UWI
ST. AUGUSTINE CAMPUS

Engineering

UNDER GRADUATE

2017/2018

Regulations & Syllabuses

TABLE OF CONTENTS

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 issued in the Faculty Handbooks should be read in conjunction with the following University Regulations:

- The Undergraduate Regulations and Syllabuses should be read in conjunction with the University regulations contained in the Undergraduate Handbook
- 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 Diplomas and Degrees (with effect from August 2014)

Progress through a programme of study at the University is governed by Faculty Regulations *and* University Regulations. Should there be a conflict between Faculty Regulations and University Regulations, **University Regulations shall prevail**.

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 altogether withdraw or modify programmes or courses as it deems necessary.

DISCLAIMER – PRIZES & AWARDS

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

ACADEMIC CALENDAR 2017-2018

ACTIVITY	SEMESTER 1 AUGUST - DECEMBER 2017	SEMESTER 2 JANUARY - MAY 2018	SUMMER MAY - JULY 2018
Semester **BEGINS**	August 27, 2017	January 21, 2018	May 27, 2018
Registration	August 21 – September 15, 2017	January 08 – February 02, 2018	May 21 – June 16, 2018
Teaching **BEGINS**	September 04, 2017	January 22, 2018	May 28, 2018
Orientation and Ice Breaker (UWILIFE)	**September 01, 2017**		
Late registration / Late Payment Fee of TT$200.00 applies **FROM**	September 11, 2017	January 29, 2018	June 11, 2018
Last day for payment of fees before course registration is removed (de-registration) / Compulsory Leave of Absence is recorded.	October 31, 2017	March 30, 2018	June 30, 2018
Application to carry forward coursework **ENDS** Change in Registration (ADD/DROP) **ENDS** Application for Leave of Absence **ENDS** Application for Credit and Exemptions **ENDS**	September 15, 2017	February 02, 2018	June 16, 2018
Teaching **ENDS**	December 01, 2017	April 20, 2018	July 07, 2018
Semester II Break	**April 22 – 29, 2018**		
Examinations **BEGIN**	December 04, 2017	April 30, 2018	July 10, 2018
Examinations **END**	December 22, 2017	May 18, 2018	July 20, 2018
Semester **ENDS**	December 22, 2017	May 18, 2018	July 20, 2018
ELPT TEST: Scheduled for the following dates	August 21, 2017 and October 12, 2017	February 15, 2018	-
SPECIALLY-ADMITTED 2017/2018	**SEMESTER I**	**SEMESTER 2**	**ENTIRE ACADEMIC YEAR**
Application for Specially Admitted **OPENS**	November 14, 2016	November 14, 2016	November 14, 2016
Application for Specially Admitted **ENDS**	June 30, 2017	December 15, 2017	June 30, 2017
CEREMONIES			
Matriculation Ceremony	September 21, 2017		
Graduation Ceremonies	October 14, 2017 (Open Campus) October 21, 2017 (Cave Hill) **October 26 - 28, 2017 (St. Augustine)** November 3 to 4, 2017(Mona)		

Revised August, 2017. This calendar is subject to change by the appropriate authorities.
For the full and most up-to-date calendar, visit https://sta.uwi.edu/registration/academiccalendar.asp

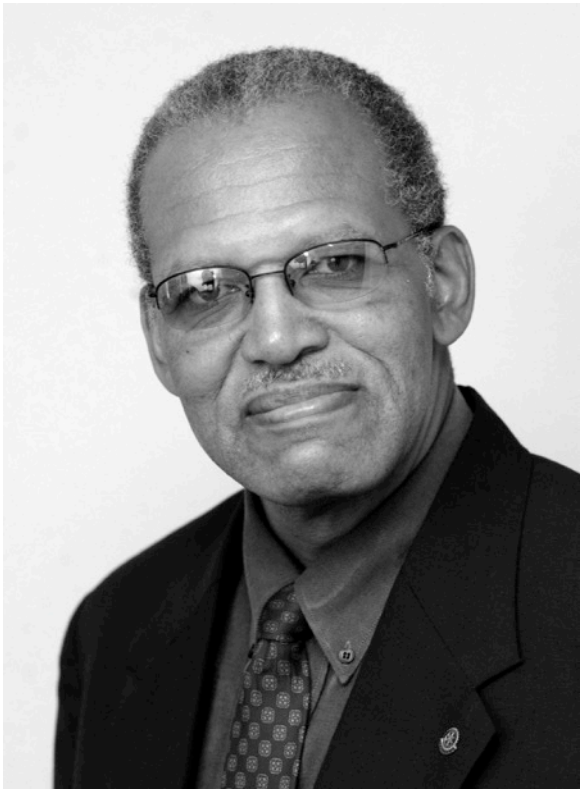
VISION STATEMENT

To be recognized as a world class Faculty of Engineering.

MISSION STATEMENT

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

MESSAGE FROM THE DEAN



The Faculty of Engineering of the University of the West Indies welcomes all new and returning students to its exciting undergraduate programmes in Engineering. This Faculty has a wonderful tradition of academic excellence and research scholarship developed over the 55 years of its existence. Today the Faculty offers internationally accredited programmes that attract students, lecturers and researchers from across the region and the world.

This booklet contains important information regarding programme content as well as the rules and regulations that will govern your progress through the system. You are encouraged to read it carefully and completely so that you are entirely familiar with your selected course of study and the associated regulations. The programmes of study and research are many and varied and cover the broad spectrum of engineering.

We in the Faculty are continuously striving to produce distinctive graduates by providing students with a high-quality and enjoyable learning experience. Towards this end, and in keeping with the University's quality assurance practices, our programmes are regularly reviewed by teams of professionals from other regional and international institutions as we try to meet or surpass the demanding accreditation standards of recognized international accreditation bodies. My colleagues and I stay at the cutting edge of research and innovation in order to expose our students to the very best ideas and techniques.

Students in turn are expected to display diligence, discipline and dedication in this teaching and learning exercise by, among other things, attending all classes, completing all assignments and engaging in adequate self-study. Also, in order to perform at optimum levels students should eat healthy meals, exercise regularly and get adequate rest. Finally, I encourage you to work closely with your lecturers who are all very knowledgeable in their fields and are eager to assist and motivate you to high levels of achievement and success.

The world of the 21st century is filled with opportunities for those who are prepared to grasp them. Your entry to the Faculty is an indication that you are prepared to take up the challenge. We are supporting you and look forward to celebrating your success.

Stephan J. G. Gift
BSc (Eng), PhD (UWI), FAPETT, SMIEEE, MCAS, REng
PROFESSOR AND DEAN, FACULTY OF ENGINEERING

AN 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.

From a modest beginning of 28 students in the Academic Year 1961/62, the Faculty has produced, up to Semester 2 of the 2014/2015 Academic Year, over 9000 graduates in the fields of Chemical and Process Engineering, Civil Engineering, Civil with Environmental Engineering, Electrical and Computer Engineering, Agricultural Engineering, Geomatics, Industrial Engineering, Land Management (Valuation), Mechanical Engineering, Mechanical Engineering with a Minor in Biosystems, Petroleum Engineering, Petroleum Geoscience, and Surveying and Land Information.

Administratively, the semester system was introduced in 1990 following decades of course delivery of over a 1-year period. The Grade Point Average (GPA) system was introduced in 2003 in an attempt to better measure student performance, and to improve global graduate marketability. The Faculty and the University engaged in another major change in the GPA system in which the pass-mark for all courses was changed from the old British tradition of a 40% threshold to 50%. This change affected new students of the Faculty of Engineering who registered for the first time as of Academic Year 2014/2015. Students who registered before the 2014/2015 Academic Year continue to be assessed using the old GPA system

QUICK REFERENCE

REGISTRATION	**REGISTRATION DEADLINES SET BY THE UNIVERSITY WILL BE STRICTLY ADHERED TO BY THE FACULTY. THERE WILL BE NO EXCEPTIONS. THESE DEADLINES ARE AS FOLLOWS:** *On-line Registration Dates:* **SEMESTER 1**: August 21, 2017 to September 15, 2017 **LATE REGISTRATION/LATE PAYMENT FEE**: from September 11, 2017 **CHANGE OF REGISTRATION (ADD/DROP)**: until September 15, 2017 *On-line Registration Dates:* **SEMESTER 2**: January 8, 2018 to February 02, 2018 **LATE REGISTRATION/LATE PAYMENT FEE**: from January 29, 2018 **CHANGE OF REGISTRATION (ADD/DROP)**: until February 03, 2017
REGULATIONS	Pages 24 - 33 of the Faculty of Engineering Undergraduate Information Guide
EXEMPTION & CREDIT	Regulations 3.3-3.5 of the Faculty of Engineering Undergraduate Information Guide
EXAMINATIONS **GENERAL EXAMINATION REGULATIONS**	Section II (16-30), pages 9-13 of the Examination Regulations for First Degrees, Associate Degrees, Diplomas and Certificates, 2011-2012
CONDUCT OF WRITTEN EXAMINATIONS	Section V (82-102), pages 28-34 of the Examination Regulations for First Degrees, Associate Degrees, Diplomas and Certificates, 2011-2012
REVIEW OF EXAMINATION RESULTS	Section VII (141-151), page 43 of the Examination Regulations for First Degrees, Associate Degrees, Diplomas and Certificates, 2011-2012
REMARKING OF EXAMINATION SCRIPTS	Section VII (143-151), pages 41-43 of the Examination Regulations for First Degrees, Associate Degrees, Diplomas and Certificates, 2011-2012
SCHEME OF EXAMINATION	Regulations 3.6-3.11 and 3.25(c) of the Faculty of Engineering Undergraduate Information Guide
WARNINGS / WITHDRAWAL	Regulation 3.28(a) - 3.29 of the Faculty of Engineering Undergraduate Information Guide
RE-ENTRY	Regulation 3.29(d) of the Faculty of Engineering Undergraduate Information Guide
PLAGIARISM	Regulation 3.31 of the Faculty of Engineering Undergraduate Information Guide

STAFF LISTING

OFFICE OF THE DEAN

DEAN
Gift, Stephan J.G.
BSc (Eng), PhD (UWI), FAPETT, SMIEEE, MCAS, REng
Professor of Electrical Engineering
Leader, Control Systems Group; Electronic Systems Group
(Electronics & Control Systems)
Ext. 82198/82199

DEPUTY DEANS
Undergraduate Student Affairs
Griffith-Charles, Charisse
BSc, MPhil (UWI), PhD (Univ of Florida), Cert. Ed. (UBC)
MISTT**,** FRICS, TTLS
(Cadastral Systems Surveying, Cartography, Land Administration)
Ext: 82520

Research & Postgraduate Student Affairs
Ekwue, Edwin
BEng (Nigeria), MSc, PhD (Cranfield), MASABE, MNSAE
Professor
Programme Coordinator -BSc Mechanical Engineering with a Minor in Biosystems
Ext. 82072/83149

Enterprise Development & Outreach
Mujaffar, Saheeda
BSc (Nat. Sci.), MPhil (Agri. Eng.), PhD (Agri. Eng.) (UWI)
(Food Process Engineering, Food Dehydration, Postharvest Technology)
Ext. 84434

Physical Facilities
Mwasha, Abrahams
BSc, MSc (Kharkov), PhD (Wolverhampton)
(Structural Engineering)
Ext. 83434/82058

SENIOR ADMINISTRATIVE STAFF
Mrs. Charmain Subero-Salandy
Administrative Officer
Ext.: 82059/84156

ADMINISTRATIVE STAFF
Ms. Melissa Dattoo
Administrative Assistant
Research & Postgraduate Student Matters
Ext: 82065

Mrs. Marlene Fletcher-Cockburn
Administrative Assistant
Enterprise Development & Outreach
Ext: 83919

Mrs. Nicole Holder-Purcell
Administrative Assistant
Human Resources
Ext: 82200

Mrs. Nikeisha Plato-Robinson
Secretary to the Dean
Exts: 82198 / 82199

Ms. Sunita Khoon Khoon
Secretary to the Deputy Deans
Ext: 83396

Ms. Tianna Lewis
Assistant to the Administrative Officer

TECHNICAL SUPPORT
Mr. Dayanand Powdhar
Workshop Engineer
Ext: 83485

Mrs. Paula John
Manager, Computer Systems Laboratory
Exts: 82375/82370

Adedotun J. Akingbala
Facilities Management and Planning Engineer
Ext. 82508

Mrs. Candice Nicholls-Jones
Clerical Assistant, Computer Systems Laboratory
Ext: 82370

Mrs. Carol-Ann Persad-Ramlogan
Clerical Assistant, Classroom Technology and Support Unit
Ext: 84443/83397/83409

Ms. Julie Kublalsingh
Engineering Institute
Ext: 82175/82197

TEACHING STAFF
ENGINEERING MATHEMATICS
Ramsamooj, Neil R.
BSc (UWI), MA (Wisconsin-Madison), MA (Auburn),
PhD (Wisconsin-Madison)
Lecturer
(Abstract Algebra, Topology, Combinatorial Maths, Applied Mathematics)
Ext: 83911

MSc PROJECT MANAGEMENT PROGRAMME
Ellis, Ruel
BSc (Eng) (UWI), MSc (Brunel), PhD (UWI)
MIEEE, Snr. MIIE, MASEE
Programme Coordinator
Ext: 83169

Mrs. Margaret Sylvester-Lawrence
Senior Administrative Assistant
Ext: 83838

PART-TIME LECTURERS
Suite, Winston H.E.
BSc (Sp Physics), BSc (Eng), MSc, PhD (UWI)
FAPETT, MASCE
Professor Emeritus
(Construction Engineering and Management, Project Management)
Ext 83149

Burgess, Kenrick
BSc (Hons) (UWI), MBA (Brunel), DipCon. Eng. & Man, DipPA (UWI), DipMan (UK), MA
(Project Management)
Ext: 83838

Jantzen, Manfred
BA and PhD (Economic History/Economics), University of Wisconsin, USA,
Ext: 83838

Lau, Stanley
BSc (Eng) (UWI), MEng (Cornell), MSc (Accounting) (UWI), CSE, MAPETT, MIEEE (Industrial Management, Engineering Economics & Finance)
Ext: 83838

DEPARTMENT OF CHEMICAL ENGINEERING

HEAD OF DEPARTMENT
Hosein, Raffie
BSc (Pet. Eng.), MPhil (Pet. Eng.), PhD (Pet. Eng.) (UWI), CEng MEI Chartered Petroleum Engineer, FIMMM, MSPEI
Coordinator of MSc Reservoir Engineering Programme
(Petroleum and Reservoir Engineering)
Ext. 82164
Tel: 662-2002, Exts. 82169/82196

ADMINISTRATIVE ASSISTANT
Mrs. Candice Simonta-Dyer
Tel: 662-2002 Ext: 82168

SECRETARIES
Mrs. Natalie Thomas-Chance
(Department)
Tel: 662-2002, Ext.: 82169/82196

Vacant
(Petroleum/Reservoir Engineering Programmes)
Petroleum Studies Unit
Ext. 84434

Ms. June Bradshaw
(Petroleum Geoscience)
Petroleum Studies Unit
Ext: 83686

CLERICAL ASSISTANTS
Mrs. Gabriella Yeates-Lopez
(Chemical & Process Engineering)
Ext. 83412

Ms. Genevieve Noel (Temp)
(Food Science and Technology)
Ext: 82190

ACADEMIC STAFF

PROFESSORS EMERITII
Dawe, Richard
BA, MA, DPhil (Oxford), Eur Eng, CEng, CSc, CGeol, FEI, CChem, FRSC, FGS
(Reservoir Engineering, Hydrocarbon Thermodynamics, Improved Oil Recovery)

McGaw, David R.
BSc, MSc (Wales), PhD (UWI), FIChemE, CEng, MAIChemE
(Separation Processes, Particle Technology)

Mellowes, Winston A.
BSc (Eng), MSc, PhD (UWI), MIChemE, CEng, MAIChemE, MCIC, FAPETT, REng
(Transport Phenomena, Sugar Technology, Biomass Utilisations)
Ext: 82513

Richards, George Maxwell *(His Excellency, former President of the Republic of Trinidad & Tobago)*
CM, MSc (Manch), PhD (Cantab), ARIC, AMCST, FInstPet, MAPE, CEng
(Process Design & Economics, Petroleum Technology)

PROFESSORS

Jupiter, Andrew
BSc (UWI), MSc (Penn State University), FEI, FIMMM
Distinguished Fellow in Practice in Petroleum Studies
MHTL Chair in Petroleum Engineering
(Petroleum Engineering, Petroleum Taxation and Contractual Arrangement)
Coordinator of Petroleum Studies Unit (PSU)
Ext. 83076

Meerdink, Gerrit
MSc (IR) Chemical Technology (Twente University, The Netherlands)
PhD Food Process Engineering (Wageningen University, The Netherlands)
Coordinator of Food Science and Technology Unit (FSTU)
Ext. 82195

Wilson, Jeremy Brent
BSc, MSc, PhD (Wales), FGS
(Palaeontology, Stratigraphy and Sedimentology)
Ext: 83676

SENIOR LECTURERS

Hassanali, Hamid
BSc (Pet. Eng.), MSc (Pet. Eng.) (UWI)
(Drilling & Completions, Production Engineering)
(Petroleum and Reservoir Engineering)
Ext. 83078

Hosein, Raffie
BSc (Pet. Eng.), MPhil (Pet. Eng.), PhD (Pet. Eng.) (UWI), CEng MEI Chartered Petroleum Engineer, FIMMM, MEI, MSPEI
(Petroleum and Reservoir Engineering)
Coordinator of MSc Reservoir Engineering Programme
Ext: 82164

Janes, David
BSc (Aston), PhD (Birmingham)
(Simulation, Automation, Optimisation
Process Design)
Ext: 84430

Riverol, Carmen
BSc, MSc (Chem Eng) (Simon Bolivar), PhD (Vigo)
(Process Design & Economics, Process Control)
Ext: 82677

Ramsook, Ryan
BSc (Earthsciences), MPhil (Geology), PhD (Geology) (Mona, UWI), FGS
(Petroleum Geoscience)
Coordinator of BSc Petroleum Geoscience Programme
Ext: 83496

LECTURERS

Blake, Oshaine
BSc (UWI), PhD (Univ. of Liverpool)
(Petroleum Geophysics)
Ext: 84431

Chakrabarti, Dhurjati Prasad
MChemE (UDCT), Mumbai), PhD (IIT, Kharagpur)
(Multi-phase Flow, Reaction Engineering)
Ext: 84001

Deo, Roger
BSc (Chem. Eng), PhD (Chem. Eng.) (UWI)
(Loss Prevention & Risk, Particle Technology)
Ext. 84000

Maharaj, Sharad
BSc (Chem. Eng), (UWI), PhD. (Chem. Eng.) (UWI)
(Separation Processes, Transport Phenomena)
Ext.:83073

Mujaffar, Saheeda
BSc Nat. Sci.), MPhil (Agri. Eng.), PhD (Agri. Eng.) (UWI)
(Food Process Engineering, Food Dehydration, Postharvest Technology)
Ext. 84434

Smith, Jeffrey
BSc (Chem. Eng.) (UWI), MASc (Toronto), MAPETT, AMIChemE
PhD Chemical & Process Engineering (UWI)
(Reaction Engineering, Transport Phenomena & Computer-aided Engineering)
Ext: 83074

Sobers, Lorraine
BSc (Chem. Eng.), MSc (Pet. Eng.) (Texas Tech University), PhD Pet. Eng. (Imperial College)
(Carbon Storage, Enhanced Oil Recovery)
Ext. 83284

Ward, Keeran
BSc (UWI), MSc (Imperial College), PhD (Imperial College), (Biotechnology)
Ext. 83077

PART-TIME LECTURERS

Archie, Curtis
BSc (Geol) (Mona, UWI)
(Petroleum Geology)

Balkaransingh, Shivanti
BSc (Surveying and Land Information)
MPhil (Geodetic Surveying)

Baptiste, Brian
BSc (Mona), Dip Man Studies, MSc (Pet Eng) (UWI)
(Petroleum Development Geology)

Bertrand, Wayne
BSc (UWI), MSc (Brit Col)
Distinguished Fellow in Practice in Petroleum Studies
(Petroleum Geoscience)
Exts: 83496/83686

Charles, Donald Gregory
BSc (Hons) (UWI), MSc (NexT)
Petrophysics & Formation Evaluation

Constance, Barbara Del Carmen
BA of Arts (UWI), MPhil (Linguistics) (UWI)

Dhanpaul, Terrell
BSc Physics (UWI), MSc Production Management (UWI), MSc Petroleum Engineering (UWI)

Farfan, Philip
BSc Geology (Edinburgh), MSc Petroleum Geology
(Imperial College)
(Geological Mapping)

Forde, Voldis
BSc, MSc (University of Winnipeg)
(Food Quality Assurance, Product Development)

Hosein, Natalie
MSc (Leeds), BSc (UWI)
(Geophysics)

Kennedy, Helen
BSc Chemistry (UWI), MSc Food Technology (UWI)

Legall, George
BSc, MSc, PhD (UWI)
(Biometrics)

Marcelle-De Silva, Jill
BSc, MSc (UWI), Eng (Stanford)
(Natural Gas Engineering & Well Test Analysis)

Mathura, Rudra
BSc (Surveying and Land Information)
IHO (Class B Hydrographic Surveying)
(Geodetics)

Ragbir, Samuel
BSc (UWI), MSc (Leeds)
(Geophysics)

Russell, Allan
BSc (Maths) (UWI), Dip, MSc (Pet Eng)
(Petroleum Engineering Management, Petroleum Economics)

Sankar, Daryle
BSc Chemical and Process Eng (UWI)
MSc Safety, Risk and Reliability Engineering (Heriot-Watt University, UK)
(Safety, Risk and Reliability Engineering)

Vincent, Hasley
BSc (Mona), MSc (Imperial), PhD (Dalhousie)
(Sedimentology)

INSTRUCTORS

Costelloe, Ashleigh
Instructor I
Dipg. (Brescia College), MSc (Geoscience) (UCL)
PhD (Petroleum Geoscience) (UWI)(Micropaleontology)
Ext: 83686

Lee, Therese
Instructor II
BSc & MPhil Chemical and Process Eng (UWI), MSc (Uni. of Manchester)
Ext. 84434

McLean, Annalize
Instructor II
BSc (Pet Geoscience) (UWI)
(Sedimentology)
Ext: 83686

GRADUATE ASSISTANTS

Baboolal, Anastasia
BSc (Major Physics, Minor Environmental Physics and Material Science), MPhil (Physics- Petrology) (UWI)

Benn-Ogeer, Shari
BSc (Major Environment and Natural Resource Management with Biology) (UWI), MSc (Environmental Eng.) (UWI)

Falloon, Oneil
BSc (Major Chemistry, Minor Food Chemistry) (UWI), MSc (Food Science and Technology) (UWI)

Jaikaran, Elmus
BSc Petroleum Geoscience (UWI)

Ramcharan, Tamitha
BAppSc (Petroleum Eng.) (UTT), MSc (Petroleum Eng.) (UTT)

Sum, Lai Shan
BSc (Petroleum Geoscience) (UWI)

INDUSTRY LIAISONS

Dr Ali, Desmond
Caribbean Poultry Association

Balgobin, Kamla
Yara

Bally, Yatindranath
bpTT

Bradshaw-Niles, Penelope
Ministry of Energy & Energy Industries

Felix-Smith, Florette
Associated Brands Industries

Forde, Voldis
Food Technology Consultant

Gillezeau, Kim
Petrotrin
Geological Society of Trinidad and Tobago

Harris, Astor
Phoenix Park Gas Processors Limited (PPGPL)

Holder, Anthony
Industrial Plant Services Limited (IPSL)

Homer, Carol
Angostura Limited

Inkim, Catherine
Petroleum Company of Trinidad and Tobago Limited (PETROTRIN)

Kennedy, Helen
Food Technology Consultant

Khan, Farz
Chemistry, Food & Drug Division
Ministry of Health

Lasley, Selwyn
Ministry of Energy and Energy Affairs

Massiah, Maurice
bpTT

Monica, Rebeiro
Caribbean Health Foods

Mohammed, Saaliha
EOG

Sagba III, Anthony
Carib Brewery

Sandy, Marc
TTMA

Santokhie, Remika
Linda's Bakery

Seujattan, Narvin
Trinidad Seafood Limited

Singh-Bogers, Vandanna
Nestle Trinindad and Tobago

Paltoo, Vernon
National Energy Corporation of Trinidad and Tobago (NEC)

Persad, Krishna
Geological Society of Trinidad and Tobago (GSTT)

Rambaran, Vishran
B G Trinidad and Tobago (GBTT)

Russell, Allan
Repsol

West Toolsie, Elizabeth
PCS Nitrogen T' dad Limited

Yarde-Blackman, Janelle
KC Agribusiness Limited

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

HEAD OF DEPARTMENT
Peters, Everson
BSc (UWI), MSc (Guelph), PhD (Lincoln, NZ) EMBA (UWI)
(Water Resources & Environmental Engineering)
Ext. 82501/82502/83447

ADMINISTRATIVE ASSISTANT
Ms Keisha Jordan
Ext: 82605

SECRETARIES
Ms Alisa Valentine
(Department)
Ext: 82501

Ms. Rohanna Rafeek
(Construction Engineering & Management)
Ext: 82504

ACADEMIC STAFF

PROFESSORS EMERITII
Phelps, Harry O.
CMT, BSc (Wales), PhD (Manch), DIC, FIVE, CEng, FAPETT
(Water Resources, Environmental Engineering)
Ext:

PROFESSORS
Ray, Indrajit
BCE (Civil - Hons), MCE (Structural Engineering) (JU, India), PhD (Civil Engg., IIT), MACI, LMIE, MASTM
(Sustainable Construction Materials; Advanced Concrete for Civil Infrastructure; Construction Engineering and Management)
Ext: 82505

SENIOR LECTURERS
Charles, Francis R.
BSc, MPhil (UWI), MAPETT, FIAT, FICE, REng
(Highway Engineering, Coastal Zone Engineering & Management)
Ext

Clarke, Richard
BSc, MPhil, PhD (UWI), MIFS, CQE, REng
(Structural Engineering)
Ext: 83438

Mwasha, Abrahams
BSc, MSc (Kharkov), PhD (Wolverhampton)
(Construction Materials)
Ext: 83434

Peters, Everson
Cert. Ed., BSc (UWI), MSc (Guelph), PhD (Lincoln, NZ), EMBA (UWI)
(Water Resources & Environmental Engineering)
Ext: 83447/ 82501/2

Townsend, Trevor A.
BSc (UWI), MSc (Univ. of Manitoba), PhD (Northwestern Univ.), FAPETT, MITE
(Transportation Engineering)
Ext: 83439

LECTURERS
Banerjee, Kailas Sekhar
BSc, MSc (India), PhD (IIT Kharagpur, National Doctoral Fellow)
(Environmental Geology and Geophysics, Environmental Radioactivity and Radon Emission)
Ext: 82506

Cooper, Vincent
BSc (UWI), MEng (McGill), MASc (Nova Scotia), PhD (McGill)
(Environmental/Water Resources Engineering)
Ext: 83435

Ellis, Leighton
Dipl, BSc, MSc, PhD, CEng MICE, MJIE, MAPETT, REng, ACIArb
(Construction Engineering and Management)
Ext. 83446

Gay, Derek
BSc (Eng) (UWI), DIC, MSc (Lond), PhD (Texas), MAPETT
(Geotechnical Engineering, Coastal Engineering)
Ext: 83429

Martin, Hector
BSc, MSc, PhD(UWI), PMP, REng, MASCE, MAPETT
(Construction Engineering and Management)
Ext: 83426

O'Brien-Delpesh, Charmaine
BSc, MSc (Waterloo)
(Coastal Engineering and Management)
Ext: 83438

Raymond, Mark
AA Dipl (Arch), TTIA, BOATT, RIBA, ARB
(Architecture)
Ext: 83433

Smith, Jovanca
BSc (Morgan State Univ.), MSc (Rensselaer Polytechnic Inst.), PhD (Northwestern Univ., NSF, GEM), MACI, AMASCE
(Structural Engineering/Concrete Fracture Mechanics)
Ext. 83440

Trotter, Ngina Binta
BSc (UWI), MEng (Cornell), MIStructE, MAPETT, MASCE REng
(Structural Analysis & Design)
Ext: 83437

Villarroel-Lamb, Deborah
BSc (Eng), PhD, (UWI)
(Coastal Engineering)
Ext: 83448

Williams, Rupert (On No-Pay Leave)
BSc (UWI), MEng (Br. Col.), PhD (Miami)
(Structural Engineering)
Ext: 83433

Wilson, William
BSc (UG), MSc, PhD, DIC (Lond)
(Structural Engineering)
Ext: 83430

PART TIME LECTURER
Outridge, Derek
BSc, GDL(LPE), LPC, MPhil, MRICS, AClarb, FQSc, Pmp
(Quantity Surveying & Cost Engineering and Management, Project Management Professional)
Ext: 83436

HONORARY FELLOW
Lee Young, Selwyn
BSc (Eng), PhD (Liverpool)
(Professional Practice)

INDUSTRY LIAISONS
Abel, Andrea
Trintoplan Consultants Limited

Francois, Mark
BBFL Consultants

Gibbs, Tony
Consulting Engineers Partnership Ltd., Barbados

Lezama, Vaughn
Consulting Engineers Associates Limited

Mellowes, Sean
CEP Limited

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

HEAD OF DEPARTMENT
Muddeen, Fasil
BSc, MSc (Eng) (UWI), PhD (UWI), MIEEE, MAPETT, REng
(Signal Processing, Instrumentation Systems, Digital Systems)
Ext. 82167

SENIOR ADMINISTRATIVE ASSISTANT
Ms. Camille Renaud
Ext. 82083

SECRETARIES
Ms. Antwinnette Williams
(Department)
Ext. 82166

Mrs. Precious Clement
(Postgraduate Affairs)
Ext. 83184

CLERICAL ASSISTANT
Ms. Renelle Martin
(Quality Assurance)
Ext. 82201

ACADEMIC STAFF

PROFESSORS EMERITII
Julien, Kenneth S.
CMT, BSc (Nott), PhD (UBC), FIEEE, FIEE
Professor Emeritus in Energy Systems

King, St. Clair A.
BSc, MSc (MIT) (Eng), PhD (Glas)
Professor Emeritus in Control Systems
Ext. 82062

PROFESSORS
Copeland, Brian
BSc (Eng) (UWI), MSc (Toronto), PhD (USC)
Professor of Electrical and Computer Engineering
(Control Systems, Digital Electronics, Microprocessors)
Exts. 82064

Gift, Stephan J.G.
BSc (Eng), PhD (UWI), FAPETT, SMIEEE, MCAS, REng
Professor of Electrical Engineering
Leader, Control Systems Group; Electronic Systems Group
(Electronics & Control Systems)
Ext. 82198/ 82199

Sharma, Chandrabhan
BSc, MSc, PhD (Eng) (UWI), SMIEEE, MAPETT, SenMemISA, MAWEA, REng
Leader, Energy Systems Group
(Industrial & Commercial Power Systems, Energy Systems)
Ext. 83141

SENIOR LECTURERS

Bahadoorsingh, Sanjay
BSc (UWI), MSc (UMIST), PhD (Manchester), SMIEE, REng
(Asset Management, Electrical Insulation, Energy Systems, Power Engineering)
Ext. 83142

Joshi, Ajay
Dip, BS, PhD
Leader, Computer Systems Engineering Group
(Embedded Systems, Advanced Computer Architecture)
Ext. 83144

Mallalieu, Kim
BSEE (MIT), M.Sc. (Rochester), PhD (Lond), MSPIE,
Leader, Communication Systems Group
(Communications, Optics)
Ext. 83191

LECTURERS

Adams, Richelle
BSc, MSc (Eng) (UWI/Lucent), PhD (Georgia Tech)
(Telecommunication and Data Communication Systems)
Ext. 83920

De Four, Ronald
BSc, MPhil (Eng), PhD (UWI), MIEEE
(Electronics, Power Systems, Power Electronics, Energy Systems)
Ext. 82514

Pooransingh, Akash
BSc, MSc, PhD (UWI)
(Digital Signal Processing, Image Processing, Computer Systems)
Ext. 82636

Radix, Cathy-Ann
BSc (Eng) (UWI), PhD (Plymouth), MIEEE
(Robotics, Embedded Systems)
Ext. 83157

Ragoobar-Prescod, Tricia
BSc (UWI), MSc, PhD (Glasgow)
(Communication Systems)
Ext. 83147

Rocke, Sean
BSc (Eng) (UWI), MCM (Coventry), PhD (WPI)
(Communication Systems)
Ext. 85468

Sastry, Musti
BTech, MTech, PhD (India)
(Computer, Energy Systems)
Ext. 83159

Singh, Arvind
BSc (UWI), MSc, PhD (UBC)
(Energy Systems)
Ext. 85467

ASSISTANT LECTURERS

Ganness, Marcus
BSc, (UWI), MASc (Toronto)
(Control Systems, Electromagnetic Field Theory)
Ext. 83140

Mohammed, Crista
BA, Dip Ed (UWI); Dip Tech Comm, MATC (University of Sheffield Hallam)
(Technical Communications)
Ext. 82462

Ramlal, Craig
BSc, MASc (Eng), (UWI)
(Control Systems)
Ext. 83160

INSTRUCTORS

Abdool, Azim
BSc (Eng), (UWI)
(Computers)
Ext. 82073

Balgobin, Andrew
BSc (Eng), (UWI)
(Energy)
Ext. 82676

Blackwell, Crystal
BSc (Eng), (UWI)
(Controls)
Ext. 83070

George, Marcus
BSc., MASc, MPhil (Eng), (UWI)
(Electronics)

Gordon, Itanie
BSc, MPhil (Eng), (UWI)
(Electronics)
Ext. 83164

Harnarinesingh, Randy
BSc (Eng), PhD (Eng), (UWI)
(Controls)

Khan, Adam
BSc, MASc (Eng), (UWI)
(Controls, Power and Communication)

Maharajh, Aniel
BSc., MPhil (Eng), (UWI)
(Computer)

DEVELOPMENT ENGINEERS
Andrews, Kevon
BSc, MSc (Eng), (UWI)
(Communication)
Ext. 82073

Deonarine, Ravi
BSc, MASc (Eng), (UWI)
(Data Communications, Telecommunications)
Ext. 82638

CONTRACT OFFICER
Goitia, Daniel
BSc, MASc (Eng), (UWI)
(Controls, Communication*)*
Ext. 82073

Romeo-Joseph, Juliet
(Engineering Practice Coordinator)
BSc, Dip (Eng), (UWI)
(Controls)
Ext. 83156

RESEARCH ASSISTANT
Dookie, Isa
BSc (Eng)
(Computer, Communication, Controls)

INDUSTRY LIAISONS
Darmanie, Colin
Fujitsu

Harrylal, Ramesh
Phoenix Park Gas Processors

Linus, Rogers
Telecommunications Services of Trinidad and Tobago (TSTT)

Prescod, Kurleigh
Colombus Communications Trinidad Limited

Ramsook, Kelvin
Trinidad and Tobago Electricity Company (T&TEC)

DEPARTMENT OF GEOMATICS ENGINEERING & LAND MANAGEMENT

HEAD OF DEPARTMENT
Sutherland, Michael
Senior Lecturer
Dip. C.S. (CAST, now UTech), (Hons**)** M.Sc.E., PhD (New Brunswick), MISTT, MCIG, MRICS
(Land Information Management)
Exts: 82108 / 82109

ADMINISTRATIVE ASSISTANT
Ms. Olawande Ojoade-Matthews
Ext: 83698

SECRETARY
Ms. Monique Joseph
Ext.: 82108/82109

ACADEMIC STAFF

PROFESSOR
Opadeyi, Jacob A.
BSc, MSc (Lagos), MEng, PhD (New Brunswick), MBA (UWI), FRICS
(Engineering Surveying, Geographic Information Systems, Land Administration)
Ext: 83313

SENIOR LECTURERS
Al-Tahir, Raid
BSc (Baghdad), MSc, PhD (Ohio State), Dip Univ Teach (New Brunswick), MCIG, MASPRS (USA)
(Photogrammetry, Remote Sensing, Spatial Analysis)
Ext: 83316

Griffith-Charles, Charisse
BSc, MPhil (UWI), PhD (Univ of Florida), Cert. Ed. (UBC) MISTT**,** FRICS, TTLS
(Cadastral Systems Surveying, Cartography, Land Administration)
Ext: 82520

Miller, Keith
BSc (CNAA), PhD (CNAA)
(Geodesy, Hydrography, GNSS)
Ext: 83314

Mycoo, Michelle
BA (Hons) (UWI), MSc (Hong Kong), PhD (McGill), MTTSP, MISOCARP
(Land Use & Natural Resources Management,
Coastal Zone Planning, Planning Law and Administration,
Urban and Regional Planning,
Planning Analysis)
Ext: 82519

Ramlal, Bheshem (on leave)
BSc (UWI), PGDip, MSc (ITC Netherlands), PhD (Maine), Cert. Ed. (UBC), MISTT**,** MRICS
(Cartography, Geoinformatics, Geomatics)
Ext 83312

Sutherland, Michael
Dip. C.S. (CAST), (Hons**),** M.Sc.E., PhD (New Brunswick), MISTT, MCIG, MRICS
(Land Information Management)
Ext: 82564

LECTURERS
Davis, Dexter
BSc (Hons) (UWI), PhD (Newcastle-upon-Tyne), MISTT
(Surveying, Digital Photogrammetry, , Adjustment Computations, GNSS)
Ext: 83311

Edwards, Earl
Dip. (CAST), BSc (Hons) (UWI), M.Phil (Cambridge), PhD (Nottingham)
(GIS and Remote Sensing, Geospatial Information Sciences)
Ext: 83634

Mohammed, Asad
BSc (Hons) (Waterloo), MRP, PhD (Cornell), MTTSP
(Planning & Development, Human Settlements, Land Administration)
Ext**:** 82565

PART-TIME LECTURERS
Blaize, Colvin
BSc (UWI), LLB (Univ of London), TTLS
(Land Law)

Boynes-Bardouille, Den'a
BSc (UWI), DipEd (UWI) PG Certificate-Education Studies (UWI)
(Statistics)

Grant, Ian
BSc (UWI), TTLS
(Engineering Surveying)

Ramos, Ria
BSc (Hons.), (UWI), MSc (Southbank Univ.)
(Valuation Methods and Projects)

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

HEAD OF DEPARTMENT
Chowdary, Boppana V.
Professor
(Production Technology, CAD/CAM, Manufacturing Systems)
BTech (Nagarjuna), MTech, PhD (IIT Delhi)
Exts: 82170 / 82171

ADMINISTRATIVE ASSISTANT
Ms. Ria Caliste (on leave)
Mrs. Anita Ali (Senior Administrative Assistant) Ag.
Ext: 83165

SECRETARIES
Ms June Charles-Noray
(Head of Department)
Ext: 82170/82171

Ms Ayana Waldron-Morris
(BSc Industrial and MSc Manufacturing Engineering and Management)
Exts: 82068/82069

Ms Nalinie Ragoonanan
(M.Sc. Production Management, M. Sc. Production Engineering Management and M. Sc. Engineering Management)
Ext: 82067

Ms Christy Walters
(M. Sc. Engineering Asset Management)
Ext: 82733

CLERICAL ASSISTANT
Ms. Nimba Wahtuse
Ext: 82071

SUBJECT GROUPS AND ACADEMIC STAFF MEMBERSHIP

Agricultural Engineering, Agricultural Mechanisation, Crop Processing & Post-harvest Technology, Soil & Water Engineering
Professor E. Ekwue
Mr. R. Birch

Industrial Engineering & Engineering Management
Prof. B.V. Chowdary
Dr. C. Benjamin
Dr. R. Ellis
Dr. G. King
Dr. T. R. M. Lalla
Professor W.G. Lewis
Professor K. F. Pun
Professor C. S. Syan

Industrial Automation & AI Applications
Dr. J. Bridge
Prof. B.V. Chowdary
Dr. G. King
Professor C. S. Syan

Materials & Manufacturing (Technology & Systems)
Prof. B.V. Chowdary
Professor W.G. Lewis
Dr. C. Maharaj
Professor C. S. Syan

Theoretical & Applied Mechanics
Dr. J. Bridge
Dr. R. Bachoo

Thermodynamics, Heat Transfer & Renewable Energy Resources
Dr. K. Manohar
Dr. A. Adeyanju
Mr. S. Matabadal

ACADEMIC STAFF

PROFESSORS EMERITII

Imbert, Clément
BSc (Eng) (UWI), MSc Tech (Brunel), PhD (UWI), FAPETT, FASME
(Material Technology and Manufacturing Processes)
Professor Emeritus
Ext: 83313

Kochhar, Gurmohan S
BE (Baroda), MS (Wisconsin), PhD (UWI), MASME, MASHRAE, FAPETT
(Applied Thermodynamics, Energy)
Professor Emeritus
Ext. 83192

Sankat, Clement K.
BSc (Eng), MSc (UWI), PhD (Guelph), FIAgrE, CEng, MASAE, FAPETT
(Post-harvest & Food Process Engineering, Engineering Graphics & Design)

PROFESSORS

Chowdary, Boppana V.
BTech, MTech, PhD
Programme Coordinator for BSc Mechanical Engineering
(Product Design and Development, Manufacturing Technology, CAD/CAM, Manufacturing Systems)
Ext: 83185

Ekwue, Edwin
BEng (Nigeria), MSc, PhD (Cranfield), MASABE, MNSAE
Programme Coordinator - BSc Mechanical Engineering with a Minor in Biosystems (Soil & Water Engineering, Farm Structures & Environment)
Ext: 82072

Lewis, Winston G.
BSc (Eng), MPhil (UWI), PhD (Tuns), FAPETT, FASME, MISS, MTSISS, REng
Professor of Industrial Systems Engineering
(Manufacturing Technology, Plant Layout & Ergonomics)
Ext: 83181

Pun, Kit Fai
MSc (Stirling), MEd (Manchester), MPhil (City Univ, Hong Kong), MSc, PhD (Middlesex), CEng, EurIng, CPEng, REng, FIET, FIEAust, FHKIE, FHKSQ, FAPETT Chartered Marketer
Programme Coordinator - BSc in Industrial Engineering (Industrial Engineering & Management)
Exts: 82068 / 82069

Syan, Chanan S.
BEng, PhD (Hull), FIMechE, CEng, MIET, MBCS, MAPETT
PRODUCTION ENGINEERING AND MANAGEMENT OFFICE
(EAM, Production Engineering & Management Automation & Robotics)
Exts: 82074

SENIOR LECTURERS

Bridge, Jacqueline
BSc (Eng)(UWI), PhD (Cornell), Dip.Ed. (UTech), MASME
(Applied Mechanics, Vibrations)
Ext: 83166

Maharaj, Chris S.
BSc (Eng) (UWI), MSc (UWI), PhD (Imperial), CEng, REng (TT), MIMechE, MASME, MAPETT
Programme Coordinator - MSc Production Engineering & Management
Senior Lecturer in Materials and Manufacturing Design
Ext: 84158

Manohar, Krishpersad
BSc (Eng), PhD (UWI), MASME, MASHRAE
(Applied Thermodynamics, Renewable Energy Systems)
Ext: 83190

Jhagroo, Kishore
BSc, MSc (Eng) (UWI)
Programme Coordinator - MSc Engineering Asset Management (Maintenance Engineering & Management)
Ext: 83494

LECTURERS

Adeyanju, Anthony A.
B.Eng, M.Eng (Nigeria), PhD (UWI), REng, COREN, MNSE, MNIMECHE, FGIST (Australia), M.ATINER (Greece).
(Thermofluid/Energy)
Ext. 82466

Benjamin, Cilla
BSc (Eng) (UWI), MSc (UWI), MSc (UTT), DBA (UWI)
MIIE, MIEEE
(Industrial Engineering and Management)
Ext: 83168

Ellis, Ruel
BSc (Eng) (UWI), MSc (Brunel), PhD (UWI)
MIEEE, Snr. MIIE, MASEE
(Industrial Engineering)
Ext: 83169

King, Graham S.
BEng (Loughborough), MSc (Warwick), EngD (Warwick), CEng, MIMechE
(Control Systems)
Ext: 83187

Lalla, Terrence R.M.
BSc (Eng) (UWI), MSc (UWI), MPhil, PhD (UWI)
(Engineering Management, Industrial Management, Behavioural Science, Industrial Design)
Ext: 83186

Ojha, Kuldeep
AMIE (IEI-India), ME (SGSITS-Indore), PhD (Dr B R Ambedkar NIT- Jalandhar)
Programme Coordinator MSc Manufacturing Engineering & Management
(Industrial and Production Engineering)
Ext: 82060

PART-TIME LECTURERS

Arumugadasan, Nagamuttu S.
BSc, MSc, MPhil (Eng) (UWI)
CEng, FIMechE
(Systems Optimisation and Asset Management)

INSTRUCTORS

Birch, Robert
BSc (Eng), MPhil (UWI)
(Biosystems Engineering)
Ext: 83176

De Noon, Ayana-Rene
BSc (Mech Eng) (UWI)
M.Sc. (Production & Engineering Management (UWI)

Koonjbeharry, Ambika
BSc (Eng) (UWI)
(Operations Research and Quality/Reliability Engineering)

DEVELOPMENT ENGINEERS

Ali, Fahraz
BSc (Eng) (UWI)

Harnarine, Rodney
BSc (Eng) (UWI), MSc (Prod. Eng) (Loughborough), REng
(Mechanical Engineering)
Ext: 83170

Matabadal, Sennen
BSc, MSc (UWI)
(Engineering Thermodynamics,
Thermal Power
Maintenance Engineering & Management)

Murray, Renique
BSc (Eng) (UWI), MPhil (UWI), PhD (UTT)
(Applied Mechanics & Energy)

FULL-TIME DEMONSTRATORS

Bansee, Jainarine
BSc (Eng Council) MSc (UWI)

Bharat, Caroltta
BSc (Eng)

Ebede, Ernest
BEng (Materials Eng)

GRADUATE / RESEARCH ASSISTANTS

Martin, Amad
BSc Physics (XULA)

Singh, Devin
BSc (Eng) (UWI)

INDUSTRY LIAISONS

Goyal, Arun
Former General Manager, TCL

Khan, Zaid
In-Corr-Tech Ltd

Tiah, Eugene
President
Phoenix Park Gas Processors Limited

SECTION 1 - GENERAL INFORMATION

1.1 PROGRAMMES OF STUDY

The Faculty offers programmes of study leading to the BSc, MSc, MPhil and PhD degrees in a variety of programmes offered by the Departments of Chemical and Process Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Geomatics Engineering and Land Management and, finally, Mechanical and Manufacturing Engineering . Overall, these Departments offer ten (10) undergraduate programmes, 9 postgraduate diploma programmes, 23 MSc programmes and 18 MPhil/PhD Programmes.

BSc Programmes

BSc programmes are offered at Levels 1, 2 and 3 are delivered over three (3) academic years of two (2) semesters each. These programmes are all accredited by British Professional Engineering Institutions relevant to the particular discipline.

Cooperative Programme (COOP)

Students who have completed Levels 1 and 2 may register for the **Cooperative Programme (COOP)** to spend a full year in industry undergoing supervised practical engineering training. At the end of their year in industry, students can return to complete their programme at Level 3. The COOP was introduced by the Faculty in 1994 and is now administered by the Student Advisory Services (http://www.uwi.tt/sas/services/career.asp).

Pre-Engineering Programme

The aim of the Pre-Engineering Programme is to provide an alternative path for potential regional candidates to BSc programmes offered by the Faculty of Engineering at the UWI. In this regard, the programme seeks to effectively prepare and motivate students for success in the first year programmes in engineering.

Specifically, the Foundation Programme strives to achieve these aims by setting objectives that are realized through educational components that:

(a) Raise all students to the equivalent of CAPE Level 2, the benchmark entry qualification for entry into BSc Engineering programmes.
(b) Expose students to the breadth and depth of University life, allowing them to better choose their academic paths and to become better prepared for the rigours of student life.
(c) Facilitate the development of key skills required for the world of work.

The programme is delivered through a 1-year course of study that includes traditional theoretical components that includes Mathematics and a Practical Immersion Activity component that provides students with Caribbean Vocational Component (CVQ) certified skills in a variety of engineering related disciplines. The Programme is administered by Faculty but delivered through the Open Campus.

Students must apply through the UWI Open Campus, Pre-University Centre, St. John Road, St. Augustine using the prescribed application forms.

Entry Requirements:

1. CAPE UNITS I & II in Mathematics and Physics or Chemistry, (CSEC in Chemistry) OR
2. GPA 3.0 – 3.4 – COSTAAT/UTT/UTECH/BCC

Certificate in Geographic and Land Information Systems Management (GLIS)

The Certificate in GLIS was introduced to meet the increasing demand for GIS specialists in the job market as a result of advancements in information technology, and the development of spatial/geographic database management programmes. This Certificate therefore provides participants with the essential skills in GIS with the aim to develop a core of trained GIS persons who can lend support for GIS programmes in the Caribbean.

Entry Requirements:

1. A minimum of five (5) O' level GCE/CXC subjects including English Language and Mathematics or equivalent qualification.
2. Applicants must also be computer literate, as knowledge of the MS Windows operating system will be required.
3. Relevant experience in application areas will be an advantage.

SECTION 2 - STUDENT 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 2015/2016 Academic Year.

- Alpha Engineering & Design (2000) Limited
- Amera Caribbean Development Limited
- Angostura Limited
- Association of Professional Engineers of Trinidad &
- Tobago (APETT)
- Barbados Land Surveyors Association
- Blue Waters Products Limited
- British Gas (Trinidad & Tobago) Limited
- Comfort Engineering (Mr. Alvin Daniell)
- Columbus Communications Trinidad Limited
- Consulting Engineers Associates 2005 Limited
- Consulting Engineers Partnership (CEP) Limited
- Coosal's Construction Company Limited
- Damus Limited
- Desmond Imbert
- Engineering Students Society (ESS)
- EOG Resources Trinidad Limited
- FaSoVe Product Design & Development Ltd
- Florette Smith-Felix
- GeoOrbis Geospatial Technologies
- Geotech Associates Limited
- Global Competitive Strategies Limited
- Hart & Leonard (1987) Limited
- Institute of Surveyors of Trinidad & Tobago
- Ixanos Limited
- Kee-Chanona Limited
- Kiss Baking Company
- KS & P Limited
- L&S Surveying Services Limited
- Land & Engineering Surveying Services
- Lauriston Lewis Associates Limited
- Lee Young & Partners
- Mootilal Moonan Engineering & Construction (T&T) Ltd
- National Agricultural Marketing & Development
- Corporation (NAMDEVCO)
- National Energy Corporation of Trinidad & Tobago Ltd
- National Petroleum
- PCS Nitrogen Trinidad Limited
- Peter Goodridge
- PETROTRIN
- Phoenix Gas Processors Limited
- Power Generation Company of Trinidad & Tobago
- Project Management Institute of T&T
- Public Transport Service Corporation (PTSC)
- PROMASERV
- Samuel Opadeyi
- Schlumberger Trinidad Inc.
- Telecommunications Services of Trinidad & Tobago
- The Geographic Information Society of T&T
- The Geological Society of Trinidad & Tobago
- Trinidad Cement Limited
- Trinidad & Tobago Electricity Commission
- Trinidad Engineering & Research (1978) Ltd
- Urban Development Corporation of Trinidad & Tobago
- UWI Project Management Alumni
- Yorke Structures

SECTION 3 - UNDERGRADUATE REGULATIONS

All students of the University are subject to the General Regulations for Students approved by the Senate of the UWI. Where there is conflict between the regulations of the Faculty and the University Regulations, the University Regulations shall apply.

The Faculty of Engineering offers ten (10) Bachelor of Science, Engineering (BSc (Eng.)) Degree Programmes as follows:

In the Department of Chemical Engineering
1. Chemical & Process Engineering
2. Petroleum Geoscience

In the Department of Civil and Environmental Engineering
3. Civil Engineering
4. Civil with Environmental Engineering

In the Department of Electrical and Computer Engineering
5. Electrical and Computer Engineering

In the Department of Geomatics Engineering and Land Management
6. Geomatics
7. Land Management (Valuation)

In the Department of Mechanical and Manufacturing Engineering
8. Industrial Engineering
9. Mechanical Engineering
10. Mechanical Engineering with a Minor in Biosystems

These programmes embody a suite of courses governed by regulations described below. A candidate becomes eligible for the award of a BSc degree only upon satisfactory completion of one of these programmes, as determined by the prescribed regulations. Degrees may be awarded in each programme with First Class Honours, Second Class Honours (Upper or Lower Division), or Pass.

3.0 QUALIFICATIONS FOR ADMISSION TO THE FACULTY OF ENGINEERING

3.1 Applications for entry into programmes offered by the Faculty of Engineering will only be considered if applicants have met the following criteria:
(a) Satisfied the University's Matriculation Requirements for entry to a Degree Programme
(b) Amassed qualification points as specified in Regulations 3.1.1 to 3.1.7. Qualification points are obtained by summing individual qualification scores as listed in **Table 3.1.**

Preference will be given to applicants with passes in Applied Mathematics at CAPE 2

The entry requirements for the Faculty of Engineering are listed below by programme of study. Qualification codes referenced are defined as follows:

'A' Level:	Advanced Level Examinations GCE (Cambridge or London)
'O' Level:	Ordinary Level Examinations GCE (Cambridge or London)
CXC:	Caribbean Examinations Council
CAPE:	Caribbean Advanced Proficiency Examination
GCE	General Certificate of Education (Cambridge or London)
N1:	Preliminary Subjects at the former Faculty of Science and Agriculture, UWI
N2:	Introductory Subjects at the former Faculty of Science and Agriculture, UWI
BCC:	Barbados Community College
CAST:	College of Arts, Science & Technology
COSTAATT:	College of Science, Technology and Applied Arts of Trinidad and Tobago
EEET:	Electrical & Electronics Engineering Technician
MET:	Mechanical Engineering Technician
NEC:	National Examinations Council
PreENG:	Pre Engineering Programme, administered by the Open Campus Centre for the Faculty of Engineering, UWI St Augustine
PreSci1:	Preliminary Subjects at the Faculty of Science and Technology, UWI
PreSci2:	Introductory Subjects at the Faculty of Science and Technology, UWI
TTIT:	Trinidad & Tobago Institute of Technology
UTech:	University of Technology, Jamaica
UTT:	University of Trinidad and Tobago

3.1.1 CHEMICAL & PROCESS ENGINEERING

(a) A minimum total of 14 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics, Physics and Chemistry at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2,

OR

(b) A minimum GPA of 3.5 obtained in PreENG

OR

(c) Any of the following Diplomas, based on merit:

- UTT National Engineering Technician Diploma (NETD) - Chemical Engineering - (GPA of 3.5 and above);
- BCC Associate Degree in Science - Chemistry, Mathematics, Physics - (GPA of 3.5 and above).
- COSTAATT Associate Degree - Chemistry, Physics - (GPA of 3.5 and above)

OR

(d) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

3.1.2 CIVIL ENGINEERING AND CIVIL WITH ENVIRONMENTAL ENGINEERING

(a) A pass in Chemistry at GCE 'O' Level or CXC or equivalent,

AND

(b) A minimum total of 8 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics and Physics at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2,

OR

(c) A minimum GPA of 2.5 obtained in PreENG,

OR

(d) Any of the following Diplomas, based on merit using the scores calculated in **Table 3.1**:

- NEC Construction Engineering Technician (Trinidad & Tobago) - Score of 65% and above;
- BCC Ordinary Technician Diploma (GPA of 3.0 and above).
- CAST or UTech Technician Diploma, Jamaica.

OR

(e) Any other equivalent qualification and experience as determined by the Department, in addition to those listed in Regulation 3.1 above.

3.1.3 ELECTRICAL & COMPUTER ENGINEERING

(a) A pass in Chemistry at GCE 'O' Level or CXC or equivalent,

AND

(b) A minimum total of 8 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics and Physics at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2,

OR

(c) A minimum GPA of 2.5 obtained in PreENG,

OR

(d) Any of the following Diplomas, based on merit using the scores calculated in **Table 3.1**:

- NEC (CET, EEET, MET) Diplomas with a B+ grade (65%) in final year Mathematics;
- UTT Mechanical or Electrical Technician Diploma with a B+ grade in final year Mathematics and GPA of 3.0 and above;
- COSTAATT Associate Degree with A grade in final year Mathematics and GPA of 3.5 and above;
- CAST or UTech Diplomas in Mechanical or Electrical Technology with a B+ grade in final year Mathematics;
- BCC Ordinary Technician Diploma in Mechanical or Electrical Technology with a B+ grade in final year Mathematics and GPA of 3.5 and above.

OR

(e) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

3.1.4 GEOMATICS

(a) A minimum total of 6 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics and one other science related subject, at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2,

OR

(b) A minimum GPA of 2.0 obtained in PreENG,

OR

(c) Any of the following Diplomas, based on merit using the scores calculated in **Table 3.1**:

- UTT Surveying or Civil Engineering Technician's Diploma (GPA of 2.8 and above);
- BCC Surveying Technician's Diploma (GPA of 3.0 and above).

OR

(d) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

INDUSTRIAL, MECHANICAL AND MECHANICAL ENGINEERING WITH A MINOR IN BIOSYSTEMS

(a) A pass in Chemistry at GCE 'O' Level or CXC,

AND

(b) A minimum total of 8 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics and Physics at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2, (Note that preference will be given to passes in Applied Mathematics. Technical

Drawing will also be an asset),
OR

(c) A minimum GPA of 2.5 obtained in PreENG,
OR

(d) Any of the following Diplomas, based on merit using the scores calculated in **Table 3.1**:
- NEC Mechanical Engineering Technician Diploma – Score of 65% and above;
- COSTAATT Associate Degree (GPA of 3.5 and above);
- TTIT/UTT Technician Diploma (GPA of 3.0 and above);
- BCC Ordinary Mechanical Technician Diploma (GPA of 3.5 and above).

OR

(e) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

3.1.6 LAND MANAGEMENT

(a) A minimum total of 6 qualification points as calculated from **Table 3.1** based on passes at any combination of 'A' Level or CAPE (averaged over CAPE I and II) or N1 and N2, or PreSci 1 and PreSci 2, in any two of the following: Pure Mathematics, Physics, Geography, Accounting, Economics and Management of Business,
OR

(b) A minimum GPA of 2.0 obtained in PreENG,
OR

(c) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

3.1.7 PETROLEUM GEOSCIENCE

(a) A minimum of 14 qualification points as calculated from **Table 3.1** based on passes in Pure Mathematics, Physics or Chemistry and one other science subject or Geography at any combination of 'A' level or CAPE (averaged over CAPE 1 and 11) or N1 and N2, or PreSci 1 and PreSci 2, (the subject Physics or Chemistry not taken at CAPE or 'A' level must have a distinction at 'O' level or CSEC/CXC)
OR

(b) A minimum GPA of 3.5 obtained in PreENG,
OR

(c) Any other qualification that is considered by the Department, in addition to those listed in Regulation 3.1 above.

PROGRAMMES OF STUDY

3.2. All students must:

(a) Not normally carry a load of more than 18 credits per semester.

(b) Pursue the approved Programme curriculum and obtain, within a maximum of 14 semesters, the credits as prescribed in the Programme's Schedule; except as otherwise provided in Regulations 3.3 (Exemptions), 3.26 and 3.27 (Credit Transfer). Students who CANNOT complete their programmes of study within 14 semesters of registration without exceeding the limit prescribed in Regulation 3.2(a) would be declared as having failed the programme.

(c) Normally pass prerequisites for courses before being allowed to register for those courses.

(d) In any semester, pursue courses worth not less than nine (9) credits except where prerequisites, the timetable and/or the number of courses required for completion of the Degree programme dictate otherwise.

(e) Ensure that in registering in any given semester that priority is given to all outstanding or trailing eligible lower level courses and to prerequisite requirements.

(f) Not take more than the normal number of credits as stipulated in the Schedule of Courses (Section 4) for the registered Programme in a particular semester unless a single course is being trailed and a minimum GPA of at least 2.7 has been achieved in the Year preceding that semester. In this case, the student shall seek approval from the Department concerned for registering for a higher load.

(g) Complete the Programme as prescribed in the Schedule of Courses in not less than three (3) academic years except as otherwise provided in Regulation 3.2(b).

(h) Attend all classes for all courses for which they are registered for examinations, including courses that are being repeated, unless they have been granted permission in accordance with Regulation 3.2(i).

(i) Request permission to register for "Examinations Only", i.e. to not attend classes but to write course examinations, in only in courses that are being repeated by the student and up to a maximum of seven (7) credits, provided they are credits needed to graduate, and provided that all coursework were previously and successfully completed.

Table 3.1 : Qualification by performance in approved individual examinations (e.g. CXC, GCE, UWI)				Qualification Score
'A' Level	CAPE[1] (½∑Unit scores)	N1*1 /N2*1	PreScience1*1 / PreScience2*1	
A	I	A	A+	5
-	-	-	A	4.5
B	II	B	A-	4
-	-	-	B+	3.5
C	III	C	B	3
-	-	-	B-	2.5
D	IV	D	C+	2
-	-	-	C	1.5
E	V	-		1

*1 For CAPE, N1 and N2 subjects, PreScience1 and PreScience2 subjects, the final score for assessment of suitability for entry into Programmes is derived by adding the scores for each Unit of examination and dividing by 2. For other qualifications in this category the qualification points are obtained by adding qualifying scores for each subject.

Applicants with qualifications that are not listed will be assessed on a case by case basis.

EXEMPTION & CREDIT

Exemption

3.3. A student who has satisfactorily completed courses outside of the Faculty may be granted exemptions up to a maximum of 36 credits towards the fulfilment of Level 1 and Level 2 requirements provided that not less than four (4) semesters of study for the degree in the Faculty are pursued.

3.4. The programme of study and courses qualifying for such exemption are subject to the approval of the Faculty Board on the recommendation of the Head of Department.

Credit

3.5. (a) A student who voluntarily withdraws from the University and who applies for re-admission within five (5) years shall be granted exemption and credit for courses previously passed, subject to the time limit for the maintenance of credits stipulated in Regulation 3.5(b) and subject to the stipulation that the courses previously passed have not substantially changed, and are not determined by the Board of the Faculty to be obsolete.

(b) Credits obtained more than five (5) years prior to an application for re-admission into a programme will not normally be applied to that programme.

(c) Where exemption and credit are granted in accordance with Regulation 3.5(a), the grades obtained at previous attempts at such courses shall be used in the determination of the student's GPA.

SCHEME OF EXAMINATION

Examination

3.6. (a) The examination of a course shall be conducted by written papers, coursework and/or project(s). Some courses require that students pass coursework as well as the final examination before a pass can be awarded. Students are required to consult their respective Departments on the matter.

(b) For students who entered the Faculty prior to the 2014/2015 academic year a minimum mark of 40% must be made in order to pass a course, subject to any "must-pass" course-component stipulated within the course. For students who enter the Faculty as of 2014/2015 as of academic

year 2014/2015 a minimum mark of 50% must be made in order to pass a course, subject to any "must-pass" course-component stipulated within the course.

(c) A candidate may also be orally examined.

(d) Students who have not attended a minimum of 75% of classes would be treated as having failed the examination in those courses. Failure of the Faculty to enforce this rule is not to be construed as a waiver for future breach of this regulation.

(e) Candidates are not allowed to write an examination once they have already passed the relevant course.

3.7. A candidate who fails to attend any examination and does not submit an acceptable medical certificate for his/her absence, as prescribed in the University Examination Regulations, shall be treated as having failed that examination. If the candidate submits an acceptable medical certificate, he/she will be permitted to write the examination at a later date, without penalty

Coursework

3.8. Coursework shall comprise laboratory, workshop, drawing and field exercises, literature surveys, problem exercises, in-house tests, reports and presentations, or such other assignments as Faculty Board may approve. With regard to their assessment, there are two types of coursework:

(a) Assessable coursework grades which contribute to the overall course mark attained in the course.

(b) Non-assessable Coursework which is graded on a PASS/FAIL basis only and does not contribute to the overall course mark attained in the course.

3.9. A student who is absent from part of the written assessable coursework tests for grave medical reasons, as prescribed in the University Regulations, shall be graded on the tests he/she has taken as if such tests constitute the full test requirement provided that the tests not taken constitute no more than 20% of the total mark for all the tests. If the tests not taken constitute more than 20% of the total mark for all the tests, the candidate shall have to take make-up tests at a later date.

3.10. (a) Students who fail a course may, within one (1) year of taking the course, request that marks from the passed laboratory coursework be transferred to the next registration of the course. In this regard, requests should be directed to the Head of Department whose decision on this matter will be final.

(b) Students are required to submit coursework by the prescribed date. Coursework will only be accepted after the deadline, in extenuating circumstances, with the specific written authority of the course Lecturer and in any event, not later than the day before the start of the relevant end of semester examinations of the semester in which the particular course is being offered.

(c) A PASS is required in all non-assessable coursework components before a student can be credited with a PASS in a course.

PROJECTS

3.11. Some Departments require that students pass their Research Projects at the first attempt in order to qualify for honours. Students are required to consult their respective Departments to determine whether this regulation applies to them.

SCHEDULE OF COURSES

COURSE LISTING

3.12. The BSc Programmes in the Faculty are ordered into three (3) Levels of courses, with each level typically corresponding to a year of study as prescribed in the Departmental Course Listing Sections. Courses are offered in each of two semesters in any given academic year, which typically runs from September to May. Some courses are offered during the summer period, usually on a remedial basis. The Schedule of Courses is provided in Section 4.

CO-CURRICULAR CREDITS

3.13. Students are free to apply for co-curricular credits based on activities in sports, clubs, etc. Co-curricular credits will be shown on the transcript but will not count towards the BSc Engineering Degree.

NOTICE OF EXAMINATIONS

3.14. Notice of the dates of end of semester examinations shall be posted on official notice boards and/or the University Website within the minimum time as prescribed by the University Regulations.

AEGROTAT DEGREES

3.15. A student who has obtained at least three-quarters of the credits required for a Bachelor's Degree but has been unable through illness to complete the programme may apply under the University Regulations for the award of an Aegrotat Degree.

3.16. An Aegrotat Degree will not be awarded unless the Board of Examiners considers that, in the courses which he/she has completed, the student has reached a standard which, if also reached in the remainder of the programme, would have qualified him/her for the award of a Degree.

3.17. An Aegrotat Degree will be awarded without class.

3.18. Holders of an Aegrotat Degree are not permitted to re-enter for the same Degree programme but may proceed to a second or higher degree on complying with the Regulations for such Degrees.

CLASSIFICATION OF DEGREE

3.19. (a) For students who entered the Faculty prior to Academic Year 2014/2015, BSc degrees in the Faculty of Engineering will be awarded in the following classes based on the overall performance of the graduating students throughout the programme:

i. First Class Honours
ii. Second Class Honours (Upper Division)
iii. Second Class Honours (Lower Division)
iv. Third Class Honours
v. Pass

(b) For students who enter the Faculty as of Academic Year 2014/2015, BSc degrees in the Faculty of Engineering will be awarded as above except for Third Class Honours degrees.

(c) The notice of the award of the BSc degrees shall be published in a separate "Pass List" for each discipline with the ID numbers of the successful graduating students.

3.20. (a) The class of degree shall be awarded as First Class Honours, Second Class Honours (Upper Division), Second Class Honours (Lower Division), or Pass on the basis of the final Grade Point Average (GPA) as given in Regulation 3.22, subject to Regulation 3.11.

(b) Where a student completes the Degree in more than eight (8) semesters, he/she shall not normally be eligible for Honours. Such a student, who would otherwise meet the requirements for the award of a degree in accordance with the Faculty's regulations, shall be awarded a Pass Degree.

(c) Students who have been granted permission to register for "Examinations Only", i.e. to write examinations without attending classes in up to two (2) courses, or who require up to seven (7) credits in one (1) semester to graduate shall have this period counted as one-half (½) of a semester.

3.21. (a) For purposes of these regulations, the following meanings shall apply, except where the context otherwise requires:

i. **Credits**
Normally, 1 credit shall represent 1 hour per week per semester in face to face lectures, OR one 3-hour lab per week per semester. The total number of credits awarded to courses, as well as for projects, laboratory sessions, foreign language classes or other approved contact hours, shall be determined by the Faculty Board and approved by the Board for Undergraduate Studies.

ii. **Credit Hours Earned**
'Credit Hours Earned' means the credits for each course that count toward the degree requirement and for which a passing grade is obtained.

iii. **Quality Hours**
'Quality Hours' mean the credits for each course that is included in the GPA calculations. Quality hours shall be assigned even when a grade of F is obtained in a course. Courses that are not used in the determination of the GPA shall be assigned zero quality hours.

iv. **Quality Points**
'Quality Points' means the numerical value assigned to the relevant letter grade earned.

(b) For the purpose of these Regulations the following meanings shall apply:

i. **Levels 1, 2 and 3 Courses**
Levels 1, 2 and 3 Courses are courses so designated by the Board for Undergraduate Studies. The numbers indicate the depth of knowledge and specialisation relevant to the respective discipline. Normally, all courses at a particular level are offered in the corresponding year of the programme, e.g. Level 1 courses at Year 1 etc.

ii. **Grade Points**
Grade points are determined by multiplying the quality hours by the quality points for a course.

iii. **Grade Point Average (GPA)**
Grade Point Average is the average obtained by dividing the total grade points earned by the total quality hours for which the student has registered, excluding courses taken on a Pass/ Fail basis [see Regulation 3.21(d)] and courses with designations as given in Section 5 entitled Additional Regulations).

iv. **Weighted Grade Point Average**
The Weighted Grade Point Average is the cumulative average determined by applying appropriate weights of 10%, 30% and 60%

for Levels 1, 2 and 3 courses, respectively, (except for the Final Year Project), to the grade points and the quality hours used in determining grade point average as set out in Regulation 3.21(b)(iii) above. Failed courses are also included in the determination of the GPA (see Faculty Webpage for online GPA calculator). Prior to any attempt at the final year project, the Weighted GPA is given by

$$W_{gpa} = \frac{\sum_1 Q_i C_i + 3\sum_2 Q_i C_i + 6\sum_3 Q_i C_i}{\sum_1 C_i + 3\sum_2 C_i + 6\sum_3 C_i}$$

where W_{gpa} is the weighted GPA, $\sum_j Q_i C_i$ is the summation of the product of quality points, Q_i and credits C_i, for all courses taken at level *j*.

In the Faculty of Engineering the Final Year project contributes 20% to the Weighted GPA calculation used to determine the class of degree. Once the Final Year project is attempted, the weighted average is determined as follows

$$W_{gpa} = 0.8\left(\frac{\sum_1 Q_i C_i + 3\sum_2 Q_i C_i + 6\sum_3 Q_i C_i}{\sum_1 C_i + 3\sum_2 C_i + 6\sum_3 C_i}\right) + 0.2Q_{project}$$

where $Q_{project}$ is the sum of the quality points earned in all attempts at the final year project.

(c) Courses for which credit and exemption have been given on the basis of qualifications obtained outside the Faculty/University shall not be taken into account in this calculation, except where the prescribed Schedule of Courses allows for a student to take a course outside of the Faculty of Engineering for credit.

(d) Credit hours earned in courses taken on a Pass-Fail basis shall not be included in calculating grade point averages.

3.22. The class of degree shall be awarded on the basis of the Weighted GPA as set out in these Regulations.

3.23 First Degrees awarded by the University for the Bachelor of Science in the Faculty of Engineering shall be classified as follows:

(a) For students who first entered the Faculty prior to 2014/2015, graduation honours will be awarded upon completion of all course requirements using the old GPA scheme as follows:

Degree Category	*Final Weighted GPA*
First Class Honours:	≥ 3.60
Upper Second Class Honours:	3.00 - 3.59
Lower Second Class Honours:	2.00 – 2.99
Third Class Honours	1.50 – 1.99
Pass:	1.00 – 1.49

(b) Students to whom Regulation 3.23 (a) refer, with final weighted averages below 1.00, will be recorded as having failed the programme.

(c) For students who first entered the Faculty as of academic year 2014/2015, graduation honours will be awarded upon completion of all course requirements using the new GPA scheme as follows:

Degree Category	*Final Weighted GPA*
First Class Honours:	≥ 3.60
Upper Second Class Honours:	3.00 - 3.59
Lower Second Class Honours:	2.50 – 2.99
Pass:	2.00 – 2.49

(d) Students to whom Regulation 3.23 (c) refer, with final weighted averages below 2.00, will be recorded as having failed the programme.

3.24 (a) In the determination of the GPA, the defined grades and the matching range of marks with the corresponding quality points shall be, for students who entered the Faculty prior to 2014/2015:

Grade	Quality Points	% Range
A+	4.30	80 - 100
A	4.00	70 - 79
A-	3.70	67 - 69
B+	3.30	63 - 66
B	3.00	60 - 62
B-	2.70	57 - 59
C+	2.30	53 - 56
C	2.00	50 - 52
C-	1.70	47 - 49
D+	1.30	43 - 46
D	1.00	40 - 42
F	0.00	0 - 39

(b) In the determination of GPA, the defined grades and the matching range of marks with the corresponding quality points shall be, for students who enter the Faculty as of Academic Year 2014/2015:

Grade Range	Quality Points	%
A+	4.30	90 - 100
A	4.00	80 - 89
A-	3.70	75 - 79
B+	3.30	70 - 74
B	3.00	65 - 69
B-	2.70	60 - 64
C+	2.30	55 - 59
C	2.00	50 - 54
F1	1.70	40 - 49
F2	1.30	30 - 39
F3	0.00	0 - 29

The table above represents adjustments made in the 2016/2017 Academic Year to the F1, F2 and F3 bands that were originally applied as at 2014/2015. These original values are outlined below:

Grade Range	Quality Points	%
F1	1.70	45 - 49
F2	1.30	40 - 44
F3	0.00	0 - 39

(c) Additional designations that are used on the student transcript are shown in SECTION 5: Additional Regulations. These designations do not directly factor into the GPA calculation.

3.25 (a) The scheme to be used for conversion of numerical marks to letter grades shall be as prescribed in Regulation 3.24 (a) and 3.24 (b) above.

(b) The courses to be used for the purpose of determining the Weighted GPA for the class of degree to be awarded shall be as prescribed for the programme for which the student is registered and in keeping with the course listing as described in SECTION 4.

(c) For the purpose of determining the Weighted GPA, all attempts at a course, failed or passed, and the grades obtained shall be included in the GPA calculation.

TRANSFER OF CREDIT

3.26. (a) Where credit for a course taken at another institution is requested, it is the student's responsibility to provide all the information needed by the University to enable the University to assess this course.

(b) Credit hours earned from another institution at the time of admission to The University of the West Indies shall not be used in the computation of a grade point average.

3.27. The following shall apply to credits earned by a UWI undergraduate from another approved institution:

(a) A UWI student who wishes to take academic courses elsewhere and apply those credits toward the UWI degree must obtain approval in advance from the relevant Academic Board on the recommendation from the Board of the Faculty in which he/she is registered.

(b) A UWI student must have a minimum GPA of 3.00 to qualify for consideration for approval to take courses as an exchange student in another approved institution.

(c) Only the grade equivalent, as determined by the Board for Undergraduate Studies, of the results achieved and not the marks or grades so earned at another Institution shall be used in the computation of the student's GPA.

WARNINGS and WITHDRAWALS

3.28 (a) For students who entered the Faculty prior to 2014/2015 a student whose GPA for a given semester is less than 1.00 shall be deemed to be performing unsatisfactorily and shall be placed on Warning. For students who enter the Faculty as of 2014/2015 a student whose GPA for a given semester is less than 2.00 shall be deemed to be performing unsatisfactorily and shall be placed on Warning. The Semester GPA is obtained by removing the weights in the WGPA calculation and applying it only to the courses registered for in the relevant semester:

$$W_{semester} = \frac{\sum Q_i C_i}{\sum C_i}$$

where $W_{semester}$ is the semester GPA, $\sum Q_i C_i$ is the summation of the product of quality points, Q_i and credits C_i, for all courses taken in the relevant semester.

(b) For students who entered the Faculty prior to 2014/2015 a student on Warning whose semester GPA for the succeeding semester is less than 1.00 will be required to withdraw. For students who enter the Faculty as of 2014/2015 a student on Warning whose semester GPA for the succeeding semester is less than 2.00 will be required to withdraw. This regulation will be waived for all students who require seven (7) credits or less to graduate.

(c) Summer School will NOT be counted as a semester in the determination of student status when using Regulations 3.28(a) and 3.28(b). As such Summer School will not normally be used to positively or negatively change the status of any student.

(d) A student on warning shall be counselled by the Dean or a designated Faculty/Department advisor. Such a student may, except where otherwise prescribed in Faculty Regulations, be permitted by the Academic Board on the recommendation of Faculty Board to carry a reduced course load.

Note: A DEAN'S HOLD will be put on the record of students who are on warning. This Hold will only be removed after counselling by the relevant representative of the Department to which the student belongs or the Administrative Officer.

3.29. **Readmission of persons who were Required to Withdraw**

(a) A person who was required to withdraw from the University in accordance with Regulation 3.28 (b) may be re-admitted after a minimum of one (1) year has passed since the date of withdrawal.

(b) A person who was required to withdraw from the University can only be readmitted after submission of on-line application at the same time as when applications are invited for new students and subsequent approval of the application by the Faculty.

(c) If a student has been readmitted as per Regulations 3.29(a) and 3.29(b), all grades previously obtained shall continue to apply for the purpose of determining the student's GPA, provided that these are relevant to the degree being pursued.

(d) If a student has been readmitted as per Regulations 3.29(a) and 3.29(b), all semesters in which the grades described in 3.29 (c) were obtained shall be counted towards the student's degree and shall be subject to Regulation 3.2 (b) (i.e., Fail Programme determination).

(e) If a student has been readmitted as per Regulations 3.29(a) and 3.29(b), work done during the period between the student being required to withdraw and being granted re- admission may be eligible for credit under Regulation 3.26.

COURSE AUDIT

3.30 Students can register for a course on audit. This allows them to attend the lectures, tutorials and laboratory sessions for a given course without the requirement of sitting the final exam.

(a) A registered student may be permitted to audit a course on the approval of the Head of Department.

(b) Satisfactory attendance certified by the Head of Department shall be awarded the designation V. In the absence of such certification, the designation 'NV' shall be recorded (see SECTION 5: Additional Regulations).

(c) No academic credit shall be granted for an audited course.

CHEATING, PLAGIARISM AND COLLUSION

3.31. **Cheating, Plagiarism and Collusion are serious offences under University Regulations.**

(a) Cheating is any attempt to benefit one's self or another by deceit or fraud.

(b) Plagiarism is the unauthorised and/or unacknowledged use of another person's intellectual efforts and creations howsoever recorded, including whether formally published or in manuscript or in typescript or other printed or electronically presented form and includes taking passages, ideas or structures from another work or author without proper and unequivocal attribution of such source(s), using the conventions for attributions or citing used in this University. Plagiarism is a form of cheating.

N.B: Please refer to Guidelines for Staff and Students on Plagiarism and The University's Regulations on Plagiarism in Section 5: Additional Regulations.

(c) For the purposes of these Regulations, 'collusion' shall mean the unauthorised or unlawful collaboration or agreement between two or more students in the preparation, writing or production of a course assignment for examination and assessment, to the extent that they have produced the same or substantially the same paper, project report, as the case may be, as if it were their separate and individual efforts, in circumstances where they knew or had reason to know that the assignment or a part thereof was not intended to be a group project, but was rather to be the product of each student's individual efforts.

PENALTIES

3.32 Cheating, plagiarism and collusion shall be reported to the Campus Committee on Examinations and the penalties would be in accordance with the University Examination Regulations.
Additional designations are as indicated Section 5: Additional Regulations.

DRESS CODE AND CONDUCT

3.33 The following regulations are included in the interest of safety and the development of a professional environment similar to what would obtain in the world of work

(a) Students must at all times conduct and present themselves in a manner in keeping with the nature of the Engineering Profession, and as directed by the Department in which the student is registered.

(b) In consideration of Occupational Health and Safety issues in the laboratories, Departments would advise students on the appropriate attire to be worn in laboratories and other locations where practical work is conducted. PRESCRIBED LABORATORY ATTIRE WOULD BE ENFORCED AT ALL TIMES.

(c) Students who are not appropriately attired SHALL NOT BE ALLOWED ENTRY in any Laboratory, Workshop, Field Trip or other locations where such attire is required in the interest of safety.

(d) Student ID cards MUST be clearly displayed at all times when on UWI premises. Student ID cards are also required to facilitate all transactions in the Faculty/University.

(e) Food and drink SHALL NOT be brought into classrooms or laboratories.

SECTION 4

Time to start thinking about ···

POSTGRADUATE STUDIES IN THE FACULTY OF ENGINEERING

Before you select your programme of study or your courses for the year, consider whether or not you would like to proceed to the postgraduate level after graduation. Even in today's Engineering job market, a Bachelor's degree is only the first step in the learning process that you should continue throughout your professional career.

However, your choices at the undergraduate level can affect your postgraduate options. This brief guide provides you with basic Information on the Faculty's current graduate programme, our research areas and any undergraduate requirements or prerequisites. For more detailed information and advice, please consult the Postgraduate Information Guide and speak with your Academic Advisor.

About Postgraduate Study
The Faculty of Engineering at the University of the West Indies offers 13 Diploma programmes, 25 MSc programmes, 18 MPhil programmes and 18 PhD programmes. Our Diploma and taught Masters programmes (eg. MASc) are particularly well suited to those who have already embarked upon their professional career and are looking to gain deeper insight into a specialised area in their field. Our research programmes (MPhil and PhD) allow students to follow their passion and provide the opportunity, resources and support for them to develop their own innovative products or processes.

Definitions and Admission Requirements
Below are brief descriptions of the different types of programmes offered by the Faculty and the general admission requirements. Please consult the Postgraduate Information Guide for more detailed information.

Postgraduate Diplomas
These programmes involve a mix of taught classes, examinations, coursework and a written paper. The duration is generally one year for full-time study and two years for part-time study.

General Admission Requirements:

- A Bachelor's Degree (at least Second Class Honours) in the specific subject area or in a related area with a record of experience in the subject area.
- Students with Pass degrees in the relevant field of study shall only be accepted for admission provided they have obtained at least two years' experience in the field and have a satisfactory confidential reference from their employer.
- Applicants holding non-engineering Bachelor's degrees may be required to pass a qualifying examination.

Master's Degrees

All Master's programmes offered by the Faculty are generally one year in duration for full-time study and two years for part-time study. MSc and MASc programmes involve courses of instruction, examination by written papers, supervised design/research work which may be industry-based and oral and written presentations. Master of Philosophy (MPhil) degrees are research degrees and are awarded on the basis of an examination by thesis.

General Admission Requirements:

- Masters' candidates should normally possess at least a Lower Second Class Honours Degree in the specific subject area or a degree in a related area with a record of experience in the subject area.
- MPhil candidates should normally possess at least a Upper Second Class Honours Degree or equivalent in the area in which he/she is working or in a related area. Holders of a Pass Degree or a General Bachelor's Degree must normally pass qualifying examinations.
- A candidate may be required to satisfy such prerequisites as are deemed necessary before proceeding to the Master's degree programme.

Doctor of Philosophy

PhD degrees are research degrees and are awarded on the basis of an examination by thesis.

Admission Requirements

- Applicants 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.
- Candidates who have obtained a Master's degree from the UWI or another approved University, provided that the Master's 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. Candidates who possess such other qualifications and experience as the Board for Graduate Studies and Research may approve.

NOTE: 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.

PREREQUISITE COURSES

Some postgraduate programmes in the Faculty require students to have passed particular courses offered at the undergraduate level. In 2014-2015 these include:

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

MASC AND DIPLOMA PROGRAMMES

Major in Communication Systems
Prerequisite Courses:

ECNG 3001	Communication Systems II
ECNG 3002	Data Communication Systems
ECNG 3003	Telecommunication Networks

Major in Control Systems
Prerequisite Courses:

ECNG 3004	Control and Instrumentation II
ECNG 3032	Control and Instrumentation I

Major in Energy Systems
Prerequisite Courses:

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

Major in Integrated Systems
Prerequisite Courses:

ECNG 3006	Microprocessor Systems Design and Applications

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

Master of Philosophy (MPhil) or a Doctor of Philosophy (PhD) in Mechanical Engineering, Manufacturing Engineering or Industrial Engineering
Prerequisite Courses:

IENG 3004	Control Systems Technology
IENG 3013	Simulation of Industrial & Business Processes
MATH 2240	Statistics
IENG 3007	Operations Research II

Mechanical/Manufacturing Engineering Option
Prerequisite Courses:

MENG 2008	Manufacturing Technology

MSc Programmes in Production Engineering & Management, Production Management, & Engineering Management

COURSE NAME: Production Technology and Materials
Prerequisite Courses:
MENG 2008 Manufacturing Technology
MENG 3015 Materials Technology

COURSE NAME: Production Systems Design
Prerequisite Courses:
MENG 3006 Production Management

COURSE NAME: Engineering Management & Optimisation
Prerequisite Courses:
MENG 3013 Product Design & Development

Postgraduate Programmes 2017/2018

All postgraduate programmes offered by the Faculty of Engineering may be pursued part-time or full-time. For further information, please check the Faculty of Engineering Postgraduate booklet. Programmes offered in the current academic year are as follows:

CHEMICAL ENGINEERING	Diploma	MSc	MPhil	PhD
Food Science & Technology		x	x	x
Petroleum Engineering	x	x	x	x
Chemical Engineering			x	x
Chemical & Process Engineering		x		
Chemical & Process Engineering with Environmental Engineering		x		
Chemical & Process Engineering with Management		x		
Reservoir Engineering		x		
Geoscience			x	x
Petroleum Geoscience			x	x

CIVIL & ENVIRONMENTAL ENGINEERING	Diploma	MSc	MPhil	PhD
Construction Engineering & Management	x	x	x	x
Construction Management	x	x	x	x
Construction Engineering	x		x	x
Civil Engineering		x	x	x
Civil with Environmental Engineering		x	x	x
Coastal Engineering & Management	x	x		
Environmental Engineering	x	x		
Water and Wastewater Services Management	x	x		

ELECTRICAL & COMPUTER ENGINEERING	Diploma	MASc	MPhil	PhD
Communication Systems (Major)*	x	x		
Control Systems (Major)*	x	x		
Energy Systems (Major)*	x	x		
Integrated Systems* (Computer Systems and Electronic Systems)	x	x		

GEOMATICS ENGINEERING AND LAND MANAGEMENT	Diploma	MASc	MPhil	PhD
Land Administration	x			
Geoinformatics	x	x	x	x
Urban and Regional Planning	x	x	x	x
Surveying and Land Information			x	X

MECHANICAL & MANUFACTURING ENGINEERING	Diploma	MSc	MPhil	PhD
Manufacturing Engineering*			x	x
Manufacturing Engineering & Management		x		
Production Engineering & Management*		x		
Production Management*		x		
Engineering Management*		x		
Engineering Asset Management		x		
Agricultural Engineering			x	x
Industrial Engineering*			x	x
Mechanical Engineering*			x	x

OFFICE OF THE DEAN	Diploma	MSc	MPhil	PhD
Project Management		x	x	x

** Denotes undergraduate prerequisites. See above for details.*

Research 2017/2018

Do you have a curious mind? A passion for knowledge? The need to blaze a trail? Do you think you can make it bigger, better, faster, stronger? Then, whether you decide to pursue full research degree or follow a taught programme, it's never too early to start thinking about the kind of research you would like to do as part of your degree. The following topics currently form part of the research agenda in the Faculty of Engineering:

DEPARTMENT OF CHEMICAL ENGINEERING

- Agricultural Crop Processing
- Biochemical Engineering
- Enhanced Oil Recovery
- Food Science & Technology
- Heavy Oil Recovery
- Industrial Pollution Control
- Mineral Processing
- Natural Gas Engineering
- Petroleum Processing Technology
- Process Design, Optimisation and Control
- Reaction Engineering
- Reservoir Engineering
- Sugar Technology
- Utilisation of Biomass

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

- Behaviour of Structural Elements/Systems under Loadings
- Building Aerodynamics
- Caribbean Construction Firms
- Civil Engineering Economics
- Civil Engineering Project Management
- Computer-aided Engineering & Design
- Construction Economics
- Construction Finance
- Construction Management & Administration
- Construction Materials
- Construction Public Policy
- Construction Technology
- Contract Procurement Systems
- Disaster Mitigation & Management
- Disaster Mitigation & Management
- Earthquake & Hurricane Resistance Design
- Energy Management and Thermal Comfort in Buildings
- Environmental Engineering
- Expert Systems
- Flood Management
- Infrastructure Planning
- Infrastructure Technology in Construction Management
- Macro & Micro Economic Issues in Construction
- Maintenance, Rehabilitation & Finance
- Management of Quality in Construction
- Materials Engineering
- Productivity in Construction
- Resource Management
- Structural Design & Codes for Disaster Mitigation
- The Analysis & Design of Foundations
- The Analysis & Design of Hydraulic Systems
- The Analysis & Design of Structures
- Transport Engineering

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

COMMUNICATION SYSTEMS RESEARCH

- Mobile technologies to demonstrably advantage traditionally excluded populations in the Caribbean
- Cognitive, semantic and related technologies to enable increased business effectiveness and personal productivity
- Communication network and application performance studies

CONTROL SYSTEMS RESEARCH

- Distributed Control Systems
- Optimum deployment of control networks for small and medium sized plants
- Algorithms for control system performance enhancement
- Web labs

ENERGY SYSTEMS RESEARCH

- Motors and Drives
- Renewable Energy
- Modelling, simulation and analysis
- Energy efficiency in motors and drives
- Alternative sources of energy
- Vector controlled motor drives, convertors and controllers
- Innovation systems for small developing countries

INTEGRATED SYSTEMS RESEARCH

- Artificial intelligence
- Robotics
- Computer Architecture
- Embedded systems
- Electronic System Design Methods
- Reconfigurable Hardware
- Linear Circuit Applications
- Near-Field Acoustical Holography for steelpan acoustics
- Visualization

DEPARTMENT OF GEOMATICS ENGINEERING AND LAND MANAGEMENT

- Priority areas and new themes of research have been identified and are being pursued. The research focus extends to areas covering geomatics, geodesy, land administration, spatial analysis, geoinformatics, spatial and settlements planning, the environment and ecosystems. The following are some topics of immediate concern:
  Mapping, monitoring, and modeling land use/cover dynamics for the sustainable management of the environment and natural resources.
- Image processing for the extraction of spatial information from aerial and satellite Imagery and Lidar.
- Coastal zone management, developing plans for coastal zones, coastal erosion 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.
- 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 man-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 spatial data and other land-related information, development of standards for spatial data exchanges.
- 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 images processing and analysis tools, GIS and mapping hardware and software, in addition to state-of-the art computing and digital services facilities.

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

AGRICULTURAL (BIOSYSTEMS) ENGINEERING

- Thermal and Electrical Conductivity of Soils
- Hydroponics System of Irrigation
- Computer-Aided Irrigation Water Scheduling
- Engineering Properties of Soils and Water Treatment Sludge
- Evaluation of Livestock Structures
- Drying of Agricultural Materials
- Post-Harvest Technology
- Engineering Design of Machinery

INDUSTRIAL ENGINEERING

- Workstudy and Ergonomics
- Testing of the Eco Tech Tutor
- Quality Management Systems
- HSC Radiation Management Model
- Strategic Formulation, Performance and Knowledge Measurement
- Comparative Studies on Different Industrial Layouts
- Science, Technology and Innovation

MANUFACTURING AND MECHANICAL ENGINEERING

- Computer Integrated Manufacture
- Rapid Prototyping Paradigms for Virtual Manufacturing Systems
- Computer-Aided Design and Drafting of Machine Elements
- Modeling, Scheduling and Analysis of Flexible Manufacturing Systems
- Cellular Manufacturing Systems
- Virtual Learning (e-Learning) to Aid Distance Engineering Education
- Disaster Management
- Thermal Conductivity of Engineering Materials
- Heat Transfer
- Solar Engineering
- Vehicle Emissions
- University-Industry Collaboration and Technology Transfer

For More Information and Advice

FIRST - Download the 2016-2017 Faculty of Engineering Postgraduate Information Guide from the UWI St. Augustine website **http://sta.uwi.edu/faculty-booklet-archive**

THEN - Contact *Research & Postgraduate Student Affairs:*
Lewis, Winston G.
BSc (Eng), MPhil (UWI), PhD (Tuns), FAPETT, FASME, REng
Professor of Industrial Systems Engineering
(Manufacturing Technology, Plant Layout & Ergonomics)
Ext: 83181

SECTION 5: ADDITIONAL REGULATIONS

5.1: Additional GPA Designations

AB	Absent - when a student is absent from an examination for acceptable reasons other than medical reasons.
AM	Absent Medical
CR	Credit
DIS	Disqualified
E	Exemption.
EC	Exemption with credit.
EI	Examination Irregularity -Candidate disqualified from examination on account of breach of the Regulations
EQ	Examination Query
FA	When a student is absent from an examination without a valid reason
FC	Failed Coursework - Indicates that a candidate has failed to satisfy the Examiner In the coursework component of the course
FE	Failed Examination - when a candidate has successfully completed the coursework requirement but has failed to satisfy the Examiners In the examination component of the course
FM	Failed Medical - when a student is absent from an examination for medical reasons or where failure in an examination is attributed to medical reasons as supported by a certificate from an authorised medical practitioner
FNP	Failed – No Penalty
FO	Fail Oral
FP	Failed Practical
FPR	Failed Programme
FT	Failed Theory
FWS	Fail/Supplemental Examination granted
I	Incomplete - indicates that the student has made progress in a course but at the end of the semester has not finished the work required to receive a letter grade. An 'I' designation is not counted in credit hours earned or quality hours until a letter grade is reported. If neither grade nor notification of an extension of time is received by the Registry from the Office of the Dean, the 'I' designation is replaced by an F' letter grade at the end of the first six (6) weeks into the next semester. An extension of time may be granted but shall not normally extend beyond the end of the semester in which the extension is granted. Any remaining 'I' symbol at the end of the period of extension will be deemed an 'F'.
IM	Incomplete Medical
IP	In Progress - when a dissertation, thesis, project, student teaching, practicum, internship, proficiency requirement, or other course intended to last more than one semester, is not completed during the semester in which the student is registered. The 'IP' designation must be replaced with an appropriate grade on completion of the course
NFC	Not for Credit
NP	Not Passed - when a student has failed a course taken on a Pass/Fail basis
NR	Grade not yet available
NV	When a student has been permitted to audit a course but has not done so satisfactorily
P	Pass - a pass obtained in a course taken on a Pass/Fail basis
PC	Preliminary Credits - used for matriculation purposes or the satisfying of prerequisites only
R1	Required to Withdraw
V	Audited - when the course has been taken in accordance with Regulation 22
W1	Warning
W2	Required to Withdraw – Waived by Dean
XM	Medical Accepted

5.2: Student Life and Development Department (SLDD)

The Department is the first and most important stop for high quality academic support for the diverse populations of students throughout The University including full-time, part-time evening and mature students, international and regional students, student athletes and students with special needs (disabilities).

The Department now provides the following services:
- Disability Support
- Academic Support
- International and Regional Student Support
- Postgraduate and Mature Student Support
- Counselling and Psychological Services (CAPS)

Support Services for STUDENTS WITH SPECIAL NEEDS (Temporary and Permanent)
- Provision of Aids and Devices such as laptops, USB drives, tape recorders and special software.
- Special Accommodations for Examinations
- Classroom Accommodations
- Liaison with Faculties and Departments

Students with special needs should make contact before or during registration. Every effort will be made to facilitate your on-campus requirements in terms of mobility, accommodation, coursework, examinations, and other areas. No student of The UWI will be discriminated against on the basis of having special needs. Sharing your needs before registration will enable us to serve you better as a part of the Campus community.

Academic Support Services for ALL STUDENTS
- Educational Assessment – LADS (dyslexia) - LASSI (Study Skills)
- Time Management
- Examination Strategies
- Workload Management
- Career Planning
- Study Skills
- Peer Tutoring
- Peer-Pairing
- Counselling Services (CAPS)

How do I register at SLDD?
- Visit SLDD to make an appointment to meet with the Manager.
- Complete the required **registration form.**
- Students with disabilities must submit a medical report from a qualified medical professional.
- An assessment of the student's needs will be conducted.
- The required assistance will be provided.

All students experiencing academic challenges should communicate with **Ms. Jacqueline Huggins**, Manager, Student Life and Development Department (SLDD), Heart Ease Building, Heart Ease Car Park, Wooding Drive, St. Augustine Campus.

Tel: 662-2002 Exts. 83921, 83923, 84254, 83866.
Fax/ Direct Line: (868) 645-7526
Email: **sldd.office@sta.uwi.edu**
Hours: Mondays to Fridays: 8:30 am to 4:30 pm

Registration forms are available at the office or from the website at **http://sta.uwi.edu/sldd/**

5.3: 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 exchanges are available to undergraduate and postgraduate students which are:

1. Exchange Students – one semester to one year duration.

2. Study tours through the "UWI Discover's" programme – for one to two weeks.
3. Visiting Students – for postgraduate students doing research on invitation by overseas institution.

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 view our website: http://sta.uwi.edu/internationaloffice/ or contact:

5.4: Information Resources at the Alma Jordan Library

A crucial part of your undergraduate training is learning when you need information, what kind of information you need, what information is available and how to search for, select and obtain relevant information. Such information literacy skills will equip you well for your assignments, examinations and career.

Our wide-ranging collection spans several subject areas relevant to the Faculty of Engineering, under these broad areas: Civil Engineering, Chemical Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering, Agricultural Engineering, Food Science, Petroleum Engineering, Project Management, Geomatics and Land Management.

Our holdings include 400,000 books and 435 print journal titles, we provide access to more than 70,048 electronic journals, 39,140 e-books and 256 databases – much of this material is not available freely on the Internet. Online resources can be accessed on and off-campus. A collection of technical standards is also available, some in print and others online.

Moreover, a sizeable body of regional research may be accessed from maps, newspapers, theses and other materials in the West Indiana and Special Collections Division.

In addition to providing resources you may consult and borrow, the Library offers audio-visual, computing, photocopying and printing facilities, as well as areas for quiet study. Our Reference Service will assist you with your research questions.

You may attend specialist information literacy training and arrange for consultation sessions that will help you to improve your research and citation skills. Training in the use of the reference management software – Endnote is also offered. I will also be available in the Undercroft for consultation on one afternoon each week – notices with the specific start date will be circulated and posted both in print and on Facebook.

Do attend our Library orientation session and tour to ensure, from the start, that you have access to essential support for your studies.

My staff and I will be pleased to assist you with any enquiries you may have. You can visit us on Floor 1 of the Alma Jordan Library or contact me:

Mrs. Mariella Pilgrim (BSc, MISt)
Faculty Liaison Librarian (Engineering)
Engineering Division
The Alma Jordan Library
Tel.: 662 2002, ext. 83594
E-mail: Mariella.pilgrim@sta.uwi.edu
Alma Jordan Library: http://libraries.sta.uwi.edu/ajl
Engineering – Library page:
http://libguides.uwi.edu/c.php?g=11312

5.5: Guidelines 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 following is an extract from The University of the West Indies Policy on Graduate Student Plagiarism approved by the Board for Graduate Studies and Research at its meeting in October 2010:

DEFINITION OF PLAGIARISM:

Plagiarism is defined as the unacknowledged use of the words, ideas or creations of another. The principal categories of unacknowledged use are unacknowledged quotation, which is failure to credit quotations of another person's spoken or written words; and unattributed borrowing, which is failure to credit another person's ideas, opinions, theories, graphs or diagrams. Unattributed borrowing also includes the failure to credit another person's work when paraphrasing from that work. Cosmetic paraphrasing is also plagiarism. This occurs when, even with acknowledgment, the words are so close to the original that what is deemed to have been paraphrased is, in fact a modified quote, but is not presented as such. A more technical form of plagiarism is wrongly attributed borrowing, where one does not acknowledge the work from which one obtained an idea, but quotes, instead, the original source without having read it. This may well convey a broader research effort than that actually expended and may perpetuate misinterpretation.

It is now a requirement for all students to pass their written assignments, be it coursework, theses, research papers, project reports, through plagiarism detection software. In the case of theses, research papers and project reports, SUPERVISORS ARE REQUIRED TO SIT WITH THEIR STUDENTS AND RUN THE THESIS, RESEARCH PAPER OR PROJECT REPORT THROUGH TURNITIN in order to provide guidance on any revisions that may be required as a result of this process. SUPERVISORS MUST THEN SIGN THE RELEVANT FORMS indicating that the student has indeed run their work through a plagiarism detection software.

Post Graduate Students submitting theses, research papers or project reports for examination **must submit an electronic copy of the Turnitin report to the Office of Graduate Studies and Research**. The similarity index in the Turnitin report should **NOT BE HIGHER THAN 9%. Please note that if it exceeds 9% the thesis, project report or research paper will not be accepted for examination by the Office of Graduate Studies and Research.**

The University has created an account to allow you to check your papers for plagiarism.

Here are some instructions for **creating a new student account:**

1. Please visit Turnitin's website at **www.turnitin.com** then click on create account.
2. Under ***New Students Start Here*** click on Create a User Profile
3. Below ***Have you Ever Used Turnitin?*** Scroll down until you see ***Create A New Account*** click on ***Student*** (Please note the credentials will not work in any other instance).
4. Under ***Create A New Student Account***, please insert the credentials (i.e. Class ID and enrolment password), complete the rest of the form and follow the instructions.

In order to obtain the credentials necessary to create your new student account please visit the Office of Graduate Studies and Research to pick up your UWI Grip Card.

USEFUL TURNITIN LINKS
Getting Started:
http://www.turnitin.com/en_us/training/getting-started

For further assistance with Turnitin please visit **www.turnitin.com/help** and submit an e-mail.

5.6: UNIVERSITY REGULATIONS ON PLAGIARISM

Application of these Regulations

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

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, for example:

a. The unacknowledged use is required for conformity with presentation standards;
b. The task set or undertaken is one of translation of the work of another into a different language or format;
c. The task set or undertaken requires producing a result by teamwork for joint credit regardless of the level of individual contribution;
d. The task set or undertaken requires extensive adaptation of models within a time period of such brevity as to exclude extensive attribution;
e. 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 It is not a justification under Regulations 2 and 3 for the unacknowledged use of the words, ideas and creations of another that the user enjoys the right of use of those words, ideas and creations as a matter of intellectual property.

Other definitions

5 In these Regulations,
"Chairman" means the Chairman of the relevant Campus Committee on Examinations;
"Examination Regulations" means the Examination and other forms of Assessment Regulations for First Degrees Associate Degrees Diplomas and Certificates of the University; *set of facts"* means a fact or combination of facts.

Evidence of plagiarism

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

Student Statement on Plagiarism

7 When a student submits for examination work under Regulation 1, the student shall sign a statement, in such form as the Campus Registrar may prescribe, that as far as possible the work submitted is free of plagiarism including unattributed quotation or paraphrase of the work of another except where justified under Regulation 3.

8 Quotation or paraphrase is attributed for the purpose of Regulation 7 if the writer has indicated using conventions appropriate to the discipline that the work is not the writer's own.

9 The University is not prohibited from proceeding with a charge of plagiarism where there is no statement as prescribed under Regulation 7.

Electronic vetting for plagiarism

10 The results of any electronic vetting although capable, where the requirements of Regulation 7 are satisfied, of constituting evidence under these Regulations, are not thereby conclusive of any question as to whether or not plagiarism exists.

Level 1 plagiarism

11 In work submitted for examination where the Examiner is satisfied that Level 1 plagiarism has been committed, he/she shall penalise the student by reducing the mark which would have otherwise been awarded taking into account any relevant Faculty regulations.

Level 2 plagiarism

12 Where an examiner has evidence of Level 2 plagiarism in the material being examined, that examiner shall report it to the Head of Department or the Dean and may at any time provide the Registrar with a copy of that report. In cases where the examiner and the Dean are one and the same, the report shall be referred to the Head of the Department and also to the Campus Registrar.

13 Where any other person who in the course of duty sees material being examined which he or she believes is evidence of Level 2 plagiarism that other person may report it to the Head of Department or the Dean and may at any time report it to the Campus Registrar who shall take such action as may be appropriate.

14 Where a Dean or Head of Department receives a report either under Regulation 12 or 13, the Dean or Head of Department, as the case may be, shall
a. where in concurrence with the report's identification of evidence of Level 2 plagiarism, report the matter to the Campus Registrar; or
b. where not concurring in the identification of evidence of plagiarism, reply to the examiner declining to proceed further on the report; or
c. where concluding that there is evidence of Level 1 plagiarism, reply to the examiner indicating that conclusion and the Examiner shall proceed as under Regulation 11.

15 Where a report is made to the Campus Registrar under Regulation 14a or 16, the Campus Registrar shall lay a charge and refer the matter to the Campus Committee on Examinations.

16 Where the Campus Registrar receives a report alleging Level 2 plagiarism from the Examiner or any other person except the Dean or Head of Department, the Campus Registrar shall refer the matter to a senior academic to determine whether there is sufficient evidence to ground a charge of plagiarism and where such evidence is found, the Campus Registrar shall proceed as under Regulation 15.

17 Where the matter has been referred to the Campus Committee on Examinations pursuant to Regulation 15, the proceedings under these Regulations prevail, over any other disciplinary proceedings within the University initiated against the student based on the same facts and, without prejudice to Regulation 21, any other such disciplinary proceedings shall be stayed, subject to being reopened.

18 If the Campus Committee on Examinations is satisfied, after holding a hearing, that the student

has committed Level 2 plagiarism, it shall in making a determination on the severity of the penalty take into consideration:

a. the circumstances of the particular case;
b. the seniority of the student; and
c. whether this is the first or a repeated incidence of Level 2 plagiarism.

19 Where the Campus Committee is of the view that the appropriate penalty for an offence of Level 2 plagiarism is for the student to be:

(i) awarded a fail mark;
(ii) excluded from some or all further examinations of the University for such period as it may determine;
(iii) be dismissed from the University,
it shall make such recommendation to the Academic Board.

Clearance on a charge of Level 2 plagiarism

20 A determination of the Campus Committee on Examinations that Level 2 plagiarism has not been found will be reported to the Campus Registrar who shall refer it to the Examiner and notify the student.

Where the Committee has not identified Level 2 but has identified Level 1, it shall be reported to the Campus Registrar who shall refer it to the examiner.

Level 2 plagiarism: Appeal to the Senate

21 A student may appeal to the Senate from any decision against him or her on a charge of plagiarism made by Academic Board.

Delegation by Dean or Head of Department

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

Conflict of interest disqualification

23 Any person who has at any time been an examiner of work or been involved in procedures for laying charges in relation to which an issue of plagiarism is being considered under these Regulations shall withdraw from performing any functions under these Regulations other than those of supervisor and examiner.

5.7. Plagiarism Declaration Forms

THE UNIVERSITY OF THE WEST INDIES
The Office of the Board for Undergraduate Studies
INDIVIDUAL PLAGIARISM DECLARATION

STUDENT ID:

COURSE TITLE:

COURSE CODE:

TITLE OF ASSIGNMENT:

This declaration is being made in accordance with the **University Regulations on Plagiarism (First Degrees, Diplomas and Certificates**) and must be attached to all work, submitted by a student to be assessed in partial or complete fulfilment of the course requirement(s), other than work submitted in an invigilated examination.

STATEMENT

1. I have read the Plagiarism Regulations as set out in the Faculty or Open Campus Student Handbook and on University websites related to the submission of coursework for assessment.

2. I declare that I understand that plagiarism is a serious academic offence for which the University may impose severe penalties.

3. I declare that the submitted work indicated above is my own work, except where duly acknowledged and referenced and does not contain any plagiarized material.

4. I also declare that this work has not been previously submitted for credit either in its entirety or in part within the UWI or elsewhere. Where work was previously submitted, permission has been granted by my Supervisor/Lecturer/Instructor as reflected by the attached Accountability Statement.

5. I understand that I may be required to submit the work In electronic form and accept that the University may subject the work to a computer-based similarity detention service.

NAME _____

SIGNATURE _____

DATE _____

GROUP PLAGIARISM DECLARATION

COURSE TITLE:

COURSE CODE:

TITLE OF ASSIGNMENT:

When submitting a group assignment for assessment each member of the group will be required to sign the following declaration of ownership which will appear on the coursework submission sheet.

We the undersigned declare that:

1. We have read the Plagiarism Regulations as set out in the Faculty or Open Campus Student Handbook and on University websites related to the submission of coursework for assessment.

2. We declare that I understand that plagiarism is a serious academic offence for which the University may impose severe penalties.

3. The submitted work indicated above is our own work, except where duly acknowledged and referenced.

4. This work has not been previously submitted for credit either in its entirety or in part within the UWI or elsewhere. Where work was previously submitted, permission has been granted by our Supervisor/Lecturer/Instructor as reflected by the attached Accountability Statement.

5. We understand that we may be required to submit the work In electronic form and accept that the University may check the originality of the work using a computer-based similarity detention service.

NAME _____

SIGNATURE _____

NAME _____

SIGNATURE _____

NAME _____

SIGNATURE _____

DATE _____

ADDITIONAL ACCOUNTABILITY STATEMENT WHERE WORK HAS BEEN PREVIOUSLY SUBMITTED

1. I/We have set out in an attached statement the details regarding the circumstances under which this paper or parts thereof has been previously submitted.

2. I/We have received written permission from my Supervisor/Lecturer/Instructor regarding the submission of this paper and I have attached a copy of that written permission to this statement.

3. I/We hereby declare that the submission of this paper is in keeping with the permission granted.

NAME _____

SIGNATURE _____

DATE _____

SECTION 6 - UNDERGRADUATE SCHEDULE OF COURSES

NOTE: The letter 'E' or 'C' preceding the credit allocation indicates Examination by written papers or by coursework, respectively.

6.1 DEPARTMENT OF CHEMICAL ENGINEERING

6.1.1 BSc in Chemical & Process Engineering

Accredited by the Institution of Chemical Engineers (IChemE) of the UK to the BEng Level, en route to CEng.

Students who pass all mandatory 95 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc in Chemical and Process Engineering

COURSE LISTING

LEVEL 1		
SEMESTER 1	**16 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 1000	Introduction to Chemical & Process Engineering	E3
CHNG 1001	Applied Chemistry I	E2
CHNG 1003	Science of Materials	E3
CHNG 1008	Communication/ Ethics	C2
ENGR 1001	Information Technology for Engineers	E3
ENGR 1180	Engineering Mathematics I	E3

LEVEL 1		
SEMESTER 2	**17 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 1002	Applied Chemistry II	E3
CHNG 1004	Chemical Process Principles I	E3
CHNG 1006	Transport Phenomena I	E3
CHNG 1007	Chemical Engineering Laboratory I	C2
ECNG 1007	Electrical Engineering Technology	E3
MENG 1001	Engineering Thermodynamics I	E3

LEVEL 2		
SEMESTER	**17 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 2000	Transport Phenomena II (Prerequisite: CHNG 1006)	E3
CHNG 2001	Process Design & Economics I	E3
CHNG 2002	Chemical Process Principles II	E3
CHNG 2004	Separation Processes I	E3
CHNG 2009	Chemical Engineering Laboratory II	C2
MATH 2230	Engineering Mathematics II (Prerequisite: ENGR 1180)	E3

LEVEL 2		
SEMESTER 2	**15 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 2003	Computer-aided Engineering	C3
CHNG 2006	Process Dynamics & Control (Prerequisite: ENGR 1180)	E3
CHNG 2007	Particle Technology	E3
CHNG 2008	Chemical Engineering Practice	C2
CHNG 2010	Chemical Engineering Laboratory III	C2
MATH 2240	Statistics	E2

LEVEL 3		
YEAR-LONG	**6 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG3012	Chemical Engineering Design Project	C6

LEVEL 3		
SEMESTER 1	**15 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 3001	Transport Phenomena III (Prerequisite: CHNG 1006)	E3
CHNG 3004	Chemical Reaction Engineering I	E3
CHNG 3006	Process Design & Economics II (Prerequisite: CHNG 2001)	E3
CHNG 3007	Separation Processes II (Prerequisite: CHNG 2004)	E3
MENG 3000	Engineering Management I	E3

LEVEL 3		
SEMESTER 2	**9 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 3002	Biochemical Engineering	E3
CHNG 3013	Chemical Engineering Research Project	C3
CHNG 3014	Safety & Loss Prevention in Process Industries	E3

6.1.2 BSc (Hons) in Petroleum Geoscience

Accredited by the Geological Society of London *en route* to CGeol.

LEARNING OUTCOMES
The BSc programme in Petroleum Geoscience aims to provide the Upstream Petroleum Industry with 'ready to work' graduates in Petroleum Geoscience. It also provides graduates with the required background and skills to easily undertake postgraduate work in any of the specializations in Petroleum Geoscience.

Graduates
- Can appropriately apply the principles, theories, tools and techniques of Petroleum Geoscience in the exploration and development of Petroleum Accumulations.
- Can undertake projects in Petroleum Geoscience, Petroleum Geology and Petroleum Geophysics.
- Have the background and ability to work with specialists in the Upstream Petroleum Industry.
- Can use their skills to work independently and /or as a member of a team.
- Confidently develop and effectively communicate professional opinions in their field and on topical issues.
- Have developed a sound basis for lifelong, self-motivated academic and professional studies and for personal integrity.

Students who pass all mandatory 100 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc in Petroleum Geoscience.

COURSE LISTING

LEVEL 1

SEMESTER 1	**17 CREDITS**	
Course Code	**Course Title**	**Credits**
CHNG 1001	Applied Chemistry I	E2
ENGR 1001	Information Technology for Engineers	E3
ENGR 1180	Engineering Mathematics I	E3
PGSC 1000	Introduction to Geology & Geological History	E3
PGSC 1002	Paleontology & Stratigraphy	E3
PGSC 1003	Engineering Graphics & Geodetics for Petroleum Geoscience	C3

LEVEL 1

SEMESTER 2	**16 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 1001	Mechanics of Fluids I	E3
PGSC 1006	Applied Chemistry II	E2
MATH 2240	Statistics	E2
PGSC 1001	Introduction to Earth Sciences, Processes & Caribbean Geology	E3
PGSC 1004	Field & Mapping Principles	C3
PGSC 1005	Geophysics Fundamentals	E3

Internship: 8 weeks with industry (optional)

LEVEL 2

YEAR-LONG	**6 CREDITS**	
Course Code	**Course Title**	**Credits**
PGSC2014	Fundamental Petroleum Geology Petroleum Geophysics	E6

LEVEL 2

SEMESTER 1	**13 CREDITS**	
Course Code	**Course Title**	**Credits**
MATH 2230	Engineering Mathematics II	E3
PGSC 2000	Structural Geology	E3
PGSC 2001	Sedimentology	E3
PGSC 2010	Communication Skills	C2
PGSC 2011	Mineralogy	E2

LEVEL 2

SEMESTER 2	**16 CREDITS**	
Course Code	**Course Title**	**Credits**
PGSC 2002	Petrophysics	E3
PGSC 2004	Geochemistry of Petroleum	E2
PGSC 2006	Stratigraphy	E3
PGSC 2008	HSE for Upstream Petroleum Industry	E3
PGSC 2009	Field & Geologic Mapping	C3
PGSC 2012	Igneous & Metamorphic Petrology	E2

Two (2) weeks Geophysics workshop and one (1) week Field Geology at beginning of Summer.

Internship: Working for 10-12 weeks with industry.

LEVEL 3

YEAR-LONG	**16 CREDITS**	
Course Code	**Course Title**	**Credits**
PGSC 3013	Advanced Petroleum Geology	E4
PGSC 3014	Advanced Petroleum Geophysics	E4
PGSC 3015	Geoscience Seminar	C2
PGSC 3016	Petroleum Geoscience Project	C6

LEVEL 3
SEMESTER 1 **10 CREDITS**

Course Code	Course Title	Credits
MENG 3000	Engineering Management	E3
PGSC 3001	Petroleum Geology of the Southeast Caribbean	E2
PGSC 3003	Formation Evaluation	E2
PGSC 3004	Essential Petroleum Engineering	E3

LEVEL 3
SEMESTER 2 **6 CREDITS**

Course Code	Course Title	Credits
PGSC 3005	Computational Petroleum Geology & Geophysics	C3
PGSC 3008	Prospect Assessment, Evaluation & Petroleum Economics	E3

NOTE: There may be field-work on a Saturday and/or on a Sunday.

6.2 DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

Programme Aim
To provide an educational foundation upon which graduate civil engineers can build with further learning and experience in order to achieve higher professional status and responsibility within the civil engineering construction industry, while increasing their contribution to improving the quality of life in society.

Programme Outcomes
Holders of the BSc (Hons) Degree in Civil Engineering, or Civil with Environmental Engineering will be able to:

i) Apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and
- understanding, and to initiate and carry out civil infrastructure projects;

ii) Critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgments, and
- to frame appropriate questions to achieve a solution - or identify a range of solutions - to a civil or environmental
- engineering system or design problem;

iii) Communicate information, ideas, problems, and solutions to both specialist and non-specialist audiences on the
- conceptualization and design of civil and environmental engineering systems and infrastructures; and
- Demonstrate qualities and transferable skills necessary for employment requiring:
  - the exercise of initiative and personal responsibility;
  - decision-making in complex and unpredictable contexts; and
  - the learning ability needed to undertake appropriate further training of a professional or equivalent nature.

Accredited by the Joint Board of Moderators (JBM) of the UK: BEng (Hons) Accredited CEng (Partial) up to 2014 -2015 cohort.

This degree is accredited as:
1. Fully satisfying the educational base for an Incorporated Engineer (IEng).
2. Partially satisfying the educational base for a Chartered Engineer (CEng).A programme of accredited Further Learning will be required to complete the educational

base for CEng. Such Further Learning can be obtained by successful completion of one of the department's accredited MSc programmes.

The Department is in the process of satisfying the accreditation requirement by December 2016 for cohorts 2015-2016 and beyond.

See **www.jbm.org.uk** for further information and details of Further Learning programmes for CEng.

Students who pass 97credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc Civil Engineering OR BSc in Civil with Environmental Engineering. Unless otherwise stated, all courses listed are mandatory.

6.2.1 BSc (Hons) Civil Engineering

COURSE LISTING

LEVEL 1

SEMESTER 1	**16 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 1005	Science of Materials	E3
ENGR 1000	Introduction to Engineering	E3
ENGR 1180	Engineering Mathematics I	E3
CVNG 1009	Engineering Graphics	C3
CVNG 1012	Civil Engineering Law	E2
CVNG 1013	Introduction to Engineering Mechanics	E2

LEVEL 1

SEMESTER 2	**17 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 1000	Mechanics of Solids	E3
CVNG 1001	Mechanics of Fluids I	E3
CVNG 1002	Civil Engineering Design I	C3
CVNG 1010	Information Technology for Engineers	C2
CVNG 1011	Geology	E3
CVNG 1008	Building Services Engineering	E3

LEVEL 2 - SEMESTER 1 & 2

YEAR-LONG	**7 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 2003	Civil Engineering Design II (Prerequisite: CVNG 1002)	C3
CVNG 2006	Structural Design 1 (Prerequisite: CVNG1000)	C4

LEVEL 2

SEMESTER 1	13 **CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 2005	Mechanics of Fluids II (Prerequisite: CVNG 1001)	E3
CVNG 2001	Structural Mechanics (Prerequisite: CVNG 1000)	E3
CVNG 2008	Soil Mechanics I (Prerequisite: CVNG 1013)	E2
MATH 2230	Engineering Mathematics II (Prerequisite: ENGR 1180)	E3
GEOM 2015	Geomatics for Civil & Environmental Engineers	E2

LEVEL 2

SEMESTER 2	**12 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 2010	Civil Engineering Management	E3
CVNG 2011	Engineering Hydrology (Prerequisite: CVNG2005)	E3
CVNG 2009	Soil Mechanics II (Prerequisite: CVNG 2008)	E2
MATH 2240	Statistics	E2
GEOM 2017	Geoinformatics for Civil & Environmental Engineers	E2

LEVEL 3 - SEMESTER 1 & 2

YEAR-LONG	**12 CREDITS**	
Course Code	**Course Title**	**Credits**
CVNG 3014	Civil Engineering Design Project (Prerequisites: Normally all Level 1 and Level 2 Courses)	C6
CVNG 3015	Special Investigative Project (Prerequisites: Normally all Level 1 and Level 2 Courses)	C6

LEVEL 3

SEMESTER 1	**(18 CREDITS INCL. YEAR-LONG)**	
Course Code	**Course Title**	**Credits**
CVNG 3002	Structural Analysis (Prerequisites: CVNG 2001, CVNG 2006)	E3
CVNG 3005	Foundation Engineering (Prerequisites: CVNG 2008, CVNG 2009)	E3
CVNG 3007	Environmental Engineering I	E3
CVNG 3009	Highway Engineering (Prerequisite: MATH 2230, MATH 2240, CVNG 2003, CVNG 2009)	E3
CVNG 3003	Structural Design II (Prerequisite: CVNG 2001, CVNG 2006)	C2

LEVEL 3

SEMESTER 2		
Course Code	**Course Title**	**Credits**
ENGR 3001	Natural Hazards & Disaster Management in the Caribbean	E3

LEVEL 3
SEMESTER 2 **12 CREDITS**
Two (2) options, subject to the approval of the Head of Dept:

Course Code	Course Title	Credits
CVNG 3001	Structural Engineering (Prerequisites: CVNG 2001, CVNG 2006)	E3
CVNG 3004	Structural Dynamics (Prerequisite: CVNG 3002)	E3
CVNG 3006	Environmental Geotechnics (Prerequisite: CVNG 3005)	E3
CVNG 3008	Environmental Engineering II (Prerequisites: CVNG 2005, CVNG 3007)	E3
CVNG 3010	Transportation Engineering (Prerequisite: CVNG 3009)	C3
CVNG 3011	Pavement Design & Management (Prerequisite: CVNG 3009)	E3
CVNG 3013	Coastal Engineering (Prerequisite: CVNG 2005)	E3
CVNG 3017	Offshore Geotechnical Engineering (Prerequisites: CVNG 2008; CVNG 2009)	E3

6.2.2 BSc (Hons) Civil with Environmental Engineering

(Levels 1 and 2 are common with BSc (Hons) Civil Engineering)

COURSE LISTING

LEVEL 3
YEAR-LONG

Course Code	Course Title	Credits
CVNG 3020	Design Project Environmental (Prerequisites: Normally all Level 1 and Level 2 Courses)	C6
CVNG 3021	Special Investigative Project Environmental (Prerequisites: Normally all Level 1 and Level 2 Courses)	C6

LEVEL 3
SEMESTER 1 **(18 CREDITS INCL. YEAR-LONG)**

Course Code	Course Title	Credits
CVNG 3002	Structural Analysis (Prerequisites: CVNG 2001, CVNG 2006)	E3
CVNG 3005	Foundation Engineering (Prerequisites: CVNG 2008, CVNG 2009)	E3
CVNG 3007	Environmental Engineering I	E3
CVNG 3009	Highway Engineering (Prerequisite: MATH 2230, MATH 2240, CVNG 2003, CVNG 2009)	E3
CVNG 3016	Design of Environmental Systems (Prerequisites: CVNG 3002, CVNG 3007)	C2

LEVEL 3
SEMESTER 2

Course Code	Course Title	Credits
ENGR 3001	Natural Hazards & Disaster Management in the Caribbean	E3

LEVEL 3
SEMESTER 2
(14 CREDITS INCL. YEAR-LONG AND OPTIONS)
Two (2) options, subject to the approval of the Head of Department:

Course Code	Course Title	Credits
CVNG 3006	Environmental Geotechnics (Prerequisite: CVNG 3005)	E3
CVNG 3008	Environmental Engineering II (Prerequisites: CVNG 2005, CVNG 3007)	E3
CVNG 3013	Coastal Engineering (Prerequisite: CVNG 2005)	E3
CVNG 3017	Offshore Geotechnical Engineering (Prerequisites: CVNG 2008; CVNG 2009)	E3

NOTE: THE LETTER 'E' OR 'C' PRECEDING THE CREDIT ALLOCATION INDICATES EXAMINATION BY WRITTEN PAPERS OR BY COURSEWORK, RESPECTIVELY.

1. Course loadings in any semester shall not exceed the credits as stated above, unless approved by the University.
2. A minimum of 97 credits is required for graduation.
3. Successful completion of the Seminar programme is a compulsory requirement for the award of the BSc Degree.

6.3 DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

6.3.1 BSc in Electrical & Computer Engineering

Students who pass at least 93 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their programme and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of the degree in Electrical and Computer Engineering. Unless otherwise stated, all courses listed are mandatory.

COURSE LISTING

LEVEL 1
SEMESTER 1 **15 CREDITS**

Course Code	Course Title	Credits
ECNG 1000	Electrical Circuits	E3
ECNG 1010	Communication Skills for Engineers	C2
ECNG 1011	Electronics	E3
ECNG 1012	Engineering Science & Technology	C4
ENGR 1180	Engineering Mathematics I	E3

LEVEL 1
SEMESTER 2 **15 CREDITS**

Course Code	Course Title	Credits
ECNG 1006	Laboratory & Project Design I	C3
ECNG 1009	Introduction to Programming	C3
ECNG 1013	Introduction to Thermodynamics	E2
ECNG 1014	Digital Electronics	E3
ECNG 1015	Introduction to Electrical Energy Systems	E3
ECNG 1016	Mathematics for Electrical Engineers I	E1

LEVEL 2
SEMESTER 1 **15 CREDITS**

Course Code	Course Title	Credits
ECNG 2004	Laboratory & Project Design II	C3
ECNG 2007	Computer Systems & Software Design (Prerequisite: ECNG 1009)	C3
ECNG 2011	Signals & Systems (Prerequisite: ECNG 1016)	E3
ECNG 2012	Electronics & Instrumentation	E3
ECNG 2013	Mathematics for Electrical Engineers II (Prerequisite: ENGR 1180)	E3

LEVEL 2
SEMESTER 2 **15 CREDITS**

Course Code	Course Title	Credits
ECNG 2000	Electromechanical Energy Conversion Systems (Prerequisites: ECNG 1000 and ECNG 1015) (For Electrical and Computer Engineering students only)	E3
ECNG 2001	Communication Systems I (Prerequisites: ECNG 2011 and ECNG 2013)	E3
ECNG 2005	Laboratory & Project Design III	C3
ECNG 2006	Introduction to Microprocessors (Prerequisites: ECNG 1009 and ECNG 1014)	E3
ECNG 2009	Control Systems (Prerequisite: ECNG 2011)	E3

LEVEL 3
Students doing Level 3 courses must:

- Register for all courses listed as compulsory.
- Select at least one (1) of the following options:
  - Communication Systems
  - Computer Systems Engineering
  - Control Systems
  - Electronic Systems
  - Energy Systems

This is achieved by registering for electives that are mandatory for these options as listed in the Department's Registration Guide.

COMPULSORY COURSES

YEAR-LONG **6 CREDITS**

Course Code	Course Title	Credits
ECNG 3020	Special Project	C6

LEVEL 3
SEMESTER 1 **3 CREDITS**

Course Code	Course Title	Credits
ECNG 3021	Introduction to Engineering Management & Accounting Systems	E3

LEVEL 3
SEMESTER 2 **3 CREDITS**

Course Code	Course Title	Credits
ECNG 3022	Electromagnetic Field Theory (Prerequisite: ECNG 2013)	E3

PLUS 21 credits to be obtained from:

ELECTIVES

SEMESTER 1

Course Code	Course Title	Credits
ECNG 3001	Communication Systems II (Prerequisite: ECNG 2001)	E3
ECNG 3002	Data Communication Systems	E3

ECNG 3006	Microprocessor Systems - Design & Applications (Prerequisite: ECNG 2006)	E3
ECNG 3008	Power Electronics Circuits (Prerequisite: ECNG 2000)	E3
ECNG 3015	Industrial & Commercial Electrical Systems (Prerequisite: ECNG 2000)	E3
ECNG 3023	Introduction to Software Engineering (Prerequisite: ECNG 2007)	E3
ECNG 3029	Robotic Technology and Applications	E3
ECNG 3031	Engineering & Technology for Acoustics & Music	E3
ECNG 3032	Control & Instrumentation I (Prerequisite: ECNG 2009)	E3
ECNG 3033	Communication Skills for Engineers II (Prerequisite: ECNG 1010)	C3
ECNG 3034	Embedded System Product Development	E3
MATH 3530	Engineering Mathematics III (Prerequisite: MATH 2230/ ECNG 2013)	E3
MENG 3006	Production Management Distribution Systems	E3

SEMESTER 2

Course Code	Course Title	Credits
ECNG 3003	Telecommunications Networks (Prerequisite: ECNG 3001 and ECNG 3002)	E3
ECNG 3004	Control & Instrumentation II (Prerequisite: ECNG 3032)	E3
ECNG 3010	Electrical Machines & Drive Systems (Prerequisite: ECNG 2000)	E3
ECNG 3012	Power Systems Analysis (Prerequisite: ECNG 3015)	E3
ECNG 3013	Electrical Transmission & Distribution Systems (Prerequisite: ECNG 3015)	E3
ECNG 3016	Advanced Digital Electronics	E3
ECNG 3019	Advanced Control Systems Design (Prerequisite: ECNG 2009)	E3
ECNG 3024	Network Synthesis	E3
ECNG 3025	Discrete Signal Processing	E3
ECNG 3030	Electromechanical Energy Conversion (Prerequisite: ECNG 1007) (Not for Electrical and Computer Engineering Students)	E3
IENG 3009	Industrial Database Systems & Design	E3
MENG 3001	Engineering Management II	E2

NOTE: THE LETTER 'E' OR 'C' PRECEDING THE CREDIT ALLOCATION INDICATES ASSESSMENT BY WRITTEN EXAMINATION OR BY COURSEWORK, RESPECTIVELY.

Students are asked to note the following:

i) The maximum course load normally allowed by the University is 18 credits per semester.

ii) The previous Course Listing provides the full complement of courses which the Department is authorised to teach at the Undergraduate level. Level 3 students should consult the Registration Guide for the list of electives which the Department will actually offer.

iii) The Registration Guide may be obtained from the Department's website at**:** **http://sta.uwi.edu/eng/electrical/index.asp** or the Department's office.

iv) The Department is only responsible for courses with the 'ECNG' code. Students should therefore, consult respective Departments for further information on other courses listed.

v) **REGISTRATION FOR LEVEL 3 COURSES WILL NOT *NORMALLY* BE APPROVED UNTIL CREDITS FOR ALL REQUIRED LEVEL 1 COURSES HAVE BEEN ATTAINED.**

vi) The minimum requirement at Level 3 is 33 credits over the two semesters.

vii) The requirements for graduation are**: A MINIMUM OF 93 CREDITS inclusive of all Levels 1, 2 and 3 compulsory courses as well as Level 3 elective courses, which MUST constitute a thematic option.**

viii) Selection of a particular thematic option does not exclude the possibility of registering for courses in other thematic areas.

6.4 DEPARTMENT OF GEOMATICS ENGINEERING AND LAND MANAGEMENT

6.4.1 BSc Geomatics

Students who pass at least 95 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc in Geomatics. Unless otherwise stated, all courses listed are mandatory.

The BSc Geomatics programme is accredited by the Chartered Institution of Civil Engineering Surveyors (**ICES**)

PROGRAMME AIMS AND LEARNING OUTCOMES

Aims

The BSc Geomatics programme aims at providing a comprehensive and detailed knowledge of the theory and methods of land surveying and the management of land information that prepare and enable graduates to work effectively in response to regional, national and international needs.

Learning Outcomes

The intended learning outcomes are that graduates with a first degree in Geomatics will be able to:

- Explain the principles, theories, tools, and techniques of surveying and land information;
- Appropriately apply specialised knowledge in land surveying and land information management and other transferable skills appropriate to a wide range of disciplines;
- Use the skills required to work independently and as a member of a team;
- Critically examine land surveying and land information management problems and develop solutions within the context of given specifications and standards;
- Confidently develop and effectively communicate professional opinions on topical issues;
- Establish a sound basis for lifelong, self-motivated academic and professional studies.

COURSE LISTING

LEVEL 1

SEMESTER 1		**15 CREDITS**
Course Code	**Course Title**	**Credits**
ENGR 1000	Introduction to Engineering	E3
ENGR 1001	Information Technology for Engineers	E3
GEOM 1001	Mathematics for Geomatics Engineering	E3
GEOM 1010	Surveying I	E3
GEOM 1011	Surveying Practice	C3

LEVEL 1

SEMESTER 2		**17 CREDITS**
Course Code	**Course Title**	**Credits**
GEOM 1015	Surveying II (Prerequisite: GEOM 1010)	E3
GEOM 1020	Photogrammetry	E3
GEOM 1030	Geodesy	E3
GEOM 1040	Statistics for Surveying	E3
GEOM 1045	Communication Skills	C2
GEOM 1050	Surveying Project (Prerequisite: GEOM 1010)	C3

LEVEL 2

SEMESTER 1		**15 CREDITS**
Course Code	**Course Title**	**Credits**
GEOM 2001	Numerical Methods for Geomatics Engineering (Prerequisite GEOM 1001)	E3
GEOM 2010	Fundamentals of GIS	E3
GEOM 2020	Digital Photogrammetry (Prerequisite: GEOM 1020)	E3
GEOM 2030	Adjustment Computations (Prerequisite: GEOM 1040)	E3
GEOM 2040	Hydrographic Surveying (Prerequisite: GEOM 1015)	E3

LEVEL 2

SEMESTER 2		**18 CREDITS**
Course Code	**Course Title**	**Credits**
GEOM 2000	Health and Safety Seminars	C0
GEOM 2060	Cartography	E3
GEOM 2025	Remote Sensing	E3
GEOM 2035	Geodetic Surveying (Prerequisites: GEOM 1015, GEOM 1030)	E3
GEOM 2045	Land Law	E3
GEOM 2048	Introduction to Planning	E3
GEOM 2050	Mapping Project (Prerequisites: GEOM 1050, GEOM 2020)	C3

LEVEL 3
SEMESTER 1 **15 CREDITS**

Course Code	Course Title	Credits
IENG 3016	Applied Project Management	E3
GEOM 3010	Cadastral Systems (Prerequisite: GEOM 2045)	E3
GEOM 3030	Global Navigation Satellite Systems (Prerequisite: GEOM 2035)	E3
GEOM 3040	Integrated Surveying Design Project	C3
	Elective Course	E3

LEVEL 3
SEMESTER 2 **15 CREDITS**

Course Code	Course Title	Credits
GEOM 3015	Professional Practice	E3
GEOM 3025	Engineering Surveying	E3
GEOM 3050	Special Investigative Project	C3
	Elective Course	E3
	Elective Course	E3

ELECTIVES
Candidates in Level 3 are expected to gain 9 credits of elective courses from the list below, or other courses subject to the approval of the Head of Department.

LEVEL 3
SEMESTER 1

Course Code	Course Title	Credits
GEOM 3020	Professional Internship	E3
GEOM 3035	Hydrography (GEOM 2040)	E3
LMGV 3004	Valuation Methods I †	E3
MATH 3530	Mathematics III	E3

LEVEL 3
SEMESTER 2

Course Code	Course Title	Credits
ENGR 3001	Natural Hazards & Disaster Management in the Caribbean	E3
AGSL 3002	Soil Survey and Land Evaluation	E4
LMGV 3003	Land Economy	E3

NOTE: The letter "E" or "C" preceding the credit allocation indicates Examination by written papers or by Coursework, respectively.

6.4.2 BSc in Land Management (Valuation)

Students who pass at least 94 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of B.Sc. in Land Management (Valuation). Unless otherwise stated, all courses listed are mandatory.

PROGRAMME AIMS AND OBJECTIVES
Aims
The Land Management (Valuation) programme aims to provide excellent and expert training, and to graduate valuation surveying professionals who are proficient in the principles and concepts of valuation surveying within the framework of land management, in support of the Caribbean regions' socioeconomic and environmental goals and objectives.

General Objectives
The graduate with a BSc degree in Land Management (Valuation) will be able to, regionally and locally:

- apply appropriate skills to satisfy a growing need for effective land valuation and land management in support of economic, environmental and social goals;
- interact with other key professionals in the construction industry to support national, institutional, and individual physical development goals; and
- advance research and application in, land valuation, land management, land administration and land economy.

Learning Outcomes
The following learning outcomes were conceptualised for the Land Management (Valuation) programme and the graduate should be able to:

1. Describe how the economy in general and land markets in particular, impact on land and estate values and how different methods of valuation are applicable in different circumstances.
2. Apply spatial measurement principles and modem technologies and methodologies to determine inputs to valuation surveying
3. Apply valuation and cost benefit procedures, computations and analyses to support economic decision making related to land and property.
4. Evaluate and synthesise estate management and economic development policy for public and private development
5. Evaluate and synthesise the role of land valuation information systems, such as fiscal cadastres, in optimising economic efficiencies, while maintaining socially equitable allocation and distribution of land.

COURSE LISTING

LEVEL 1

SEMESTER I		**19 CREDITS**
Course Code	**Course Title**	**Credits**
ACCT 1002	Introduction to Financial Accounting	E3
ECON 1001	Introduction to Economics I	E3
ENGR 1001	Information Technology for Engineers	E3
GEOM 1010	Surveying I	E3
LMGV 1003	Surveying Practical	C1
LMGV 1004	Valuation Methods I	E3
LMGV 1005	Valuation Project I	C3

LEVEL 1

SEMESTER 2		**14 CREDITS**
Course Code	**Course Title**	**Credits**
ACCT 1003	Introduction to Cost & Managerial Accounting	E3
CVNG 1008	Building Services Engineering	E3
ECON 1002	Introduction to Economics II	E3
GEOM 1045	Communication Skills	C2
LMGV 1000	Land Economy	E3

LEVEL 2

SEMESTER 1		**12 CREDITS**
Course Code	**Course Title**	**Credits**
ECON 1005	Introduction to Statistics	E3
GEOM 2010	Fundamentals of GIS	E3
MGMT 2006	Management Information Systems I	E3
MGMT 2021	Business Law	E3

LEVEL 2

SEMESTER 2		**18 CREDITS**
Course Code	**Course Title**	**Credits**
ECON 2020	Caribbean Economy	E3
GEOM 2000	Health and Safety Seminars	C0
GEOM 2045	Land Law	E3
GEOM 2048	Introduction to Planning	E3
LMGV 2002	Valuation Methods II	E3
LMGV 2003	Valuation Project II	C3
MGMT 3051	Taxation I	E3

LEVEL 3

YEAR-LONG PROJECT		**6 CREDITS**
Course Code	**Course Title**	**Credits**
LMGV 3050	Land Management Research Project	C6

LEVEL 3

SEMESTER 1	**(12 CREDITS)**	
Course Code	**Course Title**	**Credits**
GEOM 3010	Cadastral Systems	E3
LMGV 3000	Applied Valuation	E3
LMGV 3005	Introduction to Quantity Surveying	E3
MENG 3000	Engineering Management I	C3

LEVEL 3

SEMESTER 2	**(13 CREDITS)**	
Course Code	**Course Title**	**Credits**
GEOM 3015	Professional Practice	E3
IENG 2006	Engineering Economics, Accounting, & Financial Management	E4
LMGV 3002	Estate and Land Management	E3
LMGV 3060	Introduction to Land Administration	E3

6.5 DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

BSc (Hons) Programmes in the Department of Mechanical and Manufacturing Engineering (B. Sc. Industrial Engineering, B. Sc. Mechanical Engineering and the B. Sc. Mechanical Engineering with Biosystems) have been accredited by the Institute of Mechanical Engineers Institution of Mechanical Engineers (IMechE) of the UK to the BEng Level, en route to CEng.

6.5.1 BSc in Industrial Engineering

AIMS

The aim of the Industrial Engineering Programme is to produce engineers, with broad-based knowledge and skills in production and service-oriented systems, who are capable of dealing with the design, analysis, operation, control and improvement of the systems, which provide goods and services to our society.

The programme provides a sound background in technical topics in the first two years as well as the necessary non-technical subject areas. In the third year the students are introduced to a variety of concepts, tools and techniques in Industrial Engineering and Management, students also undertake a major project to demonstrate their ability to apply the knowledge and skills acquired throughout the programme to develop solutions to real-world problems.

EXPECTED LEARNING OUTCOMES/OUTPUTS

Industrial Engineering Graduates should be able to:

- Formulate and analyze problems, then synthesize and develop appropriate solutions and improvements to production operations.
- Design and operate effective systems and procedures for using the basic resources of production (people, materials, machines and capital) in organizations.
- Function in a wide range of industrial organizations such as banks, regulatory agencies and other institutions in the context of techno-economic evaluations, project management and systems implementation.

Students are required to complete at least 97 credits given that they have completed the specified number of electives for the award of the BSc in Industrial Engineering. Students who pass at least 97credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering list of students recommended for the award of BSc in Industrial Engineering. Unless otherwise stated, all courses listed are mandatory.

COURSE LISTING

LEVEL 1

SEMESTER 1		**16 CREDITS**
Course Code	**Course Title**	**Credits**
ENGR 1001	Information Technology for Engineers	E3
ENGR 1180	Engineering Mathematics I	E3
MENG 1008	Engineering Drawing	C3
MENG 1010	Statics and Strength of Materials	E3
MENG 1005	Workshop Technology	C2
MENG 1006	Introduction to Engineering	E2

LEVEL 1

SEMESTER 2		**16 CREDITS**
Course Code	**Course Title**	**Credits**
ECNG 1007	Electrical Engineering Technology	E3
MENG 1001	Engineering Thermodynamics I	E3
MENG 1004	Engineering Dynamics	E3
MENG 1012	Science of Materials C	E2
MENG 1009	Machine Drawing (Prerequisite: MENG 1008)	C2
MENG 1011	Engineering Fluid Mechanics	E2
MENG 1013	Communication Skills	CI

LEVEL 2

SEMESTER 1		**16 CREDITS**
Course Code	**Course Title**	**Credits**
IENG 2002	Operations Research I	E2
MENG 2009	Industrial Instrumentation	E2
MATH 2230	Engineering Mathematics II (Prerequisite: ENGR 1180)	E3
MATH 2250	Industrial Statistics	E3
MENG 2004	Mechanics of Machines I (Prerequisite: MENG 1004)	E3
MENG 2011	Machine Design I (Prerequisites: MENG 1009; MENG 1010)	C3

LEVEL 2

SEMESTER 2		**18 CREDITS**
Course Code	**Course Title**	**Credits**
IENG 2000	Work Study & Ergonomics	E3
IENG 2004	Industrial Database Systems & Design (Prerequisite: ENGR 1001)	E3

IENG 2006	Engineering Economics, Accounting & Financial Management	E4
IENG 2007	Operations Research II (Prerequisite: IENG2002)	E2
MENG 2008	Manufacturing Technology	E3
MENG 2015	Control Systems Technology (Prerequisite: ECNG 1007)	E3

LEVEL 3

SEMESTER:	**YEAR-LONG**	**6 CREDITS**
Course Code	**Course Title**	**Credits**
IENG 3012	Industrial Engineering Project	C6

LEVEL 3

SEMESTER 1		**13/14 CREDITS**
Course Code	**Course Title**	**Credits**
IENG 3000	Industrial Management	E3
IENG 3005	Quality Control & Reliability Engineering (Prerequisite: MATH 2250)	E2

Together with any THREE (3) of the following elective courses, subject to the approval of the Head of Department, to be chosen from:

Course Code	**Course Title**	**Credits**
IENG 3016	Applied Project Management	E3
IENG 3015	Enterprise Information Systems (Prerequisite: IENG 2004)	E3
IENG 3017	Industrial Design of Products and Services	C3
MENG 3015	Materials Technology	E2

LEVEL 3

SEMESTER 2		**12/14 CREDITS**
Course Code	**Course Title**	**Credits**
IENG 3001	Production Planning & Control	E3
IENG 3002	Plant Layout & Materials Handling	E2
MENG 3016	Maintenance & Safety Engineering	E3

Together with any TWO (2) courses of the following elective courses, subject to the approval of the Head of Department, to be chosen from:

Course Code	**Course Title**	**Credits**
ENGR 3000	The Technology of the Steelpan (Prerequisite: MATH 2230)	E3
IENG 3003	Behavioural Science in Management	E2
IENG 3006	Automation	E2
IENG 3013	Simulation of Industrial & Business Processes	E3
MENG 3001	Engineering Management II	E2

6.5.2 BSc in Mechanical Engineering

AIMS

To provide students with a core engineering educational base in the first two years through an integration of subject material including engineering analysis and design in such courses/modules as the following:

- *Engineering Materials, Mechanics & Machines,*
- *Thermodynamics and Heat Transfer,*
- *Instrumentation and Controls,*
- *Manufacturing Processes and Systems,*
- *Design, which is a thread that runs through the length of the programme, starting at Level 1 with Engineering Graphics, Drawing and Design, continuing throughout Level 2, leading to Product Design and Development, CAD/CAM and Final Year Projects at Level 3.*
- *Support courses in Mathematics, Computing, Fluid Mechanics and Electrical Energy Systems, which are provided by Other Departments, in consultation with the Department of Mechanical and Manufacturing Engineering.*

To provide breadth and depth in the final year of the Bachelor's degree programmes through exposure to such areas as: Business and Management, Power Plant Engineering, HVAC Systems, Component/Product Design and Manufacturing, Maintenance, Health & Safety and Production Operations. Students may opt to serve the Agro Industrial Sector of the region by selecting courses for the Minor in Biosystems Engineering offered by the Department. To provide students with the opportunity to develop their skills in project management, problem solving, investigation and technical report writing, through a major project, which also integrates various other subject areas in the programme.

EXPECTED LEARNING OUTCOMES/OUTPUTS

Mechanical Engineering Graduates should be able to:

Have acquired the knowledge base that makes them versatile for employment in a wide range of industries, through a selection of courses in the final year that build upon the first and second years for coherent specialization to operate effectively in one or more of the industrial/economic sectors of the Caribbean:

- Utilities (electricity generation, water and sewerage).
- Oil, Gas and Petrochemical industries, particularly in Trinidad and Tobago.
- Other Process Industries.

- Bauxite and Mining Industries, in Jamaica and Guyana particularly.
- Iron and Steel and downstream industries.
- The Agri/Food Industrial Sector.
- Manufacturing.
- Construction (Fabrication, Building Services etc.).
- Transportation.
- Other Engineering Industries.
- Industrial Planning and Development in the Private and Public Sectors.

Students who pass at least 95 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc in Mechanical Engineering. Unless otherwise stated, all courses listed are mandatory.

LEVEL 1
SEMESTER 1 **16 CREDITS**

Course Code	Course Title	Credits
MENG 1012	Science of Materials C	E2
ENGR 1001	Information Technology for Engineers	E3
ENGR 1180	Engineering Mathematics I	E3
MENG 1008	Engineering Drawing	C3
MENG 1010	Statics and Strength of Materials	E3
MENG 1006	Introduction to Engineering	E2

LEVEL 1
SEMESTER 2 **16 CREDITS**

Course Code	Course Title	Credits
ECNG 1007	Electrical Engineering Technology	E3
MENG 1001	Engineering Thermodynamics I	E3
MENG 1004	Engineering Dynamics	E3
MENG 1005	Workshop Technology	C2
MENG 1009	Machine Drawing (Prerequisite: MENG 1008)	C2
MENG 1011	Engineering Fluid Mechanics	E2
MENG 1013	Communication Skills	C1

LEVEL 2
SEMESTER 1 **17 CREDITS**

Course Code	Course Title	Credits
MATH 2230	Engineering Mathematics II (Prerequisite: ENGR 1180)	E3
MENG 2009	Industrial Instrumentation	E2
MENG 2004	Mechanics of Machines (Prerequisite: MENG 1004)	E3
MENG 2007	Engineering Thermodynamics II (Prerequisite: MENG 1001)	E3
MENG 2010	Strength of Materials I (Prerequisite: MENG 1010)	E3
MENG 2011	Machine Design I (Prerequisites: MENG 1009; MENG 1010)	C3

LEVEL 2
SEMESTER 2 **17 CREDITS**

Course Code	Course Title	Credits
MATH 2240	Statistics	E2
MENG 2003	Mechanical Vibrations (Prerequisite: MENG 1004)	E3
MENG 2008	Manufacturing Technology	E3
MENG 2012	Heat Transfer	E3
MENG 2013	Machine Design II (Prerequisites: MENG 2011)	C3
MENG 2015	Control Systems Technology (Prerequisites: ECNG 1007)	E3

LEVEL 3
SEMESTER: YEAR-LONG **6 CREDITS**

Course Code	Course Title	Credits
MENG 3019	Mechanical Engineering Project	C6

LEVEL 3
SEMESTER 1 **12/15 CREDITS**

Course Code	Course Title	Credits
MENG 3000	Engineering Management I	E3
ECNG 3030	Electromechanical Energy Conversion (Prerequisite: ECNG 1007)	E3

Together with any THREE (3) the following optional courses subject to the approval of the Head of Department to be chosen from:

Course Code	Course Title	Credits
MENG 3006	Production Management	E3
MENG 3013	Product Design & Development	E3
MENG 3015	Materials Technology	E2
MENG 3017	Finite Element Methods in Engineering Practise (Prerequisites: MENG 1011, MATH 2230, MENG 2010, MENG 2012)	E3
MENG 3022	Energy Engineering (Prerequisite: MENG 2007, MENG 2012)	E2
MENG 3023	Environmental Control Engineering I (Prerequisite: MENG 2007)	E2
MENG 3024	Strength of Materials II (Prerequisite: MENG 2010)	E2
MENG 3025	Power Plant Engineering I (Prerequisite: MENG 2007)	E2

OR other Mechanical Engineering or Industrial Engineering Level 3 course(s) subject to the approval of the Head of Department.

LEVEL 3
SEMESTER 2 **11/14 CREDITS**

Course Code	Course Title	Credits
MENG 3016	Maintenance & Safety Engineering	E3

Together with any FOUR (4) of the following optional courses subject to the approval of the Head of Department, to be chosen from:

Course Code	Course Title	Credits
ENGR 3000	The Technology of the Steelpan (Prerequisite: MATH 2230)	E3
IENG 3002	Plant Layout and Material Handling	E2
IENG 3006	Automation	E2
MENG 3001	Engineering Management II	E2
MENG 3011	Advanced Mechanics of Solids (Prerequisites: MENG 3024)	E3
MENG 3014	Computer-aided Design & Manufacture	E2
MENG 3026	Renewable Energy (Prerequisites: MENG 2012)	E2
MENG 3027	Traction & Power Hydraulics	E2
MENG 3028	Power Plant Engineering II (Prerequisite: MENG 3025)	E2
MENG 3029	Environmental Control Engineering II (Prerequisite: MENG 3023)	C2

OR other Mechanical Engineering or Industrial Engineering course(s) subject to the approval of the Head of Department.

Students doing Level 3 courses must first register for compulsory courses listed above. They must then select one (1) of the three (3) streams of specialty listed below by registering for those courses which are listed under that stream in the Students' Guide of the Department of Mechanical Engineering.

- Thermal Engineering & Energy Systems
- Engineering Mechanics & Design
- Manufacturing (Design, Processes & Systems)

Students are asked to note that **selection of a particular stream of specialisation does not exclude the possibility of registering for courses in other area**s.

6.5.3 BSc in Mechanical Engineering with a Minor in Biosystems

AIMS

To orient Mechanical Engineers towards operations and problem-solving activities in the agricultural, environmental and food production sectors in the following areas:

- Ensuring a certain level of food security in the region.
- Increasing the efficiency and productivity of agriculturists and related land users through the application of engineering principles, methods and technologies.
- Raising the awareness of rural socio-economic issues in the territories in the Caribbean, by the inclusion in the courses, of some of the cultural practices and income-earning activities of urban and rural sectors of the region. The studies extend to agriculture and to some extent, environment, horticulture, forestry and fisheries, including aquaculture, in the taught courses or in Final Year Projects.
- Increasing the general awareness of the need for efficient use of limited land and water resources of the Caribbean as well as protecting those resources.
- Advancing the body of knowledge required for the above through research leading to the M.Sc., M.Phil and Ph.D. degrees in the three main areas – Soil and Water Engineering, Post-Harvest Storage and Food Processing and Production Systems and Mechanization and Equipment/Tool Design.

Students may opt for the "full" Minor, which consists of the Final Year Project plus at least five (5) other Level 3 courses in the Biosystems Engineering area. Students may choose the courses that enable them to concentrate on the main areas of the Minor described in the last paragraph. The courses in the Minor were selected to make the student as useful and flexible as possible in aspects of Biosystems Engineering without compromising the overall Mechanical Engineering content of the degree. Most of the courses in the Minor are coded **MENG** so that other Mechanical Engineering students interested in them could take them as electives within the basic B.Sc. Mechanical Engineering Programme.

EXPECTED LEARNING OUTCOME/OUTPUTS

Mechanical Engineering Graduates with the Minor in Biosystems should be able to:

- Function competently and effectively as Mechanical Engineers within any type of organization, private or public or as individual entrepreneurs.
- Work effectively within multi-disciplinary teams in agriculture or agro-business enterprises in food/feed storage, in handling and processing of crops and foods, in soil and water and environmental engineering or rural engineering, or in other related fields, bringing to the team the ability to apply engineering knowledge, skills and techniques to solving problems in those areas. Such areas may include design, operation and maintenance of engineering systems used in agriculture and food production, environment and processing.
- Start his/her own enterprise to offer services/products, which bridge the various areas of study, to governments, other enterprises or to the public directly.
- Acquire sufficient knowledge and ability to enter and successfully complete any Graduate Studies Programme leading to higher degree(s) in the fields of Mechanical or Manufacturing Engineering, Agricultural/Biological/ Environmental Engineering or Engineering Management, as well as other fields.

Students who pass at least 96 credits of courses as prescribed below will, subject to applicable regulations, be recognized as having completed their degree and will automatically be placed on the Faculty of Engineering's list of students recommended for the award of BSc in Mechanical Engineering with Biosystems. Unless otherwise stated, all courses listed are mandatory.

LEVEL 1
SEMESTER 1 **16 CREDITS**

Course Code	Course Title	Credits
ENGR 1001	Information Technology for Engineers	E3
ENGR 1180	Engineering Mathematics I	E3
MENG 1006	Introduction to Engineering	E2
MENG 1008	Engineering Drawing	C3
MENG 1010	Statics and Strength of Materials	E3
MENG 1012	Science of Materials C	E2

LEVEL 1
SEMESTER 2 **16 CREDITS**

Course Code	Course Title	Credits
ECNG 1007	Electrical Engineering Technology	E3
MENG 1001	Engineering Thermodynamics I	E3
MENG 1004	Engineering Dynamics	E3
MENG 1005	Workshop Technology	C2
MENG 1009	Machine Drawing (Prerequisite: MENG 1008)	C2
MENG 1011	Engineering Fluid Mechanics	E2
MENG 1013	Communication Skills	C1

LEVEL 2
SEMESTER 1 **17 CREDITS**

Course Code	Course Title	Credits
MATH 2230	Engineering Mathematics II (Prerequisite: ENGR 1180)	E3
MENG 2004	Mechanics of Machines (Prerequisite: MENG 1004)	E3
MENG 2007	Engineering Thermodynamics II (Prerequisite: MENG 1001)	E3
MENG 2009	Industrial Instrumentation	E2
MENG 2010	Strength of Materials I (Prerequisite: MENG 1010)	E3
MENG 2011	Machine Design I (Prerequisites: MENG 1009; MENG 1010)	C3

LEVEL 2
SEMESTER 2 **17 CREDITS**

Course Code	Course Title	Credits
MATH 2240	Statistics	E2
MENG 2003	Mechanical Vibrations (Prerequisite: MENG 1004)	E3
MENG 2008	Manufacturing Technology	E3
MENG 2012	Heat Transfer	E3
MENG 2013	Machine Design II (Prerequisites: MENG 2011)	C3
MENG 2015	Control Systems Technology (Prerequisite: ECNG 1007)	E3

LEVEL 3
YEAR-LONG **6 CREDITS**

Course Code	Course Title	Credits
MENG 3019	Mechanical Engineering Project	C6

LEVEL 3
SEMESTER 1 **13 CREDITS**

Course Code	Course Title	Credits
CVNG 3007	Environmental Engineering I	E3
ECNG 3030	Electromechanical Energy Conversion (Prerequisite: ECNG 1007)	E3
MENG 3000	Engineering Management I	E3
MENG 3020	Elements of Food Engineering	E2
MENG 3004	Soil & Water Engineering	E2

LEVEL 3
SEMESTER 2 **11/14 CREDITS**

Course Code	Course Title	Credits
MENG 3016	Maintenance & Safety Engineering	E3

Together with any FOUR (4) of the following optional courses subject to the approval of the Head of Department, to be chosen from:

Course Code	Course Title	Credits
MENG 3001	Engineering Management II	E2
MENG 3002	Post-harvest Technology	E2
MENG 3007	Drainage & Irrigation Engineering	E2
MENG 3008	Field Machinery & Equipment	E2
MENG 3027	Traction & Power Hydraulics	E2
MENG 3030	Basic Engineering Infrastructure	E2

NOTE: The letter "E" or "C" preceding the credit allocation indicates evaluation by written examination paper(s) (and may also include a coursework component) or by coursework only, respectively. Registration for Level 3 courses will not be approved until credits for all required Level 1 courses have been attained.

SECTION 7: CO-CURRICULAR & LANGUAGE COURSES

Co-Curricular Programme

The Co-curricular programme is an integral part of the official credit system at undergraduate level at The University of the West Indies. It provides students with valuable opportunities for skill development in areas not available in their core programme. These courses are designed to help students become well-rounded graduates - prepared for their role in society and in the workplace.

At the St. Augustine Campus, Co-curricular credits are currently awarded for involvement in the following courses:

LEVEL 1

Course Code	Course Title	Credits
COCR 1001	Minding SPEC: Exploring Sports, Physical Education and Health & Wellness	3
COCR 1012	Workplace Protocol for Students	3
COCR 1013	Financial Literacy and Training	3
COCR 1030	Technology Literacy	3
COCR 1031	Managing My High (MY High): Alcohol, Drugs and Addictive Behaviours	2
COCR 1032	Living and Learning: Professional development through community service	2
COCR 1033	Mind the Gap: Towards Psychological Health & Wellness	1
COCR 1034	Public Speaking and Voice Training: Towards a More Confident You	3
COCR 1036	Ethics and Integrity: Building Moral Competencies	3
Microsoft Office 2013		
COCR1025	Microsoft Word	2
COCR1026	Microsoft Excel	2
COCR1027	Microsoft PowerPoint	2
COCR1028	Microsoft Outlook	2
COCR1029	Microsoft Access	2

All co-curricular course codes begin with COCR. Visit **http://sta.uwi.edu/cocurricular/** for course descriptions, availability and registration instructions. New courses are to be introduced so keep checking the website for updates during the academic year. You can also speak with your

Faculty COCR coordinators for help with course selection and for answers to questions related to the COCR Programme. You will find their names and contact information at the co-curricular website at: **http://sta.uwi.edu/cocurricular/contactus.asp** or check your faculty office.

Think you won't have time for co-curricular courses? Visit **http://www2.sta.uwi.edu/timetable** for the official timetable to see how you can work a COCR course into your schedule!

Languages

Centre for Language Learning (CLL)

E-mail: CLL.FHE@sta.uwi.edu
Telephone: 645-2278

The Centre for Language Learning is staffed by three full-time lecturers and a number of part-time foreign language tutors.

Courses are offered in:
ARABIC, MANDARIN CHINESE, FRENCH, GERMAN, HINDI, ITALIAN, JAPANESE, PORTUGUESE, SPANISH, YORUBA

No prerequisite is necessary to pursue Level 1 courses. If students have knowledge of the target language, they will be assigned a class based on a Common European Framework of Reference for Languages. To register, students must complete a Registration Form at the CLL, where they will be further guided. To register for credit, students must do so online and then inform the Centre in person.

FEES
For credit: $400.00 per credit PLUS
Registration - TT$50.00 = $850.00
Not for credit: Registration only - TT$50.00

Additional information is available in a separate student handbook by the Centre for Language Learning

CENTRE FOR LANGUAGE LEARNING:

List of courses with 2 credit weighting

SEMESTER I

Course Code	Course Title	Credits
FREN 1001	French 1A	2
FREN 1002	French 1B	2
FREN 1003	French 2A	2
FREN 1004	French 2B	2
FREN 1005	French 3A	2
FREN 1006	French 3B	2
SPAN 1101	Spanish 1A	2
SPAN 1102	Spanish 1B	2
SPAN 1103	Spanish 2A	2
SPAN 1104	Spanish 2B	2
SPAN 1105	Spanish 3A	2

SEMESTER II

Course Code	Course Title	Credits
FREN 1001	French 1A	2
FREN 1002	French 1B	2
FREN 1003	French 2A	2
FREN 1004	French 2B	2
FREN 1005	French 3A	2
FREN 1006	French 3B	2
SPAN 1101	Spanish 1A	2
SPAN 1102	Spanish 1B	2
SPAN 1103	Spanish 2A	2
SPAN 1104	Spanish 2B	2
SPAN 1105	Spanish 3A	2
SPAN 1106	Spanish 3B	2

SECTION 8: COURSE DESCRIPTIONS

DEPARTMENT OF CHEMICAL ENGINEERING

LEVEL: 1
SEMESTER: 1
COURSE CODE: CHNG 1000
COURSE TITLE: INTRODUCTION TO CHEMICAL & PROCESS ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: The structure of the process industries in the Caribbean. Role of the Chemical Engineer. Social and environmental impact of the process industries. Process equipment. Process flowsheets. Instrumentation and control. Introduction to mass and heat balances. Introduction to process economics. Separation processes - simple applications of stage and continuous contacting. Safety and loss prevention.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CHNG 1001
COURSE TITLE: APPLIED CHEMISTRY I
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Fundamental properties and behaviour of matter. Spectroscopy: UV, IR, AA and NMR. Applied physical chemistry: solid surface chemistry, surface and colloidal chemistry, solubility, ionic mobilities, physico-chemical methods of analysis. Applied organic chemistry: reaction mechanisms and reaction types.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CHNG 1002
COURSE TITLE: APPLIED CHEMISTRY II
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Applied organic chemistry: building blocks for organic chemicals - natural gas, methanol, ammonia, ethylene. Characteristics of important organic and inorganic unit processes. Petroleum production, polymer chemistry. Applied Biochemistry: carbohydrates, proteins, enzymes, lipids. Metabolic pathways - chemistry and thermodynamics. Introduction to microbiology, biochemical processes. Introduction to geochemistry.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CHNG 1003
COURSE TITLE: SCIENCE OF MATERIALS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to materials science. Crystal structures. Thermal equilibrium diagrams. Iron and steels I. Non-ferrous alloys I. Joining processes. Corrosion. Properties of materials. Shaping of materials. Iron and steels II. Non-ferrous alloys II. Design and selection of materials. Polymers. Ceramics. Composite materials.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CHNG 1004
COURSE TITLE: CHEMICAL PROCESS PRINCIPLES I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Applications of material and energy balances to special processes: single phase systems, multiphase systems, combustion, recycle processes. Transient balances. Introduction to flowsheet development. Property estimation techniques. Chemical kinetics. Introduction to reactor design.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CHNG 1005
COURSE TITLE: SCIENCE OF MATERIALS A
NUMBER OF CREDITS: 1
PREREQUISITES:
COURSE DESCRIPTION: Introduction to materials science. Crystal structures. Thermal equilibrium diagrams. Iron and steels I. Non-ferrous alloys I. Joining processes. Corrosion.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CHNG 1006
COURSE TITLE: TRANSPORT PHENOMENA I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Properties of fluids, statics, pressure distribution, forces on plane and curved surfaces. Kinematics: ideal and real fluids, streamlines, flow in pipes, flow measurements, introduction to dimensional analysis. Steady and unsteady state heat conduction. Convection-film and overall heat transfer coefficient. Application of dimensional analysis to heat transfer. Combined mode heat transfer. Temperature measurement. Introduction to mass transfer by molecular and convective diffusion. Introduction to heat exchangers. Analogy between heat and momentum transfer. Molecular and convective diffusion.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CHNG 1007
COURSE TITLE: CHEMICAL ENGINEERING LABORATORY I
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION:
(Coursework)

LEVEL: 1
SEMESTER: 1
COURSE CODE: CHNG 1008
COURSE TITLE: COMMUNICATION/ETHICS
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Critical and creative thinking, elements of communication, written communication: technical reports, proposals, technical descriptions, technical instructions, oral communication: oral presentations, group dynamics and team building, visual aids, technology and communication: formatting reports, electronic documentation, visual aids, information retrieval and citations, ethics: Plagiarism, decision-making, rules of professional conduct.
(Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: CHNG 2000
COURSE TITLE: TRANSPORT PHENOMENA II
NUMBER OF CREDITS: 3
PREREQUISITES: CHNG 1006
COURSE DESCRIPTION: Basic transport mechanisms in fluid flow, heat and mass transfer. Conservation of momentum: application of linear momentum balance, Navier Stokes equation, generalised Bernoulli equation (rotational and irrotational flow), angular momentum balance. Introduction to boundary layer theory. Flow in ducts. Compressible flow. Pumps, compressors, turbines (specification of equipment) Introduction to radiant heat transfer, heat transfer equipment, multitube heat exchangers, evaporators, fluidised beds. Simultaneous heat and mass transfer, water cooling. Interphase mass transfer and 2 film theory.

LEVEL: 2
SEMESTER: 1
COURSE CODE: CHNG 2001
COURSE TITLE: PROCESS DESIGN & ECONOMICS I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Process synthesis. Development of a project. Selection and economic evaluation of the process. Design methodology and general design considerations, site selection, plant layout. Services. Provision, metering and distribution of steam, electricity, cooling water, inert gases. Capital equipment and utilities cost estimate. Project capital requirements - sources of finance, debt and equity elements, interest, cost of capital. Elements of cash flow: sales, operating cost, depreciation, taxes, scrap value etc. Assessment of economic feasibility. Payback time value of money. Discounted cash flow methods - net present value and DCF Rate of Return. Sensitivity analysis. Use of codes and standards. Pressure vessels: theoretical basis for design, design procedures from standards; selection of equipment and materials of construction.

LEVEL: 2
SEMESTER: 1
COURSE CODE: CHNG 2002
COURSE TITLE: CHEMICAL PROCESS PRINCIPLES II
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Thermodynamic properties of mixtures: chemical equilibria, physical equilibria. Thermodynamic analysis of processes: availability. Physico-mechanical processes: refrigeration, power generation and cogeneration.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CHNG 2003
COURSE TITLE: COMPUTER-AIDED ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to Computer-aided drafting. Numerical methods: Solution of systems of linear and non-linear algebraic equations. Solution of differential equations. Flowsheeting: introduction to methods of steady state simulation. Introduction to available packages. Material and energy balances. Economic analysis: Use of computer packages for plant evaluation. Safety and risk analysis: reliability, risk and safety analysis methods e.g., fault tree, event tree. Failure modes and effect analysis, hazard and operability studies. Introduction to the use of physical property packages.
(Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: CHNG 2004
COURSE TITLE: SEPARATION PROCESSES I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Identification, use and characteristics of separation processes. Phase contacting in stage and continuous processes. Analysis of selected processes for the separation of binary mixtures - distillation, absorption, liquid/liquid and solid/liquid extraction. Stage efficiency determination.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CHNG 2006
COURSE TITLE: PROCESS DYNAMICS & CONTROL I
NUMBER OF CREDITS: 3
PREREQUISITES: ENGR 1180
COURSE DESCRIPTION: Mass and energy conservation for time varying systems. Lumped and distributed parameter models of simple systems. Linear analysis, Laplace transforms, transfer functions. Open loop responses to simple inputs. Bode plots. Computer simulation. Measurement of temperature, flow, Level, pressure, composition, etc. Elements of control systems. Controller algorithms. Concept of feedback. Closed loop responses. Analysis of degrees of freedom. Selection of variables for measurement and control. Performance specifications, dominant mode approximations. Stability criteria. Bode design. Root locus.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CHNG 2007
COURSE TITLE: PARTICLE TECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Properties of particles. Interactions between particles and fluids: individual particles, beds of particles. Fluidisation. Processing of particulate materials; storage and transport, size reduction and enlargement, mixing and blending, separation of particles from liquids and gases, separation by size and species.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CHNG 2008
COURSE TITLE: CHEMICAL ENGINEERING PRACTICE
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Study of specific process industry. Industrial plant evaluation.
(Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: CHNG 2009
COURSE TITLE: CHEMICAL ENGINEERING LABORATORY II
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION:
(Coursework)

LEVEL: 2
SEMESTER: 2
COURSE CODE: CHNG 2010
COURSE TITLE: CHEMICAL ENGINEERING LABORATORY III
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION:
(Coursework)

LEVEL: 3
SEMESTER: 1
COURSE CODE: CHNG 3001
COURSE TITLE: TRANSPORT PHENOMENA III
NUMBER OF CREDITS: 3
PREREQUISITES: CHNG 1006
COURSE DESCRIPTION: Integral momentum balance. Classification of fluids, steady and unsteady Newtonian and Non-Newtonian flows. (Low Reynolds number flows. Inviscid incompressible flow). Boundary layer theory. Turbulence in stirred vessels. Multiphase flows. Flows with surface tension effects. Numerical methods in fluid dynamics. Radiant heat transfer. Heat transfer in special systems. Free and forced convection heat transfer. Interphase mass transfer theories. Diffusion in solids. Simultaneous heat and mass transfer in systems other than air & water.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CHNG 3002
COURSE TITLE: BIOCHEMICAL ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Basic microbiology. Introduction to biochemistry. Enzyme technology. Kinetics of substrate utilisation. Product yield and biomass production in cell cultures. Reactor configuration. Transport phenomena in microbial systems. Design and analysis of biological reactors. Recovery of fermentation products.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CHNG 3004
COURSE TITLE: CHEMICAL REACTION ENGINEERING I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Review of kinetic rate expression and thermodynamic principles; complex kinetics homogeneous and heterogeneous catalysis. Theories of reaction rates. Classification and characterisation of reactor configurations. Conservation equations for batch, residence time distribution. Heat and mass transfer in reacting systems. Interpretation of kinetic data in laboratory, pilot and full-scaled plant operations. Commercial reactor systems. Optimisation control and stability, operating characteristics and safety; mechanical design considerations.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CHNG 3006
COURSE TITLE: PROCESS DESIGN & ECONOMICS II
NUMBER OF CREDITS: 3
PREREQUISITE: CHNG 2001
COURSE DESCRIPTION: Process synthesis: development of conceptual design and best flow sheet; synthesis of separation systems; heat integration and heat exchanger networks. Batch processes: design and scheduling, planning and operation. Process optimisation including the use of linear programming, dynamic programming, search techniques, etc. Process design and economic analysis in the presence of uncertainty.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CHNG 3007
COURSE TITLE: SEPARATION PROCESSES II
NUMBER OF CREDITS: 3
PREREQUISITE: CHNG 2004
COURSE DESCRIPTION: Basic considerations in the separation of multi-component mixtures: equilibria. Analysis of multi-component distillation and absorption. Azeotropic and extractive distillation. Analysis of further selected processes for the separation of binary mixtures - drying, crystallisation, ion exchange, membrane processes. Energy requirements for separation processes. Selection of separation processes.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: CHNG 3012
COURSE TITLE: CHEMICAL ENGINEERING DESIGN PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES:
COURSE DESCRIPTION:
(Coursework)

LEVEL: 3
SEMESTER: 2
COURSE CODE: CHNG 3013
COURSE TITLE: CHEMICAL ENGINEERING RESEARCH PROJECT
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION:
(Coursework)

LEVEL: 3
SEMESTER: 2
COURSE CODE: CHNG 3014
COURSE TITLE: SAFETY & LOSS PREVENTION IN PROCESS INDUSTRIES
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION:
Identification and Management of Hazards in the Process Industries; Management of Safety; Hazard and Operability Studies; Risk Analysis, Risk Assessment and Risk Management; Industrial Disasters Case Studies; Consequence Analysis of Chemical Releases; Quantification of Hazards; Identification of Source Models; Flammability Assessment, Fires and Explosions; Effect Models; Evasive Actions Identification and Emergency Planning; Reliability, Maintenance and Plant Performance.

PETROLEUM GEOSCIENCE COURSES

LEVEL: 1
SEMESTER: 1
COURSE CODE: PGSC 1000
COURSE TITLE: INTRODUCTION TO GEOLOGY & GEOLOGICAL HISTORY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to central concepts of geology, history of geological thought. Origin and structure of the earth, geochronology, fossils and geologic time. Rock-forming minerals. The rock cycle. Igneous and metamorphic geology. Sedimentary geology/Stratigraphy. Geologic maps. Field geology trip to view outcrops of rock types of Northern Range, Laventille and Guaracara limestones, and reservoir sandstones.

LEVEL: 1
SEMESTER: 2
COURSE CODE: PGSC 1001
COURSE TITLE: INTRODUCTION TO EARTH SCIENCES, PROCESS & CARIBBEAN GEOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Paleontology and evolution. Plate tectonics. Volcanism/earthquakes. Structural geology. Geologic hazards. Surficial processes, erosion and deposition. Rivers, deltas and coastal processes, ocean floor. Earth resources/ground water. Sedimentary structures and textures. Wind action and desert landscapes. Caribbean geology overview. Overview of the geology of Trinidad.

LEVEL: 1
SEMESTER: 1
COURSE CODE: PGSC 1002
COURSE TITLE: PALEONTOLOGY & BIOSTRATIGRAPHY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Environmental variable and evolution theory. Biostratigraphy of ammonites and bivalves, ecology and history of reef communities, the Cretaceous/tertiary boundary. Introduction to paleoecology. Micropaleontology; details of the more important microfossil groups; plat spores, pollen grains, dinoflagellates, benthis and planktonic foraminifera, calcareous nannofossils, and ostracods; historical development; technology development; Applied Biostratigraphy; global biozonations, sequence stratigraphic applications and the role of biostratigraphy in hydrocarbon exploration.

LEVEL: 1
SEMESTER: 1
COURSE CODE: PGSC 1003
COURSE TITLE: ENGINEERING GRAPHICS & GEODETICS FOR PETROLEUM GEOSCIENCE
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to Engineering Graphics – Use of Instruments, Orthographic Drawing, Auxiliary Projection, Sectional Views, Isometric and Oblique Drawings, Free Hand Sketching. Overview of Geodetics, Coordinated Systems and Charting, Positioning Equipment, Seismic Binning and Position Checks, Well Planning and Collision Avoidance, GPS Practical Session.
(Coursework)

LEVEL: 1
SEMESTER: 2
COURSE CODE: PGSC 1004
COURSE TITLE: FIELD & MAPPING PRINCIPLES
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Dip and strike, folds and fault nomenclature and symbols. Purpose and fundamentals of surface and subsurface mapping. Preparation and uses of surface maps, structure contour, isopach, paleogeographic and facies maps, cross sections block diagrams and fence diagrams. Outcrop descriptions and measured sections surface maps and aerial photographs. Field trips and lab exercises.
(Coursework)

LEVEL: 1
SEMESTER: 2
COURSE CODE: PGSC 1005
COURSE TITLE: GEOPHYSICS FUNDAMENTALS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Physics of the earth. Vibration and waves, reflection and refraction, earthquake and earth structure, magnetism of the earth, variation with time of earth's magnetic field, magnetic prospecting, earth's gravity, principles of gravity prospecting, Geoelectrics.

LEVEL: 1
SEMESTER: 2
COURSE CODE: PGSC 1006
COURSE TITLE: APPLIED CHEMISTRY II
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Applied organic chemistry: building blocks for organic chemicals - natural gas, methanol, ammonia, ethylene. Characteristics of important organic and inorganic unit processes. Petroleum production, polymer chemistry. Introduction to geochemistry.

LEVEL: 2
SEMESTER: 1
COURSE CODE: PGSC 2000
COURSE TITLE: STRUCTURAL GEOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Description, classification, and origin of earth structures. Ways in which the continental crust can deform; link scales of structure from the field, outcrops, hand specimen, thin section by integrating analytical techniques with practical examples. Theoretical and meso to microscale analysis of structures developed through a linked series of lectures and practicals; practical 2D strain analysis; 3D strain concepts; incremental strain, kinematics and polyphase deformations; fold construction and classes; fault evolution and section balancing; fault rock microstructures; fault and fold mechanics, current concepts in plate tectonics, cross-section construction techniques, structural interpretation of seismic data, structural styles in different tectonic settings (thrust and fold belts, rifts, strike-slip, gravity tectonics, inversion), structural geology of reservoir units.

LEVEL: 2
SEMESTER: 1
COURSE CODE: PGSC 2001
COURSE TITLE: SEDIMENTOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Origin of sediments and sedimentary rocks; climate, weathering, and weathering products; transport, deposition, and depositional environments for sediments; field and laboratory studies in description and interpretation of genesis of sedimentary rocks; principles of stratigraphy and basin analysis; plate tectonics and the formation of sedimentary basins stratigraphic nomenclature; geologic time and correlation; sequence stratigraphy and basin architecture. Physical processes of sedimentation: basics of flow and sediment transport; bedforms generated in unidirectional, oscillatory and multidirectional flows; soft sediment deformation and erosional sedimentary structures; depositional environments and facies analysis; Depositional environments and facies models for clastic sedimentary systems including, braided and meandering rivers, deltas, coasts and continental shelves, deep marine basins, alluvial fans and lakes. Composition and classification of carbonate rocks.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2002
COURSE TITLE: PETROPHYSICS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Scope of petroleum petrophysics. Rock properties; porosity and permeability. Core laboratory measurements of rock properties and their application to reservoir studies. Well logging vocabulary; fundamental physics of logging tools; SP, resistivity, density, sonic, nuclear. Well log interpretation, water saturation, shale effects, hydrocarbon in place.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2004
COURSE TITLE: GEOCHEMISTRY OF PETROLEUM
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Basic concepts and terminology of petroleum geochemistry; processes related to preservation of organic matter in sedimentary environments; composition and characterisation of kerogen, bitumen, and petroleum; conversion of kerogen to hydrocarbon; principles and interpretation of geochemical data; basic concepts of maturity modelling; integrating measured geochemical data with conceptual geologic models. Aspects of pure and applied inorganic and organic geochemistry; isotope geology.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2006
COURSE TITLE: STRATIGRAPHY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Mechanisms of basin formation and structure of basins; tectonic controls on sedimentation; origins and sedimentary and/or geomorphic impact of sea-level changes; sequence stratigraphic principles and concepts. Processes and products of near-surface and burial diagenesis in clastic and carbonate sediments. Principles of sequence stratigraphy, seismic expression of depositional systems; stratigraphic architecture; sequence boundaries and flooding surfaces. Nature and significance of high-resolution depositional sequences and their stacking patterns based on core, outcrop and wireline log data. Sequence stratigraphic interpretation and mapping of seismic data. Applied biostratigraphy; palynomorphs, spores and pollen, dinoflagellates, benthic and planktonic foraminifera, calcareous nannofossils, global biozonations, sequence stratigraphic applications and the role of biostratigraphy in hydrocarbon exploration.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2008
COURSE TITLE: HSE FOR THE UPSTREAM PETROLEUM INDUSTRY
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: EIA for seismic, drilling and production locations; drilling hazards that affect safety and environment, blow outs, disposal of drilling fluids and drill cuttings; effluent gases and waters in production operations. Use and disposal of CO2 and H2S. Disposal of BS&W. Management of chemicals; oil spills on land and marine; legal framework for HSE in Trinidad, emissions trading, Kyoto protocol. Safety policies and procedures. Hazops.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2009
COURSE TITLE: FIELD & GEOLOGIC MAPPING
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Field trips to observe, analyse and interpret the geology and geophysics of selected localities in Trinidad & Tobago and adjacent regions; complements classroom experience. Methods of geologic mapping with topographic maps and aerial photographs. Field studies include measuring sections, interpretation of stratigraphy, structure, environments of deposition of various sedimentary rocks. Construction of geologic cross sections; geological expression of structural styles and terrain histories; application of subsurface well and seismic data in the preparation of structural contours and facies maps. Use of remote sensing images to plan exploration strategies; Strengths and limitations of different remote sensing tools; assessment of relief, drainage, solid and drift lithologies, tectonic and sedimentary features from the appropriate images; comparison of data from images with geological map information; synthesis of data in the form of sketch maps and cross-sections; analysis of complex problem maps using structure contours; construct accurate cross-sections in areas of complex structure and stratigraphy. (Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: PGSC 2010
COURSE TITLE: COMMUNICATION SKILLS
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Review of personal and transferable skills and use of this information to compile careers documents, including CVs; word processing and use of spreadsheets. Improve oral presentation skills with practice and training in giving a talk; oral presentation of a selected topic relevant to petroleum geoscience. Library searches; collecting information. Enhance certain transferable skills such as team working and writing skills; improve written communication and scientific skills by undertaking literature reviews of scientific controversies and new developments. (Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: PGSC 2011
COURSE TITLE: MINERALOGY
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Introduction to minerals, mineral study techniques. Rock classification; physical properties of minerals and rocks; Mineralogy; crystallography, crystal chemistry, mineral chemistry, optical crystallography, physical properties, and geologic occurrence of rock-forming and economic minerals. Weathering. Review of structure of silicate materials, mineral chemistry and solid solutions of major rock-forming minerals, introduction to thermodynamics, real crystals, defects, grain boundaries and diffusion.

LEVEL: 2
SEMESTER: 2
COURSE CODE: PGSC 2012
COURSE TITLE: IGNEOUS & METAMORPHIC PETROLOGY
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Introduction to the origin and evolution of igneous, sedimentary, and metamorphic rocks; classification and petrographic analysis of major rock types; relationships to tectonic settings. Identification in field, hand specimen and under the microscope.
Igneous Petrology: Melting processes in the earth. Phase diagrams for binary and ternary systems, eutectics. Processes in magma chambers and their crystallisation history. Physical properties of magmas. Magmatism in extensional settings and in collision zones.
Metamorphic Petrology: Metamorphic rocks as equilibrium systems; petrogenetic grids, phase diagrams and projections. Progressive metamorphism of major rock types, metamorphic facies. Metamorphic processes and the role of fluids; deformation accompanying metamorphism. Geodynamic settings of metamorphism.
Sedimentary Petrology: weathering, petrologic provinces, introduction to sedimentary facies.

LEVEL: 2
SEMESTER: YEAR-LONG
COURSE CODE: PGSC 2014
COURSE TITLE: FUNDAMENTAL PETROLEUM GEOLOGY AND PETROLEUM GEOPHYSICS
NUMBER OF CREDITS: 6
PREREQUISITES:
COURSE DESCRIPTION: Nature, generation, migration and entrapment of petroleum and their relationships to source, reservoir and seal rocks. Introduction to the habitat of petroleum in the Caribbean and South American region, particularly the main controls of oil and gas distribution in the Orinoco basin.
The scope of geophysics in petroleum exploration with emphasis on the acquisition, processing and interpretation of seismic reflection data.

LEVEL: 3
SEMESTER: 1
COURSE CODE: PGSC 3001
COURSE TITLE: PETROLEUM GEOLOGY OF THE SOUTH-EAST CARIBBEAN
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Geological evolution of the Caribbean; Geology of the South-east Caribbean from Suriname to Barbados with emphasis on hydrocarbon basins in the region.

LEVEL: 3
SEMESTER: 1
COURSE CODE: PGSC 3003
COURSE TITLE: FORMATION EVALUATION
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Reservoir Petrophysics. Data acquisition, the geophysical logs and logging tools that measure the electrical, radioactive, acoustic and dielectric properties of the rocks penetrated in boreholes. Qualitative interpretation. Techniques of quantitative log interpretation. Assessment of commercial viability - porosity, water and hydrocarbon saturation, shale volume fraction. Integrated petrophysical interpretation. Field assessment - fence diagrams. Structural and sedimentological interpretation. Integrated facies analysis. Reservoir zonation. Case studies including shaly formations. Applications of dipmeter data, borehole imaging, recent advances. NMR logs. LWD. Horizontal well-logging. Computer methods.

LEVEL: 3
SEMESTER: 1
COURSE CODE: PGSC 3004
COURSE TITLE: ESSENTIAL PETROLEUM ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Overview of petroleum industry; petroleum operations and the total production system. The reservoir, the wellbore, vertical flow, well head, gathering, primary facilities and delivery system. Petroleum engineering vocabulary and units. Reservoir fluids: gases, oils and water. Petroleum reservoir types; hydrocarbon fluid recovery methods and recovery factors. Reserves determination. Principles of primary, secondary and tertiary reservoir performance and recovery. Reservoir mechanics, improved oil recovery. Well-testing. Reservoir modelling and simulation. Reservoir performance monitoring. Gas reservoirs: gas in place and depletion, water influx problems. Gas production performance; gas-processing. Drilling principles and environmental effects. Benefits of horizontal well-drilling. Completions. Production and surface facilities. Production operations.

LEVEL: 3
SEMESTER: 2
COURSE CODE: PGSC 3005
COURSE TITLE: COMPUTATIONAL PETROLEUM GEOLOGY & GEOPHYSICS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to a variety of computational tools for solving common quantitative problems in geology and geophysics; statistical description and modelling of data sets; statistical methods – palaeontology and reserves determination, overview and comparison of various techniques applied to modelling of geophysical processes, including mapping and graphics; use of UNIX and modern commercial software (Landmark and Geoquest).
(Coursework)

LEVEL: 3
SEMESTER: 2
COURSE CODE: PGSC 3008
COURSE TITLE: PROSPECT ASSESSMENT, EVALUATION & PETROLEUM ECONOMICS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Introduction to the geography and international politics of oil and gas, exploration/production licensing, taxation and development planning. Hydrocarbon history of Trinidad & Tobago. Differences in oil economy and gas economy. Prospect evaluation, risk analysis and volumetric reserves estimates. Reserve estimation, production profiles, parameterisation of risk factors, net present value, rate of return, profit to investment ratios, tax and royalties. Geostatistics; introduction to the software and techniques of geostatistics and their applications to quantifying risk and uncertainty in petroleum geoscience.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: PGSC 3013
COURSE TITLE: ADVANCED PETROLEUM GEOLOGY
NUMBER OF CREDITS: 4
PREREQUISITES:
COURSE DESCRIPTION: Development geology, including the geological controls on hydrocarbon distribution, recovery and fluid flow. Effects of Plate Tectonics on reservoir formation; structural geology, palaeontology, petrology and stratigraphy of plate margins.

Sedimentological characteristics of clastic and carbonate depositional systems in relation to the distribution of reservoir, source and seal facies. Evaluation of the nature and distribution of reservoir quality patterns in clastic and carbonate deposits. Use of physical and geophysical data to define mechanisms responsible for basin formation.

Modern geological techniques of structure, basin evolution, sequence stratigraphy, facies analysis, geochemistry and mapping techniques to predict trap configuration, integrity and timing; reservoir quality; source and hydrocarbon volume generation, timing and migration; and seal integrity. Diagenesis; effects on reservoir properties, compaction, cementation and dissolution in siliciclastic and carbonates. Local case histories.

Subsurface diagnosis of sedimentary environments from cores, ditch cuttings and wireline logs. Reservoir geological modelling, reservoir mapping and reservoir simulation. Prediction of the distribution, geometry and orientation of reservoir bodies. engineering analysis of reservoirs; measuring and monitoring reservoir pressures and reservoir formation evaluation; predicting reservoir history. Determining well locations for infill drilling; principles of primary, secondary, and tertiary reservoir performance and recovery.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: PGSC 3014
COURSE TITLE: ADVANCED PETROLEUM GEOPHYSICS
NUMBER OF CREDITS: 4
PREREQUISITES:
COURSE DESCRIPTION: Seismic sources and receiver arrays from positioning of cables and streamers to recording instruments. 2D, 3D, 3C and 4D field and marine seismic acquisition and processing of seismic data with emphasis on the applications of modern methodology using software packages to include velocity impedance, amplitude and phase effects to geologic parameters of lithology.

Seismic stratigraphy and structural interpretation of seismic data.

Acoustic wave propagation in boreholes and the acquisition and analysis of full waveform acoustic logs and crosswell and VSP data.
Use of modern geophysical techniques including gravity, magnetics and 2D, 3D, and 4D seismic in petroleum exploration and development. Case histories.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: PGSC 3015
COURSE TITLE: GEOSCIENCE SEMINAR
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Each student is assigned topics on aspects of petroleum geoscience of a selected geographic region or discussion of a subject of current importance and presents it to tutors and prepares an abstract/executive summary on each topic.
(Coursework)

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: PGSC 3016
COURSE TITLE: PETROLEUM GEOSCIENCE PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES:
COURSE DESCRIPTION: The course is an extended practical exercise where well, outcrop, cores, seismic well logs and other geophysical data are interpreted in order to evaluate the exploration or development potential of an area, or an individual study to solve a particular geological/ geophysical problem in a field or area. The course integrates all the petroleum geology, geophysics and engineering of earlier and current coursework and practically prepares the students for the job as a petroleum geoscientist.
(Coursework)

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

LEVEL: 1
SEMESTER: 2
COURSE CODE: CVNG 1000
COURSE TITLE: MECHANICS OF SOLIDS
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Simple static forces, stress, strain. Hardness, impact, temperature effects. Two-dimensional stress and strain, torsion, combined stresses. Statically determinate beams and plane frames. Bending theory and moment, shearing, force, slope, deflexion, moment-area.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CVNG 1001
COURSE TITLE: MECHANICS OF FLUIDS I
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Physical properties of fluids - statics: pressure distribution, forces on plane and curved surfaces, floating stability. Kinematics: ideal and real fluid, streamlines, path lines, streak lines; graphical plotting of streamlines. Dynamics: continuity, momentum and energy equations for one-dimensional flow. Laminar and turbulent flow, flow in pipes, flow measurements. Introduction to dimensional analysis. Dynamic similarity. Boundary layers. Pipe friction. Darcy equation. Rotodynamic machines: selection; performance, cavitation.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CVNG 1002
COURSE TITLE: CIVIL ENGINEERING DESIGN I
NUMBER OF CREDITS: C3
PREREQUISITES: NONE
COURSE DESCRIPTION: Concept of design and its contribution to the quality of life; Civil Engineering Design, the role of geomatics, the environment, and scientific laws in design; Introduction to the design of buildings and Civil Engineering Infrastructure, site appraisal; Risk and vulnerability in design; Health and safety in Civil Engineering Design, environmental impact assessment; Civil Engineering drawing, CAD techniques, introduction to GIS techniques.
(Coursework)

LEVEL: 1
SEMESTER 1
COURSE CODE: CVNG 1005
COURSE TITLE: SCIENCE OF MATERIALS
NUMBER OF CREDITS: NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Fundamental structure, properties and behaviour of other major materials used in Civil Engineering; concrete, asphalt, timber, soil, rock, paints, polymers, adhesives, composite materials; Durability and deterioration; Hazardous materials, classification and handling ion; Hazardous materials, classification and handling.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CVNG 1008
COURSE TITLE: BUILDING SERVICES ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: The course aims to provide an introduction to, and a basic understanding of the scientific principles underlying the major environmental issues related to the built environment. The module also incorporates knowledge of design techniques and issues relating to the internal 'indoor' environment.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CVNG 1009
COURSE TITLE: ENGINEERING GRAPHICS
NUMBER OF CREDITS: C3
PREREQUISITES: NONE
COURSE DESCRIPTION: Sketching as communication of design ideas: types of drawings; components of drawing; drawing standards; plans, sections, elevations, perspectives, projections, isometrics; introduction to typical production drawings of civil engineering components; fundamentals of using AUTOCAD for civil engineering design drawings.

LEVEL: 1
SEMESTER: 2
COURSE CODE: CVNG 1010
COURSE TITLE: INFORMATION TECHNOLOGY FOR ENGINEERS
NUMBER OF CREDITS: C2
PREREQUISITES: NONE
COURSE DESCRIPTION: Numerical analysis methods - f(x)=0; integration; solutions of differential equations, introduction to computer programming - flow charts; algorithms; variables, types, storage, scope; sequence, branch, loop; graphical output; introduction to using MATLAB for numerical analysis.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CVNG 1011
COURSE TITLE: GEOLOGY
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Fundamental geology for Civil Engineers: The Rock Cycle Structure and geological history of the Earth, surface geological processes, structural geology, geologic maps and their interpretation. Engineering geology - topics and concepts: Principles of rock mechanics, engineering properties of rocks, the stability of slopes and cuttings, industrial rocks and minerals, hydrogeology, geotechnical investigation, engineering seismology, dams and reservoirs. Field trips, tutorial sessions.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CVNG 1012
COURSE TITLE: CIVIL ENGINEERING LAW
NUMBER OF CREDITS: E2
PREREQUISITES: NONE
COURSE DESCRIPTION: 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 organizations; 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.

LEVEL: 1
SEMESTER: 1
COURSE CODE: CVNG 1013
COURSE TITLE: INTRODUCTION TO ENGINEERING MECHANICS
NUMBER OF CREDITS: E2
PREREQUISITES: NONE
COURSE DESCRIPTION: Fundamentals: Units of measure: Mass, Force, Stress, Momentum, Energy. Scalars, Vectors, Geometric and Trigonometric functions. Resolution of forces, concepts of limiting equilibrium.

Vectors of Motion, Linear Angular/Rotational, displacement, velocity, acceleration, Simple Harmonic Motion; Solid Mechanics.

II-Continuum Solid Mechanics: Tension, Compression, Shear Deformation/Strength, The Mohr Circle, Failure Criteria; Friction, Sliding, Limiting Equilibrium on Plastic Failure Surfaces.

Constitutive Laws; 1D Linear Elasticity, Hooke's Law, 2D Linear Elasticity, The Mohr-Coulomb Failure Criterion, Factors of Safety, Load Factors, Reliability.

Elastic Stress Distribution; Bousinessq Theory of stress distribution in semi-infinite Elastic Half Spaces from surface loading.

III-Particulate Solid Mechanics: Structure of Particulate Porous media; solids, voids, water, air. Grainsize Distribution, Water Content, Degree of saturation. Characteristics of Saturated and Unsaturated Porous Media. Fluid Pressure Head, $h = u + z + v^2/2g$. Archimedes Principle: buoyancy, effective unit weight, principle of effective stress. Surface Tension; Capillary Rise, Suction Potential Head, Water Potential/Desorption curves.

IV-Numerical Computational Techniques: Introduction to Partial Differential Equations as Models of physical phenomena; Initial and Boundary Value problems. Discretization of physical systems. Introduction to Finite Difference and Finite Element Techniques.

LEVEL: 2
SEMESTER: 1
COURSE CODE: CVNG 2001
COURSE TITLE: STRUCTURAL MECHANICS
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 1000 MECHANICS OF SOLIDS
COURSE DESCRIPTION: Introductory concepts, equilibrium and compatibility, statical determinacy; compatibility of deformations, flexibility method applied to simple flexural systems; analysis of beams (flexure, shear, thin-walled sections); compression members, strain energy and related theorems. Analysis of beams (asymmetrical bending); simple plastic theory (hinges, mechanism, equilibrium diagram method, redistribution of bending moments, moment capacity, fundamental theorems of plastic collapse), approximate methods of analysis; influence lines for statically determinate systems.

LEVEL: 2
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 2003
COURSE TITLE: CIVIL ENGINEERING DESIGN II
NUMBER OF CREDITS: C3
PREREQUISITES: CVNG1002 CIVIL ENGINEERING DESIGN I
COURSE DESCRIPTION: Innovation and creativity in conceptual design; sustainability; health and safety; investigative procedures. The use of analysis, synthesis and optimisation in design; project planning, networks and graphs. Design of embankments, dams; drainage design; route location and alignment design of roads; assessment of natural hazard impacts and environmental impacts. (Coursework)

LEVEL: 2
SEMESTER 1
COURSE CODE: CVNG 2005
COURSE TITLE: MECHANICS OF FLUIDS II
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 1001 MECHANICS OF FLUIDS I
COURSE DESCRIPTION: Rotational and irrotational flow; potential flow. Euler and Navier-Stokes equations. Bernoulli theorem, Reynolds stresses, lift and drag, curved flow, vortices. Open channel flow, energy and momentum principles, critical depths, hydraulic jump, backwater curves, surges, resistance to flow, waves, model analysis, sediment transport.

LEVEL: 2
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 2006
COURSE TITLE: STRUCTURAL DESIGN I
NUMBER OF CREDITS: C4
PREREQUISITES: CVNG 1000 MECHANICS OF SOLIDS
COURSE DESCRIPTION: Conceptual design of structures; structural design of steel, reinforced concrete, timber and masonry structures, use of construction materials in design. (Coursework)

LEVEL: 2
SEMESTER: 1
COURSE CODE: CVNG 2008
COURSE TITLE: SOIL MECHANICS I
NUMBER OF CREDITS: E2
PREREQUISITE: CVNG 1013 INTRODUCTION TO ENGINEERING MECHANICS
COURSE DESCRIPTION: Calculations for various different measures of particle packing and density are developed, culminating in Terzaghi's Fundamental Principle of Effective Stress. The theory of elasticity is applied to soils, and practical calculations are developed for short-term elastic settlements of various types of foundation. Concepts of different types and timescales for stress, deformations, and strength are developed. Terzaghi's Theory of Primary Consolidation is introduced.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CVNG 2009
COURSE TITLE: SOIL MECHANICS II
NUMBER OF CREDITS: E2
PREREQUISITES: CVNG 2008 SOIL MECHANICS II
COURSE DESCRIPTION: Starting from the principles developed in the previous course Soil Mechanics 1, an introduction is presented to the procedures, stages, and approaches of a geotechnical job. After recalling Darcy's Law, calculations are developed for aquifers, pumping from wells, and more generally the flow of water through soils and its effects on compositional and mechanical stability. The ideas of limit equilibrium and mechanisms are introduced, and used to analyse the stability of slopes. Some aspects of landslide stabilisation and avoidance are also covered.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CVNG 2010
COURSE TITLE: CIVIL ENGINEERING MANAGEMENT
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction to management theory; human resource management, leadership, corporate strategy, communication, conduct of meetings; Management Information Systems (MIS); resolution of engineering ethics, Civil Engineering case studies, resources and reasoning methods; Civil Engineering project management, networks and graphs, quality management; Facilities Management, maintenance management, managing Health and Safety; Introduction to Management Accounting and Financial Management.

LEVEL: 2
SEMESTER: 2
COURSE CODE: CVNG 2011
COURSE TITLE: ENGINEERING HYDROLOGY
NUMBER OF CREDITS: E3
PREREQUISITE: CVNG 2005 MECHANICS OF FLUIDS II
COURSE DESCRIPTION: The water resource system, meteorology, hydrologic cycle, hydro-meteorologic measurements and instrumentation, hydrologic statistics, rainfall and run-off, unit hydrographs, low flows, impoundment reservoirs, reservoir safety, groundwater flow, flow to wells, seawater intrusion, and contaminant transport.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3001
COURSE TITLE: STRUCTURAL ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 2001 STRUCTURAL MECHANICS; CVNG 2006 STRUCTURAL DESIGN I
COURSE DESCRIPTION: Introduction to matrix stiffness and flexibility methods, plate bending theory, introduction to finite element analysis, seismic loads II, plastic collapse analysis of framed structures, yield line analysis.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3002
COURSE TITLE: STRUCTURAL ANALYSIS
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 2001 STRUCTURAL MECHANICS; CVNG 2006 STRUCTURAL DESIGN I
COURSE DESCRIPTION: Symmetry and anti-symmetry, indeterminacy, slope deflection, moment distribution, structural dynamics, stability, pre-stressed concrete, plates, combined bending and axial loads, arches, influence lines, suspension cables.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3003
COURSE TITLE: STRUCTURAL DESIGN II
NUMBER OF CREDITS: C2
PREREQUISITE: **PREREQUISITE: CVNG 2001 STRUCTURAL MECHANICS; CVNG 2006 STRUCTURAL DESIGN I**
COURSE DESCRIPTION: Computer modelling, hurricane resistant design, earthquake resistant design of concrete and steel moment frames, pre-stressed concrete.(Coursework)

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3004
COURSE TITLE: STRUCTURAL DYNAMICS
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 3002 STRUCTURAL ANALYSIS
COURSE DESCRIPTION: Fourier Series and Integral, SDOF solutions in the time and frequency domains under several types of dynamic loads, numerical integration of the governing equations, MDOF solutions by modal analysis, approximate solutions for natural frequency of MDOF and continuous systems.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3005
COURSE TITLE: FOUNDATION ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 2008 SOIL MECHANICS; CVNG 2009 SOIL MECHANICS II
COURSE DESCRIPTION: Site investigations, bearing capacity and settlement, design of spread footings and rafts, pile foundations, sheet pile walls.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3006
COURSE TITLE: ENVIRONMENTAL GEOTECHNICS
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 3005 FOUNDATION ENGINEERING
COURSE DESCRIPTION: Geotechnical aspects of environmental control - Expansive soils, identification and classification, design of buildings and pavements. Landslides, geotech investigations, stability analysis, stabilisation techniques. Earthquakes, liquefaction of sands, effect on retaining structures and earthdams. Land-use planning.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3007
COURSE TITLE: ENVIRONMENTAL ENGINEERING I
NUMBER OF CREDITS: E3
PREREQUISITES: NONE
COURSE DESCRIPTION: Environmental needs and priorities, pollution, the role of environmental engineering, water quality standards, unit operations in water treatment, sources of wastewater, wastewater quality and effluent standards, unit operations in wastewater treatment, on site treatment and disposal, stream purification processes, sources of solid wastes, treatment of solid and faecal wastes, control of leachates, recycling, environmental impact assessment, soil conservation systems and mitigation of forest destruction.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3008
COURSE TITLE: ENVIRONMENTAL ENGINEERING II
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 2005 MECHANICS OF FLUIDS II; CVNG 3007 ENVIRONMENTAL ENGINEERING I
COURSE DESCRIPTION: Water supply systems, wastewater collection and disposal systems, hydraulics of treatment plants, pumping stations, urban storm water drainage systems, industrial wastewater and pollutants, treatment systems for industrial and agricultural waste water, solid waste collection systems disaster mitigation, environmental engineering in the built environment.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3009
COURSE TITLE: HIGHWAY ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITES: MATH 2230, MATH 2240, CVNG 2003, CVNG 2009)
COURSE DESCRIPTION:
The topics covered in the unit will include: Road classification and hierarchy; highway traffic characteristics, forecasting and land use, capacity, intersection analysis; Geometric design of highway segments for flat and mountainous terrains; health and safety risk assessment; sustainable highways, economic analysis of highway projects; Pavement materials, flexible and rigid highway pavement design; quality control; maintenance intervention and management.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3010
COURSE TITLE: TRANSPORTATION ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITE: CVNG 3009 HIGHWAY ENGINEERING
COURSE DESCRIPTION: Transport policy, economics and mathematics; design operation and management of air, land and sea transportation systems; Transportation planning, Intelligent Transportation Systems (ITS), architecture design and management; Road safety management systems; managing the environmental impact of transportation.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3011
COURSE TITLE: PAVEMENT DESIGN & MANAGEMENT
NUMBER OF CREDITS: E3
PREREQUISITE: CVNG 3009 HIGHWAY ENGINEERING
COURSE DESCRIPTION: Roads and highways pavement design, airport runway design, seaports and special pavements, pavement management systems, road rehabilitation and maintenance.

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3013
COURSE TITLE: COASTAL ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITE: CVNG 2005 MECHANICS OF FLUIDS II
COURSE DESCRIPTION: Introduction to coastal zone management; The marine environment, coastal processes; Wave generation and propagation; Coastal sediment transport, sediment budget; Port and marine structures. Design of coastal defense works; Port-planning and management. Coastal pollution control, EIA and waste disposal in the coastal zone.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 3014
COURSE TITLE: CIVIL ENGINEERING DESIGN PROJECT
NUMBER OF CREDITS: C6
PREREQUISITES: NORMALLY ALL LEVEL 1 AND LEVEL 2 COURSES
COURSE DESCRIPTION: The purpose of this course is to develop the student's ability in Civil Engineering Design, as well as the ability to work in a team. The emphasis is on self-learning, creativity, design, understanding, project team-working and communication skills, as well as engineering judgement and problem solving. The project gives professional orientation to work in the final year by simulating as closely as is possible the investigation and design works which are required for substantial Civil Engineering works and projects in the provision of buildings, lifeline facilities and Civil Engineering infrastructure. The integration of health and safety, and risk and vulnerability in the design process gives the student a complete outlook on the design process.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 3015
COURSE TITLE: SPECIAL INVESTIGATIVE PROJECT
NUMBER OF CREDITS: C6
PREREQUISITES: NORMALLY ALL LEVEL 1 AND LEVEL 2 COURSES
COURSE DESCRIPTION: This course is a project-based one, designed to generate an investigative learning atmosphere. The project work is carried out year-long, engenders a sense of enquiry, research and verification in the student, and draws on the first two years of learning in the programme. The emphasis is on self-learning, creativity, understanding, communication skills, as well as on engineering analysis and problem solving. The projects are supervised by tutors from the Department of Civil & Environmental Engineering. Special permission may be sought to pursue a relevant engineering-based project in other Departments in the Faculty of Engineering.

LEVEL: 3
SEMESTER: 1
COURSE CODE: CVNG 3016
COURSE TITLE: DESIGN OF ENVIRONMENTAL SYSTEMS
NUMBER OF CREDITS: C2
PREREQUISITES: CVNG 2001 STRUCTURAL MECHANICS; CVNG 2006 STRUCTURAL DESIGN 1
COURSE DESCRIPTION: Environmental and hydraulic design of water treatment systems; design of domestic wastewater collection and treatment systems; functional design of advanced wastewater treatment systems: design of industrial water and wastewater treatment systems; structural design of water and wastewater treatment systems and vessels; structural design of conduits, and supports; earthquake, hurricane and hazard-resistant design procedures and typical details for hydraulic structures, conduits and supports.
(Coursework)

LEVEL: 3
SEMESTER: 2
COURSE CODE: CVNG 3017
COURSE TITLE: OFFSHORE GEOTECHNICAL ENGINEERING
NUMBER OF CREDITS: E3
PREREQUISITES: CVNG 2008 SOIL MECHANICS I; CVNG 2009 SOIL MECHANICS II
COURSE DESCRIPTION: Introduction to offshore structures, codes of practice, companies, geohazards, risk analysis, health and safety, quality assurance and control, installation; offshore project management, deep water, offshore site investigations, geophysical methods; offshore soils, in-situ testing, geological aspects; development of design stratigraphies, assignment of engineering parameters, shallow gas, soil behaviour under cyclic loading; pile capacity, pile axial and lateral response, tension piles, pile driving, jackups, gravity platforms; seabed bearing structures, seafloor stability, scour, liquefaction, suction caissons, pipelines, cables, trenching, anchor piles, seismic analysis, model testing; awareness of FE, research, de-commissioning.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 3020
COURSE TITLE: DESIGN PROJECT ENVIRONMENTAL
NUMBER OF CREDITS: C6
PREREQUISITES: NORMALLY ALL LEVEL 1 AND LEVEL 2 COURSES
COURSE DESCRIPTION: The purpose of this course is to develop the student's ability in Environmental Engineering Design, as well as the ability to work in a team. The emphasis is on self-learning, creativity, design, understanding, project team-working and communication skills, as well as engineering judgement and problem solving. The project gives professional orientation to work in the final year by simulating as closely as is possible the investigation and design works which are required for substantial Civil & Environmental Engineering works and projects in the provision of buildings, lifeline facilities and Environmental infrastructure. The integration of health and safety, and risk and vulnerability in the design process gives the student a complete outlook on the design process.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: CVNG 3021
COURSE TITLE: SPECIAL INVESTIGATIVE PROJECT ENVIRONMENTAL
NUMBER OF CREDITS: C6
PREREQUISITES: NORMALLY ALL LEVEL 1 AND LEVEL 2 COURSES
COURSE DESCRIPTION: This course is a project-based one, designed to generate an investigative learning atmosphere. The project work is carried out year-long, engenders a sense of enquiry, research and verification in the student, and draws on the first two years of learning in the programme. The emphasis is on self-learning, creativity, understanding, communication skills, as well as on engineering analysis and problem solving. The projects are supervised by tutors from the Department of Civil & Environmental Engineering. Special permission may be sought to pursue a relevant engineering-based project in other Departments in the Faculty of Engineering**.**

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

LEVEL: 1
SEMESTER: 1
COURSE CODE: ECNG 1000
COURSE TITLE: ELECTRICAL CIRCUITS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course introduces students to the fundamental building blocks of electrical circuit theory. These include the basic electrical circuit analysis tools required to analyse the behaviour and functional as well as performance characteristics of electrical subsystems containing resistors, inductors and capacitors. These tools are applied to obtain both the full dynamic performance of circuits and the steady state performance of sinusoidal systems. Topics include: concepts of basic electrical quantities such as electric charge, current, voltage, power and energy; network theorems such as Thevenin's theorem, Norton's theorem, superposition and maximum power transfer; Laplace transform and the Laplace model; steady state and dynamic responses of simple networks; ac steady state analysis and the complex power model.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1006
COURSE TITLE: LABORATORY & PROJECT DESIGN I
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course is the first in a series of three Laboratory and Project Design courses. It consists of laboratory exercises to develop models for, and demonstrate the behaviour of energy storage devices operating under various conditions. The properties of energy storage devices would be utilised in a design project which is of use to industry. Students would be exposed to the recommended approach and procedure required to execute a design from a design brief, utilising project planning, time management and safe operating procedures. This course also includes a group project which aims to build team skills.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1007
COURSE TITLE: ELECTRICAL ENGINEERING TECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course targets students in engineering disciplines other than electrical engineering. It seeks to make the student competent in the fundamental theory of electric circuit analysis and to introduce them to the design and operation of electrical equipment such as transformers and motors. At the end of the course, the student should be able to perform analysis using fundamental electrical theorems, model simple electrical systems and calculate kW and kVA requirements of loads, understand the fundamentals of generation and distribution of electrical power, analyse and design simple signal phase and three-phase distribution systems and perform basic performance calculations on the transformer and the induction motor.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1009
COURSE TITLE: INTRODUCTION TO PROGRAMMING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course introduces students to the field of computing for the purpose of problem solving. Basic concepts of computer architecture and operating systems are discussed leading to compliers and interpreters. Students will be able to describe and analyse data structures, such as those created using arrays, lists, and pointers. This course also involves knowledge of the concepts of loops and iterative techniques, and recursion, in algorithms which include character codes and mathematical operations such as base conversions, masking and base arithmetic. The uses of algorithms are introduced for basic problem solving such as brute force/exhaustive methods, greedy methods and divide and conquer. Students are introduced to programming in C/C++ and the visual studio environment and would also be introduced to the concept of database systems.

LEVEL: 1
SEMESTER: 1
COURSE CODE: ECNG 1010
COURSE TITLE: COMMUNICATION SKILLS FOR ENGINEERS
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Course participants will explore a range of communication principles and conventions and their application to a variety of communicative situations as they may arise in the praxis of engineering. These situations include written and oral communication for industry and research and development. ECNG 1010 responds to the needs of industry by providing learning opportunities for students to hone their writing and oral communication skills, specific to the demands of the engineering profession. The course aims to develop two broad sets of communication competencies - technical writing and oral presentation skills.

LEVEL: 1
SEMESTER: 1
COURSE CODE: ECNG 1011
COURSE TITLE: ELECTRONICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course provides an introduction to analog electronics. It begins with the semiconductor diode, the simplest electronic device, and continues with the operational amplifier, a powerful device with which designs are easily executed. The course advances through binary junction transistors and field effect transistors. Simple transistor circuits using these current elements are designed.

LEVEL: 1
SEMESTER: 1
COURSE CODE: ECNG 1012
COURSE TITLE: ENGINEERING SCIENCE & TECHNOLOGY
NUMBER OF CREDITS: 4
PREREQUISITES: NONE
COURSE DESCRIPTION: This is an introductory course in Engineering Science and consists of modules to expose students to the following: the science of materials used in the production of electrical engineering components; an understanding of the mechanics of fluids when driven by electrical machines; the techniques involved in the production of engineering drawings, and the function and utilisation of basic mechanical workshop tools and equipment. On the electrical side, students would be taught to use the oscilloscope, meters, power supplies and signal generators; verify network theorems; design simple circuits, and perform computer simulation on these circuits.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1013
COURSE TITLE: INTRODUCTION TO THERMODYNAMICS
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Thermodynamics is the study of energy and its transformation from one form to another. This is a common phenomenon in many engineering systems as well as in everyday life, rendering thermodynamics as the underlying science of most engineering fields. Students will learn the different forms of energy and their qualitative nature as well as the laws governing energy transformation. Students will apply this knowledge to solve problems such as relate to internal combustion engines, steam turbine power plants and refrigeration. They will also explore performance matters.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1014
COURSE TITLE: DIGITAL ELECTRONICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course is an introductory course in digital logic analysis and design, and covers topics such as number systems, Boolean algebra, logic gates, combinational logic circuits, minimization using Karnaugh Maps, and the operation of CMOS/TTL integrated circuit technology. The course also serves to expose students to practical tools and devices used in the development of digital circuits, and to instill functional design and analysis skills in these areas. The course is assessed through a combination of written examinations and laboratory exercises.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1015
COURSE TITLE: INTRODUCTION TO ELECTRICAL ENERGY SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course presents an introduction to Electrical Energy Systems. It is divided into two sections, introduction to the electromechanical energy conversion process and the analysis of three-phase electrical systems. In the first section, electromagnetic systems are analyzed utilizing the law of conservation of energy to develop mathematical models to represent energy conversions from electrical to magnetic and magnetic to mechanical. These mathematical models are used to develop equivalent circuits to represent the electrical, magnetic and mechanical systems. In the second section on three-phase electromagnetic systems, the analysis of these systems are performed by utilizing their electric and magnetic equivalent circuits to produce the vector voltage and current phasors associated with the electromagnetic system. These vector voltage and current phasors are used to analyse the system and deduce and improve its performance.

LEVEL: 1
SEMESTER: 2
COURSE CODE: ECNG 1016
COURSE TITLE: MATHEMATICS FOR ELECTRICAL ENGINEERS I
NUMBER OF CREDITS: 1
PREREQUISITES: NONE
COURSE DESCRIPTION: ECNG 1016 introduces students to the theory and application of the Laplace Transform. The Laplace transform is an essential mathematical tool of an electrical engineer used for analysing certain systems of differential equations which, because of the nature of their forcing functions, cannot always be resolved by methods previously considered in ENGR 1180. Laplace transforms are used extensively in ECNG 2011 Signals and Systems to model linear systems. Students are therefore required to pass ECNG 1016 before they can attempt ECNG 2011.

LEVEL: 2
SEMESTER: 2
COURSE CODE: ECNG 2000
COURSE TITLE: ELECTROMECHANICAL ENERGY CONVERSION SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 1000 ELECTRICAL CIRCUITS AND ECNG 1015 INTRODUCTION TO ELECTRICAL ENERGY SYSTEMS
COURSE DESCRIPTION: This course provides an introduction to the more common types of electrical machines for students, who, as engineers, will treat with electrical machines as a critical element of a system or subsystems. Electronic and mechanical drive systems, control systems and power systems depend on the functioning characteristics of electrical machines. This course will provide the depth necessary for students requiring a comprehensive understanding of the steady-state behaviour of the basic electrical machines. The principles of operation, steady state analysis and application of four machines, in particular, will be discussed. These are transformers, three-phase induction motors, synchronous machines and DC machines. Great emphasis will be placed on problem solving and students are strongly advised to budget adequate time for this activity, throughout the semester.

NOTE: Offered as a Level 3 course in Semester I to students of Department of Mechanical and Manufacturing Engineering

LEVEL: 2
SEMESTER: 2
COURSE CODE: ECNG 2001
COURSE TITLE: COMMUNICATION SYSTEMS I
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 2011 SIGNALS AND SYSTEMS & ECNG 2013 MATHEMATICS FOR ELECTRICAL ENGINEERS II
COURSE DESCRIPTION: This is the introductory course in Communications in the Department. It establishes the technical foundation for the topic by introducing the fundamentals of communications and exploring the common principles that underpin communications systems. The course provides a detailed treatment of amplitude modulation (AM) techniques (such as conventional AM, double-sideband suppressed carrier AM, and single-sideband AM) as well as that of angle modulation techniques (i.e., frequency modulation and phase modulation) in the presence of additive white Gaussian noise. Once these communication principles are well established, the course illustrates their application to a representative set of analog communication systems.

LEVEL: 2
SEMESTER: 1
COURSE CODE: ECNG 2004
COURSE TITLE: LABORATORY & PROJECT DESIGN II
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course is the second in a series of Laboratory and Project Design courses. It consists of laboratory exercises to demonstrate the principles presented in ECNG 1014 Digital Electronics and ECNG 2012 Electronics and Instrumentation. The knowledge gained in these two courses, together with the principles demonstrated in the laboratory exercises would then be utilised in a project to design and fabricate an electronic system to meet quality, safety, and environmental standards, and take industry performance parameter requirements and legal issues into consideration.

LEVEL: 2
SEMESTER: 2
COURSE CODE: ECNG 2005
COURSE TITLE: LABORATORY & PROJECT DESIGN III
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course is the last in a series of Laboratory and Project Design courses. It consists of laboratory exercises to demonstrate the principles presented in Communication Systems (ECNG 2001, Introduction to Microprocessors (ECNG 2006) and Control Systems (ECNG 2009).The knowledge gained in these courses, together with the principles demonstrated in the laboratory exercises would then be utilised in a project to design and fabricate a system to solve an industrial problem. The project must meet quality, safety, and environmental standards, and take industry performance parameter requirements and legal issues into consideration, while utilising project planning and time management techniques. This course also includes a group project, which builds team skills. This project aims to meet a socioeconomic need of a particular community.

LEVEL: 2
SEMESTER: 2
COURSE CODE: ECNG 2006
COURSE TITLE: INTRODUCTION TO MICROPROCESSORS
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 1009 INTRODUCTION TO PROGRAMMING & ECNG 1014 DIGITAL ELECTRONICS
COURSE DESCRIPTION: Microprocessors have been one of the most widely used tools for incorporating flexibility and intelligence into automated devices. Their general-purpose nature, speed and size have made them one of the most common components in Electrical Engineering. It is therefore necessary to develop a good understanding of their operation and how they can be used as building blocks for automated systems and control applications. This course explores the inner workings of a microprocessor from the programmer's perspective, as well as treating with external hardware issues such as interfacing, and selection criteria for microprocessors. Exercises and examples are based on the PIC 16F877 microcontroller. The syllabus follows: Microprocessor architecture (PIC16F877); Microprocessor development and support systems (MPLAB); Binary, integer and floating point arithmetic operations; (PIC16Cxxx) assembly language programming; Interfacing (PIC16F877): I/O ports, Timers, Interrupts, A/D conversion, PWM; System Issues; Serial/Parallel Communication.

LEVEL: 2
SEMESTER: 1
COURSE CODE: ECNG 2007
COURSE TITLE: COMPUTER SYSTEMS & SOFTWARE DESIGN
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 1009 INTRODUCTION TO PROGRAMMING
COURSE DESCRIPTION: This course emphasises both computer systems as well as software design. For the computer systems component, there will be theoretical sessions within the classroom environment. The Software design component of the course would be delivered by short theory based sessions that would be supplemented by practical laboratory sessions and group project. The software design component aims to instill rudimentary skills that are necessary by any software developer. These practical sessions will show how to use the IDE and debugger and give the student practical skills in writing a programme. These skills would be developed around the C/C++ programming languages as they give the student an understanding of algorithmic processes which are a fundamental building block for any programming language.

LEVEL: 2
SEMESTER: 2
COURSE CODE: ECNG 2009
COURSE TITLE: CONTROL SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2011 SIGNALS & SYSTEMS
COURSE DESCRIPTION: The area of automatic control involves the use of procedures and strategies for forcing dynamic systems to behave in a specified fashion. We are all directly engaged in the control of dynamic systems on a continual basis – consciously or otherwise. For example, driving requires control of both direction and speed of an automobile; effective walking and running requires control of direction, speed and balance; our body systems control body parameters such as heart-rate, blood-pressure, temperature etc. with little conscious intervention This course uses what is termed the "classical or frequency domain" approach to control systems design. The techniques borrow heavily from the telecommunications industry of the early 1920's when engineers like Bode and others developed frequency response methods for solving problems encountered in the design of equalisers and amplifiers for long distance communication over the transatlantic cable. This course emphasises industrial application of theoretical concepts. Students require a good grasp of signals and systems theory as well as mathematics to successfully navigate this course.

LEVEL: 2
SEMESTER: 1
COURSE CODE: ECNG 2011
COURSE TITLE: SIGNALS & SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 1016 MATHEMATICS FOR ELECTRICAL ENGINEERS I
COURSE DESCRIPTION: ECNG 2011 is concerned with predicting and analysing the response of linear time-invariant (LTI) systems when certain signals, such as the unit impulse, the unit step and the sinusoid, are furnished as inputs. Transfer function models of LTI systems will be developed and analysed using a number of powerful techniques based on the Laplace Transform and the Fourier Transform. These techniques will also be used extensively in other engineering courses, for example telecommunications, control systems and signal processing. To enhance the learning experience, MATLAB will be used to explore some of the concepts discussed and to verify some of the predictions.

LEVEL: 2
SEMESTER: 1
COURSE CODE: ECNG 2012
COURSE TITLE: ELECTRONICS & INSTRUMENTATION
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: The course treats with analog electronics at an intermediate level. An increased emphasis is placed in design using discrete and integrated circuits and the concept of feedback is introduced. The main topics considered are feedback amplifiers, power supplies, active filters, oscillators, waveform generators and non-linear systems and A/D-D/A converters and instrumentation systems.

LEVEL: 2
SEMESTER: 1
COURSE CODE: ECNG 2013
COURSE TITLE: MATHEMATICS FOR ELECTRICAL ENGINEERING II
NUMBER OF CREDITS: 3
PREREQUISITES: ENGR 1180 ENGINEERING MATHEMATICS I
COURSE DESCRIPTION: ECNG 2013 is the third part of a required three-part sequence of mathematics courses offered to students of the Department of Electrical and Computer Engineering. The other courses, offered in the first year are ENGR 1180 – Engineering Mathematics I and ECNG 1016 – Mathematics for Electrical Engineering I. This course, ECNG 2013, introduces students to the techniques of multivariable/vector calculus and partial differential equations that are required by engineers to model physical situations such as electrostatic field theory and acoustics. The techniques of the Fourier series are also considered as they are necessary tools of an engineer for analyzing certain systems of differential equations which, because of the nature of their forcing functions, cannot always be resolved by methods previously considered in ENGR 1180. Methods from the theory of probability and statistics are introduced as these are required to model phenomena such as noise and other stochastic processes. Students will also be introduced to the fundamentals of discrete mathematics.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3001
COURSE TITLE: COMMUNICATION SYSTEMS II
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2001 COMMUNICATION SYSTEMS I
COURSE DESCRIPTION: ECNG 3001 explores the key principles which underpin the coding and communication of digital information; and examines contemporary techniques and technologies used for the transmission of such information over various media. Standard performance metrics are derived for digital communications in the presence of noise. The course covers basic theoretical tools required for the modeling, analysis and design of digital communication systems and treats concisely with digital communications link design. It is assessed through a mix of formative and summative exercises. The formative exercises comprise an oral presentation and design project linked to four (4) Matlab simulations of essential components in the communications signal processing chain. A final examination provides summative assessment. Analysis features strongly in all assessments.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3002
COURSE TITLE: DATA COMMUNICATION SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: ECNG 3002 explores the organization and operation of contemporary data networks by presenting fundamental principles and applying these to the architecture of the Internet. It takes a top down approach, starting with the structure and communication requirements of familiar network applications. Network architecture, including the OSI and Internet protocol suite, is introduced. Once this is established the top down approach continues by exploring the functions, implementation and performance of the Application, Transport, Network, Data Link and Physical Layers of the Internet protocol suite. Given the accessibility of the subject matter, the 30% coursework component includes hands on exercises where real network data is captured and analyzed. A final exam worth 70% rounds off the assessment.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3003
COURSE TITLE: TELECOMMUNICATION NETWORKS
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 3001 and ECNG 3002COURSE DESCRIPTION: ECNG 3003 is the capstone undergraduate course in Communication Systems. It utilizes a generic model of network architecture as the conceptual framework within which telecommunication network design is explored; and a contemporary technology is used as a demonstrative focal point. Building on the fundamentals of communications, ECNG 3003 treats with key physical channels and enabling technologies. Account is taken of the theoretical as well as practical performance limits in the time and frequency domains; and associated compensation mechanisms are presented. Broadband standards are compared according to both qualitative features and quantitative measures. The course comprises a 40% network simulation challenge comprising basic business planning and market modeling; along with network design and simulation.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3004
COURSE TITLE: CONTROL & INSTRUMENTATION II
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 3032 CONTROL & INSTRUMENTATION I
COURSE DESCRIPTION: This course seeks to equip the student with the knowledge and basic skills required for an engineer in the area of control and instrumentation. Particular emphasis is paid to developing skills necessary to design and implement computer systems for automation and control and, in particular, programmable logic controllers or PLCs. The course is significant because of the importance of automation, control and instrumentation (collectively called instrumentation in the region) to the industrial processes which are the flagships of the Caribbean economies and to the burgeoning group of small manufacturing concerns. The course introduces the student to common process and manufacturing subsystems and control components; it also looks at new trends which include, for example, Distributed Control Systems in manufacturing and process plants.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3006
COURSE TITLE: MICROPROCESSOR SYSTEMS - DESIGN & APPLICATIONS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2006 INTRODUCTION TO MICROPROCESSORS
COURSE DESCRIPTION: This elective course builds upon the knowledge acquired in ECNG 2006. Currently, it specifically treats microprocessor systems design and application with respect to real-time operating systems and its principles. It discusses microC/OS RTOS and its functions in detail. The laboratory exercises are based on the examples for microC/OS. Relevant discussion is carried out for interfacing devices like keypads, LCDs, seven-segment displays and ADC/DACs.

The course includes a project requiring students to build and test a microprocessor application based on RTOS. Students will be required to describe scheduling algorithms as well as analyse some issues and the performance of schedules. They will also be required to define and classify the different classifications of real-time systems according to their timing attributes.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3008
COURSE TITLE: POWER ELECTRONICS CIRCUITS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2000 ELECTROMECHANICAL ENERGY CONVERSION SYSTEMS
COURSE DESCRIPTION: This course applies solid-state electronics, for the control and conversion of electric power, utilising techniques for switching on and off of power semiconductor devices. It is divided into four sections; ac to dc converters, ac to ac controllers, dc to dc converters and dc to ac converters. Students will perform circuit analysis on the standard topologies for ac to dc converters, ac to ac controllers, dc to dc converters and dc to ac converters, and utilise the results from these analyses to produce the corresponding output voltage and current waveforms based on the supplied input. Analyses would then be performed on these waveforms to determine the performance parameters of these systems.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3010
COURSE TITLE: ELECTRICAL MACHINES & DRIVE SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2000 ELECTROMECHANICAL ENERGY CONVERSION SYSTEMS
COURSE DESCRIPTION: A modern electric drive system consists of a motor, an electric converter, and a controller that are integrated to perform a mechanical manoeuvre for a given load. This course covers the basic theory of control of the DC motor, the induction motor and the synchronous motor. Additionally, the course expands on the analysis and study of the synchronous generators. Power electronic converters are discussed in some detail and their performances and applications with different motors are studied. This course is designed for engineers intending to work in any area of engineering where electrical motors and machinery are operated, maintained or specified. This course is an elective 3-credit course intended for students in the third year of the B. Sc. Degree programme in Electrical and Computer Engineering. The course comprises of 30 one-hour lectures and 6 hours of tutorials. Great emphasis will be placed on problem solving and students are strongly advised to budget adequate time for this activity, throughout the semester.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3012
COURSE TITLE: POWER SYSTEMS ANALYSIS
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 3015 INDUSTRIAL & COMMERCIAL ELECTRICAL SYSTEMS
COURSE DESCRIPTION: This course is an elective 3-credit course intended for students in the third year of the B. Sc. Degree programme in Electrical and Computer Engineering. The course provides students with comprehensive material about the operation and analysis of electric power systems. It covers the major topics likely to be encountered by the transmission and distribution power systems engineer. Students will become familiar with the most common practices and technology through the classes, computer exercises and reading material. The course comprises of 30 one-hour lectures, 6 hours of tutorials and 4 computer exercises. Great emphasis will be placed on problem solving and students are strongly advised to budget adequate time for this activity, throughout the semester.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3013
COURSE TITLE: ELECTRICAL TRANSMISSION & DISTRIBUTION SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITES: ECNG 3015 INDUSTRIAL & COMMERCIAL ELECTRICAL SYSTEMS
COURSE DESCRIPTION: This is a 3 credit mandatory course for the students who opt for the Energy Systems option. The current energy systems offering focuses on the generation of the electricity and the general health of the system. This course addresses the void existing in the engineering analysis and the application of technology to the transmission and distribution area. The course is divided into 33 lecture and 6 tutorial one hour sessions. There will also be three research papers/projects and a mid-semester exam.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3015
COURSE TITLE: INDUSTRIAL & COMMERCIAL ELECTRICAL SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2000 ELECTROMECHANICAL ENERGY CONVERSION SYSTEMS
COURSE DESCRIPTION: This is a 3 credit compulsory course for all students in the Electrical and Computer Engineering Department. This course provides all the knowledge required to analyse an industrial power network from determination of the design ratings of equipment to the setting of protection relays. Human safety issues, in the handling of electrical equipment, are emphasised in all the topics covered. Topics delivered in the course are all linked as all topics depend on theory delivered in the previous topics. All topics are done by first delivering the required theory and then the application of the theory to a typical industrial design problem. This course is divided into 34 lecture and 5 tutorial sessions, each of one hour duration. Evaluation is done through 4 investigative laboratory experiments, a maximum of 5 take-home assignments, a midterm exam and a final exam.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3016
COURSE TITLE: ADVANCED DIGITAL ELECTRONICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course is designed for final year BSc Electrical and Computer Engineering students. Our aim is to present methods and design considerations of digital systems and their implementation on FPGAs. There are many different types of digital ICs, including "jelly-bean logic" (small components containing a few simple, fixed logical functions), memory devices, and microprocessors (uPs). Of particular interest are FPGAs, because their functionality can be customised in the field, they can contain millions of logic gates and can be used to implement extremely large and complex functions that previously could be realised only using ASICs (application-specific integrated circuits). FPGAs are the target ICs Technology for this course. We will analyse some major design issues and applications targeting FPGAs.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3019
COURSE TITLE: ADVANCED CONTROL SYSTEMS DESIGN
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2009 CONTROL SYSTEMS
COURSE DESCRIPTION: This course delivers an overview of the control problem and discrete time. It includes treatment of system modelling, state space methods; feedback designs, performance criteria, stability considerations; optimal discrete time control, microprocessor implementation of digital controllers; real time control systems; computers in industrial control; distributed data processing and control.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: ECNG 3020
COURSE TITLE: SPECIAL PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES: NONE
COURSE DESCRIPTION: The ECNG 3020-Special Project is regarded as the capstone course of the entire BSc Electrical and Computer Engineering Programme. ECNG 3020 is a student-driven, research and development project. Monthly seminars, intended to support the student in the research process are held and students are assessed by a final project submission and dissertation presentation. The course is year-long and counts for 6 credits and contributes 20% of the final weighted average used in the determination of honours. ECNG 3020 Special Project is designed to develop technical skills in the following areas:

- Design to specification
- Formulation of creative solutions to engineering problems
- Engineering analysis and enquiry
- Validation and testing against benchmarks
- Project management
- Time management
- Communication

ECNG 3020 presents the opportunity to build upon the core of engineering skills gained in the earlier years and to broaden the scope of knowledge already gained.

LEVEL: 3
SEMESTER: I
COURSE CODE: ECNG 3021
COURSE TITLE: INTRODUCTION TO ENGINEERING MANAGEMENT & ACCOUNTING SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course provides final year Electrical and Computer Engineering students with a background in management and accounting skills to equip them to function in the business world. It will provide a working understanding of the main elements of the successful planning, operation and control of industries and businesses as they relate to the following essential areas :
Accounting and Finance
Management and Organisational Theory
Project Management, Production Planning and Control Techniques.
Introduction to Business Law

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3022
COURSE TITLE: ELECTROMAGNETIC FIELD THEORY
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2013 MATHEMATICS FOR ELECTRICAL ENGINEERS II
COURSE DESCRIPTION: ECNG3022 encompasses the study of electromagnetic phenomena and applications under static and dynamic conditions. Example applications include optical and wireless communications, electrical machines and drives, electromagnetic compatibility, EM safety, biotechnology and high-speed microelectronics. While the evaluation of electric and magnetic fields is of utmost importance for efficient design of electromagnetic systems, in real-world applications, complex geometries and system assemblies limit the applicability of analytical solutions. ECNG3022 leverages analytical and computer-aided techniques which can be utilized for analysis and design of complex electromagnetic systems. The course is assessed through 60% final exam and 40% coursework, comprising of various problem-based analysis and design activities which draw upon the concepts introduced in the course.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3023
COURSE TITLE: INTRODUCTION TO SOFTWARE ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 2007 COMPUTER SYSTEMS AND SOFTWARE DESIGN
COURSE DESCRIPTION: This course introduces the concepts and techniques associated with the engineering of software systems. These concepts and techniques will be used to design and develop software to meet specified requirements and quality standards within the framework of time and cost. Historically, software applications have been developed as problem based solutions. While this method is sufficient for small, one-of-a-kind projects, it is very difficult to manage when applied to large projects which can have from thousands to millions of lines of code. The study of how software can be developed in an efficient, cost-effective manner has grown tremendously in importance. Software engineering processes improve the productivity of developers and the quality of the products. The IEEE Computer Society defines software engineering as the application of a systematic, disciplined, and quantifiable approach to the development, operation and maintenance of software; that is the application of engineering to software.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ECNG 3024
COURSE TITLE: NETWORK SYNTHESIS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course involves the design of active filters. It focuses principally on implementation using op amps and treats with a wide range of filter types such as low pass, high pass multiple feedback and voltage controlled voltage service. Consideration is given to sensitivity issues.

LEVEL: 3
SEMESTER:
COURSE CODE: ECNG 3025
COURSE TITLE: DISCRETE SIGNAL PROCESSING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: In this course, we will examine the techniques of discrete-time signal processing and digital signal processing, investigate the development of digital FIR and IIR filters, study the Discrete-time Fourier Transform and in particular, a numerical, efficient version called the Fast Fourier Transform (FFT) and use the FFT to carry out spectral analysis of some sample signals. We will also examine some Digital Signal Processors which are specialised microprocessors created for the sole purpose of performing numerical calculations.

LEVEL: 3
SEMESTER:
COURSE CODE: ECNG 3029
COURSE TITLE: ROBOTIC TECHNOLOGY & APPLICATIONS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This optional final year course targets students who wish to investigate and/or utilise robotic technology in their capstone project. The effective application of robots requires an understanding of, robotic manipulator dynamics, as well as ongoing developments in Robotics research. Students will be exposed to simulated, experimental, and existing robot systems. At the conclusion of the course, students will be able to identify, analyse, recommend, and justify specifications for such systems. Topics discussed include: common robotic terminology and configurations; kinematics and dynamics of 6R manipulators, and differential drive platforms; research paradigms in human interaction, control and programming of robots; robot-related social, economic and technological developments.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3031
COURSE TITLE: ENGINEERING & TECHNOLOGY FOR ACOUSTICS & MUSIC
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: This course seeks to explore and present the principles and interrelationships of Acoustics, Music, Sound Technology and Engineering. The course treats with the principles, theories and parameters used to describe the nature and sources of sound and its propagation through space. It also looks at psycho-acoustic effects – how sound is actually perceived by humans. Signals and systems techniques are used to characterise music technology and the acoustic space. The latter addresses room characteristics, sound reinforcement system design and recording techniques to optimise the listening experience.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3032
COURSE TITLE: CONTROL & INSTRUMENTATION I
NUMBER OF CREDITS:3
PREREQUISITE: ECNG 2009 CONTROL SYSTEMS
COURSE DESCRIPTION: This course attempts to cross that bridge between control systems theory and control systems practice. The department considers it significant because of the importance of automation, control and instrumentation (collectively called instrumentation in the region) to the industrial processes which are the flagships of the Caribbean economies and to the burgeoning group of small manufacturing concerns. The instrumentation area is also of particular importance in supporting regional manufacturers who compete internationally; this competition requires greater focus on quality assurance and control which, in turn requires ever competent expertise in instrumentation technology.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3033
COURSE TITLE: COMMUNICATION SKILLS II
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 1010 COMMUNICATION SKILLS I
COURSE DESCRIPTION: This course focuses on Oral Communication in professional contexts. Course participants will explore a range of oral communication principles and conventions. Most importantly, it will provide a forum for practicing spoken Standard English. The course is practical and students will be evaluated on their ability to appropriately and effectively communicate in a variety of speaking situations as they may arise in the engineering profession.

LEVEL: 3
SEMESTER: 1
COURSE CODE: ECNG 3034
COURSE TITLE: EMBEDDED SYSTEMS PRODUCT DEVELOPMENT
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: This course is the capstone course for the Computer Systems Engineering (CSE) option. Students will work in teams, creating and integrating electrical/electronic hardware, low and high-level software, instrument and communication networks, and multiple processes, to transform a conceptualized embedded system into a market-ready product. Product ideas may originate both within and outside of the Department ideally consisting of a preliminary prototype, and associated documentation. The focus of the course is on the systems, procedures, and issues involved when creating a business case for a commercially viable product. At the end of the course, originator and students may exercise the right to commercialize their product, in a manner consistent with UWI policies on ownership and intellectual property.

DEPARTMENT OF GEOMATICS ENGINEERING AND LAND MANAGEMENT

LEVEL: 1
SEMESTER: 1
COURSE CODE: GEOM 1001
COURSE TITLE: MATHEMATICS FOR GEOMATICS ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Trigonometric functions of acute angles, applications of right angled triangles, trigonometric functions of any angle, radians and arc length, trigonometric identities (Pythagorean, sum, co-function, double angle, half angle); Inverses of trigonometric functions, solving trigonometric equations, law of sines, law of cosines, polar coordinates and graphs, three dimensional coordinate systems; Vectors, dot product, cross product, equations of lines and planes; Systems of equations in two and three variables, matrices and systems of equations, matrix operations; Inverses of matrices, determinants and Cramer's rule, linear transformations and their matrix representations, examples of linear transformations - reflections, projections and rotations; Conic sections – parabola, ellipse and hyperbola. Cylinders and quadric surfaces, cylindrical and spherical coordinates; Derivatives and rates of change, differentiation formulae, derivatives of trigonometric functions, chain rule; Natural logarithms and exponentials and their derivatives, rates of change ; Related rates, linear approximations, anti-derivatives, the definite integral; Fundamental Theorem of Calculus, indefinite integrals, substitution rule; Functions of several variables, partial derivatives, tangent planes and linear approximations, chain rule for partial derivatives

LEVEL: 1
SEMESTER: 1
COURSE CODE: GEOM 1010
COURSE TITLE: SURVEYING I
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Introduction to surveying. Theories of measurement errors and plane coordinate systems. Propagation of errors. Principles of basic survey instruments and their adjustment. Measurement of distance, direction, angle, height, position, area, volume, corresponding errors and computations. Establishing horizontal and vertical control. Detail survey methods - planimetry and hypsometry.

LEVEL: 1
SEMESTER: 1
COURSE CODE: GEOM 1011
COURSE TITLE: SURVEYING PRACTICE
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Hands-on field experience in the practical aspects of surveying; measuring, booking, reporting. Conventional distance measurement, height measurement, angular measurement. Tests and adjustment of basic survey instruments. Level circuit including adjustment of results. Traverse circuit including adjustment of results. Distance measurement: optical and electronic. Intersection and resection.

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1015
COURSE TITLE: SURVEYING II
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 1010
COURSE DESCRIPTION: Topographical surveying including organisation and execution of projects, specification and representation of data in different formats. Route surveys including setting out. Vertical and transition curves and slope stakes. Project execution processes for all types of land surveys. Introduction to the theory of adjustments computation. Coordinate systems, 2-D coordinate transformation, GNSS principles, measurement techniques and data reduction.

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1020
COURSE TITLE: PHOTOGRAMMETRY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Aerial photographs and digital images. Geometry of aerial photograph: scale, relief and tilt displacement. Photo-interpretation. Stereoscopic vision. Parallax measurements. Photogrammetric cameras and camera calibration. Introduction to analytical photogrammetry, collinearity equation, interior and exterior orientation. Photogrammetric instruments. Stereo restitution and compilation.

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1030
COURSE TITLE: GEODESY
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Spherical trigonometry and its application to surveying. Concepts of geodetic astronomy, astronomic azimuths. Field astronomy. Gravity: anomalies, potential, the geoid. Earth rotation: precession, nutation and polar motion. Ellipsoidal geometry and its application to satellite surveying. Satellite mechanics: Keplerian motion, perturbed motion, coordinate and time systems. Coordinate systems and relationships between ECEF inertial and topocentric reference frames.

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1040
COURSE TITLE: STATISTICS FOR SURVEYING
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Basic ideas of probability: Random variables, probability distribution, density functions, marginal and conditional distributions; independence. Moments, expectation, variance, covariance, correlation. Some often used distributions: normal, t, chi-square and F distributions; the multinormal distribution. Sampling and sampling distribution: graphical representation, sample statistics for measures of position and spread. Estimation: consistency, unbiasedness; minimum variance, efficiency and sufficiency, methods of estimation; maximum likelihood, least squares. Confidence intervals. Statistical tests on sample means for s known and unknown, tests concerning variance. Regression: technique of least squares.

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1045
COURSE TITLE: COMMUNICATION SKILL
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Critical and creative thinking, elements of communication, written communication: technical reports, proposals, technical descriptions, technical instructions, oral communication: oral presentations, group dynamics and team building, visual aids, technology and communication: formatting reports, electronic documentation, visual aids, information retrieval and citations, ethics: Plagiarism, decision-making, rules of professional conduct. (100% Coursework)

LEVEL: 1
SEMESTER: 2
COURSE CODE: GEOM 1050
COURSE TITLE: SURVEYING PROJECT
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 1010
COURSE DESCRIPTION: Topographic survey of selected site including all planimetric and hypsometric information. Plan preparation. Computer Aided Design (CAD), Production of topographic maps and thematic plans, compilations and reports.

LEVEL: 2
SEMESTER: 1
COURSE CODE: GEOM 2000
COURSE TITLE: HEALTH AND SAFETY SEMINARS
NUMBER OF CREDITS: 0
PREREQUISITE: NONE
COURSE DESCRIPTION: General Introduction to the Occupational Safety and Health Act 2004, Accident Reporting and Investigation, Accident Prevention and Control, Responsibilities, Offences and Penalties, Safety Policies, Consultation with Employees. Security on Site, Woodworking Machines, Asbestos, Buried Services, Dust Hazards and the Control of Fumes, Electricity on Site, Working in Confined Spaces, Personal Protection, Fire Prevention and Control in the Office, Fire Prevention and Control on Site, Highly Flammable Liquids and Petroleum-Based Adhesives, Liquefied Petroleum Gases and Vehicle Fuels (including Petrol, Diesel and LPG).

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2001
COURSE TITLE: NUMERICAL METHODS FOR GEOMATICS ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES: GEOM 2001
COURSE DESCRIPTION: Numerical methods and use of the computer in numerical work; Solution of equations in one variable; Polynomials and interpolation using Lagrange and differencing methods; Curve fitting using cubic splines.; Fourier methods in frequency response of time series analysis.; Discrete and fast Fourier transforms.; Numerical differentiation and integration.; Solution of ordinary differential equations using Euler and Rung-Kutta for initial value problems. Extend to consider second order ODE's and coupled first order.; Solution of systems of linear equations through elimination and iterative methods; LU factorisation and Cholesky applied to least squares adjustment.; LU factorisation applied to matrix inversion and assessment of system condition.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2060
COURSE TITLE: CARTOGRAPHY
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction to Cartography. Cartographic communication. Digital data sources. Representation of spatial data. Symbol design. Name design and placement, Components of a map. Map design. Map generalisation methods. Map projection systems. Topographic mapping. Thematic mapping. Map production process. Automation of cartographic processes.

LEVEL: 2
SEMESTER: 1
COURSE CODE: GEOM 2010
COURSE TITLE: FUNDAMENTALS OF GIS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: GIS concepts. Data models in GIS. Sources of GIS data. GIS applications. Data acquisition systems. Data conversion techniques. Topology and digital errors. Systems development. Databases design. Attribute data coding. Linking databases. Spatial queries and analyses.

LEVEL: 2
SEMESTER: 1
COURSE CODE: GEOM 2015
COURSE TITLE: GEOMATICS FOR CIVIL & ENVIRONMENTAL ENGINEERS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Principles and field practice of Geomatics as applied to tasks in Civil and Environmental Engineering. Introduction to Geomatics; Measurement Basics. Leveling Techniques. Procedures and Applications. Distance and Angle Measurements. Adjustment of measurements. Traversing and Control Surveying; Volumetric Applications; Earthwork Applications; Profiles and Cross Sections; Construction Applications; Transportation Applications. Global navigation satellite systems (GNSS).

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2017
COURSE TITLE: GEOINFORMATICS FOR CIVIL & ENVIRONMENTAL ENGINEERS
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: The principles of Geoinformatics techniques and their applications for typical problems in Civil and Environmental Engineering. Basics of aerial and satellite imageries; extraction of graphical and numerical data. Integrated approach for addressing Civil and Environmental Engineering problems using Geoinformatics.

LEVEL: 2
SEMESTER: 1
COURSE CODE: GEOM 2020
COURSE TITLE: DIGITAL PHOTOGRAMMETRY
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 1020
COURSE DESCRIPTION: Digital images. Digital photogrammetry: image processing, softcopy-based mapping systems. Analytical photogrammetry; aerial triangulation and block adjustment. Automatic process for orientation, generation of DTM and orthophoto. Digital terrain models: data collection and interpolation. Digital image map: photo rectification, orthophotography mosaic. Lidar: principles, processing, and applications.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2025
COURSE TITLE: REMOTE SENSING
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Electromagnetic radiation properties, interaction with atmosphere and earth features. Remote sensing sensors and systems. Multi-spectral image processing: geometric and radiometric image correction, image enhancement. Thematic information extraction. Applications in the environment and natural resource management.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2030
COURSE TITLE: ADJUSTMENT COMPUTATIONS
NUMBER OF CREDITS: 3
PREREQUISITES: GEOM 1040
COURSE DESCRIPTION: Review of observables in geodetic surveying. Observation, condition and combined models for adjustment of terrestrial observations. Satellite time observations, corrections and adjustment. Stochastic models and weighting. Pre-analysis and post-analysis of geodetic survey data.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2035
COURSE TITLE: GEODETIC SURVEYING
NUMBER OF CREDITS: 3
PREREQUISITES: GEOM 1015; GEOM 1030
COURSE DESCRIPTION: Geodetic control: design and strength analysis of geodetic networks. Control survey methods, observations, data corrections and reductions. Height systems, trigonometric heighting. Network adjustment, analysis and quality control. Field work in the design, execution and analysis of control surveys. Statistical testing and reliability analysis of observations and parameters in adjustment.

LEVEL: 2
SEMESTER: 1
COURSE CODE: GEOM 2040
COURSE TITLE: HYDROGRAPHIC SURVEYING
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 1015
COURSE DESCRIPTION: Brief on different areas of interest. Introduction to various sounding data and establishment of marine data. Simple tidal analysis and studies. Position fixing - principles and techniques: planimetric - optical and electronic position fixing, vertical - lead lines and acoustic soundings. Sources of errors in position fixing. Instrument calibration. The hydrographic survey process - from pre-planning to chart production.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2045
COURSE TITLE: LAND LAW
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Caribbean legal systems, case laws. Sources of land law: equity, statutes. Doctrines of estates. Reception of English law in the Caribbean and its evolution. The meaning of 'Law'. Estates and Interests: freehold, leasehold, absolute, co-ownership, joint tenancies, tenancies in common, profits-a-prendre. Easements, restrictive covenants. Adverse possession, prescription. Contract for sale of land, the Doctrine of part performance, pre-contract enquiries and inspection. Title of unregistered and Forms of deeds and other documents. Registration of deeds, title. Registration of title, Torrens system.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2048
COURSE TITLE: INTRODUCTION TO PLANNING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: The nature of planning, urban growth and urbanism. Evolution of modern planning. Economics of planning. Aspects of planning practice. Land settlement and housing development. Physical planning and infrastructural development. Challenges for town planning. Town and country planning law. Public health and building regulations.

LEVEL: 2
SEMESTER: 2
COURSE CODE: GEOM 2050
COURSE TITLE: MAPPING PROJECT
NUMBER OF CREDITS: 3
PREREQUISITES: GEOM 1050; GEOM 2020
COURSE DESCRIPTION: Field-to-finish practical experience in the process of topographic mapping of a selected area using photogrammetry. Provision of control. Field completion and verification. Production of machine plot, computation and report.

LEVEL: 3
SEMESTER: 1
COURSE CODE: GEOM 3010
COURSE TITLE: CADASTRAL SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 2045
COURSE DESCRIPTION: Practical applications of cadastral surveying. Historical development of the cadastre. Land parcel, identifiers, boundaries, strata, interests, tenure. Techniques for cadastral survey and fitness for purpose. Ambulatory and riparian boundaries. Marine boundaries. Benefits of the cadastre, socio-economic importance. Land acquisition. Adjudication and demarcation. National Cadastre, Cadastral Index Map and their use in Land Information Systems and Land Administration. Cadastral systems in the Caribbean and internationally. Cadastral reform concepts and processes internationally.

LEVEL: 3
SEMESTER: 2
COURSE CODE: GEOM 3015
COURSE TITLE: PROFESSIONAL PRACTICE
NUMBER OF CREDITS: 3
PREREQUISITE:
COURSE DESCRIPTION: Professional negligence and liability; misrepresentation; Law of Evidence; surveyor as a professional witness. Professional ethics and conduct. Practice of land surveying and mapping in the State and private sectors.

LEVEL: 3
SEMESTER: 2
COURSE CODE: GEOM 3020
COURSE TITLE: PROFESSIONAL INTERNSHIP
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: The internship serves as a way to gain insight into respective industries that are in line with current studies Geomatics and geoinformatics. It should provide students with the opportunity to independently apply and further develop the theoretical and methodological knowledge and understandings gained in their course of study. It should be used by students to put diverse scientific knowledge and methods into practice. Possible fields of work are concentrated in the areas of conceptual, evaluation, management and advisory tasks, in particular, fields of study offered at the department.

LEVEL: 3
SEMESTER: 2
COURSE CODE: GEOM 3025
COURSE TITLE: ENGINEERING SURVEYING
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Interpreting engineering drawings. Error analysis for engineering projects. Engineering design. Deformation surveys. Applications; Onshore pipeline project (postlay). Dimension control surveys. Safety issues in the industry for surveyors. Field exercise.

LEVEL: 3
SEMESTER: 1
COURSE CODE: GEOM 3030
COURSE TITLE: GLOBAL NAVIGATION SATELLITE SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: GEOM 2035
COURSE DESCRIPTION: Code Pseudoranging, Satellite carrier phase observations and integer ambiguity resolution. GNSS concepts: GPS, Glonass, Galileo. Also WAAS, SBAS, EGNOS. Theory of different operational modes: Satic, FastStatic, RTK, DGPS. Continuously Operating Reference Stations (CORS). Virtual Reference Stations (VRS). Network adjustment of GPS/GNSS data in an international reference frame using local, regional & international CORS and processing software.

LAND MANAGEMENT (VALUATION) COURSE DESCRIPTIONS

LEVEL: 1
SEMESTER: 1
COURSE CODE: LMGV 1000
COURSE TITLE: LAND ECONOMY
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Property in land resources. Theories of land. Basic land economics; Land economy of the Caribbean. Land use and the availability of land for economic use. Economic returns to land. Land resource values and the real estate market. The role of the State in land economy and property taxation. The impact of planning and statutes on property values. The real estate industry and the finance sector. Land and property speculation. Formal and informal land economy. Welfare economics, land and the environment.

LEVEL: 1
SEMESTER: 1
COURSE CODE: LMGV 1003
COURSE TITLE: SURVEYING PRACTICAL
NUMBER OF CREDITS: 1
PREREQUISITES: NONE
COURSE DESCRIPTION: Practical application of the use of theodolites, total stations, chains, levels, GPS equipment.

LEVEL: 1
SEMESTER: 2
COURSE CODE: LMGV 1004
COURSE TITLE: VALUATION METHODS I
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Role of the Valuer. Property markets. Demand & Supply of Landed Property. Landed property as an Investment Method of Valuations. Mathematics of the Valuation Tables. Comparison, investment, residual and profit approaches to valuation.

LEVEL: 1
SEMESTER: 2
COURSE CODE: LMGV 1005
COURSE TITLE: VALUATION PROJECT I
NUMBER OF CREDITS: 3
PREREQUISITE: LMGV 1000
COURSE DESCRIPTION: Conduct of valuations. The practical application is provided by actual case studies and field trips to ensure students can apply the theoretical concepts taught to property valuations in the field.

LEVEL: 2
SEMESTER: 2
COURSE CODE: LMGV 2002
COURSE TITLE: VALUATION METHODS II
NUMBER OF CREDITS: 3
PREREQUISITE: LMGV 1004
COURSE DESCRIPTION: The Comparison Method of Valuation; The Contractors Method; Leasehold Interests; Investment Appraisals; Residual Valuations in detail; Residual Cash Flows; Development Appraisal.

LEVEL: 2
SEMESTER: 2
COURSE CODE: LMGV 2003
COURSE TITLE: VALUATION PROJECT II
NUMBER OF CREDITS: 3
PREREQUISITE: LMGV 1005
COURSE DESCRIPTION: Conduct of valuations. The practical application is provided by actual case studies and field trips to ensure students can apply the theoretical concepts taught to property valuations in the field.

LEVEL: 3
SEMESTER: 1
COURSE CODE: LMGV 3000
COURSE TITLE: APPLIED VALUATION
NUMBER OF CREDITS: 3
PREREQUISITE: LMGV 2002
COURSE DESCRIPTION: Valuation of Agricultural Properties. Valuation of Specialised Properties. Asset Valuations. Valuation of Plant and Machinery. Compensation for Compulsory Purchase. Planning Compensation. Valuation for Rating and Taxation.

LEVEL: 3
SEMESTER: 2
COURSE CODE: LMGV 3002
COURSE TITLE: ESTATE AND LAND MANAGEMENT
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Property development Process. Property Portfolio Management. Estate Formation. Property Records. Professional Practice. Estate Planning & Control. Management of Public Estates.

LEVEL: 3
SEMESTER: 1
COURSE CODE: LMGV 3005
COURSE TITLE: INTRODUCTION TO QUANTITY SURVEYING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Definition of quantity surveying. The components and function of Quantity Surveying in the construction team. Bills of Quantities (Definition, purpose and composition of Bills of Quantities. The process of preparing Bills of Quantities. The working up and billing process. The application of formulae in the setting out of dimensions). Construction (Scaffolding, Shoring and excavating, Foundations and reinforcement, Lintels and Brickwork, Presentation of materials, Roofing materials and methods, Window design and construction, Glass and Partitions, Door frames and linings, Timber stair building, Building drainage below ground, Heating, Ventilation and Air Conditioning). Taking-off (Demolitions and site clearance, Foundations, Superstructure, including walls, Measurements of windows, doors and plain openings, Measurement of roofs). Impacts of buildings on the natural and urban environment. Legislation applied to the provision of buildings.

LEVEL: 3
SEMESTER: YEAR-LONG
COURSE CODE: LMGV 3050
COURSE TITLE: LAND MANAGEMENT RESEARCH PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES:
COURSE DESCRIPTION: Research project generally involving literature review, data acquisition, processing, analysis and conclusions in respect of identified property valuation problems of interest to the region or individual states. (Coursework-100%)

LEVEL: 3
SEMESTER: 2
COURSE CODE: LMGV 3060
COURSE TITLE: INTRODUCTION TO LAND ADMINISTRATION
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: The role of professional land and valuation surveyors. Caribbean Survey Systems and Land Surveys Acts and Regulations. Cadastral surveys. Cadastral systems for valuation and taxation. Land, coastal, and marine boundaries. Caribbean and international and registration systems. Regulatory reform. Evidence of boundaries. Riparian rights. Title to land. Land reform. Design and implementation of a multi-purpose cadastre. Cadastral reform.

DEPARTMENT OF MECHANICAL & MANUFACTURING ENGINEERING

LEVEL: 1
SEMESTER: 1
COURSE CODE: MENG 1008
COURSE TITLE: ENGINEERING DRAWING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction to Engineering Drawing, Plane Geometrical Drawing, Projection of Points and Lines (In First Angle Projection Only), Projections of Planes and Solids, Development and Interpenetration of Solids, Isometric Projections, Conversion of Orthographic Views into Isometric Views and Conversion of Isometric Views to Orthographic Views, Perspective Projections, Computer Aided Drafting (Hands On Experience - AutoCAD Package

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1001
COURSE TITLE: ENGINEERING THERMODYNAMICS I
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction. Macroscopic and microscopic approaches. Definitions of Systems, Properties, Processes, Cycles. Concepts of Thermodynamic equilibrium and Quasi-static process. Laws of perfect gases. Work and Heat. 1^{st} law for closed system. 1^{st} law for open system. 2^{nd} law: Kelvin-Planck and Clausius statements, forward and reversed Carnot cycles. Entropy calculations. Gas power cycles: Introduction, Otto and Diesel cycles. Properties of liquid and vapour. Vapour power cycles: Introduction, Carnot, Rankine and Vapour compression refrigeration cycles.

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1009
COURSE TITLE: MACHINE DRAWING
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 1008
COURSE DESCRIPTION:
Machine Drawing Conventions, Drawing of Machine Elements and Simple Parts, Assembly Drawings, 3D/Solid Modeling (using AutoCAD **3D Module** and SolidWorks Package)

LEVEL: 1
SEMESTER: 1
COURSE CODE: MENG 1010
COURSE TITLE: STATICS & STRENGTH OF MATERIALS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Review of statics: Two- and Three dimensional vector representation of forces, moments and couples. Free body diagrams. Equilibrium of forces. Distributed forces; centres of gravity and mass. Moments of inertia. Analysis of trusses, frames and machines. Friction. Stress and strain in axially loaded members. Properties of materials. Generalised Hooke's law. Statically determinate and indeterminate stress systems. Shear force, bending moments and bending stresses in beams. Beams of two materials. Deflection in statically determinate beams. Analysis of stresses in two dimensions, principal stresses, Mohr circle. **Design of beams.** Torsion of circular cross sections

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1004
COURSE TITLE: ENGINEERING DYNAMICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Review of basic mechanics. Kinematics of particles: rectilinear and angular motion, plane curvilinear motion, relative motion in a plane. Kinetics of particles: equation of motion, work and energy, impulse and momentum. Introduction to central-force motion. Kinetics of systems of particles: generalised F-m-a. Work-energy (introductory section). Impulse-momentum (introductory section). Conservation laws. Plane kinematics of rigid bodies: absolute motion, relative motion - translating axes, relative motion - rotating axes. Plane kinetics of rigid bodies: review of moments of inertia. Force, mass and acceleration. Work and energy. Impulse and momentum.

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1005
COURSE TITLE: WORKSHOP TECHNOLOGY
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Basic workshop tools and procedures. Health and safety issues - OSHA Act, Factories Ordinance; ergonomic hazards; liability; safety training and promotion. Engineering materials, workshop measurements, processes (material removal), forming and joining, machine tools and special equipment. Precision fits and tolerances, fabrication techniques, jigs and fixtures. Ventilation of workshops. Lifting gear for heavy work-pieces. Machinery hazards. Electrical safety. Precautions for welding/cutting/gouging operations. Proper use of hand tools. Workshop fire safety.

LEVEL: 1
SEMESTER: 1
COURSE CODE: MENG 1006
COURSE TITLE: INTRODUCTION TO ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: An introduction to the following: historical development of engineering; formation of the engineer; role and functions of engineers and professional organisations; technical communications; ethics; liability; safety; legal forms of association; contracts; company law; intellectual property; engineering economics and business operations; infrastructure; energy systems and economics, environment and sustainable development. Scope of safety engineering. Hazardous materials used in engineering practice. Non-destructive testing. Introduction to plant maintenance. Condition monitoring. Hazards in the process industries. Rupture of process vessels.

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1011
COURSE TITLE: ENGINEERING FLUID MECHANICS
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
Mechanics deals with force, energy, motion and material properties. The study of mechanics of fluids (liquids and gases) is called Fluid Mechanics. You will learn fluid properties, fluid static, fluids in motion, conservation equations, flow through pipes, characteristics and selection of pump.

LEVEL: 1
SEMESTER: 1
COURSE CODE: MENG 1012
COURSE TITLE: SCIENCE OF MATERIALS C
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction to materials science. Crystal structures. Thermal equilibrium diagrams. Iron and steels I. Non-ferrous alloys I. Properties of materials. Iron and Steels II. Non-ferrous alloys II. Design and selection of materials. Polymers. Ceramics. Composite materials.

LEVEL: 1
SEMESTER: 2
COURSE CODE: MENG 1013
COURSE TITLE: COMMUNICATION SKILLS
NUMBER OF CREDITS: 1
PREREQUISITES: NONE
COURSE DESCRIPTION: Course participants will explore a range of communication principles and conventions and their application to a variety of communicative situations as they may arise in the engineering. These situations include written and oral communication for industry; and research development.

LEVEL: 2
SEMESTER: 2
COURSE CODE: IENG 2000
COURSE TITLE: WORK STUDY & ERGONOMICS
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Productivity; method study; work measurement - rating, allowances, standard time, PMTS; work sampling; fatigue and boredom; job enlargement; working conditions and influence on output; work place design.

LEVEL: 2
SEMESTER: 1
COURSE CODE: IENG 2002
COURSE TITLE: OPERATIONS RESEARCH I
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Operations research methodology; Linear programming: applications, graphical methods, simplex and dual simplex algorithms, sensitivity analysis and duality; Integer programming applications, cutting plane algorithm; Transportation and assignment models; Decision theory, Expected Monetary value and Expected Opportunity Loss models: Decision making under uncertain condition(optimistic, pessimistic, Savage, Laplace and Hurwicz criteria).

LEVEL: 2
SEMESTER: 2
COURSE CODE: IENG 2004
COURSE TITLE: INDUSTRIAL DATABASE SYSTEMS & DESIGN
NUMBER OF CREDITS: 3
PREREQUISITE: ENGR 1001
COURSE DESCRIPTION: Introduction to Information Systems; data requirements; Industrial Database Applications; conceptual database design; Database and Systems Planning; database design techniques and methods; Relational Database Design; Relational and Distributed Systems; database systems implementation and maintenance; Introduction to HTML, XML and Web Applications.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MENG 2009
COURSE TITLE: INDUSTRIAL INSTRUMENTATION
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION:. Introduction and overview: analogue & digital Instruments; threshold sensors; pulse train sensors; shaft encoders. Displacement measurement: resolution; pulse timing & pulse counting methods; LVDT. Temperature measurement: resistance thermometers; thermisters; thermocouples. Force measurement: strain gauges; Wheatstone bridge. Pressure measurement: u-tube manometer; mechanical sensors; strain gauge transducer. Flow measurement: differential pressure & orifice plates; characteristics of flow & Reynolds number; differential pressure transducer; Venturi meter. Signal conditioning: pre-conditioning; concepts of differential & instrumentation amplifiers; error specifications & components; offset & bias currents; effect of noise; signal/noise ratios; filters; Butterworth filter data; sample & hold; analogue multiplexers; analogue to digital conversion. Electrical measurement & calibration. International conventions & standards.

LEVEL: 2
SEMESTER: 2
COURSE CODE: IENG 2006
COURSE TITLE: ENGINEERING ECONOMICS, ACCOUNTING AND FINANCIAL MANAGEMENT
NUMBER OF CREDITS: 4
COURSE DESCRIPTION:. Basic accounting concepts and policies; analysis of financial statements; management accounting; cost-volume-profit relationship; cost analysis and estimating; techno-economic evaluation of capital investment projects; capital budgeting techniques; manufacturing systems economics; capital structure/ leverage; financial planning and control with budgeting; financial planning for initial capitalisation, working capital management, valuation of securities, multi-national financial management topics.

LEVEL: 2
SEMESTER: 2
COURSE CODE: IENG 2007
COURSE TITLE: OPERATIONS RESEARCH II
NUMBER OF CREDITS: 2
PREREQUISITE: IENG 2002
COURSE DESCRIPTION: Non□linear programming: classical optimization method, D-Rule, Lagrange methods, Kuhn Tucker conditions, Decision trees, Markov processes; Network models; shortest route and minimal spanning tree methods; Deterministic dynamic programming model. Queuing models. Games theory and Simulation.

LEVEL: 2
SEMESTER: 2
COURSE CODE: MENG 2012
COURSE TITLE: HEAT TRANSFER
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Steady and unsteady state heat conduction. Analytical, graphical and numerical solutions, convection - forced and free convection on flat plates and in pipe flow; Radiation - properties, shape factor and exchange between surfaces, Introduction to heat exchangers; combined mode of heat transfer. Introduction to mass transfer.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MENG 2010
COURSE TITLE: STRENGTH OF MATERIALS I
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 1010
COURSE DESCRIPTION: True stress and true strain, two and three dimensional systems, generalized Hooke's Law. Analysis of stresses in two dimensions, theories of failure. Elastic theorems, three-moment theorem. Thin Walled pressure vessels. Strut and beam columns. Stress Concentration, creep, fatigue, plastic behaviour of solids**.** Practical applications of strain gauge circuitry. Stresses due to shock loading. Design of bolted and welded joints

LEVEL: 2
SEMESTER: 2
COURSE CODE: MENG 2003
COURSE TITLE: MECHANICAL VIBRATIONS
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 1004
COURSE DESCRIPTION: Mechanical vibrations: fundamentals. Single degree of freedom systems. Free vibrations with and without damping. Forced vibrations. Vibration of multi-degree-of-freedom systems. Free and forced vibrations of two-degree-of-freedom systems. Vibration isolation. Transmissibility. Dynamic absorber-undamped and damped. Torsional vibrations. Lateral vibrations and whirling speeds. Introduction to controls.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MENG 2004
COURSE TITLE: MECHANICS OF MACHINES
NUMBER OF CREDITS: 3
PREREQUISITE: MENG 1004
COURSE DESCRIPTION: Introduction and principles. General dynamics. Kinematics of mechanisms. Velocity and acceleration in link mechanisms. Simple harmonic motion and the reciprocating engine. Cams. Toothed gearing and geared systems. Epicyclic gears. Dry friction. Lubrication. Belt drives and brakes. Friction clutches. Kinetics of machine elements. Static forces in machines. Inertia forces in machines. Turning moment diagrams and flywheels. Balancing of machines. Gyroscopes.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MENG 2011
COURSE TITLE: MACHINE DESIGN 1
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 1008; MENG 1009; MENG 1010
COURSE DESCRIPTION: Design Basics. Technical Report preparation. Design for Static Strength, Design for Fatigue Strength, Power Screws, Cotters and Knuckle Joints, Fasteners, Design of Shafts, keys and Couplings; Tolerances and fits; Introduction to Finite Element Analysis

LEVEL: 2
SEMESTER: 2
COURSE CODE: MENG 2013
COURSE TITLE: MACHINE DESIGN II
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 2011
COURSE DESCRIPTION: Bearings and Lubrication: Lubrication & lubricants. Ball and Roller bearings, journal bearings. The design of clutches and brakes. Gears: spur gears, helical gears, bevel gears and worm gears. Design of internal combustion engine components: cylinder, piston, crank shaft and connecting rod. Design of machine tool elements: beds, spindles and slideways.

LEVEL: 2
SEMESTER: 2
COURSE CODE: MENG 2015
COURSE TITLE: CONTROL SYSTEMS TECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: ECNG 1007
COURSE DESCRIPTION: Mathematical modeling of systems: governing equations of common systems; Laplace transforms and standard forms of equations of different orders; block diagrams and signal flow graphs; deriving transfer function of a DC electric motor in particular. System response: deriving time response by taking inverse Laplace transforms; standard time responses for first and second order systems. System stability and Root Locus: Routh Hurwitz stability criterion; Root Locus and its use in determining key system parameters. Frequency domain system analysis: Bode plots; Nyquist diagrams; Phase and gain margins; Relationship of frequency analysis to time response. Controller system design: PID controller design; Lag and lead compensators.

NOTE: Offered in Year two for students now entering year 2 and in Year 3 for students entering Year 3 for academic year 2013- 2014 only.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MENG 2007
COURSE TITLE: ENGINEERING THERMODYNAMICS II
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 1001
COURSE DESCRIPTION: Non-reactive and reactive mixtures, psychrometry, one-dimensional compressible fluid flow; vapour and gas power cycles; reciprocating engines and machine systems; refrigeration and heat pump cycles.

LEVEL: 2
SEMESTER: 2
COURSE CODE: MENG 2008
COURSE TITLE: MANUFACTURING TECHNOLOGY
NUMBER OF CREDITS: 3
PREREQUISITE: NONE
COURSE DESCRIPTION: Review of properties and applications of engineering materials. Elements of the theory and practice of metal-forming, metal-cutting, foundry technology, joining processes, heat treatment, finishing operations, industrial coatings, and polymer technology.

LEVEL: 3
SEMESTER: 1
COURSE CODE: IENG 3000
COURSE TITLE: INDUSTRIAL MANAGEMENT
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Formal and informal organisation. Corporate planning. Marketing. Human resource management. Industrial relations. Competitive strategy. Management game. Performance and appraisal systems. Communication in organisations.

LEVEL: 3
SEMESTER: 2
COURSE CODE: IENG 3001
COURSE TITLE: PRODUCTION PLANNING & CONTROL
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Production systems; forecasting; resource planning; production planning; aggregate planning; master schedule; requirements planning systems; production scheduling; progress control; integrated production control systems.

LEVEL: 3
SEMESTER: 2
COURSE CODE: IENG 3002
COURSE TITLE: PLANT LAYOUT & MATERIALS HANDLING
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Plant location; plant layout - types, layout planning and evaluation of layouts; plant services; principles of materials handling system design; techniques for analysis and solution of plant location, plant layout and material handling problems. Materials handling equipment. Warehousing - principles, design and operations.

LEVEL: 3
SEMESTER: 2
COURSE CODE: IENG 3003
COURSE TITLE: BEHAVIOURAL SCIENCE IN MANAGEMENT
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Motivation: history of the approaches to motivation: need theories and their current status. Cognitive theories: expectancy, equity, goals, current status. Laboratory approaches: classical conditioning, operant conditioning. Current status. Some applications. Leadership: history of the approaches to leadership. Trait theory and problems with this approach. Behavioural approach: Ohio State studies. Methodology. Situational (contingency) approach: current status, experiential exercises. VDL model, alternatives to leadership. Communication: defensive or problem-solving, climate, interpersonal communication. The communication process. Perception: experiential exercises. The perception process.

LEVEL: 3
SEMESTER: 1
COURSE CODE: IENG 3005
COURSE TITLE: QUALITY CONTROL & RELIABILITY ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITE: MATH 2250
COURSE DESCRIPTION: Inspection; Statistical quality control; Control charts for variables and attributes; Process capability analysis; Sampling inspection, OC curves, Sampling plans for attributes and variables; Product reliability; System reliability; Equipment survival; Reliability prediction methods; Redundancy and maintainability of equipment

LEVEL: 3
SEMESTER: 2
COURSE CODE: IENG 3006
COURSE TITLE: AUTOMATION
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Introduction to Automation and Principles. Industrial Automation including Fluidic Logic, Hard / Soft Automation. Assembly Automation and Robots in Automation. Boolean Algebra, Combinational Logic and Sequential Logic. Economics of Automation. Introduction to Programmable Logic Controllers (PLCs) Ladder Logic and introduction to High Level Code for PLCs. Introduction to Digital Control Systems and Supervisory Control And Data Acquisition (SCADA).

LEVEL: 3
SEMESTER:
COURSE CODE: IENG 3009
COURSE TITLE: INDUSTRIAL DATABASE DESIGN
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Production systems and data requirements; evolution of database systems and technology; database applications and systems development; conceptual database design: principles and modelling; systems planning and database design; data element design; relational database design; introduction to E-business, E-commerce, and enterprise resources planning systems; introduction to HTML, XML and Web applications.

LEVEL: 3
SEMESTER: YEAR LONG
COURSE CODE: IENG 3012
COURSE TITLE: INDUSTRIAL PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES: NONE
COURSE DESCRIPTION: Special project in the field of Industrial Engineering will be undertaken by all students under the supervision and direction of academic staff in the Department. Examination will be by coursework - a presentation and project report.

LEVEL: 3
SEMESTER: 2
COURSE CODE: IENG 3013
COURSE TITLE: SIMULATION OF INDUSTRIAL & BUSINESS PROCESSES
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Overview of simulation systems; components of simulation models; simulation processes; modelling methodologies and techniques; computer interfacing and networking fundamentals; system dynamics approach to modelling and decision support; simulation applications in manufacturing and service operations.

LEVEL: 3
SEMESTER: 1
COURSE CODE: IENG 3015
COURSE TITLE: ENTERPRISE INFORMATION SYSTEMS
NUMBER OF CREDITS: 3
PREREQUISITE: IENG 2004
COURSE DESCRIPTION: Organisation dynamics; Enterprise resource planning; data sources and data quality requirements; design, development and deployment of data warehouses; web-enabled data management and e-commerce; Knowledge management; strategic implications of EIS.

LEVEL: 3
SEMESTER: 1
COURSE CODE: IENG 3016
COURSE TITLE: APPLIED PROJECT MANAGEMENT
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Definitions and feasibility of projects; project management processes; project management knowledge areas; project management information systems; team communication and conflict resolution; experimental/action-learning workshop.

LEVEL: 3
SEMESTER: 1
COURSE CODE: IENG 3017
COURSE TITLE: INDUSTRIAL DESIGN OF PRODUCTS AND SERVICES
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Combine design principles, (engineering and industrial), innovation and project management to aid in decision-making. Understanding of the practical and theoretical aspects of the creation of a product, methods used in form design, form factors and the appearance of the product.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3000
COURSE TITLE: ENGINEERING MANAGEMENT I
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Management functions - corporate governance, planning and control. Business functions - Marketing - marketing mix (products, pricing, promotion, distribution). Human resources - legal and ethical issues in managing people, motivational theories, management styles and leadership, labour-management relations. Accounting and finance - financial statements and analysis, capital budgeting and project evaluation, financial and risk management. Quantitative approaches to decision-making.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3001
COURSE TITLE: ENGINEERING MANAGEMENT II
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Strategic management of technological innovation and new venture formation. The Engineering manager and the legal environment (legal forms of association, contracts, torts, company law, intellectual property).

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3002
COURSE TITLE: POST-HARVEST TECHNOLOGY
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: An introduction to post-harvest physiology, physical properties of plant material; materials handling, cleaning, grading and packaging. Quality assurance, food safety principles and storage requirements for fruits, vegetables, root crops and cut flowers. Pre-cooling, modified and controlled atmosphere storage; **freezing** and heat loads for perishables; packing-house layout and design; drying and drying systems, processing of durable Caribbean crops, e.g., root crops, coconuts, cocoa, nutmeg; milling and mixing.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3004
COURSE TITLE: SOIL & WATER ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Soil constituents, texture, structure and plasticity. Phase relations. Soil compression, **shear** strength and stress-strain relations. Prediction of forces on soil engaging tools. Design of shear walls. Hydrologic cycle. Rainfall measurement and analysis. Stream flow measurement. Runoff analysis. Open channel flow and channel design for steady uniform flow. Introductory ground water hydrology. Computer applications

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3006
COURSE TITLE: PRODUCTION MANAGEMENT
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Operations strategy; product-process-capacity planning; forecasting and investment analysis; operations layout; materials management - inventory, JIT, MRP; shop-planning and scheduling; quality assurance/quality control; project management.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3007
COURSE TITLE: DRAINAGE & IRRIGATION ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Basic soil-plant-water relations. Irrigation water requirements, sources, quantity and quality of irrigation water: Irrigation planning, scheduling and efficiencies. Design and **evaluation** of irrigation and drainage systems. Computer applications and simulation modelling.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3008
COURSE TITLE: FIELD MACHINERY & EQUIPMENT
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Concept of Mechanization and machinery management. Analysis of field machines. Planting and transplanting. Seed metering mechanisms; seed storage and treatment Mechanical weeding. Dry and liquid chemical application; Sickle bar mower, flail and rotary mower design and operation. Power calculations. Design and operation of Grain Harvesters, Root crops and fruit trees harvesters. Review of local crop production designs and fabrication.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3011
COURSE TITLE: ADVANCED MECHANICS OF SOLIDS
NUMBER OF CREDITS: 3
PREREQUISITE: MENG 3024
COURSE DESCRIPTION: Elasticity, plasticity, torsion of prismatic bars, thin plates, shells, thermal stresses, photo-elasticity and fracture mechanics. Applications of the finite element method.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3013
COURSE TITLE: PRODUCT DESIGN & DEVELOPMENT
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION: Synthesis of materials, design and processes into final products/ components. Emphasis will be placed on the following:- sheet metal products, case or moulded metal products, plastics, composites, machined products. Special machining processes. Generation of forms, tooling design, use of jigs and fixtures. Assembly processes, costing.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3014
COURSE TITLE: COMPUTER-AIDED DESIGN & MANUFACTURE
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Review of the role and elements of computer-aided design. Development of integrated databases for design and manufacture. Solid and surface modelling techniques for design and manufacture. Generation of tool path data from solid and surface models. Numerical Control technology:- manual part programming, computer-assisted part programming, CAI applications for tool path generation, e.g.: SMARTCAM.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3015
COURSE TITLE: MATERIALS TECHNOLOGY
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Basic background to the relationship between structure and properties of engineering materials with respect to selection of materials for design, processing and fabrication, the behaviour of materials in service and methods of evaluating performance. Topics include: metal alloy systems, metal structure texture and strengthening mechanisms; non-metallic materials, destructive and non-destructive testing, failure analysis, corrosion and use of standard specifications.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3016
COURSE TITLE: MAINTENANCE AND SAFETY ENGINEERING
NUMBER OF CREDITS: 3
PREREQUISITES: NONE
COURSE DESCRIPTION:
Maintenance Practices/Techniques (Run to Failure/Breakdown Maintenance, Corrective Maintenance, Preventive Maintenance: Time Based or Condition-Based (Predictive Maintenance); Planning and Scheduling; Reliability, Maintainability and Availability; Maintenance Optimization and Strategies (Total Productive Maintenance and Reliability Centred Maintenance); Maintenance Performance Metrics Key: Leading and Lagging Indicators; Maintenance Root Cause Analysis Tools (RCA and FMEA). Maintainability, corrective maintenance, preventive maintenance. Scheduling, organisation and control. Diagnostic and predictive techniques and programmes. Data acquisition and processing. Computer applications. Costs and cost benefits. Safety legislation. Accident prevention. Causation of industrial accidents. Ergonomic design. Safety management. Fire and explosion risks. Pressure vessels. Reliability and conditional probability. Environmental toxicity. Gaseous and particulate emissions. Noise and vibration. Hazard analysis techniques.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3017
COURSE TITLE: FINITE ELEMENT METHODS IN ENGINEERING PRACTICE
NUMBER OF CREDITS: 3
PREREQUISITES: MENG 1011; MATH 2230, MENG 2010, MENG 2012
COURSE DESCRIPTION: Introduction to finite element analysis - determinations. Applications: analysis of problems described by parabolic differential equations - torsion and moisture diffusion. Multidimensional finite element formation and solutions for solid bodies subjected to various boundary conditions. One-dimensional finite element formation and solution for heat transfer with mass transport. Solution to an axisymmetric stress distribution problem using the constant strain triangle method. Applications to beam, plate and trip elements.

LEVEL: 3
SEMESTER: YEAR LONG
COURSE CODE: MENG 3019
COURSE TITLE: MECHANICAL ENGINEERING PROJECT
NUMBER OF CREDITS: 6
PREREQUISITES: NONE
COURSE DESCRIPTION: Special projects in Mechanical Engineering will be undertaken by all students under the supervision and direction of academic staff of the Department. Examination will be by coursework - a presentation and project report.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3020
COURSE TITLE: ELEMENTS OF FOOD ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Heat and mass balances in food process operations, heat transfer and thermal properties of foods, heat exchange equipment for food processing; psychrometric, moisture equilibrium and drying characteristics of crops, thin layer drying. Freezing of foods (meats), thermal processing, evaporation and an introduction to food rheology.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3022
COURSE TITLE: ENERGY ENGINEERING
NUMBER OF CREDITS: 2
PREREQUISITES: MENG 2007, MENG 2012
COURSE DESCRIPTION: Role of energy in society, energy use data, resources, environmental effects. Review of Thermodynamics, irreversibility, entropy generation, exergy analyses and 2nd law efficiency. Principles and applications of cogeneration. Economic analyses of investments. Applications of optimization principle to energy systems

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3023
COURSE TITLE: ENVIRONMENTAL CONTROL ENGINEERING I
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 2007
COURSE DESCRIPTION: Indoor conditions for comfort. Climatic design information. Thermal properties of common building and insulation materials. Infiltration and ventilation loads. Cooling load calculation. Psychrometrics. Air Distribution. Life Cycle Analysis costing.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3024
COURSE TITLE: STRENGTH OF MATERIALS II
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 2010
COURSE DESCRIPTION: Product of Area. Parallel Axis theorem. Rotation of Axes. Stresses in Unsymmetrically Loaded members in bending. Stresses in thick Beams with initial Curvature. Thick Walled Pressure Vessels**.** Analysis of Stresses in and Design of Springs. Stresses under combined loading. Theory of Plastic Bending. Theory of Elastic-Plastic torsion.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MENG 3025
COURSE TITLE: POWER PLANT ENGINEERING I
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 2007
COURSE DESCRIPTION: Power Plant Engineering I is an advanced applications course which covers the thermodynamic design, performance analysis and optimization of the Steam Power Plant and its major components :

- Steam Generating Plant (Boilers, Superheaters, Reheaters, Economizers, Air Pre-Heaters etc).
- Steam Turbine Design, Operations and Technology.
- Balance of Plant (Condensers, Feedwater Heaters, Circulating Cooling Water Systems, Cooling Towers, Evaporators, Water Treatment)

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3026
COURSE TITLE: RENEWABLE ENERGY
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 2012
COURSE DESCRIPTION: Problems of fossil fuels. Solar Energy: Flat plate collector, concentrating collectors, photo-voltaic cell. Wind Energy: Characteristics of wind, wind-turbine analysis and siting. Brief description of geothermal, ocean-thermal, tidal, ocean wave and biomass energy.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3028
COURSE TITLE: POWER PLANT ENGINEERING II
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 3025
COURSE DESCRIPTION: Power Plant Engineering II is an advanced applications course which covers the thermodynamic design, performance analysis and optimization of the following types of Thermal Power Plants

- Gas Turbine
- Reciprocating Internal Combustion Engines.
- Combined Cycle and Cogeneration Systems

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3027
COURSE TITLE: TRACTION & POWER HYDRAULICS
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Terra-mechanics, mechanized field operations and fluid power applications. Traction theory, performance parameters and stability of 2WD, 4WD and track-type tractors. Soil and tool interactions, tillage and bulldozing, machine-tool selection and power calculations; Power take-off and fluid power (Power hydraulics) system design and calculations.

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3029
COURSE TITLE: ENVIRONMENTAL CONTROL ENGINEERING II
NUMBER OF CREDITS: 2
PREREQUISITE: MENG 3023
COURSE DESCRIPTION: Estimating of Cooling Loads in various building application. Typical manual calculation of a Cooling Load. Heat Balance (HB) and Radiant Time Series (RTS) methods of Cooling Load Calculations. Cooling Load Calculations of a typical building application based on Architectural Drawings and/or building survey. Practical Psychrometrics. Air Distribution. Duct design. Life Cycle Analysis. Costing of systems

LEVEL: 3
SEMESTER: 2
COURSE CODE: MENG 3030
COURSE TITLE: BASIC ENGINEERING INFRASTRUCTURE
NUMBER OF CREDITS: 2
PREREQUISITES: NONE
COURSE DESCRIPTION: Layout, economic feasibility, structural design and environmental requirements of small and/or commercial food production buildings and structures. Local water supplies: planning water supply works like pipelines, design of ponds and boreholes, access road construction.

OTHER COURSES

COMPUTER SCIENCE COURSES

LEVEL:
SEMESTER:
COURSE CODE: COMP 3100
COURSE TITLE: OPERATING SYSTEMS
NUMBER OF CREDITS: 4
PREREQUISITES:
COURSE DESCRIPTION: Operating system functions: job control and command languages. Operating system structure. Primary and secondary storage management. Process management. Resource allocation. Performance evaluation. Protection. Reliability and recovery.

LEVEL: 3
SEMESTER:
COURSE CODE: COMP 3750
COURSE TITLE: NUMERICAL COMPUTING I
NUMBER OF CREDITS: 4
PREREQUISITES:
COURSE DESCRIPTION: Floating point arithmetic: basic concepts of floating point number systems. Implications of finite precision. Illustrations of errors due to round-off. Use of mathematical sub-routine packages. Interpolation: finite differences. Polynomial interpolation. Inverse interpolation. Spline interpolation. Approximation: uniform approximation. Discrete least squares. Polynomial approximation. Fourier approximation. Chebyshev economisation. Solution of non-linear equations: bisection. Fixed point iteration. Newton's method. Secant method. Muller's method. Aitken's process. Rates of convergence. Efficient evaluation of polynomials. Bairstow 's method. Direct methods for linear system of equations: Gaussian elimination. Operational counts. Implementation including pivoting and scaling. Direct factorisation methods. Error analysis and norms: vector and matrix norms. Condition numbers and error estimates. Iterative improvement. Iterative methods. Over-relaxation.

FACULTY OF ENGINEERING COURSES

LEVEL: 1
SEMESTER: 1
COURSE CODE: ENGR 1000
COURSE TITLE: INTRODUCTION TO ENGINEERING
NUMBER OF CREDITS: 3 CREDITS
PREREQUISITES:
COURSE DESCRIPTION: An introduction to the following: historical development of engineering; formation of the engineer; role and functions of engineers and professional organisations; creative and critical thinking; technical communications; ethics; liability; safety; legal forms of association; contracts; company law; intellectual property; engineering economics and business operations; infrastructure; energy systems and economics, environment and sustainable development; approaches to design.

LEVEL: 1
SEMESTER: 1
COURSE CODE: ENGR 1001
COURSE TITLE: INFORMATION TECHNOLOGY FOR ENGINEERS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Spreadsheets: Introduction to spreadsheets for repeat computations, creating and editing graphs and charts, use of solver, introduction to analysis tools. Databases: constructing a database using tables and forms, retrieving information through reports and queries. Binary computations: storage of data within the computer, variable types and limitations imposed on computations. Algorithms for simple numerical methods. Development of algorithms. Programming: Introduction to C++, coding of algorithms, syntax for data types, input and output, mathematical operations, loops, functions and pointers.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ENGR 3000
COURSE TITLE: THE TECHNOLOGY OF THE STEELPAN
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: This course attempts to summarise and present, in a formal fashion, current knowledge on various technological aspects of the steelpan musical instrument. The major technologies that impact on the instrument are acoustics, mechanical vibrations, metallurgy, physical structure and signal analysis. However, no special prerequisite knowledge is required in any of these areas. The course starts off with an overview of the very subjective area of the perception of music. This is essential as it provides a reference point for later discussions. Other topics include the manufacturing process, including a discussion on the types of metallurgical properties required for different instrument characteristics, the modal properties of the instrument and the dynamics of the stick impact. The course ends with some consideration of significant recent developments.

LEVEL: 3
SEMESTER: 2
COURSE CODE: ENGR 3001
COURSE TITLE: NATURAL HAZARDS & DISASTER MANAGEMENT IN THE CARIBBEAN
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Definitions and concepts, characteristics of natural hazards in the Caribbean, economic, social and environmental impacts; techniques for identification, mapping and prediction, vulnerability and risk assessment, the disaster management cycle, structural and non-structural mitigation, emergency planning, recovery and reconstruction, disaster management and development planning, disaster management and agriculture, tourism, public health, public policy and legislation, sociology of disasters, disaster education.

LEVEL: 1
SEMESTER: III SUMMER
COURSE CODE: ENGR 3002
COURSE TITLE: ENGINEERING INTERNSHIP
NUMBER OF CREDITS: 3 CREDITS
PREREQUISITES: Completion of all Level II Courses
COURSE DESCRIPTION: This course provides students with practical, career-related experience while earning academic credit. The Internship takes place in organizations which deal with subject matters similar to those offered by the Faculty's Departments. Students will be given the opportunity to apply the theories, tools and techniques learned in the classroom to actual operational situations, under the guidance of an Industry Supervisor. The internship activities are based on a prearranged Learning Agreement between the Industry Supervisor and Academic Supervisor in the Department in which the student is registered; and focuses on the application of Engineering principles learned in the classroom, team participation and problem solving. Students must be in good academic standing (cumulative and degree GPA of at least 3.00) to pursue this course. The course is evaluated via the appraisal of the students' work logs, written report and the Industrial Supervisor's appraisal.

LEVEL: 3
SEMESTER:
COURSE CODE: ENGR 3003
COURSE TITLE: ENGINEERING ENTREPRENEURSHIP
NUMBER OF CREDITS: 3 CREDITS
PREREQUISITES: Completion of all Level II Courses
COURSE DESCRIPTION: This 13-week course apprises students who wish to participate in entrepreneurial activities, of a range of issues related to engineering entrepreneurship within national and regional market spaces. It offers students experience in creating a feasibility study and business plan/model. A mix of academic staff and engineering entrepreneurs will facilitate the course using lectures and case studies. Students will work in small groups to identify an engineering product, process or service to be introduced/improved to meet local/regional demand. Course resources will be drawn from both the entrepreneurship literature and locally produced resources for entrepreneurs.

SEMESTER: 1
COURSE CODE: FOST 3000
COURSE TITLE: PRINCIPLES OF FOOD SCIENCE
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: The basic chemistry of carbohydrates, proteins, lipids, vitamins, salt, preservatives and antioxidants, enzymes, additives and water in relation to food preservation and processing.

SEMESTER: 2
COURSE CODE: FOST 3001
COURSE TITLE: PRINCIPLES OF FOOD PROCESSING
NO. OF CREDITS: 3
PREREQUISITES:
SYLLABUS: Introduction to basic concepts and operations used to accomplish food preservation.

MATHEMATICS COURSES

LEVEL: 1
SEMESTER: 1
COURSE CODE: ENGR 1180
COURSE TITLE: ENGINEERING MATHEMATICS I
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Vectors: plane and space vectors, dot and cross product, vector equations of lines and planes. Elementary linear algebra: geometric interpretation of linear equations, Gaussian elimination, definition of a vector space, span and subspace, basis, dimension. Matrices: transpose, determinants, rank and its application to linear systems, matrix inversion by cofactors. Series: partial sums, comparison and ratio tests, Maclaurin and Taylor series. Complex numbers: definition and properties, complex roots of a quadratic equation, complex numbers as vectors, modulus and argument, products and quotients, De Moivre's theorem, exponential form, hyperbolic functions, loci in the Argand diagram. Ordinary differential equations: definitions, direction fields, linear first order differential equations, separable differential equations, modelling with first order equations, exact equations, numerical approximations, homogeneous second order equations with constant coefficients, fundamental solutions, complex and repeated roots of the characteristic equation, reduction of order, method of undetermined coefficients.

LEVEL: 2
SEMESTER: 1
COURSE CODE: MATH 2230
COURSE TITLE: ENGINEERING MATHEMATICS II
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Vector calculus: parametric curves and arc length, review of partial differentiation, vector fields, line integrals and double integrals, Green's theorem, surface integrals, triple integrals and Divergence theorem. Laplace transforms: definition and existence of Laplace transforms, properties of Laplace transforms (linearity, inverse transform, shift formulae, Laplace transform of derivatives), applications and further properties of Laplace transforms (solving differential equations, convolution and integral equations, Dirac's delta function, differentiation of transforms, Gamma function). Fourier series: definitions, convergence, even and odd functions, half range expansions. Partial differential equations: definitions, heat equation (derivation, solution by separation of variables, insulated ends as boundary conditions, nonhomogeneous boundary conditions), wave equation (derivation, solution by separation of variables), Laplace's equation in Cartesian and polar coordinates.

LEVEL: 2
SEMESTER: 2
COURSE CODE: MATH 2240
COURSE TITLE: STATISTICS
NUMBER OF CREDITS: 2
PREREQUISITES:
COURSE DESCRIPTION: Statistics and probability; frequency distribution, frequency polygons and histograms; introduction to probability; basic axioms; conditional probability, Bayes theorem, mutual independence; introduction to random variables; probability distribution, Bernoulli trials, the binomial distribution and the Poisson distribution; probability density and mass functions of a continuous random variable; expectation and variance; the exponential and normal distributions; distributions of sample means; point estimates; confidence intervals; statistical inference - tests of significance; linear regression.

LEVEL: 2
SEMESTER: 2
COURSE CODE: MATH 2250
COURSE TITLE: INDUSTRIAL STATISTICS
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Statistics and probability; frequency distributions, frequency polygons and histograms; introduction to probability; basic axioms, conditional probability, Bayes theorem, mutual independence; introduction to random variables; probability distribution, Bernoulli trials, the Binomial distribution and the Poisson distribution; probability density and mass functions of a continuous random variable; expectation and variance; the exponential and normal distributions; distribution of sample means; point estimates; confidence intervals; statistical inference - tests of significance. Regression analysis; analysis of multiple regression; non-parametric statistical methods; analysis of variance; design of experiments; randomised block design and analysis.

LEVEL: 3
SEMESTER: 1
COURSE CODE: MATH 3530
COURSE TITLE: MATHEMATICS III
NUMBER OF CREDITS: 3
PREREQUISITES:
COURSE DESCRIPTION: Linear algebra: systems of equations, vector spaces, determinants, eigenvalues, similarity, positive definite matrices, singular value decomposition. Optimisation and mathematical programming, calculus of variations.

LANGUAGES COURSE DESCRIPTIONS

COURSES WITH 2 CREDIT WEIGHTING

FRENCH

LEVEL: I
SEMESTER: ALL
COURSE CODE: FREN 1001
COURSE TITLE: FRENCH 1A
NUMBER OF CREDITS: 2
PRE-REQUISITES: NONE
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that introduces students to the French language and to some of its cultural aspects. Students will develop an initial ability to communicate in the target language in basic situations relating to their personal lives. Students will be introduced to the concept of learner autonomy in language learning.
ASSESSMENT:
100% in course testing
Test 1: 40% of the overall mark
Test 2: 60% of the overall mark

LEVEL: I
SEMESTER: ALL
COURSE CODE: FREN 1002
COURSE TITLE: FRENCH 1B
NUMBER OF CREDITS: 2
PRE-REQUISITE: FREN 1001 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Level 1A French. Students will enhance their ability to communicate in the target language in situations relating to themselves and areas of immediate relevance. Students will continue to develop their autonomy in language learning.
ASSESSMENT:
100% in course testing
Test 1: 40% of the overall mark
Test 2: 60% of the overall mark

LEVEL I
SEMESTER: ALL
COURSE CODE: FREN 1003
COURSE TITLE: FRENCH 2A
CREDITS: 2
PRE-REQUISITES: FREN 1002 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in French 1B. Students will be able to function Increasingly Independently In all four skills in familiar situations and topics.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL I
SEMESTER: ALL
COURSE CODE: FREN 1004
COURSE TITLE: FRENCH 2B
CREDITS: 2
PRE-REQUISITES: FREN 1003 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in French 2A. Students will be able to function more independently in a variety of familiar situations and topics.
ASSESSMENT:
100% in course testing
Test 1: 40%; Test 2: 60%

LEVEL I
SEMESTER: ALL
COURSE CODE: FREN 1005
COURSE TITLE: FRENCH 3A
CREDITS: 2
PRE-REQUISITES: FREN 1004 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in French 2B. Students will start showing a degree of fluency in the four different skills. Students will demonstrate more of the behaviours and attitudes of independent learners.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL I
SEMESTER II
COURSE CODE: FREN 1006
COURSE TITLE: FRENCH 3B
CREDITS: 2
PRE-REQUISITES: FREN 1005 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in French 3A. Students will be able to demonstrate increased ease when interacting whether orally or in writing. Students will demonstrate more of the behaviours and attitudes of independent learners.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

SPANISH

LEVEL: I
SEMESTER: ALL
COURSE CODE: SPAN 1101
COURSE TITLE: SPANISH IA
NUMBER OF CREDITS: 2
PRE-REQUISITES: NONE
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that introduces students to the Spanish language and to some of its cultural aspects. Students will develop an initial ability to communicate in the target language in situations relating to their personal lives. Students will be introduced to the concept of learner autonomy in language learning.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL 1
SEMESTER: ALL
COURSE CODE: SPAN 1102
COURSE TITLE: SPANISH IB
NUMBER OF CREDITS: 2
PRE-REQUISITES: SPAN 1101 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Level 1A Spanish. Students will enhance their ability to communicate in the target language in situations relating to themselves and areas of immediate relevance. Students will continue to develop their autonomy in language learning.
ASSESSMENT:
100% in course testing
Test 1: 40; Test 2: 60%

LEVEL: I
SEMESTER: ALL
COURSE CODE: SPAN 1103
COURSE TITLE: SPANISH 2A
CREDITS: 2
PRE-REQUISITES: SPAN 1102 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Spanish 1B. Students will be able to function Increasingly Independently In all four skills in familiar situations and topics.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL: I
SEMESTER: ALL
COURSE CODE: SPAN 1104
COURSE TITLE: SPANISH 2B
CREDITS: 2
PRE-REQUISITES: SPAN 1103 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Spanish 2A. Students will be able to function more independently in a variety of familiar situations and topics.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL: I
SEMESTER: ALL
COURSE CODE: SPAN 1105
COURSE TITLE: SPANISH 3A
CREDITS: 2
PRE-REQUISITES: SPAN 1104 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Spanish 2B. Students will start showing a degree of fluency in the four different skills. Students will demonstrate more of the behaviours and attitudes of independent learners.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

LEVEL: I
SEMESTER: ALL
COURSE CODE: SPAN 1106
COURSE TITLE: SPANISH 3B
CREDITS: 2
PRE-REQUISITES: SPAN 1105 OR EQUIVALENT
COURSE DESCRIPTION: A four skill (listening, speaking, reading and writing) course that builds on the work done in Spanish 3A. Students will be able to demonstrate increased ease when interacting whether orally or in writing. Students will demonstrate more of the behaviours and attitudes of independent learners.
ASSESSMENT:
100% in course testing
Test 1: 40% Test 2: 60%

UWI

ST. AUGUSTINE
CAMPUS