALL ISLAND DEVELOPING STATES (SIDS) RESOURCE MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: This course is aimed at giving the student an appreciation of the critical issues in land use and natural resources management, and to foster a solution-oriented approach to the management of these vital resources. The content of this course includes: The concept of ecosystems, Debates on development and the environment, Challenges of rural environments, The Brown Agenda, Land Use and integrated water resources management, Natural Hazards, Policy framework, Institutional

Postgraduate Diploma/MSc in Geoinformatics

SEMESTER:
COURSE CODE: GINF 6007
COURSE TITLE: ISSUES & APPLICATIONS IN REMOTE SENSING
NO. OF CREDITS: 4
PREREQUISITES: GINF 6015 OR EQUIVALENT
SYLLABUS: The course is intended to familiarise students with the range of management and scientific problems that may be addressed with remote sensing. Scale issues in remote sensing, multi-spectral image processing methods, image interpretation, analysing spatial patterns, issues in data integration, accuracy assessment, remote sensing and GIS. Remote sensing and change detection, remote sensing in the Caribbean. Remote sensing and hazard assessment and mitigation, remote sensing and biodiversity, remote sensing and coastal zone management, global remote sensing. New directions in remote sensing.

SEMESTER: 2
COURSE CODE: GINF 6010
COURSE TITLE: APPLICATIONS OF GEOINFORMATICS IN URBAN DEVELOPMENT
NO. OF CREDITS: 4
PREREQUISITES:
SYLLABUS: Introduction to GIS concepts; GIS application areas in urban development; database design and development; building applications in urban planning and development: site selection models, locating landfill sites, estimating the carrying capacity of land resources; urban crime analysis; modelling equity in the distribution of social facilities.

SEMESTER: 1
COURSE CODE: GINF 6100
COURSE TITLE: PRINCIPLES OF GEOINFORMATICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE, COMPUTER SKILLS WOULD BE AN ASSET
SYLLABUS: Introduction to GIS: definitions of GIS, The Geography, Information and Systems in the GIS, Current Issues and Views of GIS, Spatial data issues- Acquisition and Input, introduction to GNSS measurements and processing, Data Management, Data Processing. GIS Data Structures, Raster GIS Capabilities, Vector GIS capabilities, GIS and Network Analysis, GIS functionality and applications, Manipulating and extracting information, Spatial data quality issues, Hardware and Software Systems, Introduction to designing and implementing GIS.

SEMESTER: 2
COURSE CODE: GINF 6015
COURSE TITLE: EXTRACTION AND MANAGEMENT OF INFORMATION FROM GEO-IMAGES
NUMBER OF CREDITS:
PREREQUISITES: NONE
SYLLABUS: Electromagnetic radiation: properties and behaviour; Interaction of EM with Earth's atmosphere and surface features. Aerial photographs: geometry of aerial photograph: scale, relief, and tilt displacement; Principles of photo interpretation. Space borne sensors and systems (optical, thermal, radar). Principles of digital image processing: digital images; Image correction and enhancement; Thematic information extraction. Applications in the environment and natural resource management. Practical Work: photo interpretation, digital image processing, multi-spectral classification.

SEMESTER: 1
COURSE CODE: GINF 6020
COURSE TITLE: SPATIAL DATABASES
NUMBER OF CREDITS:
PREREQUISITES: NONE
SYLLABUS: A review of basic concepts of databases; Spatial database design; The Extended Entity-Relationship Model; Object-Oriented Database for GIS; Distributed and Networked Spatial Databases; Web-based GIS database design and management.

SEMESTER: 2
COURSE CODE: GINF 6021
COURSE TITLE: GIS AND SOCIETY
NUMBER OF CREDITS:
PREREQUISITES: NONE
SYLLABUS: This course examines the interrelationships between GIS and the structures of modern society. Through case studies of related to private and public organisations as well as the public, the broader social implications of GIS will be examined. How GIS systems and spatial data are embedded in particular economic, political, social and legal structures create social barriers affecting the wider use of GIS, such barriers will be debated throughout the course. The way in which GIS is employed in society can influence values, perceptions and knowledge, the representation of knowledge in GIS will be discussed with particular reference to how information held by marginalised groups of society is represented. Other areas of importance include the impact of internet mapping, ethics and privacy and the use and misuse of GIS.

SEMESTER: 2
COURSE CODE: GINF 6022
COURSE TITLE: SPATIAL ANALYSIS AND MODELLING
NUMBER OF CREDITS:
PREREQUISITES: GINF 6100 OR EQUIVALENT
SYLLABUS: Introduction to spatial analysis; spatial phenomenon types and relationships. Spatial analysis and GIS; raster and vector capabilities, network analysis, spatial phenomena, and relationships; analysis for discrete entries, spatial data modelling; cartographic modelling, vector and raster overlay. Statistical analysis of attributes: univariate and bivariate descriptions. Spatial interpolation; polynomials, splines, TIN, Geostatistics; spatial correlation, modelling of a spatial process, geostatistical interpolation, semivariogram, kriging, Digital Elevation Models, surface analysis techniques. Spatial Analysis Applications.

SEMESTER: 1
COURSE CODE: GINF 6023
COURSE TITLE: ENTERPRISE GIS DESIGN AND DEVELOPMENT
NUMBER OF CREDITS: 4
PREREQUISITES: GINF 6100 OR EQUIVALENT
SYLLABUS: Enterprise GIS design concepts and issues; user requirements analysis including the design of URA questionnaires; conceptual and logical design strategies; executing and evaluating pilot studies, benchmarking methodologies, planning for data collection and automation; GIS system integration, application development, Graphic User Interface development and customisation.

SEMESTER: 2
COURSE CODE: GINF 6024
COURSE TITLE: RESEARCH METHODOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Research and its characteristics, types of research, defining a research topic, originality and thinking of research, identifying issues and objectives for research, developing research methodology, literature review, finding research material, referencing and citation, executing the research, reporting the findings of the research, dealing with supervisors.

SEMESTER: 2
COURSE CODE: GINF 6025
COURSE TITLE: PROFESSIONAL INTERNSHIP
NUMBER OF CREDITS: 3
PREREQUISITES: ON COMPLETION OF A MINIMUM OF 2 CORE COURSES
SYLLABUS: The content of this course will vary with the agency to which the student is assigned.

SEMESTER:
COURSE CODE: GINF 6006
COURSE TITLE: RESEARCH PROJECT
NUMBER OF CREDITS: 12
PREREQUISITES: NONE
SYLLABUS: A Research Project is required to be completed for the MSc Geoinformatics. The research project report is expected to be the result of a comprehensive investigation and independent in-depth analysis of a topic that is germane to the concentration that is being pursued by the student. The goal of the research should be to study a specific area or phenomenon and to provide an incremental contribution of new knowledge to the field of study or produce a new interpretation of existing information.

Agricultural Engineering (Biosystems Engineering)

SEMESTER:
COURSE CODE: AENG 6000
COURSE TITLE: RESEARCH METHODOLOGY
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Critical discussion of the application of scientific methodology to research in agricultural economics. The role of inductive and deductive logic in scientific research in the Caribbean.

SEMESTER:
COURSE CODE: AENG 6001
COURSE TITLE: PROCESSING & STORAGE OF PERISHABLE CROPS
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Harvesting and handling of perishable crops; post-harvest physiology; Crop pre-treatment for storage and processing; Water activity; Intermediate moisture foods; Principles of refrigeration and application to chilling and freezing; Thermal properties; Packing-house requirements; Packaging; Perishable process/Preservation principles.

SEMESTER:
COURSE CODE: AENG 6002
COURSE TITLE: PROCESSING & STORAGE OF DURABLE CROPS
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Crop physical properties and characteristics; Harvest methods; Transient heat and mass transfer; Psychrometrics; Handling; Cleaning; Drying and storage systems; Dehydration; Pest control; Primary processing operations; Milling; Separation and Extraction; Processing of selected tropical crops.

SEMESTER:
COURSE CODE: AENG 6003
COURSE TITLE: PHYSICAL PROPERTIES OF AGRICULTURAL PRODUCTS
NO. OF CREDITS:
SYLLABUS: Geometry and shape factors. Some flotation and aerodynamic properties. Elastic and viscoelastic behaviour including variation with moisture and temperature. Measurement of toughness, friction, impact strength, and other properties that may be used as quality indicators.

SEMESTER:
COURSE CODE: AENG 6004
COURSE TITLE: SPECIAL TOPICS IN DESIGN
NO. OF CREDITS:
SYLLABUS: This is a project course graded by coursework only. Students will be required to analyse problems and existing equipment and to carry out design or modification work.

SEMESTER:
COURSE CODE: AENG 6006
COURSE TITLE: HYDROLOGY & WATER RESOURCES
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Surface water hydrology and movement; Meteorology, Runoff measurement; Hydrograph analysis; Water balance studies; Groundwater resources; Pumping test; Bore hole design; Computer applications.

SEMESTER:
COURSE CODE: AENG 6007
COURSE TITLE: IRRIGATION & DRAINAGE ENGINEERING
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Surface, sprinkler and trickle irrigation, land grading; On-farm and scheme water requirements; Scheduling of irrigation; Design of canals and hydraulic structures; Drainage design theories; Drain spacing and depth requirement for irrigated areas; Drainage system monitoring; Computer applications.

SEMESTER:
COURSE CODE: AENG 6008
COURSE TITLE: SOIL MECHANICS & CULTIVATION
NO. OF CREDITS:
PREREQUISITES:
SYLLABUS: Soil shear strength; Coulomb equation; Mohr-Coulomb failure criteria; Active and passive Rankine states; Bearing capacity; The general soil mechanics equation; Techniques for predicting forces on soil engaging tools; Soil cultivation requirements and techniques for effective crop production.

SEMESTER:
COURSE CODE: AENG 6009
COURSE TITLE: SOIL & WATER CONSERVATION ENGINEERING
NO. OF CREDITS:
SYLLABUS: Soil erosion study as a basis for designing soil conservation schemes; Water and wind erosion; Erosivity; Erodibility; Soil loss prediction; Design of terraces; Waterways; Shelter belts; Gully control structures; Conservation tillage; Water resources conservation and development. Computer applications.

SEMESTER:
COURSE CODE: IENG 6000
COURSE TITLE: TOTAL QUALITY MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Principles of Quality Systems, Quality Assurance, and Total Quality Management. Company-wide planning for quality. Quality improvement tools. Basic philosophies of Deming, Juran, Crosby, Taguchi, Imai, etc., training for quality. Cost of quality systems. Quality Standards and ISO 9000 - Implementation, Certification, Auditing. Design of experiment; Taguchi approaches to robust design.

SEMESTER:
COURSE CODE: IENG 6001
COURSE TITLE: EXPERT SYSTEMS
NO. OF CREDITS: 3
PREREQUISITES: COMP 2800 OR IENG 3004
SYLLABUS: Expert systems, applications, and domains. Languages, shells, and tools. Procedural paradigms/non-procedural paradigms. Knowledge engineering process (knowledge, acquisition, knowledge representation, inference methods, etc.). Prototyping, hardware and software support. Reasoning under uncertainty. Approximate reasoning/fuzzy sets/logic. Neural networks.

SEMESTER:
COURSE CODE: IENG 6002
COURSE TITLE: DISTRIBUTED INFORMATION SYSTEMS & DATABASES
NO. OF CREDITS: 3
PREREQUISITES: IENG 3013
SYLLABUS: Information systems in business/industry. Systems planning, requirements analysis. Systems analysis and design methods including structured methodologies. Data communications and distributed processing. Distributed database system, Management support systems.

SEMESTER:
COURSE CODE: IENG 6003
COURSE TITLE: COMPUTER INTEGRATED MANUFACTURING SYSTEM
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Overview of CIM. CIM user-computer interface. Interactive display techniques for CIM. Modelling in manufacturing design. Concurrent engineering techniques in design. Distributed processing and networks. Automated assembly. Quality control in CIM. Planning for CIM. Implementation and management of CIM systems.

SEMESTER:
COURSE CODE: IENG 6004
COURSE TITLE: OCCUPATIONAL BIOMECHANICS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to anatomy and neurophysiology. Work physiology. Anthropometry in Occupational Biomechanics. Basic statics and dynamics and its application to the human body. Modelling in Biomechanics. Mechanical work-capacity evaluation. Measurement systems and bioinstrumentation. Electromyography. Applications to Industry.

SEMESTER:
COURSE CODE: IENG 6005
COURSE TITLE: INDUSTRIAL ERGONOMICS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to the attributes of the human as a functioning system. The human sensory processes as human information input channels. Anthropometry and physical workspace and arrangement. Displays, controls and workplace design. Manual material handling and human strength. The working environment - atmospheric conditions; light, colour, illumination; noise and vibration. Circadian rhythms, chronobiology, and shift work in the workplace. Human-computer interaction.

SEMESTER:
COURSE CODE: IENG 6006
COURSE TITLE: OCCUPATIONAL SAFETY & HEALTH
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to occupational safety and health. Occupational health. Occupational safety. Ergonomics applied to occupational safety and health. Insurance. Management of occupational safety and health. Information sources and databases. Training programmes in occupational safety and health. Economics. Analytical tools. Legal aspects of occupational safety and health.

SEMESTER:
COURSE CODE: IENG 6007
COURSE TITLE: INDUSTRIAL AUTOMATION
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to control systems. Discrete models for machines and processes. Analog and discrete controllers. The B-transform. Transfer functions and block diagrams. Solution of difference equations. Stability analysis. Discrete function generation. Response of computer control systems. Final value theorem. Discrete controller design. Sampling. Feedforward and cascaded control systems. Binary logic. Architecture of computer systems. Assembly programming. Interfacing techniques. Boolean algebra. Ladder diagrams. Sequential logic design.

SEMESTER:
COURSE CODE: IENG 6009
COURSE TITLE: ROBOTIC TECHNOLOGY & APPLICATIONS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Basic structure of robotics; classification and structure of robotic systems. Drives and control systems. Co-ordinate transformation and kinematic analysis. Trajectory planning and control. Programming. Intelligent robotic systems. Robotic applications and installations.

SEMESTER:
COURSE CODE: IENG 6010
COURSE TITLE: OPERATIONS RESEARCH IN MANUFACTURING I
NO. OF CREDITS: 3
PREREQUISITES: IENG 3013
SYLLABUS: Application of Operations Research methodology to Strategy, Planning, Scheduling, Sequencing, and distribution decisions in manufacturing organisations.

SEMESTER:
COURSE CODE: IENG 6011
COURSE TITLE: OPERATIONS RESEARCH IN MANUFACTURING II
NO. OF CREDITS: 3
PREREQUISITES: IENG 3007
SYLLABUS: Application of operations research methodology to distribution, independent inventory, layout and handling, and Maintenance decisions in manufacturing organisations.

SEMESTER:
COURSE CODE: IENG 6012
COURSE TITLE: OPERATIONS RESEARCH IN SERVICES
NO. OF CREDITS: 3
PREREQUISITES: IENG 3007
SYLLABUS: Application of operations research methodology to strategy, facilities, logistics, and scheduling decisions in service organisations.

SEMESTER:
COURSE CODE: IENG 6013
COURSE TITLE: DIRECTED READINGS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: A critical review of the current literature in a special topic of importance to Industrial Engineering.

SEMESTER:
COURSE CODE: MATH 3530
COURSE TITLE: MATHEMATICS III
NO. OF CREDITS: 3
PREREQUISITES: MATH 2240
SYLLABUS: Linear algebra. Systems of equation, vector spaces, determinants, eigen values, similarity, positive definite matrices, singular value decomposition. Optimisation and mathematical programming. Calculus of variations.

YEAR:1
SEMESTER:2
COURSE CODE: MENG 6200
COURSE TITLE: PRODUCTION TECHNOLOGY
NO. OF CREDITS: 3
PREREQUISITES: MENG 2008
SYLLABUS: This course follows on from the fundamental principles of the manufacturing process and design in the undergraduate programme and emphasises the broader aspects of the production systems as opposed to the processes themselves. Topics will include welding design considerations and specifications, foundry systems, metal-forming equipment, polymer technology, machining system, automation, and Computer Integrated Manufacturing.

YEAR:
SEMESTER:
COURSE CODE: MENG 6201
COURSE TITLE: MACHINE TOOL TECHNOLOGY
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Functional study of different types of machine tool elements such as spindles drives, bedways, bearings, tool holders, and work holding devices; effect of vibrations and methods of controlling vibrations; lubrication and cooling; acceptance test for machine tools; machine tools for newer machining techniques; large machine tool systems, numerical control of machine tools.

YEAR: 2
SEMESTER:2
COURSE CODE: MENG 6202
COURSE TITLE: APPLIED MATERIALS TECHNOLOGY
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course follows on from the fundamental principles in the undergraduate programme and goes further into the more applied aspects of materials performance. The emphasis would be on preventive and investigative methods and would include such topics as inspection techniques, failure mechanisms and analysis.

YEAR: 2
SEMESTER:1
COURSE CODE: MENG 6203
COURSE TITLE: ROBOTIC TECHNOLOGY & APPLICATIONS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Basic structure of robots; Classification and structure of robotic systems; Drives and control systems; Co-ordinate transformation and kinematic analysis; Trajectory planning and control; Programming; Intelligent robotic systems; Robotic applications and installation. Programmable Logic Controls.

YEAR:
SEMESTER:
COURSE CODE: MENG 6204
COURSE TITLE: ADVANCED MACHINING METHODS & ANALYSIS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Overview of methods and systems for material removal; Machining methods employing tools of defined geometry; Mechanics of orthogonal and oblique cutting; Nature of contact between chip and tool; Thermal aspects; Tool wear and Tool life; Machinability; Cutting fluids; Analysis of turning, drilling, and milling processes; Abrasive machining processes; Developments in non-traditional machining methods; Economics of machining.

YEAR:
SEMESTER:
COURSE CODE: MENG 6205
COURSE TITLE: ADVANCED FORMING METHODS & ANALYSIS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Stress and strain analysis; Yield conditions; Stress-strain relations in elastic and plastic deformations; Workhardening; Formulation of elastic and plastic problems; Methods of solution: Slab method; Slip-line fields and extremum principles; Applications of theory of plasticity to metal-working operations viz: wire drawing, extrusion, rolling, forging, deep drawing, spinning, etc; Friction in metal-forming; Recent developments in technology and theory of metal-forming.

YEAR:
SEMESTER:
COURSE CODE: MENG 6206
COURSE TITLE: PLASTICS PROCESSING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Properties and applications of common and engineering plastics; Manufacturing methods for products of thermosetting and thermoplastic polymers; Design for production and development of tooling for Extrusion, Injection moulding; Thermoforming; Calendering; Rotational moulding; Compression moulding; Transfer moulding; Blow moulding; Film blowing; Analysis of polymer melt-flow; Processing of reinforced plastics.

YEAR:
SEMESTER:
COURSE CODE: MENG 6207
COURSE TITLE: COMPUTER INTEGRATED MANUFACTURING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to CIM; Role of the computer in manufacturing; Hardware and software components of computer automation; Advanced computer architectures used in manufacturing; Computer Aided Design (CAD); Computer Aided Manufacturing (CAM); Linking CAD with CAM; Control of manufacturing equipment; Computer controlled parts handling and assembly; Simulation of manufacturing processes; Quality in CIM perspective; Programmable factory.

YEAR:
SEMESTER:
COURSE CODE: MENG 6208
COURSE TITLE: PRODUCT TOOL & MANUFACTURING ENGINEERING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Product domain/process domain; Product design/product quality; Process flow chart; Sheet metal forming design considerations; Metal cast parts design; Plastic component design; Wood products design; Design for assembly; Finishes; Detailed tool, dye, and mould design; Equipment selection; Manufacturing support systems.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6300
COURSE TITLE: APPLIED ERGONOMICS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Effect of heat on workers, acclimatisation; noise in industry, hearing loss, noise control; Colours in working environments; Light sources, illumination standards, brightness and contrast, visual fatigue; Levers, dials, and controls; Human vibration control; Man-machine systems; Work design, hand-tool design, work-station design; Wider application of ergonomics.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6301
COURSE TITLE: COMPUTER APPLICATIONS IN MANUFACTURING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course provides an overview of how computers are used to improve competitiveness in manufacturing enterprises. It takes a holistic viewpoint, tying together more detailed considerations of elements of the manufacturing business that are presented in other courses. Understanding how computers and especially modelling and simulation have transformed product and process development is a key theme. Another is how computer applications are used in management of production operations and support functions.

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6302
COURSE TITLE: DESIGN OF PLANT & SERVICES
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Product, process and schedule design, line balancing; Activity relationships and space requirements; Personnel requirements; Material handling including robotic and automatic-guided vehicles; Plant layout; Computer-aided plant layout; Receiving and shipping; Storage and warehousing; Office planning; Facility services - electricity, water, air-conditioning communications.

YEAR: 2
SEMESTER:2
COURSE CODE: MENG 6303
COURSE TITLE: COMPUTER CONTROL SYSTEMS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Concepts of computer control; Process modelling, solution of difference equations; Stability analysis; System inputs and generating functions; System response; Discrete controller design, stability and realisability; sample period selection, feed forward control and cascade control; control computers; computer interfacing and sensors for computer control.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6305
COURSE TITLE: FINITE ELEMENT ANALYSIS IN MANUFACTURING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to Finite Element Analysis (FEA). Material properties. Truss and beam elements. Two-dimensional brick elements. Combining elements. Static linear analysis, modal analysis and buckling. Verification of accuracy of results. Introduction to non-linear analysis. Application to manufacturing problems.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6306
COURSE TITLE: ADVANCED CAD/CAM FOR PRODUCT REALIZATION
NO. OF CREDITS: 3
PREREQUISITES: MENG 3014
SYLLABUS: Review of the role and elements of Computer Aided Design (CAD) and Computer Aided Manufacture (CAM); Solid and Surface Modeling Techniques for Design, Evaluation and Manufacture; Generation of Tool Path Data from Solid and Surface Models using Manual Part Programming and Computer-assisted Part Programming with Mastercam; Elements of Computer Integrated Manufacturing (CIM).

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6307
COURSE TITLE: DESIGN & SIMULATION OF MANUFACTURING SYSTEMS
NO. OF CREDITS: 3
PREREQUISITES: MATH 2240 INDUSTRIAL STATISTICS OR A SIMILAR COURSE
SYLLABUS: Simulation and System Dynamics: Introduction to Simulation, System Dynamics, Simulation Basics, Discrete Event Simulation, Monte-Carlo Simulation; System Modeling and Analysis: Data Collection and Analysis, Model Building, Verification and Validation, Simulation Output Analysis; Simulation Application: Modeling of Various Manufacturing Systems Such as Job, Cellular and Virtual Cellular, Modeling of Manual and Automated Assembly Lines, Modeling of Various Material Handling Systems Such as AGVs, Robots and AS/RS, Modeling of Automated Manufacturing System.

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6400
COURSE TITLE: PRODUCTION PLANNING & CONTROL
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Computer-controlled production and inventory systems; Computer-aided process planning techniques; Database configuration and techniques for forecasting and implementation of aggregate plans; Groups Technology for planning and control; Manufacturing Automation Protocol at the Shop Floor; Computer-controlled scheduling and sequencing techniques; Computerised costing systems.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6402
COURSE TITLE: HUMAN RESOURCE MANAGEMENT I
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Formal and informal organisation; The bureaucratic model; The organisational environment; Modern organisation theory; The individual in the organisation; SKAO; Theories of motivation and leadership industrial relations; IRA, RSBA; Communication in organisations; Performance appraisal systems.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6403
COURSE TITLE: HUMAN RESOURCE MANAGEMENT II
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: External staffing; Internal staffing; Base wage and salary systems; Training and development; Job evaluation systems; HRM planning; OD and change; Occupational health and safety; Future issues.

YEAR 1:
SEMESTER: 1
COURSE CODE: MENG 6404
COURSE TITLE: MAINTENANCE ENGINEERING & MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Objectives and policies of maintenance; Reliability, availability, and maintainability; Failure statistics and analysis. Terotechnology and life cycle costing; Preventive maintenance: Condition-based and scheduled maintenance; Corrective maintenance and overhauls; Plant turnarounds; Work-planning and control; Performance and productivity analysis; Quantitative technique; Computer in maintenance.

YEAR: 2
SEMESTER: 2
COURSE CODE: MENG 6405
COURSE TITLE: TOTAL QUALITY MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Philosophy and principles of total quality management; Customer satisfaction; Quality systems; Quality tools; Continuous improvement; Employee involvement and empowerment; Supplier partnerships; Benchmarking; Quality function deployment; Statistical process control; Taguchi's quality engineering; Experimental design.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6500
COURSE TITLE: INDUSTRIAL MARKETING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Nature and scope of marketing; Characteristics of industrial marketing; Organisational buyer behaviour; Industrial marketing research; Industrial marketing planning; Product planning, industrial innovation and new product strategies; Choice of channels and physical distribution; Price determination; Industrial advertising and sales promotion; Personal selling; Marketing audit, cost analysis and controls.

YEAR:
SEMESTER:
COURSE CODE: MENG 6501
COURSE TITLE: STATISTICAL METHODS IN ENGINEERING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Probability distributions; Estimation and hypothesis testing; Correlation and regression analysis of variance; Experimental design; Multivariate statistics.

YEAR: 2
SEMESTER: 2
COURSE CODE: MENG 6502
COURSE TITLE: FINANCIAL MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Analysis of financial statements; Financial forecasting and planning; Risk, return and valuation; Capital budgeting; Financial structure and leverage; Cost of capital; Financing mix decisions; Current asset management: Cash, marketable securities, accounts receivables, inventory and short-term financing; Long-term financing; Common stock, debt, preferred stock, term loans, and leasing; Dividend policy.

YEAR:
SEMESTER:
COURSE CODE: MENG 6503
COURSE TITLE: APPLIED OPERATIONS RESEARCH
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Modelling and optimisation of large-scale systems; Linear and non-linear models, stochastic models, multi-criteria models; Use of computer software packages; Decision support systems.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6504
COURSE TITLE: TECHNOLOGY & PRODUCT DEVELOPMENT
NO. OF CREDITS: 3
PREREQUISITES: MENG 3013
SYLLABUS: Relationship between technology transfers, technological change, and economic development. Technology diffusion and innovation industry; Technology selection and capacity planning; Design axioms and corollaries; Features in design and manufacturing; Management of product development; Strategic approval; Integration of expert systems; Databases and CAD; Neural networks in design of products.

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6505
COURSE TITLE: HEALTH, SAFETY & THE ENVIRONMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Hazards associated with manual work, machinery, mechanical systems, construction and other common industrial scenarios; Safety technology and engineering controls; Electricity and fire; Principles of industrial hygiene; Occupational health hazards; Personal Protective Equipment; Ergonomics; Welfare issues - the working environment; Risk assessment and hazard analysis; Job safety analysis; Safe systems of work, including permit to work systems; Inspection techniques; Accidents: causation, investigation, reporting and costs; Communication; Motivation and training; Psychological factors in safe behaviour; Safety and health legislation (in Trinidad and Tobago, and key legislation in the UK and USA).

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6506
COURSE TITLE: PROJECT MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Project identification in context of investment programme at national and sectorial level; Pre-investment studies; Detailed project preparation, development and evaluational project organisation; Project analysis and evaluation (technical, economics, financial, social and environmental). Project implementation (procurement/contracts programming and control); ex-post evaluation.

YEAR:
SEMESTER:
COURSE CODE: MENG 6507
COURSE TITLE: ENTREPRENEURSHIP & INNOVATION
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Entrepreneurship (Theory and Practice); Entrepreneurship in small businesses; Entrepreneurial ventures; Creative design and innovation; Patterns of creativity and innovation (Ideas to Product to Market); Design, marketing, and the consumers; Diffusion and transfer of technology and innovation; Strategic planning (Business Planning and New Ventures).

YEAR: 2
SEMESTER: 2
COURSE CODE: MENG 6508
COURSE TITLE: RESEARCH METHODS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to research methods. Research process from conceptualisation to analysis and conclusions. The use of constructs. Operationalisation of constructs. Measurement. instruments - design, testing, and administration. Data collection. Data coding and encoding. Data entry and verification. Hypothesis testing. Data analysis. Model building. Drawing conclusions from data analysis. Report writing and presentation of results. References and searches.

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6506
COURSE TITLE: PROJECT MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Project identification in the context of investment programmes at national and sectoral levels; Pre-investment studies; Project management, development and evaluation; Project organisation; Project analysis and evaluation (market, technical, economic, financial, social and environmental); Project implementation (procurement/contracts programming and control); Export evaluation.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6700
COURSE TITLE: STRATEGIC ASSET MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Historical development of maintenance practices. Strategic characteristics of physical assets. Business Plans. Operations Strategy and Plans. Maintenance Objectives and Goals. Maintenance Strategies and Tactics. Maintenance Organisation and Staffing. Outsourcing Maintenance. Quality and Maintenance. Asset Strategy and Acquisitions. Life Cycle Costing. Measurement of Performance. Data Collection and Reporting Systems.

YEAR: 1
SEMESTER: 1
COURSE CODE: MENG 6701
COURSE TITLE: ASSET MAINTENANCE TECHNOLOGIES
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Preventive and Corrective Maintenance. Condition based Maintenance. Predictive Maintenance. Cost, benefits and implementation guidelines. RCM: Concepts and processes; Introduction and implementation issues. TPM: Concepts and processes. Introduction and implementation issues. CMMS: Features and benefits; Systems specification, sourcing and implementation issues.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6702
COURSE TITLE: WORK PLANNING AND SCHEDULING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Maintenance Plans and Programs. Job Planning. Work Order Systems. Work Measurement. Maintenance Resource Planning. Quality Assurance. Work Scheduling, Monitoring and Control. Backlog Control. Budget Preparation and Control. Inventory Control Systems. Inventory usage analysis and control. Shutdowns and Overhauls: Planning; Estimating and Budgeting; Scheduling, Feedback and Control.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6703
COURSE TITLE: CONDITION MONITORING AND DIAGNOSTICS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Predictive Maintenance: Condition Monitoring Techniques. Selection, Justification, and Applications. Vibration Basics. Vibration Analysis Techniques Lubricating Oil Analysis. Wear Debris Analysis. Thermography Process Parameters. Ultrasonics. Visual Inspection Selection and Implementation of System Optimisation and Control of Programme.

YEAR: 2
SEMESTER: 2
COURSE CODE: MENG 6704
COURSE TITLE: MAINTENANCE ANALYSIS AND OPTIMISATION
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Component Replacement Decisions: Individual Replacement Policies; Group Replacement Policies Inspection Decisions to Maximise Profits Inspection Decisions to Maximise Availability. Equipment Replacement for Minimisation of Cost. Equipment Replacement for Maximisation of Discounted Benefits Optimum Number of Machines to Meet Service Demand Optimum Crew Size to Meet Service Demand

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6705
COURSE TITLE: MAINTAINABILITY ENGINEERING AND MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Maintainability Functions and Measures. Maintainability Tools. Availability. Maintainability Design Characteristics. Maintainability Design for Human Factors and Safety. Maintainability Prediction and Demonstration.

YEAR: 1
SEMESTER: 2
COURSE CODE: MENG 6706
COURSE TITLE: ASSET RELIABILITY MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Reliability of components and systems. Reliability Modeling and Prediction Failure Mode Effects and Criticality Analysis. Fault Tree Analysis. Design for Reliability Data Collection and Analysis. Reliability Testing and Demonstration. Root Cause Failure Analysis. Reliability Improvement.

SEMESTER: 2
COURSE CODE: MENG 6707
COURSE TITLE: ASSET PERFORMANCE MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Maintenance Scorecard: Strategy Level Functional Level Implementation. Benchmarking Fundamentals. Benchmarking Best Practices. Maintenance Improvement Plans. Corrective Action and Continuous Improvement.

YEAR: 2
SEMESTER: 1
COURSE CODE: MENG 6708
COURSE TITLE: RELIABILITY CENTERED MAINTENANCE
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Developments in RCM. RCM Process: Equipment Functions, Standards, and Failures. Maintenance Tasks. Maintenance Plans and Schedules. Implementation Plans. Review and Control.

SEMESTER:
COURSE CODE: ENGR 6701
COURSE TITLE: MANAGEMENT & LEADERSHIP
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Leadership and Team-Building; Decision Making, Communication and Presentation; Motivation and People Management; Time and Project Management; Business Processes; New Venture Development; Supply Chain Management; other related areas.

Project Management Core Courses

SEMESTER: 1
COURSE CODE: PRMG 6001
COURSE TITLE: PROJECT LEADERSHIP & ORGANISATIONAL BEHAVIOUR
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course examines interpersonal and intrapersonal dynamics as they affect the achievement of corporate goals. Topics include: leadership, theories of organisational behaviour including motivation, group dynamics, organisational communication processes, leadership skills for project managers (profile of effective project managers), project leadership, developing a project vision, leadership and team building, team dynamics and cultural diversity, Project organisational design and structure, managing stress, negotiation, understanding conflict in the project environment, managing change in a complex domestic and international environment, leadership, power, influence and politics in project management

SEMESTER: 2
COURSE CODE: PRMG 6002
COURSE TITLE: PROJECT MANAGEMENT INFORMATION SYSTEMS (PMIS)
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course addresses project management principles and methods from the standpoint of the project and programme manager who must organise, plan, implement and control non-routine activities to achieve schedule, budget and performance objectives. Topics include project life cycles, definition of PMIS, the planning system and the control systems, networking systems, performance management systems, cost and resource management systems, capacity planning systems. Evaluating systems, project management procedures, system selection and implementation, project management software, earned value techniques and project audits are studied.

SEMESTER: 1
COURSE CODE: PRMG 6003
COURSE TITLE: PROJECT & PROGRAMME MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course will explore the strategic and tactical dimensions of project and programme management. The course will address foundation and advanced principles associated with the management of projects and programmes in today's complex and dynamic business environment. Critical project and programme management tools and techniques associated with key Project Management Bodies of Knowledge will be addressed. These tools and techniques include, Internal and External Analyses, Turner's 7 Forces, Project Appraisal and Selection Models, Project Charter, Work Breakdown Structures, Project Schedules, Risk Management Frameworks and Earned Value Management. Student will also be introduced to critical aspects of the Project Management Office, Project Management Maturity Models and Project Management Methodologies. The course will be delivered using lectures, project- based learning, problem-based learning, class discussions, and group presentations. Assessments will be conducted via written coursework, groups presentations and examination.

SEMESTER: 1
COURSE CODE: PRMG 6004
COURSE TITLE: PROJECT ACCOUNTING & FINANCE
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: The objective of this course is to apply principles, concepts, tools and techniques of accounting and finance to the different phases of project conception, imitation and planning, scheduling and control and implementation, termination and post-evaluation; financial statements and analysis; accounting principles and policies, valuing projects - engineering economic analysis, financial methods (NPV, IRR, profitability index), multi-criteria methods of evaluation, real options analysis, social cost-benefit analysis and development impacts, cost capacity relationships/life cycle costing, earned value approach, the costing of products and services (product-costing, job-costing), projects budgets in planning, cost control and performance evaluation.

SEMESTER: 2
COURSE CODE: PRMG 6007
COURSE TITLE: PROCUREMENT MANAGEMENT, LOGISTICS & CONTRACTING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Principles and concepts essential to effecting large procurement programmes. Planning, sourcing, and contractual design for diverse acquisitions. This course examines processes through which works, goods and services are acquired in the project management. Topics include what is procurement management, contract and procurement strategies [IDB, WB, EEC, CDB, private sector and public sector]; legal issues, contracting pricing alternatives; writing terms; reference, technical, managerial and commercial requirements, request for proposals (RFP) development, source selection, invitation to bid, bid evaluation (process criteria report), risk assessment, contract negotiation and administration, contract close out and case studies.

SEMESTER: 2
COURSE CODE: PRMG 6010
COURSE TITLE: RISK MANAGEMENT FOR PROJECT MANAGERS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course will emphasise risks and risk management processes in projects and firms that are involved in project management. It will discuss and explore the concept of risk management both from the strategic and tactical levels. Topics: Why project risk management? The risk management cycle, the nature of risk management, risk and decision-makers, integration, general approach and definitions, risk identification, risk assessment goals and methodology, computer applications, risk response and documentation, management of contingency allowances, managing the risks of the project environment dealing with risks in contracts and project risk analysis and management (tools and techniques) e.g. assumption analysis, check lists, prompt lists, brainstorming, Delphi technique, probability impact tables, interviews, risk register, decision trees, influence diagrams, Monte Carlo simulation, sensitivity analysis, PERT and control techniques). The practical use of statistics in collecting, organising, analysing, interpreting, and presenting data both descriptive and inferential techniques are covered. The perspective will be aimed at medium and upper-level project managers in various organisations.

SEMESTER: 1
COURSE CODE: PRMG 6015
COURSE TITLE: CONTRACT MANAGEMENT & CONTRACT LAW FOR PROJECT MANAGERS
NO. OF CREDITS: 3
SYLLABUS: An introduction of the different legal systems, the hierarchy of local courts, creation of laws and the role of the Parliament and Statute. Contract and the conduct of business. Types of Contracts (Oral v. Written). Employment contract, contracts of service and contracts for services (Consultation, etc.). Elements of the law of Contract and application to business. Sale of Goods Contracts, Insurance Contracts, Warranties, Guarantees. Different types of Contracts, Admeasurement Contracts, Cost plus Imbursement Contracts, Lump Sum Contracts, Labour only contracts, their Application and Management. Standard Form Contracts and their parts. Standards, Specification and Codes of Practice. The different procurement systems; Design and Build (D&B) Turnkey contracts, Design, Finance and Contracts.

SEMESTER: 2
COURSE CODE: PRMG 6019
COURSE TITLE: RESEARCH METHODS FOR PROJECT MANAGERS
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Recognizing the uniqueness of projects and project environments, this course provides an introduction to the key components of applied scientific research. As a complement to the programme's research project, it is specifically tailored to meet the research needs, at the local, regional or international setting, of candidates enrolled in the MSc Project Management programme. In addition to the core tenets of research methodology such as conceptualization and data collection, learners will be exposed to advanced concepts such as error analysis and open-source data.

Project Management Electives

SEMESTER: 2
COURSE CODE: PRMG 6005
COURSE TITLE: MARKETING MANAGEMENT & BUSINESS COMMUNICATION
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course presents a structured approach to understanding the marketing function. Each student chooses a product or service and develops a written marketing plan to learn how to determine and integrate the elements of marketing strategy. Topics include marketing segregation, targeting and positioning, market research, product decisions, pricing, channels of distribution, sales management, advertising, marketing budgets. Business communication emphasises communication competencies that can help ensure business success. Topics covered include how to conduct research, analyse information, and prepare business reports, deliver effective information and persuasive oral presentations, work successfully with an assigned group and communicate effectively in a global workplace.

SEMESTER: 1
COURSE CODE: PRMG 6008
COURSE TITLE: PROJECT ESTIMATING & COST MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course addresses the need for project managers to understand and apply advance tools and techniques to the development and management of project financial plans. Topics include project cost and benefit estimation, project financial analysis, project simulation, budgeting, cost/schedule integration, the cost breakdown structure, the cost commitment profile, techniques for monitoring and controlling project cost, methods of payment and their uses, types of estimate, estimates at different stages of the project life cycle, estimating methods such as: parametric, comparative, bottom-up estimating, computerised tools, analytical, accuracy of estimates, earned value management systems.

SEMESTER: 2
COURSE CODE: PRMG 6009
COURSE TITLE: MANAGING INFORMATION TECHNOLOGY PROJECTS
NO. OF CREDITS: 3
PREREQUISITE: PRMG 6002
SYLLABUS: This course addresses all areas of IT project management, hardware, software, systems integration, and human resources. It extends traditional project management concepts into the IT arena. Topics covered: IT project phases, strategies for IT projects, Project initiation and requirements definition, establishing IT project teams, project planning estimation, project execution and control, project close-out, managing hardware and telecommunications projects, managing software projects, managing systems, integration projects.

SEMESTER: 2
COURSE CODE: PRMG 6011
COURSE TITLE: ADVANCED PROJECT MANAGEMENT PRACTICE
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Advanced PM practice and professional exam preparation examines current topics in the project management field and provides a comprehensive review of the project management body of knowledge PMBOK (USA) and BOK (Europe). Topics include: global project management, leadership, virtual teams and project information systems.

SEMESTER: 1
COURSE CODE: PRMG 6012
COURSE TITLE: VALUE ENGINEERING & MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: This course provides students with central concepts and practical tools and techniques in Value Engineering (VE), Value Management (VM) and Value Analysis (VA). Topics include: the value concept, value engineering methodology [information phase, speculative phase, analytical phase, proposal phase and final report phase]. Several techniques for project selection e.g., breakdown analyses, cost modelling techniques, delphi techniques, energy modelling, lifecycle cost model. Life cycle costing methodology. Value management plan, keys to successful VE implementation and programme management strategy for a VE/VA programme.

SEMESTER: 1
COURSE CODE: PRMG 6013
COURSE TITLE: INTERNATIONAL PROJECT MANAGEMENT
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Geography, culture and society, transnational commerce, and finance; international principles and regulations for procurement of finance, goods and services, tendering procedures; project preparation, planning, financing and execution; international contract law and operations in the conduct of transnational projects, preparing contracts, negotiating contracts, dispute resolution; transnational joint ventures and the management of resources for project execution and closure.

SEMESTER: 2
COURSE CODE: PRMG 6017
COURSE TITLE: PROJECT MANAGEMENT FOR SMALL AND MEDIUM SIZE ORGANISATIONS
NO OF CREDITS: 3
PREREQUISITES: NONE
SYLLABUS: The course discusses the business environment within the informal sector, small and medium enterprises, sole traders, the NGOs, and CBOs. It discusses the unique challenges to the conduct of business within this sector. It treats with the principal weaknesses of management operations and practice in the sector and the role of documentation, availability and use of technology, written and oral communication and the preparation of a business plan as well as managing finance, organisational structure, applications of management tools in respect of time, cost, and quality management. It discusses the unique challenges of applying management tools to this sector. The course is about identifying and studying the unique nature of small business and seeks to answer the question; does small business require a separate and distinct managerial strategy and distinct tools?

SEMESTER: 2
COURSE CODE: PRMG 6018
COURSE TITLE: FINANCIAL RISK MANAGEMENT AND REGULATORY COMPLIANCE (BANKS AND FINANCIAL INSTITUTIONS)
NO OF CREDITS: 3
PREREQUISITES: PRMG 6010; PRMG 6004
SYLLABUS: The course is offered as a specialist course in Risk Management as it applies to the financial sector. It provides knowledge and understanding of the key elements of risk management and their ability to protect business organizations and add value to the organisation and shareholder value. It identifies the key risks facing financing services institutions and identifies the source of risks especially in banks, insurance companies and other financial institutions. It discusses the question of due diligence and the role of central banks and regulatory legislation. It explores the relevance and application of various statistical measures within risk analysis. It also discusses special issues e.g., Efficient Market Hypothesis; Mean Variance Portfolio Theory, Arbitrage Pricing Theory and Factor Models and Risk Adjusted Measures. The course uses case studies as the principal vehicle of treating with financial risk management practices.



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