This booklet gives information on courses offered in the Faculty of Pure and Applied Sciences at the Cave Hill Campus of the University of the West Indies (Barbados). For courses offered at the other Campuses, please see Faculty booklets for the Mona (Jamaica) and St. Augustine (Trinidad & Tobago) Campuses.

This Guide is intended for students entering the Faculty of Pure and Applied Sciences from academic year 2009-2010. Continuing students must refer to the Faculty Regulations that govern their year of entry – available on the Faculty website.

THE UNIVERSITY RESERVES THE RIGHT TO MAKE SUCH CHANGES TO THE CONTENTS OF THIS PUBLICATION AS MAY BE DEEMED NECESSARY.

Disclaimer:

The information in this booklet is accurate at the time of printing. Subsequent publications may therefore reflect updated information. Students should consult their Dean where clarification is required.
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INTRODUCTION TO THE FACULTY

The University of the West Indies is a regional and international institution primarily serving the needs of the Commonwealth Caribbean. Established in 1948 at Mona, Jamaica, as a college in special relationship with the University of London, it received full university status in 1962, as an independent degree-granting institution. In 1960, a second campus was established at St Augustine, Trinidad, and in 1963 teaching started in Barbados, first at a temporary site at the Bridgetown Port and then at the Cave Hill Campus.

Sciences have been taught at the Cave Hill Campus of the University of the West Indies from its inception. The Faculty was formerly known as the Faculty of Natural Sciences and later the Faculty of Science & Technology before settling on the current name of the Faculty of Pure & Applied Sciences. Our full-time Academic Staff are mainly Caribbean nationals but we are also very much an international Faculty with about one third of our lecturers drawn from countries far and wide. Our degree programmes are well-respected regionally and internationally with many of our graduates working or pursuing further studies overseas. The Faculty comprises three sections:-

- Department of Biological & Chemical Sciences – undergraduate & graduate programmes
- Department of Computer Science, Mathematics & Physics – undergraduate & graduate programmes
- Centre for Resource Management and Environmental Studies (CERMES) – graduate programmes

In the undergraduate BSc programme, courses are offered in all major scientific disciplines, with first year courses also taught at Tertiary Level Colleges in Antigua and St. Lucia. Students may Major in one or two disciplines and current enrollment in the Faculty is just over one thousand undergraduates, most of whom are full-time students.

Science graduates may register for the research degrees of M.Phil. and PhD. under the supervision of a member of the Academic Staff. The Faculty also offers two taught MSc programmes, MSc in Natural Resource and Environmental Management and the new MSc in Electronic Commerce.

The research interests in the Faculty are diverse, addressing both fundamental questions in Science as well as finding scientific solutions to real life problems facing Caribbean people. Faculty members also constitute an unmatched source of expertise to Governments, Non-Governmental Organisations and the Private Sector in providing technical advice.

The Sports Agronomy Research Unit (SARU), within the Department of Biological & Chemical Sciences, conducts basic and contract research and provides consultancy services in the area of living grass surfaces for sporting and recreational activities. It complements the UWI Centre for Cricket Excellence.

Through collaboration with the Caribbean Institute for Meteorology and Hydrology, the Faculty offers a Major in Meteorology within the BSc degree.
### CALENDAR: 2009-2010

#### Semester 1
<table>
<thead>
<tr>
<th>Event</th>
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<tr>
<td>Payment of fees</td>
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<tr>
<td>Registration period</td>
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<td>Teaching Begins</td>
<td>Monday September 7, 2009</td>
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<td>Applications for Leave of absence:</td>
<td>by Friday September 11, 2009</td>
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<td>Change in Registration (Add/Drop):</td>
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<tr>
<td>Teaching Ends</td>
<td>Friday December 4, 2009</td>
</tr>
<tr>
<td>Examinations Begin</td>
<td>Monday December 7, 2009</td>
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<td>Tuesday December 22, 2009</td>
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<td>Semester Ends</td>
<td>Tuesday December 22, 2009</td>
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<td>Teaching Begins</td>
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<td>Change in Registration (Add/Drop) by:</td>
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<td>Examinations Begin</td>
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<td>Examinations End</td>
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#### Graduation
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<td>Cave Hill</td>
<td>October 24, 2009</td>
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<tr>
<td>St. Augustine</td>
<td>October 30-31, 2009</td>
</tr>
<tr>
<td>Mona</td>
<td>November 6-7, 2009</td>
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</tbody>
</table>
STAFF OF THE
FACULTY OF PURE AND
APPLIED SCIENCES

Faculty Office & Officers

Tel: (246) 417-4310
Fax: (246) 417-4597
Website http://www.cavehill.uwi.edu/fpas
E-Mail: fpas@cavehill.uwi.edu

Dean and Senior Lecturer
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Deputy Dean
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BEng, MSc (Lond), PhD (UWI)

Deputy Dean (Outreach & Research)
Thea Scantlebury-Manning
BSc, PhD (Concordia)

Administrative Assistant
Kay Browne
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Administrative Assistant (Projects)
Natasha Corbin
BSc, MSc (UWI)
417-4739

Stenographer/Clerk
Gloria Harper
417-4312

Secretary:
Shana Odle
417-4310

Office Assistant
Anthony Howell
417-4312
Centre for Resource Management and Environmental Studies (Cermes)

Tel: (246) 417-4339 
Fax: (246) 424-4204 
Website: http://cavehill.uwi.edu/cermes 
E-Mail: nrm@cavehill.uwi.edu

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Professor of Marine Affairs and Director
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PhD (UBC)
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MSc (York), PhD (Sheff.)
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Administrative Assistant
Shirley Jones

Stenographer/Clerk
Cynthia Spooner

Stenographer/Clerk
Pauline Moore

Stenographer/Clerk
Susan Phillips

BIOLOGICAL SCIENCES

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C. M. Sean Carrington
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417-4330

Professor of Conservation Ecology
Julia A. Horrocks
BSc (Reading) PhD (UWI)
417-4320

Professor of Ecology & Environmental Sciences & Pro-Vice Chancellor (Research)
Wayne Hunte
BSc, PhD (UWI)
417-4129/4218

Professor
Marc Lavoie
BSc, MSc, PhD (Montreal)
417-4354

Emeritus Professor of Biology
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BSc (Brist.), PhD (Nott.)

Senior Lecturer
Louis Chinnery
BSc, DPhil (Ulst.)
417-4361

Senior Lecturer
Sarah L. Sutrina
BA (Colorado), PhD (John Hopkins)
417-4360

Lecturer
Angela Alleyne
BSc, MPhil, PhD (UWI)
417-4861

Lecturer
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BSc, PhD (UWI)
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Peter Moores Lecturer in Tropical Horticulture
Rajendra Maurya
BSc, MSc (RAU), PhD (HAU)
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### Lecturers

- **Food Science**
  - **Marilaine Mota-Meira**
    - Ing. (Curitiba) MSc, PhD (Laval)
    - 417-4859
  - **Thea Scantlebury-Manning**
    - BSc, PhD (Concordia)
    - 417-4356
  - **Lyndon D. Waterman**
    - BSc, PhD (UWI)
    - 417-4331
  - **Suzanne Workman**
    - BSc (Manch.) MPhil, PhD (UWI)
    - 417-4318

- **Chemical Sciences**
  - **Francis Lopez**
    - BSc, PhD (UWI)
    - 417-4345
  - **Georgette C. Briggs**
    - BSc (UWI), MSc (Toronto), PhD (McGill)
    - 417-4330

### Research Fellow

- **Francis Lopez**
  - BSc, PhD (UWI)
  - 417-4334

### Temporary Lecturer

- **Georgette C. Briggs**
  - BSc (UWI), MSc (Toronto), PhD (McGill)
  - 417-4330

### CHEMICAL SCIENCES

- **Sean McDowell**
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  - 417-4352

- **Winston Tinto**
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  - 417-4357/4329

### Earth Sciences

- **Steven Corder**
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- **Isabelle Gouirand**
  - Lic, PhD (Aix-Marseille I)
  - 417-4837
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Stenographer/Clerk Deidre Jemmott

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BSc, MPhil (UWI), PhD
(Sheffield Hallam)
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John Charlery
BSc (UWI), Dip. Trop. Met. (Miami), Adv. Dip. (Comp. Sci), MPhil, PhD (UWI)
417-4368

Dwaine Clarke
BSc, MEng, PhD (MIT)
417-4333

Colin Depradine
BEng, MSc (Lond.) PhD (UWI)
417-4375

Thomas Edward
BSc, PhD (UWI)
417-4792

Curtis Gittens
BSc (UWI), MSc, PhD (W. Ont.)
417-4473

Michelle Gittens
BSc (UWI), MSc, PhD (W. Ont.)
417-4465

Hussein Thompson
BSc, PhD (UWI)
417-4558

Paul Walcott
BSc, MPhil (UWI), PhD (City)
417-4372

Jeffrey Elcock
BSc (UWI), MSc (Oxon.), PhD (UWI)
417-4380
### Mathematics

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Qualifications</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Emeritus Professor of Mathematics</td>
<td>Charles Cadogan</td>
<td>BSc (Lond-UCWI) PhD (UWI), FTICA</td>
<td>417-4363</td>
</tr>
<tr>
<td>Professor of Mathematical Statistics</td>
<td>Smail Mahdi</td>
<td>BSc, MSc (Constantine), PhD (Montreal)</td>
<td>417-4367</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>Jayaram Chillumuntala</td>
<td>MSc (Andra), PhD (Madras)</td>
<td>417-4462</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>Hugh Millington</td>
<td>BSc (UWI), PhD (UBC), Dr. Habil. (Erlangen)</td>
<td>417-4337</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>Yefim Schwartzman</td>
<td>MA, PhD (Voronezh)</td>
<td>417-4797</td>
</tr>
<tr>
<td>Lecturer</td>
<td>Peter Chami</td>
<td>BSc, PhD (UWI)</td>
<td>417-4369</td>
</tr>
<tr>
<td>Lecturer</td>
<td>Jonathon R. Funk</td>
<td>BSc, MSc (Sask.) PhD (McGill)</td>
<td>417-4383</td>
</tr>
<tr>
<td>Lecturer</td>
<td>Bermd Sing</td>
<td>BSc. (Eberhard-Karls), PhD (Bielefeld)</td>
<td>417-4737</td>
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### Physics & Electronics

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<tbody>
<tr>
<td>Professor</td>
<td>Tane Ray</td>
<td>BSc, (Illinois), PhD (Boston)</td>
<td>417-4377</td>
</tr>
<tr>
<td>Professor of Condensed Matter Physics</td>
<td>Upindranath Singh</td>
<td>BSc, MPhil (UWI) MSc, PhD (Delaware)</td>
<td>417-4376</td>
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<tr>
<td>Senior Lecturer</td>
<td>Peter Gibbs</td>
<td>BSc, DipEd (UWI), MSc (Guelph)</td>
<td>417-4374</td>
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<tr>
<td>Senior Lecturer</td>
<td>Janak Sodha</td>
<td>BSc MSc PhD (Manch.)</td>
<td>417-4573</td>
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<tr>
<td>Lecturer</td>
<td>Yousef Akhtman</td>
<td>BSc (Hebrew U. of Jerusalem), PhD (Southhampton)</td>
<td>417-4851</td>
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<tr>
<td>Lecturer</td>
<td>Sujit Bag</td>
<td>BTech (IIT Kharagpur), PhD (Leic.)</td>
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<tr>
<td>Lecturer</td>
<td>Carlos Hunte</td>
<td>BSc, MPhil, PhD (UWI)</td>
<td>417-4382</td>
</tr>
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</table>
The Caribbean Institute For Meteorology & Hydrology

is an Affiliate Institution whose Faculty members teach our degree programme in Meteorology

Tel: (246) 425-1362
Fax: (246) 424-4733
Website: http://www.cimb.edu.bb

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Meteorology Coordinator
TBA
425-1362

Lecturer
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425-1362

Lecturer
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BSc, MPhil (UWI)
425-1362

Lecturer
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BSc (Guyana), Post-Graduate Dip. (Delft)
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Lecturer
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425-1362

Lecturer
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MSc (Penn. State), PhD (Howard)
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Lecturer
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MPhil. (UWI)
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Assistant Lecturer
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Assistant Lecturer
Shawn Boyce
BSc (UWI), MSc (Newcastle)
425-1362

Assistant Lecturer
Cherie Pounder
BSc (UWI), MSc (Birmingham)
425-1362
FACULTY OF PURE AND APPLIED SCIENCES  
HANDBOOK 2009-2010

PRINCIPAL OFFICERS OF THE UNIVERSITY OF THE WEST INDIES

**Chancellor**  
Professor The Hon. Sir George Alleyne  
OCC, MD, FRCP, FACP (Hon), DSc (Hon) UWI

**Vice-Chancellor**  
Professor E. Nigel Harris  
BA Howard, MPhil Yale, MD Penn, DM UWI

**Chairmen, Campus Councils**  
Sir Neville Nicholls - Cave Hill  
KA, BA Cantab, LLB Lond, Dip in Diplomacy Col,  
Hon. LLD UWI

Dr. Marshall Hall - Mona  
CD, BSc Col, PhD Wis

Mr. Ewart Williams - St. Augustine  
BSc, MSc UWI

**Campus Principals & Pro-Vice Chancellors**  
Prof. Sir Hilary Beckles - Cave Hill  
BA, PhD Hull

Prof. Gordon Shirley - Mona  
BSc UWI, MBA, DBA Harvard

Prof. Clement Sankat - St. Augustine  
BSc, MSc UWI, PhD Guelph, MASAE, MAPETT, FIAgreE

Prof. Hazel Simmons-McDonald - Open Campus  
BA, Dip. Ed. UWI, MA Ling, MA Dev Ed, PhD. Stanford

**Deputy Campus Principals**  
Prof. V. Eudine Barritteau - Cave Hill  
BSc UWI, MPA NYU, PhD Howard

Mr. Joseph Pereira - Mona  
BA, Dip Ed UWI, MA Qu

Prof. Rhoda Reddock - St. Augustine  
BSc UWI, MSc ISS The Hague, PhD Amst

Prof. Vivienne Roberts - Open Campus  
BSc, Dip Ed UWI, MEd Tenn, PhD UWI

**University Registrar**  
Mr. C. William Iton  
BSc UWI, LLM Essex

**University Bursar**  
Mr. Winston H. Bayley  
BSc Lond-UCWI, FCCA

**University Librarian**  
Ms. Jennifer Joseph  
BA UWI, Dip Lib & Info Sci UWI, MS Columbia,  
Dip Hum Res Mgt UWI

PRINCIPAL OFFICERS OF THE CAVE HILL CAMPUS

**Campus Principal**  
Prof. Sir Hilary Beckles  
BA, PhD Hull

**Deputy Campus Principal**  
Prof. V. Eudine Barritteau  
BSc UWI, MPA NYU, PhD Howard

**Campus Registrar**  
Mrs. Jacqueline Wade JP  
BA UWI, MSc Manc

**Campus Bursar**  
Ms. Annice Dalrymple JP  
BSc UWI, MBA Hull, CMA, FA

**Campus Librarian**  
Miss Elizabeth Watson  
BA UWI, MSc LIU, FCLIP
APPLICATION PROCEDURE

Applications for entry to all Faculties must be received on or before January 10 of the year in which the applicant wishes to enter and should be accompanied by:

Certified evidence of all examinations passed;

- A signed statement from parent/guardian agreeing that the applicant shall become an undergraduate in the Faculty.

- A signed statement from parent/guardian or from a responsible individual or authority that funds will be available for the payment of fees.

- The relevant application fee.

Students are encouraged to apply on-line at www.cavehill.uwi.edu/apply. Application forms may also be obtained from the Student Affairs Section at Cave Hill or other campuses of the UWI.

Table 1:
Minimum CAPE (or equivalent) qualifications for entry to 3-Year BSc Science Programmes

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<th>BSc Major in</th>
<th>Required CAPE Passes</th>
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<tr>
<td>Biochemistry</td>
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<tr>
<td>Biology ¹</td>
<td>Biology &amp; Chemistry</td>
</tr>
<tr>
<td>Ecology</td>
<td>Biology &amp; Chemistry</td>
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<tr>
<td>Microbiology</td>
<td>Biology &amp; Chemistry</td>
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<tr>
<td>Chemistry ¹</td>
<td>Chemistry &amp; another subject</td>
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<tr>
<td>Computer Science ¹</td>
<td>Mathematics &amp; another subject</td>
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<tr>
<td>Information Technology (IT)</td>
<td>Mathematics &amp; another subject</td>
</tr>
<tr>
<td>Mathematics ¹</td>
<td>Mathematics &amp; another subject</td>
</tr>
<tr>
<td>Electronics</td>
<td>Mathematics &amp; Physics or another subject</td>
</tr>
<tr>
<td>Physics</td>
<td>Mathematics &amp; Physics or another subject</td>
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<tr>
<td>Meteorology</td>
<td>Mathematics &amp; Physics</td>
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<table>
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<th>BSc Options ²</th>
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<td>Computer Science (or IT) &amp; Accounting</td>
<td>Mathematics &amp; another subject</td>
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<tr>
<td>Computer Science (or IT) &amp; Management</td>
<td>Mathematics &amp; another subject</td>
</tr>
<tr>
<td>Mathematics &amp; Economics</td>
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<td>Mathematics &amp; another subject</td>
</tr>
<tr>
<td>Science &amp; Management</td>
<td>Mathematics &amp; requirements as for the Science Major</td>
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<tr>
<td>Science &amp; Psychology</td>
<td>Requirements as for the Science Major</td>
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</table>

¹ Double Major also offered
² Numbers taking these Options are restricted
INTERNATIONAL EXCHANGE/ STUDY ABROAD PROGRAMME

The exchange programme allows students to spend one or two semesters abroad at overseas universities in order to broaden their experience, understanding and perception. Such exchanges typically take place in Year 2 of the BSc degree and the application deadline is December 1st of the year prior to the exchange.

UWI students, while at exchange Universities, continue as regular full-time students of the University of the West Indies. They pay UWI tuition and other fees and pursue matching and approved courses for credit. Credits earned abroad are transferred to UWI and applied to regular Faculty degree requirements in accordance with Regulation 39. For study abroad the requirements may vary.

Interested students are advised to consult the International Exchange/Study Abroad brochure available from the Admissions Section of Student Affairs. This contains a current list of Universities with which UWI has entered into cooperative arrangements for study exchanges. Programmes of study must be pre-approved by the Dean.

PRIZES AWARDED ANNUALLY IN THE FACULTY OF PURE AND APPLIED SCIENCES

THE GRAHAM GOODING BIOLOGY PRIZE

The prize consists of a commemorative scroll and voucher for BDS $600.00 to be spent on books related to the Biological Sciences.

It will be awarded to the best student majoring in the Biological Sciences (Biochemistry, Biology, Ecology, Microbiology) based on the student’s performance (minimum B+ average) in the courses comprising the Biological major.

R. L. SEALE & CO. LTD. PRIZE IN CHEMISTRY

This prize consists of a book voucher of BDS $600.00 and a commemorative scroll. It is awarded to the best student (who meets the standard) on the basis of performance during the final two years of the programme.

SYSTEMS CONSULTING LTD. (SCL) PRIZES IN

(a) Computer Science

(b) Computer Science and Accounting or Computer Science and Management

These prizes consist of a cash voucher of BDS $1500 to be spent on computer-related materials.

Students must have completed Year 1 of the Pure and applied Sciences Programme; and have fulfilled the Year 1 requirements for the major in Computer Science or Computer Science and Accounting or Computer Science and Management and have attained the highest average grade which must be at least B+.

None of these courses should have been repeated.
SCL will offer each Prizewinner a three-month paid work attachment at SCL after graduation.

**SYSTEMS CONSULTING LTD. (SCL) PRIZE IN MATHEMATICS**

The prize consists of a voucher of **BDS $ 500** to be spent on books on Mathematics and related fields.

Students must be graduating in the current year, have majored in Mathematics and have attained the highest average marks in the Mathematics courses relevant to the major with an overall average grade of at least B+

*None of the courses should have been repeated.*

**MOORE PARAGON PRIZE IN PHYSICS**

The prize consists of a voucher for books and/or student materials, of a value of **BDS $ 500**. The prize will be awarded annually to the student who obtains the highest average marks in the First Year courses offered in Physics, provided that the student obtains, at least a B+ average and continues within the degree programme in the Faculty of Pure and Applied Sciences, Cave Hill.

*None of the courses should have been repeated.*

**MOORE PARAGON PRIZE IN ELECTRONICS**

This prize consists of a voucher for books and/or student materials of a value of **BDS $ 500**. The prize will be awarded annually to the student who obtains the highest average marks in the First Year courses offered in Electronics, provided that the student obtains, at least a B+ average and continues within the degree programme in the Faculty of Pure and Applied Sciences, Cave Hill.

*None of these courses should have been repeated.*

**FACULTY PRIZE**

This prize consists of a voucher of **BDS $ 500** to be spent on books. It is awarded to the Part I/Level I student with the best academic performance.

**DEAN’S PRIZES, FACULTY OF PURE AND APPLIED SCIENCES**

There shall be two (2) Prizes awarded annually, called the Dean’s Prizes, Faculty of Pure and Applied Sciences. The Prizes shall be awarded to two (2) students registered in the Faculty of Pure and Applied Sciences who:

- have obtained at least an A average grade over 64 credits in the Faculty of Pure and Applied Sciences courses at Levels II/III
- should be nominated by their Department and interviewed by an Interdisciplinary panel. The names shall be inscribed on an appropriate plaque to be displayed in the Faculty Office.

The value of the Prizes shall be

- **FIRST PRIZE (Bds)** $900.00
- **SECOND PRIZE (Bds)** $500.00

**THE PFIZER CARIBBEAN SCIENCE PRIZE**

Valued at **BDS $1000**, it is open to undergraduate students registered for a major in Biology, Chemistry or their sub-disciplines in the Department of Biological and Chemical Sciences.
## GLOSSARY TO THE REGULATIONS

<table>
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<tr>
<th>TERM</th>
<th>DEFINITION</th>
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<tr>
<td>Science Faculties</td>
<td>The Faculties of Pure and Applied Sciences at Cave Hill and Mona and the Faculty of Science and Agriculture at St. Augustine.</td>
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<tr>
<td>Discipline</td>
<td>A body of knowledge encapsulated in a set of courses distinguishable from other such bodies on the basis of criteria such as method of enquiry, axioms, areas of application.</td>
</tr>
<tr>
<td>Subject</td>
<td>An area of study traditionally assigned to the purview of a department.</td>
</tr>
<tr>
<td>Course</td>
<td>A body of knowledge circumscribed by a syllabus to be imparted to students by sundry teaching methods and usually followed by an examination.</td>
</tr>
<tr>
<td>Faculty Courses</td>
<td>All courses except Foundation and Co-curricular courses.</td>
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<tr>
<td>In-Faculty Courses</td>
<td>All Faculty courses originating in the Science Faculties.</td>
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<tr>
<td>Out-of-Faculty Courses</td>
<td>All Faculty courses originating in Faculties other than the Science Faculties.</td>
</tr>
<tr>
<td>Foundation Courses</td>
<td>Broad-based courses, three of which must be taken, and which provide a general foundation of knowledge.</td>
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<tr>
<td>Programme</td>
<td>A selection of courses (designed to achieve pedagogical goals) the taking of which is governed by certain regulations and the satisfactory completion of which (determined by such regulations) makes a candidate eligible for the award of a degree/diploma/certificate.</td>
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<tr>
<td>Level</td>
<td>A measure of the standard of a course, designated at the UWI by the first digit in the course number.</td>
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<tr>
<td>Part</td>
<td>A stage of a programme:</td>
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<tr>
<td></td>
<td>(i) Part I (Introductory Stage) comprises Preliminary and Level I Courses</td>
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<td></td>
<td>(ii) Part II (Advanced Stage) comprises Level 2 and 3 courses</td>
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<tr>
<td>Credit</td>
<td>A measure of the workload required of students. 1 Credit Hour = 1 hour lecture/tutorial/problem class Per week OR 2 hours laboratory session per week, for a Semester.</td>
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<tr>
<td>Major</td>
<td>32 credits from prescribed courses at Levels 2 &amp; 3 (as defined)</td>
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<tr>
<td>Minor</td>
<td>16 credits of prescribed courses at Levels 2 &amp; 3 (as defined).</td>
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<tr>
<td>Option</td>
<td>A prescribed programme, comprising in-Faculty and, in some cases, out-of-Faculty courses, leading to a specific degree.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Elective</td>
<td>A course within a programme taken by choice of the student.</td>
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<tr>
<td>Marginal Failure</td>
<td>A score for the overall examination of a course which is not more than 5 marks below the minimum pass mark for that course.</td>
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<tr>
<td>Supplemental Examination</td>
<td>A re-sit of an examination of a course which is not more than 5 marks below the minimum pass mark for that course.</td>
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<tr>
<td>Supplementary Oral</td>
<td>An oral examination, offered on recommendation of Department and Faculty, to candidates who have registered a marginal failure in a Level 2 or 3 course.</td>
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<tr>
<td>Pre-requisite</td>
<td>A course which must be passed before another course for which it is required may be pursued.</td>
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<tr>
<td>Anti-requisites</td>
<td>Two courses of which credit may be granted for only one.</td>
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<tr>
<td>Semester GPA</td>
<td>Grade point average (GPA) computed on the basis of all courses done in a semester, without reference to weighting except in terms of credits. (The terms Grade Point, GPA, Quality Hours and Quality Points are defined in the UWI Grade Point Average Regulations Booklet).</td>
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<tr>
<td>Honours GPA</td>
<td>Weighted grade point average used to determine the class of degree. This GPA is computed on the basis of all courses done in the Advanced Part (Levels 2 &amp; 3) of the degree programme, weighted with respect to credits and to earned quality hours.</td>
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<tr>
<td>Supplemental Examination</td>
<td>A re-sit of an examination of a course which is not more than 5 marks below the minimum pass mark for that course.</td>
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<tr>
<td>Cumulative GPA</td>
<td>Grade point average obtained by dividing the total grade point earned by the total quality hours for which the student has registered for any period of time excluding courses taken on a Pass/Fail basis, audited courses, courses taken for Preliminary credit, incomplete and in-progress courses.</td>
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GENERAL REGULATIONS FOR
THE DEGREE OF BACHELOR
OF SCIENCE

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 any Faculty
and the University Regulations, the University Regulations
shall apply.

A. Admission

1. Students admitted to the four-year degree programme,
candidates must satisfy the University requirements for
Matriculation (see the UWI General Regulations for Students)
and have passed Elementary Mathematics at CSEC General
Proficiency level at Grades I, II or, since 1998, Grade III
(or equivalent) plus at least two of the disciplines listed
in Appendix I(b).

2. Students admitted to the three-year degree programme,
candidates must satisfy the University requirements for
Matriculation (see the UWI General Regulations for Students)
and have passed Mathematics and two approved science
subjects (Appendix Ib) at CSEC General Proficiency level
at Grades I, II or, since 1998, Grade III (or equivalent) plus
at least two of the disciplines listed in Appendix I(b).

and

(a) Have obtained passes in two two-Unit subjects at CAPE,
both Units at Grade V or better (or equivalent). One
of the CAPE subjects must be an Approved Science
subject (see Appendix Ia).

or

(b) Have an approved Associate Degree with a GPA
of 2.5 (or equivalent) or higher, from a Tertiary
Level Institution.

Students must have also satisfied the Departmental
Requirements.

B. Outline of the Degree Programme

3. The degree of BSc is awarded on the basis of a programme
of studies comprising combinations of courses in Science
disciplines, together with certain Foundation courses.
Approved Out-of-Faculty (see Glossary) courses may be
included.

4. The Science Faculties offer the following Bachelors degrees
in Science (the terms Major, Minor, Option etc., are defined
in the Glossary):

(a) A general degree with a single major (32 credits from
Levels 2 and 3) or a double major in two Science
disciplines (2x32 credits from Levels 2 and 3). (See
Appendix II for a list of Science Majors offered).

(b) A general degree with a single major in a Science
discipline plus

(i) one or two minors from other distinct Science
disciplines (each 16 credits from Levels 2 and 3)
or

(ii) a major or one or two minors from other Faculties.
Out-of-Faculty Majors and minors are governed by
the regulations of the Faculty of origin.

(c) Options comprising a prescribed set of departmental,
inter-departmental or inter-faculty courses which
satisfy the requirements for a specific degree
(see Appendix VI).

(d) Special Degrees offered by the Science Faculties as
listed by the respective departments. (Mona only)
5. The following types of courses, which may consist of both theoretical and practical parts, are offered by the University:

(a) Courses taught by the Science Faculties (in-Faculty courses) include Preliminary (Level 0) and Levels 1, 2 and 3 courses. (Preliminary courses may be used to satisfy entry requirements of Regulation 2 above, but do not contribute towards the requirements for the award of a degree.)

(b) Service courses, which provide students with basic techniques and skills needed for dealing with the academic programme.

(c) Approved Out-of-Faculty courses which may contribute toward the requirements for the award of a degree.

(d) Foundation courses (see Appendix III) which are given throughout the University to augment the general education of students.

(e) Co-curricular activities approved for credit by Academic Board. A maximum of three credits of co-curricular activities may be included as part of the credits required for the award of a degree, but shall not be taken into account in the determination of the Cumulative GPA or the class of degree. They may not be substituted for Foundation Courses. Co-curricular credits gained in excess of three will be entered on the student’s transcript but will not contribute toward the requirements for the degree.

6. Courses normally extend over not more than one semester, but in special cases may extend over two semesters. The contact hours for a course are expressed in terms of Credit Hours (credits) and the credit-rating of a course is determined by the Faculty which administers the course. (See Appendix IV).

7. In order to be eligible for award of the Science Faculties’ degrees, candidates must:

(a) have been in satisfactory attendance for a period equivalent to at least six semesters of full-time study from entry into Level 1;

and

(b) have passed courses totalling a minimum of 101 credits from Level 1, 2 and 3 Faculty and Foundation courses for the general degree as follows:

<table>
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<th>Level</th>
<th>Credits</th>
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<td>Level 1</td>
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<tr>
<td>Foundation courses</td>
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\[101\]

(i) A minimum of 16 credits (18 credits at Mona) at Level 1 and 32 credits at Levels 2 and 3 must be taken from in-Faculty courses.

(ii) Specific Options or Programmes (e.g. Special degrees, Double Majors or Major/Minor combinations) may require more than 101 credits (see Appendix VI)

(iii) Exemptions from specific parts of the degree programme may be obtained under the provisions of Section I: Exemptions & Transfers (below).

(c) have a Cumulative GPA of at least 1.00.

C. Registration

8. A student pursuing a degree in the Faculty may register full-time or part-time. A student who is in full-time employment may pursue a degree on a part-time basis
only. No allowances, with respect to attendance at classes, laboratories, tutorials or examinations, will be made for students on the basis of conditions of their employment.

9. Students must register for courses at the beginning of the academic year. Time limits governing changes in registration are as outlined in the student handbooks for each Campus. A student is deemed to be registered for a course only after his/her financial obligations to the University have been fulfilled.

10. Registration for any course (except audited courses) automatically implies entry for the associated examinations. A student who fails to attend the examinations without having previously withdrawn from the course (see Reg.9), or without having tendered evidence of illness at the time of the examinations, certified by a medical practitioner recognized by the University, will be deemed to have failed the course. Medical certificates must reach the Campus Registrar no later than seven days after the date of the examination concerned.

11. A student who has passed a course will not be permitted to re-register for that course.

D. Progress through the Programme

12. (a) Students admitted into the four-year degree programme (Reg.1) who have already obtained one CAPE/GCE A-level pass (or equivalent) in an approved science subject, may be permitted to register for up to 12 credits of Level 1 courses.

(b) Students admitted into the three-year degree programme (Reg.2) who satisfy the pre-requisites, may register for 12 credits in one of the Preliminary subjects offered in the Science Faculties or by Distance, for the purpose of obtaining prerequisites for entry into certain Level 1, 2 or 3 courses.

(c) Students may not register for Preliminary courses in a subject which overlaps substantially with any CAPE/GCE A-Level courses (or equivalent) previously passed.

13. (a) Full-time Part I students are required to register for a minimum of fifteen credits from Faculty courses per semester plus one Foundation course, that is, 33 credits over Semesters I and II.

(b) In order to satisfy the minimum requirement for entry to Part II, a student must normally pass a minimum of 24 credits in Level 1 Faculty courses. At least 16 of these credits (18 at Mona and 15-16 in Agriculture) must be from in-Faculty courses.

(c) A student who has passed the minimum number of required in-Faculty Level 1 credits in the first two semesters of full-time study may, on the recommendation of the Dean and subject to Reg.14, be allowed to register for a limited number of Part II courses.

(e) Exemptions from some courses may be obtained on the basis of the regulations contained in Section I, Exemptions & Transfers.

(f) The minimum number of credits for which a full-time Part II student must register in any one semester is 13.

(g) The normal load for a full-time Part II student is 16 advanced course credits per semester, plus one Foundation course, that is, 35 credits over Semesters I and II.
14. The maximum number of credits for which a student may register is as follows:

(a) In the case of Part I students:
   (i) for full-time registration, 18 credits from Preliminary/Introductory level courses in any one semester, plus one Foundation course per semester, that is, 42 credits over Semesters I and II.
   (ii) for part-time registration, 12 credits per semester from Faculty courses, plus one Foundation course, that is, 27 credits over Semesters I and II.

(b) In the case of Part II students:
   (i) for full-time registration, with the permission of the Dean, 20 credits from Faculty courses plus one Foundation course per semester.
   (ii) for part-time registration, 12 credits per semester from Faculty courses, plus one Foundation course, that is, 27 credits over Semesters I and II.

(c) Full-time students who require more than 20 but not more than 24 credits in order to graduate, have satisfied all Foundation course requirements, and are exempt from coursework in at least one course may, with the Dean’s permission, register for the required credits.

15. (a) Students must make a final declaration of their proposed major(s) and/or minor(s) by the end of the registration period of the semester in which they intend to graduate.

(b) Students must graduate as soon as they have met the requirements for the degree for which they are registered.

E. Examinations

16. In order to pass a course, a student must have been in satisfactory attendance at the course and must have satisfied the examiners in the associated examinations.

17. The examination associated with each course shall be conducted mainly by means of written and/or practical papers, normally taken at the end of the semester in which the candidate has registered for the courses concerned. However, oral examinations as well as performance in course work in the form of essays, in-course tests, research papers, projects, or continuous assessment of theoretical and/or practical work may contribute towards the final grade awarded in a course.

18. When practical papers and/or practical coursework contribute towards an examination, candidates must satisfy the examiners in both the theoretical and practical aspects of the course. On the basis of performance in the practical component of the course, a candidate may, on the recommendation of the Department concerned, be exempted from the practical part of the examination.

19. A candidate who marginally fails the examination associated with a Preliminary or Level 1 course may, if recommended by the relevant Department, be granted permission by the Board of Examiners to sit a Supplemental Examination. Such permission will be given on the basis of the performance of the candidate in the courses concerned.

20. A Part II student who marginally fails a course needed for advancement or for graduation, having satisfied the
Departmental requirements, may, at the discretion of the Faculty Board of Examiners, be offered a Supplementary Oral. Any candidate who satisfies the examiners in a Supplementary Oral will be given the minimum passing grade in the course. No more than eight credits may be gained through Supplementary Orals.

21. A candidate who fails the examination associated with a course may be given permission to repeat the course and the examination on a subsequent occasion.

(a) In the event that such a candidate has satisfied the examiners in the theory or practical coursework, the candidate may, on the recommendation of the relevant Department, be exempted from the theory or practical coursework passed. If such a recommendation has been made, the candidate may apply to the Dean for permission to take the examination without attending the course (Exam Only).

(b) A Part I student who fails a course twice will not normally be allowed to repeat this course again. Examinations associated with the Summer Programme are counted as repeats; Supplemental Examinations are not.

22. The Academic Board of a candidate’s Campus on the recommendation of the Faculty Board concerned, may debar the candidate from writing the examination associated with a course if the candidate has not attended and/or performed satisfactorily in the course. The grade for such a candidate will be recorded as Absent Fail.

F. GPA and Class of Degree

23. (a) A Semester grade point average which includes all approved courses for which the student is registered in a semester, whether passed or failed, will be calculated for the determination of academic standing.

(b) A Cumulative grade point average which includes all courses completed excluding those taken on a Pass/Fail basis, audited courses, Preliminary courses and courses designated I or IP will be calculated and recorded on the student’s transcript.

(c) An Honours grade point average including all Level 2 and 3 courses, whether passed or failed, will be calculated for determination of the class of the degree. (See Appendix V for the relationship between marks, grade point average and class of degree).

24. All courses included in the computation of the grade point averages in Regulation 23, are weighted according to their credit rating.

G. Leave of Absence and Voluntary Withdrawal

25. (a) A student who wishes to be absent from the Faculty for a semester or more may apply for Leave of Absence, through the Dean, to the campus Academic Board, stating the reasons for the application.

(b) Leave of Absence will not be granted for more than two consecutive semesters in the first instance. However, students may apply for an extension of leave.

(c) Leave of Absence will not be granted for more than four consecutive semesters.

(d) Applications for Leave of Absence or extension thereof
should normally be submitted by the end of the registration period in the relevant semester.

26. A student who registers for no courses during a semester without having obtained Leave of Absence will be deemed to have withdrawn from the Faculty.

27. A student who voluntarily withdraws from the university and who applies for re-admission within five years shall be granted exemption and credit for all courses previously passed unless the Department concerned declares that the material covered in a course has become outdated. All grades previously obtained except those for courses declared outdated shall be used in the determination of the GPA of such a student.

H. Time Limits for Completion and Enforced Withdrawals

28. For the purposes of Regulations 29 & 30 below, any semester in which a student is registered part-time including the Summer session, will be counted as half of a semester of full-time study. After the total of equivalent full-time study has been obtained in this way, it will be rounded down to a whole number.

29. Students will be required to withdraw from the Faculty if in any two successive semesters they fail to gain passes in Faculty courses equivalent to at least:

   **Part I**
   - Eleven (11) credits, if registered full-time.
   - Six (6) credits, if registered part-time.

   **Part II**
   - Eight (8) credits, if registered full-time.
   - Four (4) credits, if registered part-time.

30. (a) A student whose Semester Grade Point Average is less than or equal to 0.75 will be deemed to be performing unsatisfactorily and will be placed on warning.

   (b). A student on warning whose Semester grade point average is less than or equal to 0.75 will be required to withdraw from the Faculty.

31. (a) Students admitted to the programme under Reg.2 shall complete the requirements for the degree in a minimum of six or a maximum of ten semesters of full-time study.

   (b) Students admitted to the programme under Reg.1 shall complete the requirements for the degree in a minimum of eight or a maximum of twelve semesters of full-time study.

   (c) Students who cannot complete the programme within the maximum periods given in (a) and (b) above will normally be required to withdraw from the Faculty at the end of the academic year in which the maximum is reached.

32. In the event that a student has exhausted the maximum periods mentioned in Reg.31 above, but still requires for the completion of the degree programme,

   Either:

   (a) passes in courses totalling no more than eight credits,

   or:

   (b) passes in Foundation courses only,

   the Faculty Board may at its discretion recommend to Academic Board an extension of the period of study by one or two semesters.
33. For the purposes of Regulations 28 to 32 above, any semester for which a student has obtained Leave of Absence from the Faculty shall not be counted.

34. Notwithstanding Regulations 28 to 33 above, Academic Board may, on the recommendation of the Faculty Board, require the student to withdraw from the Faculty at the end of any semester on grounds of persistent neglect of work and/or repeated failure in examinations.

35. A student required to withdraw from one Faculty:

(a) may register immediately in another, if in the opinion of the student and the Dean of the receiving Faculty this is desirable and the student satisfies that Faculty’s entry requirements;

(b) will be required automatically to withdraw from the University if not granted registration in another Faculty; and

(c) may not register in the ensuing Academic Year, for any courses in the Faculty from which (s)he had been required to withdraw.

(d) if readmitted and required to withdraw for a second time, will not be considered for readmission until a minimum period of five years has elapsed.

36. A student who was required to withdraw for reasons of failure to progress may be readmitted to the Faculty on the following conditions:

(a) A minimum of one year has passed since the date of withdrawal

(b) The Faculty is satisfied that the circumstances attending the reasons for the withdrawal have altered substantially.

(c) All grades previously obtained, except for courses to be repeated (having been deemed outdated), shall continue to apply for the purpose of determining the student’s GPA.

(d) Subject to UWI Grade Point Average Regulation 11, courses pursued at an institution other than the UWI during the period of withdrawal may be eligible for credit.

(e) Courses pursued in the UWI Summer School during the period of withdrawal shall be included in all relevant grade point average calculations if the student re-enters the UWI.

I. Exemptions and Transfers

37. Holders of degrees from approved universities, or candidates who have partially fulfilled the requirements of such degrees, may apply to the Board for Undergraduate Studies, through the Faculty Board of the candidate’s campus, for exemption from Level 1 courses. Each such application will be considered on its own merit.

38. Students on transfer between different BSc degree programmes or from other programmes of study within the University may, on the basis of passes already obtained, and on the recommendation of the Departments concerned, be exempted from some or all of the Level 1 courses, and some of the Level 2 and/or Level 3 courses. Students exempted from all Level 1 courses may complete the degree programme in a minimum of four or a maximum of eight semesters of full-time study from the time of transfer. Students exempted from all Level 1 courses and some Level 2 and/or Level 3 courses may complete the degree programme in a minimum of two semesters of full-time study from the time of transfer.
39. (a) A student who wishes to take academic courses as
an exchange/transfer student at an institution other
than the UWI and to apply those credits toward
the degree must obtain written approval in advance
from the Dean. Failure to obtain written approval in
advance may preclude the acceptance of the credits.

(b) A student must have a minimum GPA of 3.00 by the
end of Semester II to be approved as an exchange/
transfer student in the following academic year.

(c) Where the course to be taken is to be substituted for a
UWI course, the content of the course must be certified
by the relevant Department as being equivalent to
the UWI course. Course outlines and syllabuses must
be provided by the student in order to permit the
evaluation of the course content.

(d) A student may not take courses for degree credit at
an institution other than the UWI during the semester
(including the succeeding summer) in which he or she
completes or is expected by the Faculty to complete the
requirements for graduation from the UWI.

J. Aegrotat Degree

40. (a) A candidate who, by reason of illness, was prevented
from attending examinations or part of the examinations
associated with a Level 2 or 3 course in the year
of anticipated graduation may apply to the Board
for Undergraduate Studies through the University Registrar, for an Aegrotat pass in the course. Such an
application will be granted only if all the following
conditions are satisfied:

(i) The appropriate Head of Department reports
that, on the basis of the candidate’s performance
during the period preceding the examinations, the
candidate was expected to pass the examinations
concerned and has satisfactorily completed any
associated course work.

(ii) The application reaches the University Registrar not
later than 30 days after the date of the last paper in
the examination concerned.

(iii) The application is accompanied by a medical
certificate attesting to the illness and issued by a
medical practitioner recognized for this purpose
by the University.

(b) No grade will be awarded in respect of an Aegrotat pass,
and a candidate having been awarded an Aegrotat pass
will not be allowed to re-enter the examination for
the course concerned on a subsequent occasion. An
Aegrotat pass may not be used to satisfy a pre-requisite
for other Level 2 and/or Level 3 courses.

(c) A student who, having satisfactorily completed the
degree programme, includes Aegrotat passes in courses
counted for the degree programme, will be eligible for
the award of an Aegrotat degree if both of the following
conditions are satisfied:

(i) The courses in which Aegrotat passes have been
granted (and which need to be counted toward
the award of the degree) are equivalent to no more
than 24 credits.

(ii) No more than 16 credits mentioned in (i)
above arise from courses making up the
candidate’s major.

(iii) The Aegrotat degree will be awarded
without Honours.
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APPENDIX I

(a) List of approved Science CAPE / GCE A-Level subjects.

Applied Mathematics *
Biology
Botany
Chemistry
Computer Science
Environmental Science
Further Mathematics *
Geography
Geology
Physics
Pure & Applied Mathematics
Pure Mathematics*
Zoology

* The following cannot be counted together:

(i) Further Mathematics with Applied Mathematics CAPE/GCE A-Level;

(ii) Mathematics (Pure and Applied) with Pure Mathematics or Applied Mathematics at CAPE/GCE A-Level.

(b) List of Approved Science CSEC General Proficiency/GCE O-Level subjects:

Additional Mathematics
Biology
Chemistry
Computer Science
Geography
Information Technology (General)
Integrated Science
Physics

APPENDIX II

List of Majors in the UWI Science Faculties:

Agriculture
Alternative Energy
Applied Chemistry
Biochemistry *
Biology*
Biotechnology
Botany
Chemistry *
Computer Science *
Earth Science
Ecology *
Electronics *
Environmental Biology
Experimental Biology
Food Chemistry
Geology
Information Technology *
Mathematics *
Meteorology *
Microbiology *
Molecular Biology
Physics *
Zoology

* Offered at Cave Hill
APPENDIX III

FOUNDATION COURSES

FOUN 0100 – Fundamentals of Written English
1FOUN 1001 – English for Academic Purposes
1FOUN 1008 – Rhetoric II: Writing for Special Purposes
FOUN 1101 – Caribbean Civilization
2FOUN 1210 – Science, Medicine & Technology in Society
FOUN 1301 – Law, Governance, Economy & Society

1 Both courses cannot be taken - students must choose one or the other
2 Not normally available to Science Faculty Students

FOUN 0100 FUNDAMENTALS OF WRITTEN ENGLISH
(0 Credits)
This course is required for all students entering the University who are not exempted from the Proficiency Test and have not taken it or failed it.

FOUN 1001 ENGLISH FOR ACADEMIC PURPOSES
(3 Credits)
This course is designed to: equip students with the study and research skills they will need in order to get the maximum benefit from all their courses at the University; to familiarize them with the linguistic situation in the Caribbean and break down certain misconceptions they usually have about it and to introduce students to the rhetorical modes of discourse.

FOUN 1008 RHETORIC II; WRITING FOR SPECIAL PURPOSES (3 Credits)
This course is designed to equip students across the disciplines (particularly the Social Sciences, Law, Pure and Applied Sciences) with skills in business, technical and scientific writing.

FOUN 1101 CARIBBEAN CIVILIZATION (3 Credits)
This course is designed to develop an awareness of the main process of cultural development in Caribbean societies, highlighting the factors, the problematics and the creative output that have fed the emergence of Caribbean identities; to develop a perception of the Caribbean as wider than island nations or linguistic blocs; to stimulate students’ interest in, and commitment to Caribbean civilization and to further their self-determination.

FOUN 1210 SCIENCE, MEDICINE AND TECHNOLOGY IN SOCIETY (3 Credits)
The overall aim of the course is to develop the ability of the student to engage in an informed manner in public discourse on matters pertaining to the impact of science, medicine and technology on society. The course will help students to appreciate the essential characteristics of the scientific method as a mode of enquiry into nature and to understand why it provides the foundations of the technological world.

FOUN 1301 LAW, GOVERNANCE, ECONOMY AND SOCIETY (3 Credits)
This is a multi-disciplinary course of the Faculty of Social Sciences which is designed mainly for non-Social Sciences students. The course will introduce students to some of the major institutions in Caribbean society. It will expose them to both historical and contemporary aspects of Caribbean society, including Caribbean legal, political and economic systems. In addition, Caribbean culture and Caribbean social problems are discussed.
APPENDIX III

FPAS CREDIT TABLE

The following table describes the approximate weekly contact hours for one-semester (thirteen teaching weeks) courses. One credit is obtained for every hour of lecture/tutorial/problem class per week OR two hours laboratory sessions per week, for a semester. A normal full-time load in Part I is 16-18 credits per semester (excluding Foundation courses). A normal load for a student in Part II (Advanced) is 16 credits (four 4-credit courses) per semester (excluding Foundation courses).

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<td>3</td>
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<td>1</td>
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<tr>
<td></td>
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<td>1</td>
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<td>1</td>
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<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>4</td>
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APPENDIX V

GRADING SYSTEM

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<th>Grade</th>
<th>Mark(%)</th>
<th>QP</th>
<th>Grade</th>
<th>Mark(%)</th>
<th>QP</th>
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<tr>
<td>A+</td>
<td>86–100</td>
<td>4.3</td>
<td>C+</td>
<td>53–56</td>
<td>2.3</td>
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<tr>
<td>A</td>
<td>70–85</td>
<td>4.0</td>
<td>C</td>
<td>50–52</td>
<td>2.0</td>
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<tr>
<td>A–</td>
<td>67–69</td>
<td>3.7</td>
<td>C–</td>
<td>47–49</td>
<td>1.7</td>
</tr>
<tr>
<td>B+</td>
<td>63–66</td>
<td>3.3</td>
<td>D+</td>
<td>43–46</td>
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<tr>
<td>B</td>
<td>60–62</td>
<td>3.0</td>
<td>D</td>
<td>40–42</td>
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<tr>
<td>B–</td>
<td>57–59</td>
<td>2.7</td>
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<tr>
<td>Pass</td>
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</table>
A. Programmes with the Faculty of Social Sciences

Under an agreement with the Faculty of Social Sciences, a limited number of students will be allowed to pursue the following cross-Faculty programmes, subject to timetable restrictions:

- Computer Science & Accounting
- Computer Science with Accounting
- Computer Science & Economics
- Computer Science with Economics
- Computer Science & Management
- Computer Science with Management
- Information Technology & Accounting
- Information Technology with Accounting
- Information Technology & Economics
- Information Technology with Economics
- Information Technology & Management
- Information Technology with Management
- Mathematics & Economics
- Mathematics with Economics
- Mathematics and Accounting
- Mathematics with Accounting
- Science Major & Management
- Science Major with Management

COMPUTER SCIENCE AND ACCOUNTING:

**LEVEL I**

- COMP1105 Computer Programming I
- COMP1115 Computer Programming II
- MATH1100 Basic Mathematics
- MATH1110 Applied Statistics
- ACCT1002 Introduction to Financial Accounting
- ACCT1003 Cost and Management Accounting I
- ECON1001 Introduction to Microeconomics
- ECON1002 Introduction to Macroeconomics
- MGMT1001 Principles of Management

**AND**

- ELET1110 Digital Electronics

**OR**

- FOUR (4) Level I Credits from any Faculty

**AND**

- FOUN1001 English For Academic Purposes

**OR**

- FOUN1008 Rhetoric II: Writing for Special Purposes

**LEVEL II**

- COMP2105 Discrete Mathematics
- COMP2115 Information Structures
- COMP2125 Computer Architecture
- COMP2145 Software Engineering I
- ACCT2014 Financial Accounting I
- ACCT2015 Financial Accounting II
- MGMT2023 Financial Management
- FOUN1101 Caribbean Civilization
LEVEL II ACCOUNTING ELECTIVES
AND Six (6) Credits From:
ACCT2018 Government Accounting
MKTG2001 Principles of Marketing
MGMT2005 Microcomputer Applications for Business
MGMT2008 Organisational Behaviour
MGMT2020 Managerial Economics
MGMT2006 Management Information Systems I
MGMT2021 Business Law I

LEVEL III
COMP3100 Operating Systems
COMP3180 Algorithm Design and Analysis
ACCT2017 Intermediate Cost Accounting
ACCT3043 Auditing
FOUN1301 Law, Governance and Society

And One Level III COMP course
And One Level II/III COMP course

AND Either
ACCT3040 Accounting Theory
OR
ACCT3041 Advanced Financial Accounting

AND Six (6) Credits From Accounting Electives:
ACCT3015 Accounting Information Systems
ACCT3039 Cost & Management Accounting II
ACCT3040 Advanced Accounting Theory
ACCT3041 Advanced Financial Accounting
ACCT3044 Advanced Auditing
MGMT3023 Independent Study
MGMT3024 Managerial Communications
MGMT3048 Financial Management II
MGMT3049 Financial Institutions and Markets
MGMT3052 Taxation and Tax Management
MGMT3072 Services Sector Accounting

COMPUTER SCIENCE WITH ACCOUNTING

LEVEL 1
COMP1105 Computer Programming I
COMP1115 Computer Programming II
MATH1100 Basic Mathematics
MATH1110 Applied Statistics
ACCT1002 Introduction to Financial Accounting
ACCT1003 Cost & Management Accounting I
ECON1001 Introduction to Microeconomics
ECON1002 Introduction to Macroeconomics
MGMT1001 Principles of Management

AND
ELET1110 Digital Electronics
OR
FOUR (4) Level 1 Credits from any Faculty

LEVEL II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2125 Computer Architecture
COMP2145 Software Engineering I
ACCT2014 Financial Accounting I
ACCT2015 Financial Accounting II
ACCT2017 Management Accounting

LEVEL III
COMP3100 Operating Systems
COMP 3180 Algorithm Design and Analysis
ACCT3043 Auditing

AND
ACCT3040 Accounting Theory
OR
ACCT3041 Advanced Financial Accounting

And One Level III COMP Course
And One Level II/III COMP Course
AND Fourteen (14) Level II/III Credits

FOUN
FOUN 1008  Rhetoric II: Special Purposes
OR
FOUN 1001  English for Academic Purposes
AND
FOUN1101  Caribbean Civilization
FOUN1301  Law, Governance and Society

COMPUTER SCIENCE AND ECONOMICS

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ECON1001  Introd. to Microeconomics
ECON1002  Introd. to Macroeconomics
AND Eight (8) Level I Credits

LEVEL II
COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2125  Computer Architecture
COMP2145  Software Engineering I
ECON2000  Intermed. Microeconomics I
ECON2001  Intermed. Microeconomics II
ECON2002  Intermed. Macroeconomics I
ECON2003  Intermed. Macroeconomics II
ECON2008  Statistical Methods I

LEVEL III
COMP3100  Operating Systems
COMP3180  Algorithm Design and Analysis
ECON3049  Econometrics I

One Level III COMP course
One Level II/III COMP course
Four Level II/III ECON courses

FOUN
FOUN 1008  Rhetoric II: Special Purposes
OR
FOUN 1001  English for Acad. Purposes
AND
FOUN 1101  Caribbean Civilisation
FOUN1301  Law, Governance and Society
COMPUTER SCIENCE WITH ECONOMICS

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ECON1001  Introd. to Microeconomics
ECON1002  Introd. to Macroeconomics

AND Eight (8) Level I Credits

LEVEL II
COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2125  Computer Architecture
COMP2145  Software Engineering I
ECON2000  Intermed. Microeconomics I
ECON2001  Intermed. Microeconomics II
ECON2002  Intermed. Macroeconomics I
ECON2003  Intermed. Macroeconomics II

AND One Level II/III ECON course

LEVEL III
COMP3100  Operating Systems
COMP3180  Algorithm Design and Analysis

One Level III COMP course

One Level II/III COMP course

And Fifteen Level II/III credits

AND

FOUN 1008  Rhetoric II: Special Purposes

OR

FOUN 1001  English for Acad. Purposes

AND

FOUN 1101  Caribbean Civilisation
FOUN1301  Law, Governance and Society

COMPUTER SCIENCE AND MANAGEMENT

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ACCT1002  Introduction to Financial Accounting
ACCT1003  Cost and Management Accounting I
ECON1001  Introduction to Microeconomics
ECON1002  Introduction to Macroeconomics
MGMT1001  Principles of Management

AND

ELET1110  Digital Electronics

OR

FOUR (4) Level I Credits from any Faculty

AND

FOUN1001  English for Academic Purposes

OR

FOUN1008  Rhetoric II: Writing for Special Purposes

LEVEL II
COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2125  Computer Architecture
COMP2145  Software Engineering I
MKTG2001  Principles of Marketing
MGMT2006  Information Systems I
MGMT2008  Organisational Behaviour
MGMT2020  Managerial Economics
MGMT2023  Financial Management
MGMT2026  Production & Operations Management

AND

FOUN1101  Caribbean Civilization
LEVEL III
COMP3100  Operating Systems
COMP3180  Algorithm Design and Analysis
MGMT3017  Human Resources Management

AND
FOUN1301  Law, Governance and Society

One Level III COMP course
One Level II/III COMP course

AND Nine (9) Credits from LEVEL III Electives:
ACCT3015  Accounting Information Systems
ACCT3039  Advanced Management & Cost Accounting
MGMT3011  Management Information Systems II
MGMT3018  Industrial Relations
MGMT3022  Organisational Development
MGMT3033  Business, Government and Society
MGMT3037  International Business
MGMT3038  Cross-National Management
MGMT3045  Business Law II
MGMT3048  Financial Management II
MGMT3049  Financial Institutions and Markets
MGMT3052  Taxation and Tax Management
MGMT3053  International Financial Management
MGMT3056  Project Management
MGMT3058  New Venture Management
MGMT3075  Public Enterprise Management
MGMT3076  Managing Financial Institutions
MKTG3000  Marketing Management
MKTG3001  International Marketing Management
MKTG3002  Marketing Research
MKTG3009  Services Marketing

COMPUTER SCIENCE WITH MANAGEMENT

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ACCT1002  Introduction to Financial Accounting
ACCT1003  Cost & Management Accounting I
ECON1001  Introduction to Microeconomics
ECON1002  Introduction to Macroeconomics
MGMT1001  Principles of Management

AND
ELET1110  Digital Electronics
OR
FOUR (4) Level I Credits from any Faculty

AND
FOUN1001  English for Academic Purposes
OR
FOUN1008  Rhetoric II: Writing for Special Purposes

LEVEL II
COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2125  Computer Architecture
COMP2145  Software Engineering I
MKTG2001  Principles of Marketing
MGMT2006  Management Information Systems I
MGMT2008  Organizational Behaviour
MGMT2023  Financial Management
FOUN1101  Caribbean Civilization
### LEVEL III
- COMP3100  Operating Systems
- COMP3180  Algorithm Design and Analysis
- MGMT3017  Human Resources Management
- FOUN1301  Law, Governance and Society

**AND**

*One Level III COMP course*

*One Level II/III COMP course*

**AND**

Fourteen (14) Level II/III credits

### INFORMATION TECHNOLOGY AND ACCOUNTING

### LEVEL I
- COMP1105  Computer Programming I
- COMP1115  Computer Programming II
- MATH1100  Basic Mathematics
- MATH1110  Applied Statistics
- ACCT1002  Introduction to Financial Accounting
- ACCT1003  Cost and Management Accounting I
- ECON1001  Introduction to Microeconomics
- ECON1002  Introduction to Macroeconomics
- MGMT1001  Principles of Management

**AND**

ELET1110 Digital Electronics

**OR**

FOUR (4) Level I Credits from any Faculty

**AND**

FOUN1001 English for Academic Purposes

**OR**

FOUN1008 Rhetoric II: Writing for Special Purposes

### LEVEL II
- COMP2105  Discrete Mathematics
- COMP2115  Information Structures
- COMP2145  Software Engineering I
- COMP2160  Object-Oriented Programming
- ACCT2014  Financial Accounting I
- ACCT2015  Financial Accounting II
- MGMT2023  Financial Management
- FOUN1101  Caribbean Civilization

**AND** Six (6) Credits From Accounting Electives:
- ACCT2018  Government Accounting
- MKTG2001  Principles of Marketing
MGMT2005  Microcomputer Applications for Business
MGMT2008  Organisational Behaviour
MGMT2020  Managerial Economics
MGMT2006  Management Information Systems I
MGMT2021  Business Law I

LEVEL III
FOUN1301  Law, Governance and Society
COMP3160  Database Management Studies
COMP3170  Web-Based Applications
ACCT2017  Intermediate Cost Accounting
ACCT3043  Auditing

AND
ACCT3040  Accounting Theory

OR
ACCT3041  Advanced Financial Accounting

AND
One Level III COMP course
One Level II/III COMP course

AND Six (6) Credits From Accounting Electives:
ACCT3015  Accounting Information Systems
ACCT3039  Cost & Management Accounting II
ACCT3040  Advanced Accounting Theory
ACCT3041  Advanced Financial Accounting
ACCT3044  Advanced Auditing
MGMT3023  Independent Study
MGMT3024  Managerial Communications
MGMT3048  Financial Management II
MGMT3049  Financial Institutions and Markets
MGMT3052  Taxation and Tax Management
MGMT3072  Services Sector Accounting

INFORMATION TECHNOLOGY WITH ACCOUNTING

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ACCT1002  Introduction to Financial Accounting
ACCT1003  Cost & Management Accounting I
ECON1001  Introduction to Microeconomics
ECON1002  Introduction to Macroeconomics
MGMT1001  Principles of Management

AND
ELET1110  Digital Electronics

OR
FOUR (4) Level I Credits from any Faculty

AND
FOUN1001  English for Academic Purposes

OR
FOUN1008  Rhetoric II: Writing for Special Purposes

LEVEL II
COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2145  Software Engineering I
COMP2160  Object-Oriented Programming
ACCT2014  Financial Accounting I
ACCT2015  Financial Accounting II
ACCT2017  Management Accounting
FOUN1101  Caribbean Civilization

LEVEL III
COMP3160  Database Management Studies
COMP3170  Web-Based Applications
ACCT3043  Auditing
FACULTY OF PURE AND APPLIED SCIENCES
HANDBOOK 2009-2010

FOUN1301  Law, Governance and Society

AND

One Level III COMP course
One Level II/III COMP course

AND

ACCT3040 Accounting Theory
OR
ACCT3041 Advanced Financial Accounting

AND

Fourteen (14) Level II/III Credits

INFORMATION TECHNOLOGY AND ECONOMICS

LEVEL I

COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
ECON1001  Introd. to Microeconomics
ECON1002  Introd. to Macroeconomics
AND Eight (8) Level I Credits

LEVEL II

COMP2105  Discrete Mathematics
COMP2115  Information Structures
COMP2145  Software Engineering I
COMP2160  Object-Oriented Programming
ECON2000  Intermed. Microeconomics I
ECON2001  Intermed. Microeconomics II
ECON2002  Intermed. Macroeconomics I
ECON2003  Intermed. Macroeconomics II
ECON2008  Statistical Methods I

LEVEL III

COMP3160  Database Management Studies
COMP3170  Web-Based Applications
ECON3049  Econometrics I

One Level III COMP course
One Level II/III COMP course
Four Level II/III ECON courses

FOUN

FOUN 1008  Rhetoric II: Special Purposes
OR
FOUN 1001  English for Acad. Purposes
AND
FOUN 1101  Caribbean Civilisation
FOUN1301  Law, Governance and Society
## INFORMATION TECHNOLOGY WITH ECONOMICS

### LEVEL I
- COMP1105  Computer Programming I
- COMP1115  Computer Programming II
- MATH1100  Basic Mathematics
- MATH1110  Applied Statistics
- ECON1001  Introd. to Microeconomics
- ECON1002  Introd. to Macroeconomics

**AND Eight (8) Level I Credits**

### LEVEL II
- COMP2105  Discrete Mathematics
- COMP2115  Information Structures
- COMP2145  Software Engineering I
- COMP2160  Object-Oriented Programming
- ECON2000  Intermed. Microeconomics I
- ECON2001  Intermed. Microeconomics II
- ECON2002  Intermed. Macroeconomics I
- ECON2003  Intermed. Macroeconomics II

**AND One Level II/III ECON course**

### LEVEL III
- COMP3160  Database Management Studies
- COMP3170  Web-Based Applications

**One Level III COMP course**

**One Level II/III COMP course**

**And Fifteen (15) Level II/III credits**

### FOUN
- FOUN 1008  Rhetoric II: Special Purposes
- FOUN 1001  English for Acad. Purposes

**AND**

- FOUN 1101  Caribbean Civilisation
- FOUN1301  Law, Governance and Society

## INFORMATION TECHNOLOGY AND MANAGEMENT

### LEVEL I
- COMP1105  Computer Programming I
- COMP1115  Computer Programming II
- MATH1100  Basic Mathematics
- MATH1110  Applied Statistics
- ACCT1002  Introduction to Financial Accounting
- ACCT1003  Cost and Management Accounting I
- ECON1001  Introduction to Microeconomics
- ECON1002  Introduction to Macroeconomics
- MGMT1001  Principles of Management

**AND**

- ELET1110  Digital Electronics

**OR**

**FOUR (4) Level I Credits from any Faculty**

**AND**

- FOUN1001  English for Academic Purposes

**OR**

- FOUN1008  Rhetoric II: Writing for Special Purposes

### LEVEL II
- COMP2105  Discrete Mathematics
- COMP2115  Information Structures
- COMP2145  Software Engineering I
- COMP2160  Object-Oriented Programming
- MKTG2001  Principles of Marketing
- MGMT2006  Management Information Systems I
- MGMT2008  Organisational Behaviour
- MGMT2020  Managerial Economics
- MGMT2023  Financial Management
- MGMT2026  Production & Operations Management

**AND**

- FOUN1101  Caribbean Civilization
LEVEL III
COMP3160 Database Management Studies
COMP3170 Web-Based Applications
MGMT3017 Human Resources Management

AND
FOUN1301 Law, Governance and Society

AND
*One Level III COMP course*

*One Level II/III COMP course*

AND Nine (9) Credits from Level III Electives:
ACCT3015 Accounting Information Systems
ACCT3039 Advanced Management & Cost Accounting
MGMT3011 Management Information Systems II
MGMT3018 Industrial Relations
MGMT3022 Organisational Development
MGMT3033 Business, Government and Society
MGMT3037 International Business
MGMT3038 Cross-National Management
MGMT3045 Business Law II
MGMT3048 Financial Management II
MGMT3049 Financial Institutions and Markets
MGMT3052 Taxation and Tax Management
MGMT3053 International Financial Management
MGMT3056 Project Management
MGMT3058 New Venture Management
MGMT3075 Public Enterprise Management
MGMT3076 Managing Financial Institutions
MKTG3000 Marketing Management
MKTG3001 International Marketing Management
MKTG3002 Marketing Research
MKTG3009 Services Marketing

INFORMATION TECHNOLOGY WITH MANAGEMENT

LEVEL I
COMP1105 Computer Programming I
COMP1115 Computer Programming II
MATH1100 Basic Mathematics
MATH1110 Applied Statistics
ACCT1002 Introduction to Financial Accounting
ACCT1003 Cost & Management Accounting I
ECON1001 Introduction to Microeconomics
ECON1002 Introduction to Macroeconomics
MGMT1001 Principles of Management

AND
ELET1110 Digital Electronics

OR
FOUR (4) Level I Credits

LEVEL II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2145 Software Engineering I
COMP2160 Object-Oriented Programming
MKTG2001 Principles of Marketing
MGMT2006 Management Inform. Systems I
MGMT2008 Organizational Behaviour
MGMT2023 Financial Management

LEVEL III
COMP3160 Database Management Systems
COMP3170 Web-Based Applications
MGMT3017 Human Resources Management

AND
*One Level III COMP course*

*One Level II/III COMP course*
**AND**

Fourteen (14) Level II/III credits

**FOUN**

FOUN 1008 Rhetoric II: Special Purposes

**OR**

FOUN 1001 English for Academic Purposes

**AND**

FOUN 1101 Caribbean Civilization

FOUN1301 Law, Governance and Society

**MATHEMATICS AND ACCOUNTING**

**LEVEL I**

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<td>ECON1001</td>
<td>Introduction to Microeconomics</td>
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<td>MGMT1001</td>
<td>Principles of Management</td>
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<tr>
<td>MATH1100</td>
<td>Basic Mathematics</td>
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<tr>
<td>MATH1130</td>
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**AND**

COMP1105 Computer Programming I

**OR**

COMP1005 Computer Applications

**LEVEL II**

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**AND Six (6) Credits From:**

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<td>Microcomputer Appl. for Business</td>
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</table>
LEVEL III
Two Level III MATH courses
Two Level II/III MATH courses
ACCT2017 Intermediate Cost Accounting
ACCT3043 Auditing

AND
ACCT3040 Accounting Theory

OR
ACCT3041 Advanced Financial Accounting

AND Six (6) Credits From:
ACCT3015 Accounting Info. Systems
ACCT3039 Cost & Managt. Accounting II
ACCT3040 Advanced Accounting Theory
ACCT3041 Adv. Financial Accounting
ACCT3044 Advanced Auditing
MGMT3023 Independent Study
MGMT3024 Managerial Communications
MGMT3048 Financial Management II
MGMT3049 Fin. Institutions and Markets
MGMT3052 Taxation and Tax Mangt.
MGMT3072 Services Sector Accounting

FOUN
FOUN 1008 Rhetoric II: Special Purposes

OR
FOUN 1001 English for Academic Purposes

AND
FOUN 1101 Caribbean Civilization
FOUN1301 Law, Governance and Society

MATH1100 Basic Mathematics
MATH1105 Computer Programming I

OR
COM1005 Computer Applications

LEVEL II
MATH2100 Abstract Algebra
MATH2110 Linear Algebra
MATH2120 Analysis & Methods I
MATH2130 Ord. Differential Equations
ACCT2014 Financial Accounting I
ACCT2015 Financial Accounting II
ACCT2017 Intermediate Cost Accounting

LEVEL III
Two Level III MATH courses
Two Level II/III MATH courses
ACCT3043 Auditing

AND
ACCT3040 Accounting Theory

OR
ACCT3041 Adv. Financial Accounting

AND Fourteen (14) Level II/III credits

ACCT3043 Auditing
ACCT3040 Accounting Theory
ACCT3041 Adv. Financial Accounting

AND
ACCT3043 Auditing
ACCT3040 Accounting Theory
ACCT3041 Adv. Financial Accounting

AND Fourteen (14) Level II/III credits
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<tr>
<td>FOUN 1001</td>
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AND Four (4) Level I Credits

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*Four Level II/III ECON courses*

*Two Level III MATH courses*

*Two Level II/III MATH courses*

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<tbody>
<tr>
<td>FOUN 1008</td>
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<td>OR</td>
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<td>FOUN 1001</td>
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<tr>
<td>AND</td>
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<td>FOUN 1101</td>
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</table>
MATHEMATICS WITH ECONOMICS

LEVEL I
MATH1100 Basic Mathematics
MATH1120 Calculus I
MATH1130 Calculus II
MATH1110 Applied Statistics
COMP1105 Computer Programming I
ECON1001 Introd. to Microeconomics
ECON1002 Introd. to Macroeconomics
AND Four (4) Level I Credits

LEVEL II
MATH2100 Abstract Algebra
MATH2110 Linear Algebra
MATH2120 Analysis & Methods I
MATH2130 Ord. Differential Equations
ECON2000 Intermed. Microeconomics I
ECON2001 Intermed. Microeconomics II
ECON2002 Intermed. Macroeconomics I
ECON2003 Intermed. Macroeconomics II
AND One Level II/III ECON course

LEVEL III
Two Level III MATH courses
Two Level II/III MATH courses
AND Fifteen Level II/III credits

SCIENCE AND MANAGEMENT

LEVEL I
Required Level 1 Courses for Science Major plus
MATH1100 Basic Mathematics
MATH1110 Applied Statistics
ACCT1002 Introd. to Financial Accounting
ACCT1003 Cost & Mangt. Accounting I
ECON1001 Introd. to Microeconomics
ECON1002 Introd. to Macroeconomics
MGMT1001 Principles of Management

LEVELS II & III
Thirty-two (32) credits of required Level II/III Courses for Science Major plus
MKTG2001 Principles of Marketing
MGMT2006 Mangt. Info. Systems I
MGMT2008 Organisational Behaviour
MGMT2020 Managerial Economics
MGMT2023 Financial Management
MGMT2026 Prodn. & Operations Mangt.
MGMT3017 Human Resources Mangt.

AND Nine (9) Credits from LEVEL III ELECTIVES
ACCT3015 Accounting Info. Systems
MGMT3011 Mangt. Info. Systems II
MGMT3018 Industrial Relations
MGMT3022 Organisational Development
MGMT3033 Business, Govt. and Society
MGMT3037 International Business
MGMT3038 Cross-National Management
MGMT3045 Business Law II
MGMT3048 Financial Management II
MGMT3049 Financial Inst. and Markets

FOUN
FOUN 1008 Rhetoric II: Special Purposes
OR
FOUN 1001 English for Acad. Purposes
AND
FOUN 1101 Caribbean Civilisation
FOUN1301 Law, Governance and Society
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<td>MGMT3075</td>
<td>Public Enterprise Mangt.</td>
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<td>MGMT3076</td>
<td>Managing Fin. Institutions</td>
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<td>MKTG3000</td>
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<td>MKTG3001</td>
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<td>English for Acad. Purposes</td>
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<td>Caribbean Civilization</td>
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<tr>
<td>FOUN1301</td>
<td>Law, Governance and Society</td>
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</tbody>
</table>

**SCIENCE WITH MANAGEMENT**

**LEVEL I**

**Required Level 1 Courses for Science Major plus**

- MATH1100  Basic Mathematics
- MATH1110  Applied Statistics
- ACCT1002  Introd. to Financial Accounting
- ACCT1003  Cost & Mangt. Accounting I
- ECON1001  Introd. to Microeconomics
- ECON1002  Introd. to Macroeconomics
- MGMT1001  Principles of Management

**LEVELS II & III**

**Thirty-two (32) credits of required Level II/III Courses for Science Major plus**

- MKTG2001  Principles of Marketing
- MGMT2008  Organisational Behaviour
- MGMT2023  Financial Management
- MGMT3017  Human Resources Management

**And Fourteen (14) Level II/III Credits**

**FOUN**

- FOUN1008  Rhetoric II: Special Purposes
- OR
- FOUN1001  English for Acad. Purposes
- AND
- FOUN1101  Caribbean Civilization
- FOUN1301  Law, Governance and Society
B. Programmes with the Faculty of Humanities & Education

Under an agreement with the Faculty of Humanities & Education, a limited number of students will be allowed to pursue the following programmes, subject to timetable restrictions:

- Science Major & Psychology Major
- Science Major with Psychology Minor
- Science Major with Spanish Minor
- Science Major with Education Minor

The Psychology Major comprises 30 credits of specified advanced courses while the Psychology and Spanish Minor each comprise 15 credits of specified advanced courses. In addition, students must satisfy the requirements of their Science Major and complete a minimum total of 101 credits.

**SCIENCE AND PSYCHOLOGY**

**LEVEL 1**
Twenty-four (24) credits from Level 1 Science Courses plus

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>PSYC1003</td>
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<tr>
<td>PSYC1004</td>
<td>Introduction to Social Psychology</td>
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<tr>
<td>PSYC1012</td>
<td>Introduction to Developmental Psychology</td>
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<tr>
<td>PSYC1013</td>
<td>Introduction to Research Methods</td>
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<tr>
<td>PSYC1015</td>
<td>Historical Issues in Psychology</td>
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</table>

**LEVELS II & III**
Thirty-two (32) credits of required Level II/III Courses for Science Major plus

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PSYC2002</td>
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**SCIENCE WITH PSYCHOLOGY**

**LEVEL 1**
Twenty-four (24) credits from Level 1 Science Courses plus

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PSYC1003</td>
<td>Introduction to Psychology</td>
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<td>PSYC1004</td>
<td>Introduction to Social Psychology</td>
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<td>PSYC1012</td>
<td>Introduction to Developmental Psychology</td>
</tr>
<tr>
<td>PSYC1013</td>
<td>Introduction to Research Methods</td>
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**LEVELS II & III**
Thirty-two (32) credits of required Level II/III Courses for Science Major plus

<table>
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<td>PSYC2004</td>
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<td>PSYC2014</td>
<td>Statistics And Research Design II</td>
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<td>PSYC2---</td>
<td>Introduction to Cognitive Psychology</td>
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<td>PSYC2---</td>
<td>Developmental Psychology II: From Conception to Adolescence</td>
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<td>PSYC3017</td>
<td>Personality Theory II</td>
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<td>PSYC3030</td>
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<td>Caribbean Civilization</td>
</tr>
<tr>
<td>FOUN1301</td>
<td>Law, Governance and Society</td>
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</table>

*Students registered for a Science Research Project course (E.G. BIOC3950, BIOL3950, CHEM3500, CHEM3505, COMP 3910) must replace PSYC3011 by 6 credits from the electives listed above.
PSYC2014 Statistics And Research Design II
PSYC3016 Research Project in Psychology (Minor)
AND Fifteen (15) Level II/III credits

FOUN
FOUN1008 Rhetoric II: Special Purposes
OR
FOUN1001 English for Acad. Purposes
FOUN1101 Caribbean Civilization
FOUN1301 Law, Governance and Society

SCIENCE WITH SPANISH

LEVEL I
Twenty-four (24) credits from Level I Science Courses plus
SPAN1001 Spanish Language IA
SPAN1002 Spanish Language IB

LEVELS II & III
Thirty-two (32) credits of required Level II/III Courses for Science Major plus
SPAN2001 Spanish Language IIA
SPAN2002 Spanish Language IIB
SPAN2214 Hispanic Culture
SPAN3502 Business Spanish
SPAN3503 Spanish for Tourism
AND Fifteen (15) Level II/III credits

FOUN
FOUN1008 Rhetoric II: Special Purposes
OR
FOUN1001 English for Acad. Purposes
AND
FOUN1101 Caribbean Civilization
FOUN1301 Law, Governance and Society

SCIENCE WITH EDUCATION

LEVEL I
Twenty-four (24) credits from Level I Science Courses plus
EDPS1001 Introduction to Human Development

LEVELS II & III
Thirty-two (32) credits of required Level II/III Courses for the Science Major plus
EDCU2101 Introduction to Curriculum, Theory, Planning & Practice
EDRS2201 Introduction to Research Methods
EDSO3102 Social Context of Education

And ONE of the following:-
EDPH2016 Philosophy of Education
EDME2211 Testing, Measurement & Evaluation I
EMA2111 The Structure and Nature of Mathematics
EDSC2110 The Structure and Nature of Science
EDEA2304 Introduction to Educational Administration
EDSE2924 Introduction to Special Education

And ONE of the following:-
EDTK3304 Media & Technology in Education
EDTE3001 Issues in Teacher Education
AND Eighteen (18) Level II/III credits

FOUN
FOUN1008 Rhetoric II: Special Purposes
OR
FOUN1001 English for Acad. Purposes
AND
FOUN1101 Caribbean Civilization
FOUN1301 Law, Governance and Society
# FACULTY OF PURE AND APPLIED SCIENCES
# HANDBOOK 2009-2010

## DEPARTMENT OF BIOLOGICAL AND CHEMICAL SCIENCES

### SEMESTER I

**PRELIMINARY**
- CHEM0615  Preliminary Chemistry I
- BIOL0051  Biology I

**YEAR I**
- BIOL1051  Biodiversity I
- BIOL1052  Biodiversity II
- CHEM1010  Fundamentals of Chemistry

**YEAR II**
- BIOC2351  Biochemistry I
- BIOL2053  Physiology of Plants and Animals
- BIOL2151  Genetics I
- ECOL2451  Population Ecology
- ECOL2453  Caribbean Island Biogeography
- MICR2251  General Microbiology
- CHEM2010  Practical Chemistry I
- CHEM2100  Inorganic Chemistry I
- CHEM2200  Organic Chemistry I
- ERSC2001  Earth & Life
- ERSC2002  Climatology

**YEAR III**
- BIOC3251  Microbial Biochemistry
- BIOC3354  Biochemistry of Human Disease
- BIOL3152  Bioinformatics
- ECOL3452  Behavioural Ecology
- ECOL3454  Fisheries Biology
- MICR3253  Biology of Viruses
- CHEM3100  Inorganic Chemistry II
- CHEM3300  Physical Chemistry II
- CHEM3415  Analytical Chemistry III
- CHEM3500  Chemistry Project
- CHEM3515  Environmental Chemistry

### SEMESTER II

**PRELIMINARY**
- CHEM0625  Preliminary Chemistry II
- BIOL0052  Biology II

**YEAR I**
- BIOL1151  Introductory Genetics
- BIOC1351  Introductory Biochemistry
- CHEM1020  Introductory Chemistry
- ERSC1001  Dynamic Earth

**YEAR II**
- BIOC2352  Biochemistry II
- BIOL2058  Tropical Ornamental Plants
- BIOL2152  General Molecular Biology
- ECOL2454  Marine Biology
- ECOL2452  Community Ecology
- MICR2252  Eukaryotic micro-organisms
- CHEM2020  Practical Chemistry II
- CHEM2300  Physical Chemistry I
- CHEM2400  Analytical Chemistry I
- ERSC2003  Oceanography

**YEAR III**
- BIOC3053  Cell Signalling
- BIOC3254  Biochemical Plant Pathology
- BIOL3023  Coral Reef Biology
- BIOL3053  Developmental Physiology
- ECOL3451  Human Ecology and Conservation
- ECOL3453  Crop Ecology
- MICR3251  Food Microbiology
- MICR3252  Microbial Ecology
DEPARTMENT OF
COMPUTER SCIENCE,
MATHEMATICS AND
PHYSICS

SEMESTER I
PRELIMINARY
MATH0101 Preliminary Mathematics I
PHYS0070 Preliminary Physics I

YEAR I
COMP1005 Computer Applications
COMP1105 Computer Programming I
COMP1115 Computer Programming II
COMP1125 Introduction to UNIX
ELET1100 Circuit Analysis
ELET1110 Digital Electronics
MATH1100 Basic Mathematics
MATH1110 Applied Statistics
MATH1120 Calculus I
PHYS1100 Mechanics

YEAR II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2125 Computer Architecture
COMP2135 Systems Software
COMP2145 Software Engineering I
COMP2150 Computer Networks I
COMP2160 Object-Oriented Programming
ELET2100 Microprocessors I
ELET2130 Digital Communications I
MATH2100 Abstract Algebra
MATH2120 Analysis and Methods

YEAR-LONG COURSES
CHEM3505 Chemistry Research Project
BIOC3950 Biochemistry Research Project
BIOL3950 Biology Research Project
ECOL3950 Ecology Research Project
MICR3950 Microbiology Research Project

MICR3258 Pathogenic micro-organisms
CHEM3135 Bio-Inorganic Chemistry
CHEM3145 Bonding in Inorganic Chemistry
CHEM3200 Organic Chemistry II
CHEM3210 Bioorganic & Medicinal Chemistry
CHEM3500 Chemistry Project
ERSC3001 Climate Variability & Predictability
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<td>PHYS2101</td>
<td>Quantum Mechanics and Special Relativity</td>
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<td>Advanced Physics/Technology Lab. I</td>
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**YEAR III**

- COMP3100  Operating Systems
- COMP3135  Programming Languages
- COMP3140  Software Engineering II
- COMP3180  Algorithm Design and Analysis
- COMP3210  Electronic Commerce
- COMP3220  Human-Computer Interaction
- COMP3260  Computer Graphics I
- COMP3910  Computer Science Research Project
- ELET3110  Control and Instrumentation
- ELET3120  Communication Circuits
- ELET3130  Introduction to DSP
- ELET3160  Electronics Research Project
- MATH3130  Optimization Theory
- MATH3150  Complex Variables I
- MATH3160  Number Theory
- MATH3190  Matrix Analysis
- PHYS3100  Quantum Mechanics
- PHYS3102  Optics and Lasers
- PHYS3106  Physics Research Project

**SEMESTER II**

**PRELIMINARY**

- MATH0102  Preliminary Mathematics II
- PHYS0071  Preliminary Physics II

**YEAR I**

- COMP1105  Computer Programming I
- COMP1115  Computer Programming II
- COMP1130  Web Technology Fundamentals

**YEAR II**

- COMP2105  Discrete Mathematics
- COMP2115  Information Structures
- COMP2125  Computer Architecture
- COMP2145  Software Engineering I
- COMP2160  Object-Oriented Programming
- ELET2110  Circuit Simulation
- ELET2120  Discrete Device Electronics
- MATH2110  Linear Algebra
- MATH2130  Ordinary Differential Equations
- MATH2150  Mathematical Statistics
- PHYS2103  Classical Mechanics
- PHYS2105  Computational Physics I
- PHYS2107  Advanced Physics / Technology Laboratory II

**YEAR III**

- COMP3115  Information Systems
- COMP3125  Artificial Intelligence
- COMP3155  Computer Networks II
- COMP3160  Database Management Systems
- COMP3170  Web-based Applications
- COMP3240  Introduction to Distributed Systems
- COMP3230  Network & Computer Security
- COMP3910  Computer Science Research Project
- ELET3100  Microprocessors II
- ELET3110  Control and Instrumentation
- ELET3140  Microcomputers and Control
- ELET3151  Digital Communications II
METEOROLOGY

SEMESTER I
PRELIMINARY

METE1000  Introduction to Physical Meteorology & Weather Observations & Weather Systems
METE1200  Oceans & Climate
METE2000  Physical Meteorology I
METE2100  Dynamic Meteorology I
METE2300  Hydrometeorology
METE3100  Dynamic Meteorology II
METE3200  Synoptic Meteorology II

SEMESTER II

METE1100  Introduction to Dynamic Meteorology
METE1300  Climate Change, Education and Awareness
METE2001  Physical Meteorology II
METE2200  Synoptic Meteorology I
METE3300  Tropical Meteorology
METE3400  Weather Radars and Satellites
METE3500  Bioclimatology

MATH3100  Multivariate Analysis
MATH3120  Numerical Analysis
MATH3170  Advanced Algebra
MATH3460  Statistical Theory II
PHYS3101  Electrodynamics
PHYS3105  Statistical Mechanics
PHYS3106  Physics Research Project
## COURSES TYPICALLY OFFERED AT SUMMER SCHOOL OF RELEVANCE TO SCIENCE STUDENTS

### FACULTY OF HUMANITIES AND EDUCATION
- **FOUN1101**: Caribbean Civilization
- **FOUN1001**: English for Academic Purposes
- **FOUN1008**: Rhetoric II – Writing for Special Purposes
- **PSYC1003**: Introduction to Psychology
- **PSYC1004**: Introduction to Social Psychology
- **PSYC2009**: Learning Theory and Practice

### FACULTY OF SOCIAL SCIENCES
- **ECON1001**: Introduction to Microeconomics
- **ECON1002**: Introduction to Macroeconomics
- **ACCT1002**: Introduction to Financial Accounting
- **ACCT1003**: Introduction to Cost and Management Accounting
- **ACCT2014**: Financial Accounting I
- **ACCT2015**: Financial Accounting II
- **ACCT2017**: Management Accounting
- **ACCT3039**: Cost and Management Accounting
- **ACCT3040**: Accounting Theory
- **ACCT3043**: Principles of Auditing
- **MKTG2001**: Principles of Marketing
- **MGMT2005**: Microcomputer Applications for Business
- **MGMT2006**: Management Information Systems
- **MGMT2008**: Organisational Behaviour
- **MGMT2020**: Managerial Economics
- **MGMT2021**: Business Law I
- **MGMT2026**: Production and Operations Management
- **MGMT3011**: Management Information Systems II
- **MGMT3017**: Human Resources Management
- **MGMT3018**: Industrial Relations
- **MGMT3031**: Business, Strategy and Policy
- **MGMT3033**: Business, Government and Society

### FACULTY OF PURE AND APPLIED SCIENCES
- **BIOL1051**: Biodiversity I
- **BIOL1052**: Biodiversity II
- **COMP1115**: Computer Programming II
- **COMP2105**: Discrete Mathematics
- **COMP2115**: Information Structures
- **COMP3100**: Operating Systems
- **COMP3160**: Database Management Systems
- **COMP3910**: Computer Research Project
- **MATH0101**: Preliminary Mathematics I
- **MATH1100**: Basic Introductory Mathematics
- **MATH1120**: Calculus I
BIOLOGICAL SCIENCES

The Department of Biological & Chemical Sciences offers Single Majors in Biochemistry, Biology, Ecology and Microbiology as well as a Double Major in Biology. The Level II/III courses used for a Biology, Biochemistry, Ecology and/or Microbiology major cannot be used to simultaneously satisfy the requirements for a second biological major or a Biochemistry, Biology, Ecology or Microbiology minor.

MAJOR IN BIOCHEMISTRY:

LEVEL I
BIOC1351 Introductory Biochemistry
BIOL1051 Biodiversity I
BIOL1151 Introductory Genetics
CHEM1010 Fundamentals of Chemistry
CHEM1020 Introductory Chemistry

LEVEL II
BIOC2351 Biochemistry I
BIOC2352 Biochemistry II
BIOL2151 Genetics I
BIOL2152 General Molecular Biology

LEVEL III
BIOC3251 Microbial Biochemistry

AND Twelve (12) Credits from:
BIOC3053 Cell Signalling
BIOC3254 Biochemical Plant Pathology
BIOC3352 Biochemistry III
BIOC3354 Biochemistry of Human Disease
BIOC3950 Biochemistry Research Project
BIOL3152 Bioinformatics
CHEM3135 Bio-inorganic Chemistry
CHEM3210 Bioorganic & Medicinal Chemistry

* A student taking a major in Microbiology cannot use BIOC2351 or BIOC3251 to satisfy the requirements for a Biochemistry minor.

MAJOR IN BIOLOGY:

LEVEL I
BIOC1351 Introductory Biochemistry
BIOL1051 Biodiversity I
BIOL1151 Introductory Genetics

LEVEL II
BIOC2351 Biochemistry I
BIOC2352 Biochemistry II
BIOL2151 Genetics I
BIOL2152 General Molecular Biology

LEVELS II & III
BIOL2053 Physiology of Plants & Animals
BIOL3053 Developmental Physiology

AND
BIOL2151 Genetics I
MICR2251 General Microbiology

OR
BIOC2351 Biochemistry I
BIOC2352 Biochemistry II

OR
ECOL2451 Population Ecology
ECOL2452 Community Ecology

A Student Majoring in Biochemistry cannot also Major in Microbiology.
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### MINOR IN BIOLOGY [Sixteen (16) Credits]:

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BIOL3023  Coral Reef Biology
BIOL3053  Developmental Physiology
BIOL3152  Bioinformatics
ECOL3451  Human Ecology and Conservation
ECOL3452  Behavioural Ecology
ECOL3453  Crop Ecology
ECOL3454  Fisheries Biology
MICR3252  Microbial Ecology
MICR3253  Biology of Viruses
MICR3258  Pathogenic Micro-organisms

AND
ECOL2055  Horticulture

OR
ECOL2454  Marine Biology

LEVEL III
ECOL3451  Human Ecology and Conservation

AND Twelve (12) Credits from:
BIOL3023  Coral Reef Biology
ECOL3452  Behavioural Ecology
ECOL3453  Crop Ecology
ECOL3454  Fisheries Biology
ECOL3950  Ecology Research Project
MICR3252  Microbial Ecology

MINOR IN ECOLOGY [Sixteen (16) Credits]:
ECOL2451  Population Ecology
ECOL2452  Community Ecology
ECOL2453  Caribbean Island Biogeography

AND
ECOL2055  Horticulture

OR
ECOL2454  Marine Biology

MAJOR IN MICROBIOLOGY:

LEVEL I
BIOC1351  Introductory Biochemistry
BIOL1051  Biodiversity I
BIOL1052  Biodiversity II
BIOL1151  Introductory Genetics

LEVEL II
ECOL2451  Population Ecology
ECOL2452  Community Ecology
ECOL2453  Caribbean Island Biogeography
MICR2251  General Microbiology
MICR2252  Eukaryotic Micro-organisms

LEVEL III
BIOC3251  Microbial Biochemistry
MICR3252  Microbial Ecology

AND Eight (8) Credits from:
BIOC3254  Biochemical Plant Pathology
MICR3059  Immunobiology
MICR3251  Food Microbiology
MICR3253  Biology of Viruses
MICR3258  Pathogenic Micro-organisms
MICR3950  Microbiology Research Project

A student taking a Major in Microbiology cannot also Major in Biochemistry.

MINOR IN MICROBIOLOGY [Sixteen (16) Credits]:
MICR2251  General Microbiology
MICR2252  Eukaryotic Micro-organisms

AND Eight (8) Credits from:
BIOC3251  Microbial Biochemistry
BIOC3254  Biochemical Plant Pathology
MICR3059  Immunobiology
MICR3251  Food Microbiology
MICR3252  Microbial Ecology
MICR3253  Biology of Viruses
MICR3258  Pathogenic Micro-organisms
MICR3950  Microbiology Research Project

PRELIMINARY BIOLOGICAL COURSES

BIOL0051 - BIOLOGY I (6-P Credits)

Pre-requisite:  None

Syllabus  Cellular Activities: Subcellular organisation.
Cell membrane structure and function.
Biological chemistry – water and living systems, carbohydrates, lipids, proteins and amino acids, enzymes as catalysts, nucleic acids.

Genetics:  The genetic material. Nuclear division.
Patterns of inheritance. Mutation.
Genetic engineering. Reproduction

Systems: Examples of bacterial and fungal reproduction and viral replication.
Angiosperm sexual and asexual reproduction.
Human reproduction.

Teaching:  Three lectures, one tutorial and three hours of practicals per week.

Method of Final Examination:  Theory Examination (3 hours)  60%
Two in-course Tests  20%
Laboratory reports  20%
BIOL0052 - BIOLOGY II (6-P Credits)

Pre-requisite: None

Syllabus: The organism and the environment: Acquisition of energy - autotrophic, holozoic, saprophytic and parasitic nutrition. Cellular respiration - glycolysis, the Krebs cycle, anaerobic respiration. Ecosystems - structure, function, population interactions. Environmental change & evolution - variation in populations, evolution and natural selection. Human ecology - biodiversity and its value, anthropogenic pollution. Systems and their maintenance: Exchanges with the environment - respiratory gas exchange and excretion. Plant and animal transport systems. Chemical coordination in plants and animals. Nervous coordination in mammals - nervous tissue, conduction and transmission of nerve impulses, the CNS. Support and movement - supporting tissue in plants and tropisms, skeletal diversity and movement in animals.

Teaching: Three lectures, one tutorial and three hours of practicals per week.

Method of Final Theory Examination (3 hours) 60%
Examination: Two in-course tests 20%
Laboratory reports 20%

LEVEL I BIOLOGICAL COURSES

BIOC1351 - INTRODUCTORY BIOCHEMISTRY (4 credits)

Prerequisite: Either CAPE Chemistry Unit 1 or CHEM0615 or an approved equivalent.


Teaching: Two lectures, one tutorial and (the equivalent of) three hours of practical per week.

Method of Final Theory Examination (3 hours) 50%
Examination: Mid-semester test 10%
Tutorial Assignments 15%
Practical reports 25%

BIOL1051 - BIODIVERSITY I (4 credits)

Pre-requisite: CAPE Biology Unit 1 or CAPE Biology Unit 2 or BIOL0051 Biology 1 or BIOL0052 Biology 2 or (CAPE Environmental Science Units 1 & 2 & CSEC Biology).
**Syllabus:**

**Evolution:** "Theories" of Evolution: Genesis; Linnaeus; Lamarck; Darwin-Wallace; Neo-Darwinism. Mechanisms: selection, mutation, migration, genetic drift, isolation mechanisms, hybridisation. Fossilisation and the fossil record, speciation and the time continuum.

**Ecology:** Populations and communities. Habitat and niche. The Ecosystem Concept: energy flow; nutrient cycles; food chains and webs. Relationships: competition; predator-prey; types of symbioses.

**Diversity and Classification:** Fundamental principles of Taxonomy; Units of Classification: The species as the basic unit of classification; Scientific names of species; The Species Concept. Classical, numerical and molecular taxonomy; Biosystematics and Cladistics.

**Microorganisms:** Introduction to structure and classification of viruses, bacteria and fungi.

**Plants:** A systematic review of the plant kingdom.

**Teaching:** Two lectures, one tutorial and three hours of practical per week.

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**BIOL1052 - BIODIVERSITY II (4 credits)**

**Pre-requisite:** CAPE Biology Unit 1 or BIOL0051 Biology 1 and CAPE Biology Unit 2 or BIOL0052 Biology 2 or (CAPE Environmental Science Units 1 & 2 and CSEC Biology).

**Syllabus:** A systematic review of the animal kingdom, with emphasis on the major groups. Animal body plans: germ layers, levels of organisation, symmetry, metamerism, cephalisation. Characteristics of major groups; adaptive radiation; vertebrate evolution.

**Teaching:** Two lectures, one tutorial and three hours of practical per week.

**Method of Final Theory Examination: Final Theory Examination (3 hours) 50%**

**Method of Examination:**
- Tutorial essays 10%
- Practical Test(s) 15%
- Practical reports 25%

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**BIOL1151 - INTRODUCTORY GENETICS (4 credits)**

**Prerequisite:** CAPE Biology Unit I or BIOL0051 or (CAPE Environmental Science & CSEC Biology).

**Syllabus:**

**The Nature of the Genetic Material:** Experimental evidence implicating the nucleic acids. DNA structure - experimental evidence & theory. DNA conformation.

Mendelism. Linkage and Recombination.

**The Genetic Material as an Information Carrier:** The Central Dogma. Colinearity. Transcription and translation in prokaryotes & eukaryotes. Gene expression/regulation - lac and/or trp operons in E. coli.

**Population Genetics:** Gene pools; Transmission of genes between generations; Hardy-Weinberg (2 and 3 alleles); Selection pressures; selection against a recessive allele; mutation and migration.

**Level II Biological Courses**

**BIOC2351 - Biochemistry I (4 credits)**

**Pre-Requisites:** BIOC1351 Introductory Biochemistry & CHEM0625 Preliminary Chemistry II

**Syllabus:**
- **Enzymes:** Enzyme kinetics. Catalytic mechanisms. Use of kinetics to elucidate catalytic mechanisms. Models of allosteric enzymes. Regulation of enzyme activity.
- **Vitamins:** Structure and activity of water-soluble and lipid-soluble vitamins.
- **Carbohydrate Metabolism:** Metabolic pathways and their regulation including glycolysis, tricarboxylic acid cycle, gluconeogenesis, biosynthesis of polysaccharides, glyoxylate pathway and pentose phosphate pathway. Dark reactions of photosynthesis.

**Lipid Metabolism:** Metabolic pathways and their regulation - β-oxidation, fatty acid biosynthesis. Biological membranes and transport.

**Nitrogen Metabolism:** Overview of amino acid catabolism and biosynthesis. Urea cycle. Nitrogen fixation. Amino acids as biosynthetic precursors.

**Nucleic Acids:** DNA replication. Protein synthesis. Regulation of prokaryotic gene expression.

**Teaching:** Two one-hour lectures and one three-hour practical class per week.

**Method of Examination:**
- Final Theory Examination (3 hours) 60%
- In-Course Test(s)/Assignment(s) 20%
- Practical Reports 20%

**BIOC2352 - Biochemistry II (4 credits)**

**Pre-requisite:** BIOC2351 Biochemistry I

**Syllabus:**

Toxicology: Overview of toxicology. Environmental toxicology. Biological fate of pesticides and other potential environmental pollutants. Regulatory concerns. Metabolism and toxicology of xenobiotics, including pharmacologicals and food additives.

Teaching: Two one-hour lectures and one five hour practical every other week.

Method of Final Theory Examination (3 hours) 60%
Examination: In-course test(s) / Assignment(s) 20%
Practical reports 20%

BIOL2053 - PHYSIOLOGY OF PLANTS & ANIMALS (4 credits)
Pre-requisites: BIOL1052 Biodiversity II and BIOC1351 Introductory Biochemistry
Syllabus:

Animals: Physiological processes in animals. Circulation, gas exchange, osmotic regulation, acquisition of energy, thermoregulation.

Teaching: Two one-hour lectures, one tutorial and three hours of practicals per week

Method of Final Theory Examination (3 hours) 70%
Examination: In-course Tests/Assignments 10%
Practical Reports 20%

BIOL2057 - BIOLOGY FIELD COURSE (2 credits)
Pre-requisites: BIOL1051 Biodiversity I & BIOL1052 Biodiversity II
Syllabus: A practical introduction to Caribbean flora and fauna, including the use of ecological methods.

Teaching: A five day residential course on a Caribbean island.

Method of An assessment of the student's field Examination: note book 100%

BIOL2151 - GENETICS I (4 credits)
Pre-requisites: BIOC1351 Introductory Biochemistry & BIOL1151 Introductory Genetics
Syllabus: Gene structure and expression: The modern concept of the gene in prokaryotes and eukaryotes. Transcription and processing of RNA.
Genome organisation: In prokaryotes and eukaryotes. Extranuclear genomes.


Teaching: Two lectures, one-three hour practical and one tutorial per week.

Method of Final Theory Examination (3 hours) 60%
Examination: Practical reports 20%
In-course Test(s)/Assignment(s) 20%

BIOL2152 - GENERAL MOLECULAR BIOLOGY (4 credits)
Pre-requisite: BIOL1151 Introductory Genetics I


Teaching: Two lectures, three hours of practicals and one tutorial per week.

Method of Final Theory Examination (3 hours) 60%
Examination: Practical reports 20%
In-course Test(s)/Assignment(s) 20%

BIOL2950 BIOLOGY ELECTIVE (4 credits)
Pre-requisites: None
Syllabus: An advanced course in the Biological Sciences taken as an exchange student at an approved institution and pre-approved by the Dean.

ECOL2055 - HORTICULTURE (4 credits)
Pre-requisites: BIOL1051 Biodiversity I & BIOL1052 Biodiversity II
Syllabus: Horticulture is reviewed from a scientific base, exploring the environmental, genetic and cultural manipulation of plants for food (fruits and vegetables), pleasure (ornamentals) and recreation (turf). Sessions begin with a brief survey of horticulture and its significance locally and worldwide. These progress to study representative plant
groups through stages in plant production, from propagation to growth through development both of the whole plant and of the population. In lectures, tutorials and practicals, plant responses to variations in soil / substrate type, water, minerals, light temperature, genotype and the presence of other organisms (pest, diseases and weeds) as well as spacing, pruning and imposed stress will be considered. Methods for analysing plant productivity in terms of quality and quantity are introduced and discussed.

Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Final Theory Examination (2 hours) 50%
Examination: Practical reports 20%
Tutorial essays, case studies, presentations 30%

ECOL2451 - POPULATION ECOLOGY (4 credits)
Pre-requisites: BIOL1051 Biodiversity I & BIOL1052 Biodiversity II
Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Final Theory Examination (3 hours) 70%
Examination: Project Report/Essay 30%

ECOL2452 - COMMUNITY ECOLOGY (4 credits)
Pre-requisite: ECOL2451 Population Ecology
Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Final Theory Examination (3 hours) 70%
Examination: Project report/Essay 30%

ECOL2453 - CARIBBEAN ISLAND BIOGEOGRAPHY (4 Credits)
Pre-requisites: BIOL1051 Biodiversity I & BIOL1052 Biodiversity II
Taxon cycle. The major habitat types found in the Caribbean - location, structure, anthropogenic influences and typical species. Reviews of distribution, evolution and ecology of selected taxonomic groups. Field survey methods.

**Teaching:** Two lectures, one tutorial and one practical per week.

**Method of Examination:** Final Theory Examination (3 hours) 50%

**Examination:** Mid-term Test 10%

Field Notebook 40%

**ECOL2454 - MARINE BIOLOGY (4 credits)**


**Syllabus:** Basic oceanography - tidal cycles, waves, ocean circulation and seawater chemistry. Global distributions, zonation and adaptations of sublittoral, intertidal planktonic, nektonic and deep sea organisms. Sampling techniques.

**Teaching:** Two lectures, one tutorial and three hours of practical per week.

**Method of Examination:** Final Theory Examination (3 hours) 60%

**Examination:** Practical Reports 30%

In-course Test(s)/Assignment(s) 10%

**MICR2251 - GENERAL MICROBIOLOGY (4 credits)**

Pre-requisites: BIOL1051 Biodiversity I & BIOC1351 Introductory Biochemistry

**Syllabus:** This course is an introduction to microorganisms: Bacteria, Archaea, Algae, Fungi, Protozoa and Viruses. Topics presented include: the structure and function of microorganisms, microbial reproduction, physiology, taxonomy, behaviour and ecology. Techniques for the isolation, cultivation, enumeration and control of microorganisms are introduced. Some aspects of applied microbiology are covered.

Teaching: Two lectures, one tutorial and three hours of practical per week.

**Method of Examination:** Final Theory Examination (3 hours) 60%

**Examination:** Practical Reports 30%

In-course Test(s)/Assignment(s) 10%

**MICR2252 – EUKARYOTIC MICROORGANISMS (4 credits)**

Pre-requisite: MICR2251 General Microbiology

**Syllabus:** An introduction to the biology of the eukaryotic microorganisms: algae, fungi, and protista. Structure and function, reproduction, physiology, behaviour, and ecology.

**Teaching:** Two lectures, one tutorial and three hours of practical per week.

**Method of Examination:** Final Theory Examination (3 hours) 60%

**Examination:** Practical Reports 30%

In-course Test(s)/Assignment(s) 10%

**ECOL2950 ECOLOGY ELECTIVE (4 credits)**

Pre-requisites: None

**Syllabus:** An advanced course in the Ecological Sciences taken as an exchange student at an approved institution and pre-approved by the Dean.

Teaching: Two lectures, one tutorial and three hours of practical per week.

**Method of Examination:** Final Theory Examination (3 hours) 60%

**Examination:** Practical Reports 30%

In-course test(s)/Assignment(s) 10%
MICR2950 MICROBIOLOGY ELECTIVE (4 credits)

Pre-requisites: None

Syllabus: An advanced course in Microbiology taken as an exchange student at an approved institution and pre-approved by the Dean.

LEVEL III BIOLOGICAL COURSES

BIOC3053 - CELL SIGNALLING (4 credits)

Pre-requisite: BIOL2152 General Molecular Biology.

Syllabus: Intracellular signalling: ion fluxes and electrical fields, establishment of cell polarity.


Plant systems: the molecular basis of plant hormone action.

Teaching: Two lectures and three hours of practicals per week.

Method of Examination: Final Theory Examination (3 hours) 70%
Practical report(s) 20%
In-course test(s)/Assignment(s) 10%

BIOC3251 - MICROBIAL BIOCHEMISTRY (4 credits)

Pre-requisite: BIOC2351 Biochemistry I.


Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 60%
Practical report(s) 30%
In-course test(s)/Assignment(s) 10%

BIOC3254 - BIOCHEMICAL PLANT PATHOLOGY (4 Credits)

Pre-requisites: MICR2251 General Microbiology and BIOL2151 Genetics I.


Teaching: Two lectures, one tutorial and three hours of practicals per week.
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Method of Final Theory Examination (3 hours) 60%
Examination: In-course Test(s)/Assignment(s) 20%
Practical reports 20%

BIOC3352 - BIOCHEMISTRY III (4 Credits)
Pre-requisites: BIOC2351 Biochemistry I & BIOC2352 Biochemistry II
Syllabus: The areas of study may vary from year to year but will usually include:-Clinical biochemistry and techniques, biological membranes and transport, food biochemistry, protein structure and function, molecular chaperones.
Teaching: Two one-hour lectures and one three hour practical every week.
Method of Final Theory Examination (3 hours) 60%
Examination: In-course test(s)/assignment(s) 20%
Practical reports 20%

BIOC3950 - BIOCHEMISTRY RESEARCH PROJECT (8 credits)
Pre-requisites: BIOL2151 Genetics I, BIOL2152 General Molecular Biology, BIOC2351 Biochemistry I & BIOC2352 Biochemistry II
Restrictions: Not to be taken with BIOL3950 Biology Research Project, MICR3950 Microbiology Research Project or ECOL3950 Ecology Research Project
Syllabus: A practical project in Biochemistry carried out under the supervision of a staff member. Students will be allocated one of the available research topics and are expected to spend not less than 144 hours in field/laboratory studies. The project will be presented both orally in the form of a short seminar and in a written report. Three typed and bound copies of the written report must be presented.
Method of Supervisor’s Assessment 15%
Examination: Seminar 15%
Project Report 70%

BIOC3354 - BIOCHEMISTRY OF HUMAN DISEASE (4 credits)
Prerequisite: BIOC2351 Biochemistry I
Syllabus: The areas of study will focus on a variety of human diseases such as: HIV/AIDS, cardiovascular disease, diabetes, obesity, various cancers, liver disease, kidney disease, various syndromes and deficiencies including in-born errors of metabolism. Various aspects of the biochemistry will be studied for the diseases, with a highlight of the latest ground-breaking research in the area. The areas studied will include specific biochemical pathways, key proteins and enzymes that play a role in the disease, and linkage of these pathways with the presentation of the symptoms of the disease.
Method of Final Theory Examination (3 hours) 60%
Examination: In-course test(s)/assignment(s) 20%
Practical reports 20%
**BIOL3023 – CORAL REEF BIOLOGY (4 credits)**

**Pre-requisite:** ECOL2454 Marine Biology

**Syllabus:**

**Biology of scleractinian corals:** Anatomy, skeletal morphology, calcification and skeletogenesis, endosymbiosis with zooxanthellae, modes of feeding, reproduction and recruitment, environmental factors that influence growth and distribution.

**Ecology of coral communities:** Theory of coral reef formation, types of reef. Reef community structure and zonation. Dynamics of coral communities including diversity/stability relationships, keystone species, algal-herbivore and predator prey interactions, inter-specific competition, succession, and disturbance. A survey of the major groups of reef-associated organisms including other coelenterates, porifera, molluscs, echinoderms, fishes, and algae. Emphasis will be on Caribbean coral reefs, but comparisons will be made among reefs from other regions.

**Practical Work:** Laboratory exercises on taxonomy and physiology of corals and other reef-associated organisms. Field exercises, with extensive in-water work, on coral reef community structure and dynamics.

**Teaching:** Two one-hour lectures, one tutorial and three hours of practicals per week

**Method of Examination:**

- One 2-hour theory paper 60%
- Laboratory reports 30%
- In-course practical tests 10%

**BIOL3053 - DEVELOPMENTAL PHYSIOLOGY (4 credits)**

**Prerequisite:** BIOL 2053 Physiology of Plants & Animals

**Syllabus:**

**Plants:** Internal and external regulation of flowering, plant growth and development. Phytohormones.

**Animals:** Human growth and development. Reproduction. Overview of prenatal and postnatal development. Integrative systems. In depth analysis of selected processes in plant and animal development.

**Teaching:** Two one-hour lectures, one tutorial and three hours of practicals per week

**Method of Examination:**

- Final Theory Examination (3 hours) 70%
- In-course tests/assignments 10%
- Project reports 20%

**BIOL3152 - BIOINFORMATICS (4 Credits)**

**Pre-requisite:** BIOL2152 General Molecular Biology

**Syllabus:**

Common types of genomic and proteomic data including DNA and protein sequences, motifs, domains, patterns, secondary structure and folding classes, tertiary structure. DNA and protein sequence analysis including analysis of homology, identification of motifs and domains, pair-wise and multiple alignments including global and local alignments. Dynamic programming algorithms for sequence alignment, prediction of secondary structure, prediction of gene structure. Methods of phylogenetic analysis.
The distribution of data through public databases, data formats, and end-user applications for manipulation and analysis including use of PAM250 scoring matrix, BLOSUM 62, scoring matrix, FASTA, BLAST, PSI-BLAST, PHI-BLAST, PSSM, Smith-Waterman dynamic Programming.

Teaching: Two lectures, one tutorial, and three hours of practical per week

Method of Examination:
Final Theory Examination (3 hours) 60%
In-course test(s)/Assignment(s) 40%

BIOL3950 - BIOLOGY RESEARCH PROJECT (8 credits)

Pre-requisites: 16 credits from Level II Biological courses. Only available to final year students majoring in Biology.

Restrictions: Not to be taken with BIOC3950 Biochemistry Research Project, MICR3950 Microbiology Research Project or ECOL3950 Ecology Research Project

Syllabus: A practical project in Biology carried out under the supervision of a staff member. Students will be allocated one of the available research topics and are expected to spend not less than 144 hours in field/laboratory studies. The project will be presented both orally in the form of a short seminar and in a written report. Three typed and bound copies of the written report must be presented.

Method of Examination:
Supervisor’s Assessment 15%
Seminar 15%
Project Report 70%

ECOL3451 - HUMAN ECOLOGY AND CONSERVATION (4 credits)


Teaching: Two lectures and three hours of practical per week.

Method of Examination:
Final Theory Examination (3 hours) 70%
Project Report/Essay 30%

ECOL3452 - BEHAVIOURAL ECOLOGY (4 credits)

Pre-requisites: ECOL2451 Population Ecology & ECOL2452 Community Ecology

conflict. Interspecific comparisons of parental investment.

Teaching: Two lectures and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 70%
Project Report/Essay 30%

ECOL3453 - CROP ECOLOGY (4 credits)

Pre-requisites: ECOL2452 Community Ecology & BIOL1151 Introductory Genetics

Syllabus: Autecology of selected crop species and their evolution, propagation and breeding. Interactions of crop species with weed, pest, disease and beneficial organisms in the agroecosystem. Control of weeds, diseases and pests by cultural, chemical and biological means. Integrated pest management.

Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 60%
Project Report 20%
Essay 20%

ECOL3950 - ECOLOGY RESEARCH PROJECT (8 credits)

Pre-requisites: ECOL2451 Population Ecology, ECOL2452 Community Ecology & ECOL2453 Caribbean Island Biogeography

Restrictions: Not to be taken with BIOL3950 Biology Research Project, MICR3950 Microbiology Research Project or BIOC3950 Biochemistry Research Project

Syllabus: A practical project in Ecology carried out under the supervision of a staff member(s). Students will be allocated one of the available research topics and are expected to spend not less than 144 hours in field/laboratory studies. The project will be presented both orally in the form of a short seminar and in a written report. Three typed, and bound copies of the written report must be presented.

Method of Examination: Supervisor’s assessment 15%
Seminar 15%
Project Report 70%

ECOL3454 - FISHERIES BIOLOGY (4 credits)


Teaching: Two lectures and three hours of practicals per week.

Method of Examination: Final Theory Examination (3 hours) 70%
Practical Reports 20%
In-course test(s)/Assignment(s) 10%
MICR3059 - IMMUNOBIOLOGY (4 credits)

Pre-requisites: BIOC1351 Introductory Biochemistry & BIOL2151 Genetics I


Teaching: Two lectures and three hours of practical and one tutorial per week.

Method of Examination: Final Theory Examination (3 hours) 80%

Examination: In-course Test(s)/Assignments 20%

MICR3251 – FOOD MICROBIOLOGY (4 credits)

Pre-requisites: MICR2251 General Microbiology & MICR2252 Eukaryotic Microorganisms

Syllabus: Factors regulating the development of food microorganisms and methods to control these factors. Food pathogens and microorganisms deteriorating the major food types. Good practices in alimentary transformations. Food contamination and intoxications.

Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 60%

Examination: Practical Report(s) 30%

In-course test(s)/Assignment(s) 10%

MICR3252 - MICROBIAL ECOLOGY (4 credits)

Pre-requisites: Either MICR2251 General Microbiology & MICR2252 Eukaryotic Microorganisms or ECOL2451 Population Ecology, ECOL2452 Community Ecology & ECOL2453 Caribbean Island Biogeography


Teaching: Two lectures, one tutorial and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 60%

Examination: Practical Report(s) 30%

In-course test(s)/Assignment(s) 10%

MICR3253 - BIOLOGY OF VIRUSES (4 credits)

Pre-requisites: MICR2251 General Microbiology & BIOL1151 Introductory Genetics

MICR3258 - PATHOGENIC MICRO-ORGANISMS
(4 credits)

Pre-requisites: MICR2251 General Microbiology & BIOL1151 Introductory Genetics


Teaching: Two lectures and one tutorial per week and three hour practicals including attachment to a Medical Laboratory.

Method of Examination:
- Final Theory Examination (3 hours) 70%
- Practical Report 10%
- In-course Test(s)/Assignment(s) 20%

MICR3950 - MICROBIOLOGY RESEARCH PROJECT
(8 credits)

Pre-requisites: MICR2251 General Microbiology, BIOL2151 Genetics I, BIOC2351 Biochemistry I & MICR2252 Eukaryotic Micro-organisms

Restrictions: Not to be taken with BIOC3950 Biochemistry Research Project, BIOL3950 Biology Research Project or ECOL3950 Ecology Research Project

Syllabus: A practical project in Microbiology carried out under the supervision of a staff member. Students will be allocated one of the available research topics and are expected to spend not less than 144 hours in field/laboratory studies. The project will be presented both orally in the form of a short seminar and in a written report. Three typed and bound copies of the written report must be presented.

Method of Examination:
- Supervisor’s assessment 15%
- Seminar 15%
- Project Report 70%
# CHEMISTRY

The Department of Biological & Chemical Sciences offers a Single Major, Double Major and Minor in Chemistry.

## MAJOR IN CHEMISTRY:

### LEVEL I
- CHEM1010  Fundamentals of Chemistry
- CHEM1020  Introductory Chemistry

### LEVEL II
- CHEM2010  Practical Chemistry I (2 credits)
- CHEM2020  Practical Chemistry II (2 credits)
- CHEM2100  Inorganic Chemistry I
- CHEM2200  Organic Chemistry I
- CHEM2300  Physical Chemistry I
- CHEM2400  Analytical Chemistry I

### LEVEL III
- CHEM3500  Chemistry Project (4 credits)
- OR
- CHEM3505  Chemistry Research Project (8 credits)

And Eight (8) credits from:
- CHEM3100  Inorganic Chemistry II
- CHEM3200  Organic Chemistry II
- CHEM3300  Physical Chemistry II

## MINOR IN CHEMISTRY (Sixteen (16) Credits):

- CHEM2010  Practical Chemistry I (2 credits)
- CHEM2020  Practical Chemistry II (2 credits)
- CHEM2100  Inorganic Chemistry I
- CHEM2200  Organic Chemistry I
- CHEM2300  Physical Chemistry I

## DOUBLE MAJOR IN CHEMISTRY:

### LEVEL I
- CHEM1010  Fundamentals of Chemistry
- CHEM1020  Introductory Chemistry

### LEVEL II
- CHEM2010  Practical Chemistry I (2 credits)
- CHEM2020  Practical Chemistry II (2 credits)
- CHEM2100  Inorganic Chemistry I
- CHEM2200  Organic Chemistry I
- CHEM2300  Physical Chemistry I
- CHEM2400  Analytical Chemistry I

### LEVEL III
- CHEM3505  Chemistry Research Project (8 credits)

AND Thirty-six (36) Credits From:
- BIOC2351  Biochemistry I
- CHEM2950  Chemistry Elective
- CHEM3100  Inorganic Chemistry
- CHEM3135  Bioinorganic Chemistry
- CHEM3145  Bonding in Inorganic Chemistry
- CHEM3200  Organic Chemistry II
- CHEM3210  Bioorganic & Medicinal Chemistry
- CHEM3300  Physical Chemistry II
- CHEM3415  Analytical Chemistry III
- CHEM3515  Environmental Chemistry
PRELIMINARY CHEMISTRY COURSES

CHEM0615 - PRELIMINARY CHEMISTRY I (6 Credits)

Prerequisite: None

Syllabus: A course of about 39 lectures, associated tutorials and a maximum of 39 hours of laboratory work on the Fundamentals of Chemistry and Physical Chemistry.


Teaching: Three lectures, one tutorial and three hours of practical work per week.

Examination: Final examination (three hours) 60%
In-course test(s) / assignment(s) 20%
Practicals 20%

CHEM0625 - PRELIMINARY CHEMISTRY 2 (6 P-credits)

Prerequisite: None

Syllabus: A course of about 39 lectures, associated tutorials and a maximum of 39 hours of laboratory work on elementary Organic Chemistry and Inorganic Chemistry.

Organic Chemistry: Structures, formulae and nomenclature of organic compounds. Introduction to reaction mechanisms. Functional groups and their reactions: hydrocarbons, halides, alcohols, amines, carbonyl compounds, carboxylic acids and their derivatives, including aliphatic and aromatic systems. Polymers.


Teaching: Three lectures, one tutorial and three hours of practical work per week.

Examination: Final examination (three hours) 60%
In-course test(s) / assignment(s) 20%
Practicals 20%
LEVEL I CHEMISTRY COURSES

CHEM1010 - FUNDAMENTALS OF CHEMISTRY
(6 Credits)

Prerequisite: CHEM0615 Preliminary Chemistry I & CHEM0625 Preliminary Chemistry II, or CAPE Chemistry Units 1 & 2, or equivalent.

Syllabus: This course seeks to provide the student with knowledge of the fundamental principles of chemistry with an emphasis on atomic and molecular structures and properties. Introductions to chemical kinetics, electrochemistry, fundamentals of spectroscopy and organic chemistry will also be explored. The student will also be introduced to fundamental laboratory techniques required in the Organic, Inorganic and Analytical sub-disciplines.

Teaching: Three lectures, one tutorial and four hours of practical work per week.

Method of Examination:
- Final examination (three hours) 60%
- In-course test(s) / assignment(s) 20%
- Practicals 20%

CHEM1020 - INTRODUCTORY CHEMISTRY (6 Credits)

Prerequisite: CHEM0615 Preliminary Chemistry I and CHEM0625 Preliminary Chemistry II, or CAPE Chemistry Units 1 & 2, or equivalent.

Syllabus: The second half of this introductory course covers three disciplines of chemistry - Inorganic, Organic and Physical and presents introductory information on structures, nomenclature, properties, and reactions of monofunctional and polyfunctional carbon bases compounds; the chemistry of the main group and transition elements; thermodynamics, energetics and the packing arrangements of ionic structures. Additionally, students will become acquainted with the industrial and commercial applicability of certain and their compounds.

Teaching: Three lectures, one tutorial and four hours of practical work per week.

Method of Examination:
- Final examination (three hours) 60%
- In-course test(s) / assignment(s) 20%
- Practicals 20%

LEVEL II CHEMISTRY COURSES

CHEM2010 - PRACTICAL CHEMISTRY I (2 Credits)

Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry

Syllabus: A course of sixty (60) hours of practical work selected from the disciplines of Analytical Chemistry, Inorganic Chemistry, Organic Chemistry and Physical Chemistry.

Teaching: Six hours of practical classes per week.

Method of Examination:
- Practical work 60%
- In-course tests and assignments 40%
CHEM2020 - PRACTICAL CHEMISTRY II (2 Credits)

Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry

Syllabus: A course of sixty (60) hours of practical work selected from the disciplines of Analytical Chemistry, Inorganic Chemistry, Organic Chemistry and Physical Chemistry.

Teaching: Five hours of practical classes per week.

Method of Practical work: 60%
Examination: In-course tests and assignments: 40%

CHEM2100 - INORGANIC CHEMISTRY I (4 Credits)

Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry

Syllabus: A course of 36 lectures and associated tutorials, surveying the chemistry of the main group and d-block transition elements.

Main Group Chemistry: A survey of the structures, properties and reactions of the s- and p-block elements, and their compounds, including hydrides, oxides, halides, polymers and technologically important materials.

Transition Metals: A survey of the properties and reactions of the first row transition metals and their compounds, with emphasis on the effects of the non-degeneracy of the d-orbitals in complexes and on technologically important materials.

Teaching: Three lectures and one tutorial per week.

Method of Final examination (2 hours): 60%
Examination: In-course tests and assignments: 40%

CHEM2200 - ORGANIC CHEMISTRY I (4 Credits)

Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry

Syllabus: A course of 36 lectures and associated tutorials on the essential areas of Organic Chemistry.

Reaction mechanisms: Energetics, kinetics and the investigation of mechanisms. Substitution, elimination and addition reactions. Linear free energy relationships


Spectroscopy: The application of spectroscopic techniques in elucidating the structures of organic molecules.


Teaching: Three lectures and one tutorial per week.

Method of Final examination (2 hours): 60%
Examination: In-course tests and assignments: 40%
CHEM2300 - PHYSICAL CHEMISTRY I (4 Credits)
Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry
Syllabus: A course of 36 lectures and associated tutorials, surveying thermodynamics, properties of matter, molecular spectroscopy and electrochemistry
Teaching: Three lectures and one tutorial per week
Method of Examination: Final examination (2 hours) 60%
Examination: In-course tests and assignments 40%

CHEM2400 - ANALYTICAL CHEMISTRY I (4 Credits)
Prerequisite: CHEM1010 Fundamentals of Chemistry & CHEM1020 Introductory Chemistry
Syllabus: A course of 36 lectures and associated tutorials, surveying the essential areas of analytical chemistry: methodology and sampling; statistical methods; the use of spectroscopic, electrochemical, and chromatographic techniques.
Teaching: Three lectures and one tutorial per week
Method of Examination: Final examination (2 hours) 60%
Examination: In-course tests and assignments 40%

CHEM2950 - CHEMISTRY ELECTIVE (4 Credits)
Pre-requisites: None
Syllabus: An advanced course in Chemistry taken as an exchange student at an approved institution and pre-approved by the Dean.

LEVEL III CHEMISTRY COURSES

CHEM3100 - INORGANIC CHEMISTRY (4 credits)
Prerequisites: CHEM2100 Inorganic Chemistry I
Syllabus: This final year inorganic chemistry course covers topics in the applications of group theory to problems in bonding and spectroscopy, the use of spectroscopic techniques in Inorganic Chemistry, organometallic chemistry of main group and transition elements and rates and mechanisms of inorganic reactions. The course requires a sound grounding in descriptive inorganic chemistry.
Teaching: Three lectures and one tutorial per week.
Method of Examination: Final examination (2 hours) 60%
Examination: In-course tests and assignments 40%

CHEM3135 - BIOINORGANIC CHEMISTRY (4 credits)
Prerequisites: CHEM2100 Inorganic Chemistry I or CHEM2115 Main Group Chemistry & CHEM3115 Transition Metal Chemistry I
Syllabus: Importance of metal ions in the environment. Basic concepts of ions in aqueous solutions. Determination of hydration numbers by NMR spectroscopy. Redox potentials of cautions. Acidity and polymerization of aquocations. The chemical and physical factors controlling the elements of life energy in biological systems and hydrogen biochemistry, the role of biological macromolecules and polymers. The roles of some individual elements in
biology and medicine sodium, potassium and chlorine. The chemistry of thallium, lead and chromium, molybdenum enzymes, cofactors and model systems. The chemistry of cobalt and iron complexes and their role in biological systems with respect to electron transfer reactions in aqueous media.

Teaching: Two lecturers, one tutorial and three hours of practicals per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course test(s)/Assignment(s) 40%

CHEM3145 - BONDING IN INORGANIC CHEMISTRY
(4 credits)

Prerequisites: CHEM2100 Inorganic Chemistry I or CHEM2115 Main Group Chemistry


Teaching: Three lecturers and one two-hour tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course test(s)/Assignment(s) 40%

CHEM3200 – ORGANIC CHEMISTRY II (4 credits)

Pre-requisites: CHEM2200 Organic Chemistry I or CHEM2215 Basic Organic Chemistry

Syllabus: This course aims to develop and understanding of the basic synthesis reactions used in Organic Synthesis. Students will be taught to indentify advantages and limitations associated with generally applied methodologies of compound classes and to propose echanisms for the general reactions covered in the course. General principles of retrosynthetic analysis will be sued to design simple synthetic schemes for synthesis of target molecules, including important natural products and drug Targets.

Teaching: The teaching approaches used will include lectures, tutorials and student presentations

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course test(s)/Assignment(s) 40%

Weekly assignments 10%

Presentations 10%
CHEM3210 - BIOORGANIC & MEDICINAL CHEMISTRY
(4 credits)
Pre-requisite: CHEM2200 Organic Chemistry I or CHEM2215 Basic Organic Chemistry
Restrictions: Not available to persons who have passed CHEM3225 Natural Products Chemistry or CHEM3235 Bioorganic Chemistry
Syllabus: The aim of this course is to give students an understanding of the basic principles used in the synthesis of compounds of biological importance, an overview of the major classes of secondary metabolites found in nature, and an introduction to medicinal chemistry. The advantages and disadvantages of different approaches to the synthesis of the biologically important compounds will be discussed, while modern methods for the study of natural products and medicinal chemistry will be emphasized.
Teaching: Three lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
In-Course Tests/Quizzes 20%
In-Course Assignments 20%

CHEM3300 – PHYSICAL CHEMISTRY II (4 credits)
Pre-requisite: CHEM2300 Physical Chemistry I or CHEM2315 Physical Chemistry II
Syllabus: This final year physical chemistry course covers topics in advanced spectroscopy and fundamental theoretical aspects of chemical kinetics, quantum mechanics and statistical Thermodynamics. This course also requires a sound grounding in basic mathematics as well as the calculus.
Teaching: Three lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
In-Course Test(s)/Assignment(s) 40%

CHEM3415 - ANALYTICAL CHEMISTRY III
Prerequisites: CHEM2400 Analytical Chemistry I
Syllabus: A survey of advanced instrumental techniques, applications, and data analysis, selected from the following: chromatographic methods, including gas chromatography; mass spectrometry, high performance liquid chromatography (HPLC); Atomic absorption spectroscopy (AAS) and atomic emission spectroscopy (AES); use of the diode array spectroscopy, including Fourier transform infrared (FTIR) and Raman spectroscopy; electrochemical methods, including potentiometric, conductometric, biochemical methods, including enzymatic protein sequencing, and fluorescence; thermogravimetric methods and differential scanning calorimetry; fundamentals of crystallography, including origin of systematic absences, intensity of diffraction, and comparison of monochromatic and Laue methods, fluorescence, including energy transfer, quenching and fluorescence anisotrophy statistics; multiplexing; experimental design; use of computers to analyse data. Students will complete an
instrumentation related project worth 15% of the course grade. The project will include approximately 20 hours of lab work.

Teaching: Two lectures, one tutorial and three hour practicals per week.

Method of Examination: Final Theory Examination (2 hours) 60%

In-course test(s)/Assignment(s) 10%
Practicals 15%
Project 15%

CHEM3505 - CHEMISTRY RESEARCH PROJECT (8 credits)


Description: A practical project carried out under the supervision of a member of staff. The project will run throughout the academic year and students are expected to spend at least 144 hours on laboratory work. Each student will be required to give a seminar on completion of the project as well as submit two typed and bound copies of a written report. Enrolment will be limited to those students who have demonstrated good practical skills and an aptitude for research.

Method of Examination: Supervisor’s Assessment 15%
Seminars 15%
Project Report 70%

CHEM3515 – ENVIRONMENTAL CHEMISTRY (4 credits)

Pre-requisites: CHEM2010 Practical Chemistry I, CHEM2020 Practical Chemistry II and CHEM2400 Analytical Chemistry I

Syllabus: The atmosphere: Regions of the atmosphere, reactions and properties.
Stratospheric chemistry - ozone formation and turnover. Tropospheric chemistry - smog, photochemical smog, exhaust gases,


**The terrestrial environment:** Soil properties – soil formation and properties, chemical and physical. Soil pollution and soil quality. The biosphere and xenobiotics: Global biogeochemical cycles. Persistent organic pollutants, toxic metals, pesticides. Toxicological Chemistry. Emerging Issues – e.g. personal care products, nanoparticles. Other environmental concerns e.g. energy issues, waste, recycling, Caribbean issues.

Sampling and analysis – an overview of the fundamentals of environmental sampling design, sampling techniques and quality assurance/quality control (QA/QC) essential to acquire quality environmental data.

**Teaching:** Two lectures, one tutorial and three hour practicals per week.

**Method of Examination:**
- Final Theory Examination (3 hours) 60%
- In-course test(s)/Assignment(s) 20%
- Practicals 20%
COMPUTER SCIENCE & INFORMATION TECHNOLOGY

The Department of Computer Science, Mathematics & Physics offers a Major, Double Major and Minor in Computer Science and a Major and Minor in Information Technology. In association with the Faculty of Social Sciences, the Options of a Double Major combining Computer Science or Information Technology with Accounting or Management are also offered to select students (See Appendix VI Options, p ).

It is a requirement of the discipline that to pass any Computer Science course students must pass both Coursework and Final exam.

MAJOR IN COMPUTER SCIENCE:

LEVEL I
COMP1105 Computer Programming I
COMP1115 Computer Programming II
MATH1100 Basic Introductory Mathematics

AND
ELET1110 Digital Electronics (Not required but strongly recommended)

OR
Four (4) Level I credits from this Faculty

LEVEL II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2125 Computer Architecture
COMP2145 Software Engineering I

LEVEL III
COMP3100 Operating Systems
COMP3180 Algorithm Design and Analysis
COMP2135 Systems Software
COMP2150 Computer Networks I
COMP2160 Object-Oriented Programming
COMP2950 Computer Science Elective
COMP3115 Information Systems
COMP3125 Artificial Intelligence
COMP3135 Programming Languages
COMP3140 Software Engineering II
COMP3155 Computer Networks II
COMP3160 Data Base Management Systems
COMP3170 Web-Based Applications
COMP3190 Special Topics in Computer Science
COMP3200 Compiler Theory
COMP3210 Electronic Commerce
COMP3220 Introduction to Distributed Computing
COMP3230 Network and Computer Security
COMP3240 Human-Computer Interaction
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3910 Computer Science Research Project
Minimum Course Requirements for BSc.
(Major in Computer Science) or the Computer Science Component of a Double Major

MATH1100

ELET1110*

COMP1105

COMP1115

COMP2105

COMP2115

COMP2125

COMP2145

COMP3180

COMP3100

Two from (at least one must be from Level III courses):

COMP2135 COMP3170
COMP2150 COMP3190
COMP2160 COMP3200
COMP2950 COMP3210
COMP3115 COMP3220
COMP3125 COMP3230
COMP3135 COMP3240
COMP3140 COMP3260
COMP3155 COMP3270
COMP3160 COMP3910

*Not required but strongly recommended.
MINOR IN COMPUTER SCIENCE [Sixteen (16) Credits]:

At Least Eight (8) Credits From:
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2125 Computer Architecture
COMP2145 Software Engineering I
COMP3100 Operating Systems
COMP3180 Algorithm Design and Analysis

AND At Most Eight (8) Credits from:
COMP2135 Systems Software
COMP2150 Computer Networks I
COMP2160 Object-Oriented Programming
COMP2950 Computer Science Elective
COMP3115 Information Systems
COMP3125 Artificial Intelligence
COMP3135 Programming Languages
COMP3140 Software Engineering II
COMP3155 Computer Networks II
COMP3160 Data Base Management Systems
COMP3170 Web-Based Applications
COMP3190 Special Topics in Computer Science
COMP3200 Compiler Theory
COMP3210 Electronic Commerce
COMP3220 Introduction to Distributed Computing
COMP3230 Network and Computer Security
COMP3240 Human-Computer Interaction
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3910 Research Project

N.B: Students are not allowed to take both COMP3115 Information Systems AND MGMT3011 Management Information Systems II for credit.

MAJOR IN INFORMATION TECHNOLOGY:

LEVEL I
COMP1105 Computer Programming I
COMP1115 Computer Programming II
MATH1100 Basic Introductory Mathematics

AND
ELET1110 Digital Electronics (Not required but strongly recommended)

OR
Four (4) Level I credits from this Faculty

LEVEL II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2145 Software Engineering I
COMP2160 Object-Oriented Programming

LEVEL III
COMP3160 Database Management Systems
COMP3170 Web-Based Applications

AND Eight (8) Credits (including at least one Level III course) from:
COMP2125 Computer Architecture
COMP2135 Systems Software
COMP2150 Computer Networks I
COMP2950 Computer Science Elective
COMP3100 Operating Systems
COMP3115 Information Systems
COMP3125 Artificial Intelligence
COMP3135 Programming Languages
COMP3140 Software Engineering II
COMP3155 Computer Networks II
Minimum Course Requirements for B.Sc. (Major in IT) or the IT Component of a Double Major

- MATH1100
- ELET1110*
- COMP1105
- COMP1115
- COMP2105
- COMP2115
- COMP2145
- COMP2160
- COMP3160
- COMP3170

Two from (at least one must be from Level III courses):
- COMP2125  COMP3180
- COMP2135  COMP3190
- COMP2150  COMP3200
- COMP2950  COMP3210
- COMP3100  COMP3220
- COMP3115  COMP3230
- COMP3160  COMP3240
- COMP3125  COMP3260
- COMP3135  COMP3270
- COMP3140  COMP3910
- COMP3155

*Not required but strongly recommended.
COMP3180 Algorithm Design and Analysis
COMP3190 Special Topics in Computer Science
COMP3200 Compiler Theory
COMP3210 Electronic Commerce
COMP3220 Introduction to Distributed Computing
COMP3230 Network and Computer Security
COMP3240 Human-Computer Interaction
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3910 Computer Science Research Project

COMP3200 Compiler Theory
COMP3210 Electronic Commerce
COMP3220 Introduction to Distributed Computing
COMP3230 Network and Computer Security
COMP3240 Human-Computer Interaction
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3910 Research Project

MINOR IN INFORMATION TECHNOLOGY

[Sixteen (16) Credits]:

At Least Eight (8) Credits From:
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2145 Software Engineering I
COMP2160 Object-Oriented Programming
COMP3160 Database Management Systems
COMP3170 Web-Based Applications

AND At Most Eight (8) Credits From:
COMP2125 Computer Architecture
COMP2135 Systems Software
COMP2150 Computer Networks I
COMP2950 Computer Science Elective
COMP3100 Operating Systems
COMP3115 Information Systems
COMP3125 Artificial Intelligence
COMP3135 Programming Languages
COMP3140 Software Engineering II
COMP3155 Computer Networks II
COMP3180 Algorithm Design and Analysis
COMP3190 Special Topics in Computer Science

N.B: Students are not allowed to take both COMP3115 Information Systems AND
MGMT3011 Management Information Systems II for credit

DOUBLE MAJOR IN COMPUTER SCIENCE:

LEVEL I
COMP1105 Computer Programming I
COMP1115 Computer Programming II
MATH1100 Basic Introductory Mathematics

AND
ELET1110 Digital Electronics (Not required but strongly recommended)

OR
Four (4) Level I credits from this Faculty

AND Twenty (20) Level II/III Credits as indicated below:

LEVEL II
COMP2105 Discrete Mathematics
COMP2115 Information Structures
COMP2125 Computer Architecture
COMP2145 Software Engineering I
COMP2150 Computer Networks I
COMP2160 Object-Oriented Programming

AND at most Eight (8) Credits From:
COMP2135 Systems Software

COMP2135 Systems Software
Minimum Course Requirements for B.Sc. (Major in IT) or the IT Component of a Double Major

At most two from:

- COMP3135
- COMP3220
- COMP3125
- COMP3230
- COMP3135
- COMP3240
- PHYS2104
- COMP3140
- COMP3260
- ELET2100
- COMP3170
- COMP3270
- ELET2130
- COMP3190
- ELET3100
- COMP3200
- ELET3151
- COMP3210

At least three from:

*Not required but strongly recommended.*
COMP2950  Computer Science Elective  
ELET2100  Microprocessors I  
ELET2130  Digital Communications I  
PHYS2104  Neural Networks  

LEVEL III  
COMP3100  Operating Systems  
COMP3155  Computer Networks II  
COMP3160  Database Management Systems  
COMP3180  Algorithm Design and Analysis  
COMP3910  Computer Science Research Project  

AND at least Twelve (12) Credits From:  
COMP3115  Information Systems  
COMP3125  Artificial Intelligence  
COMP3135  Programming Languages  
COMP3140  Software Engineering II  
COMP3170  Web-Based Applications  
COMP3190  Special Topics in Computer Science  
COMP3200  Compiler Theory  
COMP3210  Electronic Commerce  
COMP3220  Introduction to Distributed Computing  
COMP3230  Network and Computer Security  
COMP3240  Human-Computer Interaction  
COMP3260  Computer Graphics I  
COMP3270  Computer Graphics II  
ELET3100  Microprocessors II  
ELET3151  Digital Communications II  

LEVEL I COMPUTER SCIENCE COURSES  

COMP1005 - COMPUTER APPLICATIONS (4 Credits)  

Pre-requisite:  None (but registration restricted to non-majors in Computer Science)  

Overview:  An introduction to the fundamental concepts of computing and computers with a particular emphasis on providing a broad overview of the field of Computer Science.  


Teaching: Three (3) lectures and one tutorial per week.  

Method of Examination:  
Final Theory Examination (2 hours)  60%  
In-course Tests/Assignments  40%  

COMP1105 - COMPUTER PROGRAMMING I (4 Credits)  

Pre-requisite: None  

Overview: An introductory treatment of computer programming with an emphasis on problem analysis, algorithmic development and the fundamental principles of programming.
**COMP1115 - COMPUTER PROGRAMMING II (4 Credits)**

**Pre-requisite:** COMP1105 Computer Programming I

**Overview:** An intermediate treatment of computer programming with an emphasis on modular design and basic data structures.

**Syllabus:**
- Problem Solving (Recursion, randomness)
- Files (Direct and indexed files)
- Data Types (Enumerated types, type definitions)
- Data Structures (Structures, multidimensional arrays, systems, pointers)
- Basic Abstract Data Types (Lists, stacks, queues)
- Pointers (Dynamic memory allocation)
- Classes and Data Abstraction

**Teaching:** Three lectures and two hours of lab per week.

**Method of Examination:**
- Final Theory Exam 60%
- In course Test/Assignments 40%

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**COMP1125 – INTRODUCTION TO UNIX (4 Credits)**

**Pre-requisite:** None

**Syllabus:**
- The role of UNIX, its current uses and applications and the UNIX family of operating systems. Interacting with UNIX – graphical and command line interfaces. File creation and their management. Navigating Directories - UNIX directory hierarchy, maintaining directories and locating files. Working with the C shell – wildcards, command history facility. Developing and executing shell scripts. Accessing servers remotely and transferring data. Data manipulation – selecting, searching, sorting, counting and trimming. Customizing and monitoring of the system.

**Teaching:** Three lectures and two hours of lab per week.

**Method of Examination:**
- Final Theory Exam 60%
- In course Test/Assignments 40%
COMP1130 - WEB TECHNOLOGY FUNDAMENTALS  
(4 Credits)

Pre-requisite: None

Overview: An introduction to the major Internet components, protocols, and technologies utilized for the development and support of e-commerce applications.


Teaching: Three (3) lectures, one tutorial and two (2) hours of labs per week

Method of Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

COMP2105 - DISCRETE MATHEMATICS (4 Credits)

Pre-requisite: MATH1100 Basic Mathematics

Overview: A continued introduction to the mathematical foundations of Computer Science.

Syllabus: Predicate Calculus (Universal and existential quantifiers, proofs, logical equivalences and inferences) Asymptotic Analysis and Notation ($O$, $\Theta$ and $\Omega$) Recurrence Relations (Homogeneous, non-homogeneous, change of variable) Mathematical induction Elementary Combinatorics (permutations and combinations, Binomial Theorem,

Pigeonhole principle) Elementary Graph Theory (Paths, cycles and connectivity, classes of graphs, trees, minimum spanning trees, depth-first and breath-first traversals, adjacency and incident matrices) Finite State Machines (State graphs/tables, regular sets, recognizers, Kleene’s theorem, machine minimization)

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

COMP2115 – INFORMATION STRUCTURES (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

Overview: An advanced treatment of computer programming with an emphasis on the design and implementation of abstract data types. Syllabus: Abstract Data Types (Lists, queues, stacks, trees) Indices (Open/closed hash tables, hash functions, collision resolution schemes) Dictionaries (Binary search trees, AVL-trees, splay trees, B-trees) Graphs (Adjacency matrices/lists, mapping functions) Sets (Forest, path compression, weighted unions) Teaching: Three (3) lectures, one tutorial and two (2) hours of labs per week.

Method of Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

LEVEL II COMPUTER SCIENCE COURSES

COMP2105 - DISCRETE MATHEMATICS (4 Credits)
COMP2125 - COMPUTER ARCHITECTURE (4 Credits)

Pre-requisite: (COMP1115 Computer Programming II & MATH1100 Basic Mathematics) or ELET1110 Digital Electronics

Overview: An example of the salient features of modern computer architectures.

Syllabus: Instruction Sets and Execution Pipelining, Addressing Modes - Memory Hierarchies, Caching RISC vs CISC Architecture, Interrupt Processing, I/O Processing

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%

COMP2135 - SYSTEMS SOFTWARE (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

Overview: An introduction to the fundamental concepts of modern operating systems from the perspective of the systems programmer and with a particular emphasis on the use of operating systems calls.

Syllabus: Programming Tools (Structure and use of: Compilers, linkers, Debuggers, profilers and preprocessors) Process Management (Overview of processes and threads, creating and using child processes, creating and using pipes) File Management (Overview of file management, manipulating file attributes, binary I/O, streamed I/O, redirection of standard I/O, use of shell redirection operators, filers, atomic operations, directory manipulation) Memory Management (Memory layout of a program, advanced memory, Array and pointer manipulations, command line arguments and Environment variables) Device Management (Accessing and managing I/O devices)

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%

COMP2145 - SOFTWARE ENGINEERING I (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

Overview: An introduction to the principal concepts of software engineering with a particular emphasis on the software development process.

Syllabus: Software Development (Requirements analysis, specifications, Design, implementation, validation and verification, maintenance) Product and Project Documentation (user manuals, internal documentation) Software Development Approaches (e.g. prototyping, agile development) Testing Strategies (black box, white box, usability)

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%
COMP2150 - COMPUTER NETWORKS I (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: An introduction to digital communication systems and local area networks, with a view to providing the foundation for the advanced computer network course(s).
Syllabus: Data Communication Fundamentals
The ISO Reference Model
Transmission Media
Interface Standards
Asynchronous and Synchronous Transmission
Communications Control Devices
Data Compression
Error Detection Methods
Farming Methods
Flow Control
Network Topology
LAN Technologies – including Wireless LANs
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP2160 - OBJECT-ORIENTED PROGRAMMING (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: A comprehensive introduction to the object-oriented paradigm with a particular emphasis on the class design and design patterns.

COMP2150 - COMPUTER NETWORKS I (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: An introduction to digital communication systems and local area networks, with a view to providing the foundation for the advanced computer network course(s).
Syllabus: Fundamental Concepts (Encapsulation, information hiding, classes and objects, inheritance, polymorphism, dynamic binding)
Fundamentals of Class Design (Inheritance vs composition relationships, constructors and destructors, copy constructors, selectors, modifiers) Design by Contract (Exception handling, assertions) Advanced Concepts (Abstract and concrete classes, frame-works and design patterns) Applications using Class Libraries
Teaching: Three (3) lectures, one tutorial and two (2) hours of labs per week.
Method of Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP2160 - OBJECT-ORIENTED PROGRAMMING (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: A comprehensive introduction to the object-oriented paradigm with a particular emphasis on the class design and design patterns.

COMP2150 - COMPUTER NETWORKS I (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: An introduction to digital communication systems and local area networks, with a view to providing the foundation for the advanced computer network course(s).
Syllabus: Fundamental Concepts (Encapsulation, information hiding, classes and objects, inheritance, polymorphism, dynamic binding)
Fundamentals of Class Design (Inheritance vs composition relationships, constructors and destructors, copy constructors, selectors, modifiers) Design by Contract (Exception handling, assertions) Advanced Concepts (Abstract and concrete classes, frame-works and design patterns) Applications using Class Libraries
Teaching: Three (3) lectures, one tutorial and two (2) hours of labs per week.
Method of Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP2160 - OBJECT-ORIENTED PROGRAMMING (4 Credits)
Pre-requisite: COMP1115 Computer Programming II
Overview: A comprehensive introduction to the object-oriented paradigm with a particular emphasis on the class design and design patterns.

COMP2950 - COMPUTER SCIENCE ELECTIVE (4 Credits)
Pre-requisites: None
Syllabus: An advanced course in Computer Science taken as an exchange student at an approved institution and pre-approved by the Dean.

LEVEL III COMPUTER SCIENCE COURSES

COMP3100 - OPERATING SYSTEMS (4 Credits)
Pre-requisite: COMP2115 Information Structures & COMP2125 Computer Architecture
Overview: An introduction to the fundamental concepts of modern operating systems.
Syllabus: Evolution of Operating Systems  
Characteristics of Modern Operating Systems  
Process Management (Processes and threads, process synchronization, Scheduling, deadlock)  
Memory Management (Memory partitioning, paging, virtual memory segmentation)  
File Management (File organization, file system implementation, example file systems)  
Device Management (I/O devices, device drivers, I/O design issues, diskscheduling)  
Security (Security threats, protection mechanisms, trusted systems)

Teaching: Three (3) lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP3125 - ARTIFICIAL INTELLIGENCE (4 Credits)
Pre-requisite: COMP2105 Discrete Mathematics & COMP2115 Information Structures
Overview: An introduction to the fundamental concepts of artificial intelligence with a particular emphasis on knowledge representation and searching.

Syllabus: Problems and Search (Problem spaces, heuristic search), Knowledge Representation (Predicate logic, rule-based systems, Reasoning, slot-and-filler) Advanced Topics (Game playing, natural language, planning, learning) Applications (Expert systems, software agents, programming-by-example)  
Software Development Approaches (e.g. prototyping, agile development) Testing Strategies (black box, white box, usability)

Teaching: Three (3) lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP3135 - PROGRAMMING LANGUAGES (4 Credits)
Pre-requisite: COMP2115 Information Structures
Overview: An introduction to the major concepts of programming language Design with a particular emphasis on the imperative, functional, Logic, object-oriented and concurrent paradigms of programming.
Syllabus: Imperative Programming (Basic Semantics, data types control structures)
Object-Oriented Programming (Objects, classes and methods, Inheritance, polymorphism) Functional Programming (Referential transparency, recursion, types and Polymorphism, lambda calculus) Logic Programming (Predicate calculus and logical deduction, unification and resolution, non-determinism and back-tracking) Scripting Languages (Regular expressions) Concurrent Programming (Communication and synchronization)

Teaching: Three (3) lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP3155 - COMPUTER NETWORKS II (4 Credits)
Pre-requisite: COMP2150 Computer Networks I
Overview: A further exploration of general networking concepts, focusing on the higher layers of the ISO protocol stack. In particular, routing, internetworking with TCP/IP and network security. Network design issues as well as management issues are also explored.

Syllabus: The ISO Reference Model – layer 3 and above Internetworking with TCP/IP WAN Technologies e.g. ATM, Frame Relay Quality of Service in Communications Networks Network Security Network Design Network Performance Network Management

Teaching: Three (3) lectures and one tutorial per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%
Syllabus:  Principles of Database Design (Logical and Physical schemas, Data independence, entity-relationship model)
Relational Database Systems (Data normalization, data description Languages, query languages)
Advanced Database Concepts (Distributed databases, object-oriented databases, data warehousing)

Teaching:  Three (3) lectures, one tutorial and two (2) hours of labs per week.

Method of Examination:  Final Theory Examination (2 hours) 60%
Examination:  In-course Tests/Assignments 40%

COMP3170 - WEB-BASED APPLICATIONS (4 Credits)

Pre-requisite:  COMP2160 Object-Oriented Programming
Overview:  An introduction to the fundamentals of web applications development with a particular emphasis on client-server applications, database connectivity, networking considerations and security.

Syllabus:  Overall Client-Server Model
Client Side Programming (Development of browser software, Client side scripting)
Networking (TCP/IP, HTTP, sockets, datagrams, routing issues)
Server Side Programming (GGI, server side scripting, web services)
Database Connectivity (Server to database connectivity issues)
Security (Policy development, physical security, securing web applications)
Design Issues (User interface factors, hardware issues)

Teaching:  Three (3) lectures and one tutorial per week.

Method of Examination:  Final Theory Examination (2 hours) 60%
Examination:  In-course Tests/Assignments 40%

COMP3180 - ALGORITHM DESIGN AND ANALYSIS (4 Credits)

Pre-requisite:  COMP2105 Discrete Mathematics & COMP2115 Information Structures
Overview:  An introduction to the design and analysis of sequential algorithms with a particular emphasis on the paradigms of algorithmic design and their application to diverse problem areas.

Syllabus:  Analysis of Algorithms: computational models, time and space complexities, worst-case and expected complexities, lower and upper bounds; Techniques for designing efficient algorithms: recursion, divide-and-conquer, balancing, dynamic programming, and branch-and-bound; Problems on sets and sequences including sorting and selection; string matching.; Matrix and Boolean matrix multiplication; Graph algorithms; The classes of P, NP and NP-Complete problems.

Teaching:  Three (3) lectures, one tutorial and two (2) hours of labs per week.

Method of Examination:  Final Theory Examination (2 hours) 60%
Examination:  In-course Tests/Assignments 40%
COMP3190 - SPECIAL TOPICS IN COMPUTER SCIENCE (4 Credits)

Pre-requisite: Restricted to Finalists majoring in Computer Science.

Overview: An advanced treatment of an applied or theoretical area of Computer Science that reflects the current concerns and/or research interest of the Department.

Syllabus: Topics will be drawn from the principles of programming languages, operating systems, information systems, graphics, artificial intelligence, software engineering, networks, logic, computability and complexity theory, algorithms, program verification, discrete mathematics and any other area of current interest.

Teaching: Three (3) lectures and one tutorial per week.

Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

COMP3210 - ELECTRONIC COMMERCE (4 Credits)

Pre-requisite: COMP2160 Object-Oriented Programming

Overview: Provides a comprehensive introduction to electronic commerce.

Syllabus: Internet concepts and technology
Economic foundation of electronic commerce
Storefronts, shopping carts and Landing pages
Order processing
Pricing and payment processing
Security issues

Teaching: Three (3) hours of lectures and two (2) hours of labs per week.

COMP3220 – HUMAN-COMPUTER INTERACTION (4 Credits)

Pre-requisite: COMP2115 Information Structures & COMP2145 Software Engineering I

Overview: An introduction to the design, evaluation and implementation of human-computer interfaces. With the continual growth of computer use in every facet of daily life, the need for truly usable human-computer interfaces is paramount. This course is intended for students wishing to gain an understanding of the issues involved with the successful implementation of human-computer interfaces.


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP3230 – NETWORK AND COMPUTER SECURITY (4 Credits)

Pre-requisite: COMP2105 Discrete Mathematics & COMP2150 Computer Networks I

Overview: An introduction to cryptographic algorithms, security protocols and security engineering. As computers become increasingly inter-networked, and as the information and resources stored on networked computers become more valuable, the need to develop security mechanisms that are scalable, flexible, and easy to use has increased. This course is intended for students wishing to gain an understanding of security engineering, common cryptographic algorithms and common security protocols.


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.

Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP3240 – INTRODUCTION TO DISTRIBUTED COMPUTING (4 Credits)

Pre-requisite: COMP2115 Information Structures & COMP2125: Computer Architecture

Overview: This course provides an introduction to Distributed Systems. Since distributed systems have become so pervasive in industry and research, it is necessary to expose students to an introduction of the algorithms and technologies of distributed systems. This course will teach the fundamentals of distributed systems and present systems where these fundamentals have been implemented.


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.

Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%
COMP3260 – COMPUTER GRAPHICS I (4 Credits)

Pre-requisite: COMP2115 - Information Structures & COMP2105 - Discrete Mathematics

Overview: This course provides an introduction to the fundamental concepts and techniques used in 2D and 3D computer graphics. It covers both the theory and practice of computer graphics. The lectures and examination will focus on the mathematical foundations of computer graphics, while the lab sessions and programming projects will deal with translating the theory into practice. This course is intended for students wishing to gain an understanding of the issues involved with the successful implementation of computer graphics and an interest in programming techniques for the interactive display of two and three dimensional object


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.

Method of Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

COMP3270 - COMPUTER GRAPHICS II (4 Credits)

Pre-requisite: COMP3250 - Computer Graphics I

Overview: This course provides further instructions on the concepts and techniques used in 3D computer graphics. The focus is on animation and real-time rendering techniques, such as those found in computer games. This course is intended for students wishing to write programs to render 3D objects using techniques ranging from simple flat shading to complex ray-shading and to implement techniques of computer animation.


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.

Method of Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 40%

COMP3910 - COMPUTER SCIENCE RESEARCH PROJECT (4 Credits)

Pre-requisite: Restricted to Finalists majoring in Computer Science.

Overview: An opportunity for final year students in Computer Science, to apply and Develop their classroom knowledge in a real-world or research environment.
Syllabus: In consultation with and under the supervision of a Faculty member, students are expected to define, investigate and report on an applied or theoretical research topic in Computer Science. The project itself is equivalent to a single Faculty course and must therefore reach that standard in terms of content and research effort. The project should contain some originality in material and evidence of extensive reading and comprehension of the subject area. A proposal and literature review must be submitted no later than the fourth week of Semester II and a final written report must be submitted and presented orally to a panel of at least three Faculty members no later than the last week of classes in Semester II.

N.B. Enrolment will be limited to those students who have demonstrated a sound academic background and an aptitude for research.

Teaching: Three (3) lectures and one tutorial per week.

Examination: Method of Written Report 60%
Oral Presentation 20%
Proposal and Literature Review 20%

EARTH SCIENCES

Earth Sciences is an interdisciplinary programme of the Faculty comprising individual courses as well as a Minor in Earth Sciences. The Minor is restricted to students in the Faculty of Pure & Applied Sciences.

MINOR IN EARTH SCIENCES

ERSC1001 Dynamic Earth
METE1200 (ERSC1002) Oceans & Climate

AND Sixteen (16) credits from:
ERSC2001 Earth & Life
ERSC2002 Climatology
ERSC2003 Oceanography
ERSC2004 Renewable Energy Sources
ERSC3002 Climate Variability & Predictability

ERSC1001 - DYNAMIC EARTH (4 credits)

Pre-requisites: None

Syllabus: An introduction to geology with specific reference to the Caribbean. Earthquakes, magnetism and the structure of the Earth. The geological processes that shape the Earth’s surface – volcanism, weathering, erosion, transport and deposition; large-scale dynamic processes – plate tectonics. The Earth through geological time. Introduction to rocks, minerals and geological maps.

Teaching: Two lectures, one tutorial and three hours of labs per week.

Method of Examination: Theory Examination (2 hours) 60%
Laboratory 20%
In-course assignments/tests 20%
ERSC2001 - EARTH & LIFE (4 credits)

Pre-requisites: ERSC1001 Dynamic Earth


Teaching: Two lectures, one tutorial and three hours of labs per week.

Method of Examination: Laboratory 20%
In-course assignments/tests 20%

ERSC2002 - CLIMATOLOGY (4 credits)

Pre-requisites: ERSC1002 Oceans & Climate or METE1200 Oceans & Climate


Teaching: Two lectures, one tutorial and three hours of labs per week.

Method of Examination: Laboratory 20%
In-course assignments/tests 20%

ERSC2003 - OCEANOGRAPHY (4 credits)

Pre-requisites: CSEC Chemistry and ERSC1002 Oceans & Climate or METE1200 Oceans & Climate.


Teaching: Two lectures, one tutorial and three hours of labs per week.

Method of Examination: Theory Examination (2 hours) 60%
In-course assignments/tests 20%
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Pre-requisites</th>
<th>Syllabus</th>
<th>Teaching:</th>
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<tr>
<td><strong>ERSC2004: RENEWABLE ENERGY SOURCES</strong></td>
<td>4 credits</td>
<td>16 Level 1 FPAS credits</td>
<td>Current and future energy generation systems. Resources, extraction, conversion, and end-use, with emphasis on meeting regional and global energy needs in the 21st century in a sustainable manner. Aspects of energy production and consumption. Patterns of national, regional and global energy patterns of supply and utilization. Environmental effects of energy and the energy-prosperity-environmental dilemma. Mathematical representations of sustainability. Allowability, efficiency, and production rates of different renewable energy sources - solar energy, wind energy, tidal power, wave energy, geothermal energy, hydroelectricity, and bioenergy. Energy systems and sustainability systems in the renewable energy context. Major economic issues of production, storage, transportation, and distribution of energy.</td>
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<tr>
<td><strong>ERSC3002 – CLIMATE VARIABILITY &amp; PREDICTABILITY</strong></td>
<td>4 credits</td>
<td>ERSC2001 Climatology</td>
<td>Climate system and variability, mean state, cycle, trend Concepts of variability, solar radiation and the role of aerosols on climate processes. Data used in climate analysis: observation, reconstruction, modeling. Model simulation and limitations of the climate models. Skill, robustness and reliability of the climate models. Climate response to external and internal forcings. North Atlantic Oscillation and sea surface temperature forcing. ENSO and climate predictability in the north Atlantic region. Oscillations in the climate system. Monthly and seasonal predictability. Past climate variability. Short term and Long term climate prediction.</td>
<td>Two lectures, one tutorial and three hours of labs per week.</td>
<td>Theory Examination (3 hours) 60%</td>
<td>Final Examination (3 h) 50%</td>
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<td>Laboratory 20%</td>
<td>Project: 2 5%</td>
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<td>In-course Test(s): 20%</td>
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ELECTRONICS

The Department of Computer Science, Mathematics & Physics offers a Major and a Minor in Electronics.

MAJOR IN ELECTRONICS:

LEVEL I
ELET1100  Circuit Analysis
ELET1110  Digital Electronics
ELET1120  Basic Electronics
MATH1120  Calculus I

And 32 Credits from Level II & III Electronics courses as indicated below.

LEVEL II
At Least Twelve (12) Credits From:
ELET2100  Microprocessors I
ELET2110  Circuit Simulation
ELET2120  Discrete Device Electronics
ELET2130  Digital Communications I
ELET3100  Microprocessors II
ELET3110  Control and Instrumentation
ELET3120  Communication Circuits
ELET3130  Introduction to Digital Signal Processing (DSP)

LEVEL III
At Most Twenty (20) Credits (Five Courses) From:
ELET3140  Microcomputers and Control
ELET3151  Digital Communications II
ELET3160  Electronics Research Project

MINOR IN ELECTRONICS [Sixteen (16) Credits]:

Sixteen (16) Credits (Four Courses) From:
ELET2100  Microprocessors I
ELET2110  Circuit Simulation
ELET2120  Discrete Device Electronics
ELET2130  Digital Communications I
ELET3100  Microprocessors II
ELET3110  Control and Instrumentation
ELET3120  Communication Circuits
ELET3130  Introduction to Digital Signal Processing (DSP)

LEVEL I ELECTRONICS COURSES

ELET1100 – CIRCUIT ANALYSIS (4 Credits)

Pre-requisite: CAPE Physics Units I & II or CAPE Pure Mathematics Units I & II

Objectives: An introduction to the theory of circuit analysis of DC & AC networks, and operational amplifiers.

Electronics Major

- ELET1100
- ELET1110
- ELET1120
- MATH1120

- ELET2110
- ELET2100
- ELET2120
- ELET2130

- ELET3100
- ELET3120
- ELET3140
- ELET3160

- ELET3110
- ELET3130
- ELET3151

Mutual inductance, circuit transients, bode plots. Operational amplifier circuits - amplifiers, integrators, differentiators, adders, subtractors, multivibrators, waveform generators, power op-amps.

Teaching: Two (2) lectures, one tutorial and three (3) laboratory hours every week.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 20%
Laboratory 10%

ELET1100 – DIGITAL ELECTRONICS (4 Credits)

Pre-requisite: None

Objectives: An introduction to digital logic and its applications.


Teaching: Two (2) lectures, one tutorial and three (3) laboratory hours every week.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 20%
Laboratory 10%

ELET1120 – BASIC ELECTRONICS (4 Credits)

Pre-requisite: None

Objectives: An introduction to analog electronic components and how they operate in simple circuits.

Syllabus: Resistors, capacitors, inductors & their applications in circuits. Characteristics and applications of diodes including photodevices. Other semiconductor devices and their applications (SCR, TRIACS, etc...). Transistors (BJT & FETS), how they work and their application in circuits. Simple amplifiers, their design and properties. Basic filters, power supplies and regulators. Analysis of some standard electronic circuits.

Teaching: Two (2) lectures, one tutorial and three (3) laboratory hours every week.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 20%
Laboratory 10%
LEVEL II ELECTRONICS COURSES

ELET2100 – MICROPROCESSORS I (4 Credits)

Pre-requisite: ELET1110 Digital Electronics

Objectives: An applied introduction to the Microprocessor and computer architecture. Assembly Language and simple interfaces are studied.

Syllabus: Architecture of 8-bit CPU's e.g. INTEL 8085, Instruction set, Registers and their uses, Operation, Busses, Addressing, Data flow, Control section, Interrupts, Stack, Branching, Subroutines, Loops, Serial I/O, Interfacing, Port and memory mapping, Polling, Handshaking, Parallel ports, Serial communications (RS-232), A/D and basic D/A interfacing, device control with simple examples, comparison with other 8-bit CPU's, Introduction to advanced microprocessors.

Teaching: Two (2) lectures four (4) hours of laboratory per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 20%

Laboratory 20%

ELET2110 – CIRCUIT SIMULATION (4 Credits)

Pre-requisite: ELET1100 Circuit Analysis

Objectives: An introduction to circuit analysis & design using SPICE simulation software.

Syllabus: Introduction to SPICE, Language syntax, netlists, Source specification and passive element models, Active device modeling, macro models, AC, DC, transient, frequency and Monte Carlo analysis, Issues of convergence and stability.

Teaching: Two (2) contact hours and four (4) laboratory hours per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 20%

Laboratory 20%

ELET2120 – DISCRETE DEVICE ELECTRONICS (4 Credits)

Pre-requisite: ELET1120 Basic Electronics

Objectives: A more detailed study of analog circuits and amplifiers.


Teaching: Two (2) lectures and four (4) hours of laboratory per week.

Method of Examination: Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 20%

Laboratory 20%
ELET2130 - DIGITAL COMMUNICATIONS I (4 credits)

Pre-requisite: MATH1120 Calculus I and ELET1110 Digital Electronics

Objective: An introduction to basic digital communication systems.


Teaching: Two (2) 1-hour lectures and four (4) hours of laboratory per week.

Examination: Final Theory Examination (2 hours) 60%
In-course Tests/Assignments 20%
Laboratory 20%

ELET3110 – CONTROL & INSTRUMENTATION (4 Credits)

Pre-requisite: ELET2120 Discrete Device Electronics

Objectives: A detailed study of control and instrumentation with applications.

Syllabus: Block diagrams, signal flow graphs, frequency response, stability, steady state and transient response. Transducers, controllers and control systems for level, temperature, speed and position control. Sampled systems. Introduction to computer control and robotics.

Teaching: Two (2) lectures and four (4) hours of laboratory per week.

Method of Examination: Final Theory Examination (2 hour) 60%
In-course Tests/Assignments 20%
Laboratory 20%

LEVEL III ELECTRONICS COURSES

ELET3100 – MICROPROCESSORS II (4 Credits)

Pre-requisite: ELET2100 Microprocessors I

Objectives: Further studies of the microprocessor with emphasis on the PC and interfacing.

ELET2950 ELECTRONICS ELECTIVE 4 credits

Pre-requisites: None

Syllabus: An advanced course in Electronics taken as an exchange student at an approved institution and pre-approved by the Dean.
FACULTY OF PURE AND APPLIED SCIENCES
HANDBOOK 2009-2010

ELET3120 – COMMUNICATION CIRCUITS (4 Credits)

Pre-requisite: ELET2120 Discrete Device Electronics

Objectives: The analysis of circuits and systems used in rf communications.


Teaching: Two (2) lectures and four (4) hours of laboratory per week.

Method of Final Theory Examination (2 hour)  60%
Examination: In-course Tests/Assignments  20%
Laboratory  20%

ELET3130 – INTRODUCTION TO DIGITAL SIGNAL PROCESSING (DSP) (4 Credits)

Pre-requisite: ELET2110 Circuit Simulation

Objectives: To cover the fundamentals of digital signal processing.


Teaching: Two (2) lectures and four (4) hours of laboratory per week.

Method of Final Theory Examination (2 hour)  60%
Examination: In-course Tests/Assignments  20%
Laboratory or Project  20%

ELET3140 – MICROCOMPUTERS & CONTROL (4 Credits)

Pre-requisite: ELET2100 Microprocessors I

Objectives: A look at the application of microcomputers for control.

Syllabus: Integrated circuits for serial communications and their properties. Programming the serial ports in higher level languages and on different operating systems. Analog input and output. Programming the parallel and game port. Universal Serial Bus. Controller networks, types and properties. Controlling PC’s configured as controllers and Inter-net servers from internet clients.

Teaching: Two (2) lectures and four (4) hours of laboratory per week.

ELET3151 - DIGITAL COMMUNICATIONS II (4 credits)

Pre-requisite: ELET2130 Digital Communications I

Objectives: A detailed study of more advanced Digital Communication systems

Syllabus: Signals and Spectra, Bandpass Transmission, Error Control Coding (Convolutional), Satellite Communications, Wireless Communications.

Teaching: Two (2) 1-hour lectures and four (4) hours of laboratory per week.
Method of Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 20%
Laboratory 20%

**ELET3160 - ELECTRONICS RESEARCH PROJECT**
(4 Credits)

Pre-requisite: Restricted to Finalists Majoring in Electronics

Objectives: For Final Year students in Electronics to apply and develop their classroom knowledge in a real-world or research environment.

Syllabus: Students will be given a problem for which they must develop a workable electronics solution which should preferably be of commercial interest. The developed solution should be of sufficient Breadth and depth to make it equivalent to a 4-credit advanced Course in electronics. Solution may include Mathematics and Computer Software but an electronic circuit component is required.

Method of Proposal and Literature Review 20%
Examination: Oral Presentation 20%
Final Written Project Report 60%

**MATHEMATICS**

The Department of Computer Science, Mathematics & Physics offers a Double Major, Major and Minor in Mathematics as well as a Minor in Statistics.

**MAJOR IN MATHEMATICS:**

**LEVEL I**
MATH1100 Basic Mathematics
MATH1120 Calculus I
MATH1130 Calculus II

AND
COMP1105 Computer Programming I
OR
COMP1005 Computer Applications

**LEVEL II**
MATH2100 Abstract Algebra
MATH2110 Linear Algebra
MATH2120 Analysis & Methods I
MATH2130 Ordinary Differential Equations

**LEVEL III**
Sixteen (16) Credits from Levels II and III courses (including AT LEAST two Level III courses) from:
MATH2140 Probability Theory
MATH2150 Mathematical Statistics
MATH3100 Multivariate Analysis
MATH3110 Design of Experiments
MATH3120 Numerical Analysis
MATH3130 Optimization Theory
MATH3140 Fourier Analysis and PDE
MATH3150 Complex Variables I
MINOR IN MATHEMATICS [Sixteen (16) Credits]:
MATH2100 Abstract Algebra  
MATH2120 Analysis & Methods I  
AND Eight (8) Credits From:  
MATH2110 Linear Algebra  
MATH2130 Ordinary Differential Equations  
MATH2140 Probability Theory  
MATH2150 Mathematical Statistics  
MATH3100 Multivariate Analysis  
MATH3110 Design of Experiments  
MATH3120 Numerical Analysis  
MATH3130 Optimization Theory  
MATH3140 Fourier Analysis and PDE  
MATH3150 Complex Variables I  
MATH3160 Number Theory  
MATH3170 Advanced Algebra  
MATH3180 Introduction to Topology  
MATH3190 Matrix Analysis  
MATH3200 Lambda Calculus  
MATH3210 Mathematical Logic  
MATH3220 Sampling Theory  
MATH3230 Lebesgue Measure  
MATH3300 Mathematics Research Project  
MATH3460 Statistical Theory II

MINOR IN STATISTICS [Sixteen (16) Credits]:
MATH 2140 Probability Theory  
MATH 2150 Mathematical Statistics  
MATH 3100 Multivariate analysis  
MATH 3460 Statistical Theory II

DOUBLE MAJOR IN MATHEMATICS:
LEVEL I  
MATH1100 Basic Mathematics  
MATH1120 Calculus I  
MATH1130 Calculus II  
AND  
COMP1105 Computer Programming I  
OR  
COMP1005 Computer Applications

LEVEL II  
MATH2100 Abstract Algebra  
MATH2110 Linear Algebra  
MATH2120 Analysis & Methods I  
MATH2130 Ordinary Differential Equations

LEVEL III  
Forty-eight (48) Credits from Levels II and III courses:  
MATH2140 Probability Theory  
MATH2150 Mathematical Statistics  
MATH3100 Multivariate Analysis  
MATH3110 Design of Experiments  
MATH3120 Numerical Analysis  
MATH3130 Optimization Theory  
MATH3140 Fourier Analysis and PDE  
MATH3150 Complex Variables I
### MATH3160  Number Theory
- Teaching: Five (5) lectures and one tutorial per week.
- Examination: Final Theory Examination (3 hours) 80%
  In-course Tests/Assignments 20%

### MATH3170  Advanced Algebra

### MATH3180  Introduction to Topology

### MATH3190  Matrix Analysis

### MATH3200  Lambda Calculus

### MATH3210  Mathematical Logic

### MATH3220  Sampling Theory

### MATH3230  Lebesgue Measure

### MATH3300  Mathematics Research Project

### MATH3460  Statistical Theory II

### PRELIMINARY MATHEMATICS COURSES

#### MATH0101 - PRELIMINARY MATHEMATICS I
(6 P-Credits)
- Pre-requisite: CXC Mathematics or equivalent.
- Syllabus:
  - **Algebra:** Sets. Cartesian Product, functions, operations, the integers, mathematical induction, algebraic operations on polynomials and rational quadratics, step functions, modulus function.
  - **Geometry:** Coordinate geometry, trigonometrical functions and identities, complex numbers, Argand diagram; vectors.
  - **Calculus:** Limits, continuity, intermediate-value theorem, gradient of a tangent, differentiation, Mean value theorem and its consequences (motivation, but no proof), curve sketching, integration as inverses of differentiation, fundamental theorem of calculus, techniques of integration, numerical techniques.

  - Teaching: Five (5) lectures and one tutorial per week.
  - Method of Examination: Final Theory Examination (3 hours) 80%
    In-class Tests/Assignments 20%

#### MATH0102 – PRELIMINARY MATHEMATICS II
(6-Credits)
- Pre-requisite: CXC Mathematics or equivalent
- Syllabus:
  - **Sequences and Series:** Use of notation, arithmetic and geometric progressions, binomial theorem.
  - **Special functions:** Exponential and logarithmic functions as solutions of initial value problems, definition of arbitrary exponential, coordinate transformations, differential and integral calculus applied to transcendental functions.
  - **Elementary first and second order differential equations:** Classification, techniques of solution, linear ordinary differential equations with constant coefficients.
  - **Combinatorics and Matrices:** Elementary combinatorics, matrices of arbitrary size, determinants. Mathematical modelling: Ordinary differential equations of Physics, Biology, Economics, applications of Mathematics.

  - Teaching: Five (5) lectures and one tutorial per week.
  - Method of Examination: Final Theory Examination (3 hours) 80%
    In-class Tests/Assignments 20%
LEVEL I MATHEMATICS COURSES

MATH1100 – BASIC MATHEMATICS (4 Credits)

Pre-requisites: CAPE Pure Mathematics Units 1 & 2 or MATH0101 & MATH0102 or equivalent.

Objectives: The course provides an introduction to linear algebra, algebraic structures and number systems.

Syllabus: Logic, summation conventions, mathematical induction; sets, relations and functions; equivalence relations, graphs, trees, partial orders; binary operations; number systems, real numbers, complex numbers; counting principles; systems of linear equations, Gaussian elimination; matrices, adjoint and inverse; linear independence.

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (3 hours) 75%
In-class Test(s)/Assignment(s) 25%

MATH1110 - APPLIED STATISTICS (4 Credits)

Pre-requisites: CAPE Pure Mathematics Units 1 & 2 or MATH0101 & MATH0102 or equivalent.

Objectives: To acquaint students with the fundamental ideas of modern applied statistics, and provide an opportunity for the students to use a computer in the study of this subject.


Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 75%
In-course Tests/Assignments 25%

MATH1120 – CALCULUS I (4 Credits)

Pre-requisite: CAPE Pure Mathematics Units 1 & 2 or MATH0101 & MATH0102 or equivalent.

Objective: To introduce students to the basic properties and applications of real-valued functions of one real variable.

Syllabus: Functions and graphs, limits, continuity, differentiability, the concept of an extremum, curve sketching, antiderivatives, the definite integral, fundamental theorem of calculus, improper integrals, sequences and series.
MATH1130 – CALCULUS II (4 Credits)

Pre-requisite: MATH1120 Calculus I

Objective: To introduce basic concepts of vector functions on subsets of Euclidean space.

Syllabus: Function of several variables, vector functions, limits, continuity, and sketching, differentiation, partial derivatives, extrema for functions of 2 and 3 variables, Lagrange multipliers, change of variable and Jacobian, polar, spherical and cylindrical coordinates, double and triple integrals, line and surface integrals.

Teaching: Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 75%

Examination: In-class Tests/Assignments 25%

LEVEL II MATHEMATICS COURSES

MATH2100 – ABSTRACT ALGEBRA (4 Credits)

Pre-requisite: MATH1100 Basic Mathematics

Objective: To expose students to fundamentals of mathematical structures.


Teaching: Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 75%

Examination: In-class Tests/Assignments 25%

MATH2110 – LINEAR ALGEBRA (4 Credits)

Pre-requisite: MATH1100 Basic Mathematics, MATH1120 Calculus I & MATH1130 Calculus II

Objective: To provide an introduction to fundamental concepts in linear algebra.


Teaching: Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 70%

Examination: In-class Tests/Assignments 30%

MATH2120 – ANALYSIS & METHODS I (4 Credits)

Pre-requisite: MATH1100 Basic Mathematics, MATH1120 Calculus I & MATH1130 Calculus II

Syllabus: The real number system. Countability and topology of the real line; Continuity and differentiability. The Riemann integral. Infinite series and power series.

Teaching: Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 70%

Examination: In-class Tests/Assignments 30%
MATH2130 – ORDINARY DIFFERENTIAL EQUATIONS
(4 Credits)
Pre-requisite: MATH1100 Basic Mathematics, MATH1120 Calculus I & MATH1130 Calculus II
Objective: To introduce students to elementary techniques of solution and classification for ordinary differential equations.
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination: (2 hours) 70%
Examination: In-class Tests/Assignments 30%

MATH2140 – PROBABILITY THEORY (4 Credits)
Pre-requisite: MATH1120 Calculus I & MATH1130 Calculus II
Syllabus: Basic probability theory: Combinational Methods, Laws of probability, conditional probability, independence. Bayes formula; random variables, discrete and continuous distributions, expectations, moments, moment generating functions, functions of random variables, jointly distributed random variable. Special distributions: binomial, geometric, negative binomial, Poisson, hypergeometric, uniform, exponential, gamma, normal, bivariate normal. Law of large numbers, the central limit theorem.
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination: (2 hours) 70%
Examination: In-class Tests/Assignments 30%

MATH2150 – MATHEMATICAL STATISTICS (4 Credits)
Pre-requisite: MATH2140 Probability Theory
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory examination: (2 hours) 70%
Examinations: In-class Tests/Assignments 30%

MATH2950 - MATHEMATICS ELECTIVE (4 Credits)
Pre-requisites: NONE
Syllabus: An advanced course in Mathematics taken as an exchange student at an approved institution and pre-approved by the Dean.
LEVEL III MATHEMATICS COURSES

MATH3100 – MULTIVARIATE ANALYSIS (4 credits)
Prerequisites: MATH2110 Linear Algebra and MATH2140 Probability Theory.
Teaching: Three lectures and one tutorial per week.
Examination: One 2-hour written paper 60%
Coursework 40%

MATH3120 – NUMERICAL ANALYSIS (4 Credits)
Pre-requisite: MATH2110 Linear Algebra or MATH2120 Analysis & Methods I
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination (2 hours) 60%
Examination: In-class Tests/Assignments 40%

MATH3130 – OPTIMIZATION THEORY (4 Credits)
Pre-requisite: MATH2110 Linear Algebra
Syllabus: Linear Programming and Duality – Mathematical Structure of the Primal; Equivalent Linear Programmes; Simplex and revised Simplex Techniques; Dual Linear Programmes. Complimentary Slackness, Matrix Theoretic Overview, the Duality Theorem, Special Linear Programmes, - Transportation Problems; Modified Distribution techniques; Construction of Algorithms for Computation.
Teaching: Three (3) lectures and one tutorial per week.

MATH3150 – COMPLEX VARIABLES 1 (4 credits)
Pre-requisite: MATH2120 Analysis & Methods I
Description: This is a first course in the theory and methods of complex variables. Many concepts in complex variable are generalizations of topics in calculus and real analysis, while other results and methods are specific to the subject itself. The material in this course is a blend of mathematical theorems and computational techniques. This course will be of interest to students majoring in mathematics or physics. Syllabus: Complex numbers, their analysis and geometry. Functions of a complex variable, limits, continuity. Analytic functions and harmonic functions. Complex integration,

Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-class Tests/Assignments 40%

MATH3160 – NUMBER THEORY (4 Credits)
Pre-requisite: MATH2100 Abstract Algebra

Objective: To offer a basic course in the fundamentals of the development of formal number systems with applications to Cryptography.


Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-class Tests/Assignments 40%

MATH3170 – ADVANCED ALGEBRA (4 Credits)
Pre-requisite: MATH2100 Abstract Algebra

Objective: To build on the foundation laid in MATH2100 by providing an in-depth study of selected topics in groups, rings and fields.

Teaching: Three (3) lectures and one tutorial per week.


MATH3180 – INTRODUCTION TO TOPOLOGY
(4 Credits)
Pre-requisites: MATH2100 Abstract Algebra & MATH2120 Analysis & Methods I

Objective: This is a first course in point-set topology. The subject of topology grew out of the study of geometric and analytic properties of the real-line and Euclidean space. In particular, topology studies generalizations of the concepts of union, intersection, open intervals, closed intervals, limit points, and continuous functions. The material of topology is a combination of ideas from algebra, analysis and geometry. The emphasis in this course is on mathematical proofs and generalizations. Introduction to topology will be of interest primarily to mathematical students. Syllabus: Definition of a topological space, examples, continuous functions. Connected spaces and compact spaces. Topology of the real line and Euclidean space. Countability of topological spaces and separation axioms.

Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination (2 hours) 60%  
Examination: In-class Tests/Assignments 40%

**MATH3190 – MATRIX ANALYSIS (4 Credits)**

**Pre-requisite:** MATH2110 Linear Algebra  
**Objective:** This course is designed to expose the student to a number of general results on matrices and to provide techniques for solving difference equations and differential equations by formulating such equations as eigen value problems.


**Teaching:** Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 60%  
Examination: In-class Tests/Assignments 40%

**MATH3300 - MATHEMATICS RESEARCH PROJECT**  
(4 Credits)

**Pre-requisite:** Restricted to Finalists Majoring in Mathematics  
**Overview:** An opportunity for final year students in Mathematics to apply and develop their classroom knowledge in a real-world or research environment.

In consultation with and under the supervision of a Faculty member, students are expected to define, investigate and report on an applied or theoretical research topic in Mathematics. The project itself is equivalent to a single Faculty course and must therefore reach that standard in terms of content and research effort. The project should contain some originality in material and evidence of extensive reading and comprehension of the subject area. A proposal and literature review must be submitted no later than the fourth week of the Semester and a final written report must be submitted and presented orally to a panel of at least three Faculty members no later than the last week of classes in the same Semester.

N.B. Enrolment will be limited to those students who have demonstrated a sound academic background and an aptitude for research.

Method of Written Report 60%  
Examination: Oral Presentation 20%  
Proposal and Literature Review 20%

**MATH3460 – STATISTICAL THEORY II (4 Credits)**

**Pre-requisite:** MATH2140 Probability Theory and MATH2150 Mathematical Statistics  
**Syllabus:** Methods of finding estimators and their properties; Bayesian Inference; Regression Analysis; Time Series Analysis; Testing of Hypothesis; Design of Experiments; Sampling Theory.
Teaching: Three (3) lectures and one tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 60%  
Class tests/computer assignments 40%

METEOROLOGY

Through our affiliate institution, the Caribbean Institute for Meteorology & Hydrology, a Major and Minor in Meteorology are offered.

MAJOR IN METEOROLOGY:

LEVEL I

METE1000  Introduction to Physical Meteorology & Weather Observations
METE1100  Introduction to Dynamic Meteorology & Weather Systems
METE1200  Oceans & Climate
MATH1120  Calculus I
MATH1130  Calculus II

LEVEL II

METE2000  Physical Meteorology I
METE2001  Physical Meteorology II
METE2100  Dynamic Meteorology I
METE2200  Synoptic Meteorology I

LEVEL III

METE3100  Dynamic Meteorology II
METE3200  Synoptic Meteorology II
METE3300  Tropical Meteorology

AND Four (4) Credits from:

METE2300  Hydrometeorology
METE3400  Weather Radar and Satellites
METE3500  Bioclimatology
MINOR IN METEOROLOGY [Sixteen (16) Credits]:
METE2100  Dynamic Meteorology I
METE2200  Synoptic Meteorology I
AND Four (4) Credits from:
METE2000  Physical Meteorology I
METE2001  Physical Meteorology II
AND Four (4) Credits from:
METE3100  Dynamic Meteorology II
METE3200  Synoptic Meteorology II
METE3300  Tropical Meteorology

LEVEL I METEOROLOGY COURSES

METE1000 - INTRODUCTION TO PHYSICAL METEOROLOGY & WEATHER OBSERVATIONS (4 Credits)
Pre-requisites:  CAPE Pure Mathematics Units 1 & 2 (or equivalent) & CAPE Physics Unit 1 (or equivalent).
Teaching:  Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.
Method of Examination:  Final Theory Examination (2 hours) 70%
Examination:  In-course Tests/Assignments 30%

METE1100 - INTRODUCTION TO DYNAMIC METEOROLOGY & WEATHER SYSTEMS (4 Credits)
Pre-requisites:  CAPE Pure Mathematics Units 1 & 2 (or equivalent) & CAPE Physics Unit 1 (or equivalent).
Syllabus:  Air pressure and winds. Wind: small-scale and local systems. Wind: global systems. Air masses and fronts. Middle-latitude cyclones. Thunderstorms and tornadoes. Tropical weather systems. Laboratory classes will include basic scalar analysis, computation exercises of geostrophic gradients and thermal winds, frontal analysis utilizing surface and upper air charts.
Teaching:  Two (2) lectures, one (1) tutorial and three (3) hours of practical per week.
Method of Examination:  Final Theory Examination (2 hours) 60%
Examination:  In-course Tests/Assignments 40%

METE1200 – OCEANS AND CLIMATE (4 Credits)
Pre-requisites:  None.
Restriction:  Not to be taken with ERSC1002 Oceans & Climate.
The biosphere – hydrosphere interaction. Classification of oceans and seas. Topography of ocean floor. Chemistry of the ocean: temperature, salinity and density. The circulations of the oceans: wind driven and thermohaline circulation. Ocean and atmospheric interactions: tropical cyclones, monsoon circulation, upwelling, ENSO. Waves and tides. Drivers of natural climate variability and anthropogenic climate change. Laboratory classes will involve basic analysis of earth science datasets by hand, and using the Grid Analysis and Display System (GrADS), a computer based application for manipulation and visualization of earth science datasets.

Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%

LEVEL II METEOROLOGY COURSES

METE2000 - PHYSICAL METEOROLOGY I (4 Credits)

Pre-requisites: (METE1000 Introduction to Physical Meteorology and Weather Observations, METE1100 Introduction to Dynamic Meteorology and Weather Systems and METE1200 Oceans and Climate) OR (METE1010 Introduction to Meteorology I & METE1011 Introduction to Meteorology II), and MATH1120 Calculus I & MATH1130 Calculus II.

Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 30%

**METE2001 - PHYSICAL METEOROLOGY II (4 Credits)**

Pre-requisites: (METE1000 Introduction to Physical Meteorology and Weather Observations, METE1100 Introduction to Dynamic Meteorology and Weather Systems and METE1200 Oceans and Climate) OR (METE1010 Introduction to Meteorology I & METE1011 Introduction to Meteorology II), and MATH1120 Calculus I & MATH1130 Calculus II.


Teaching: Three (3) lectures and one (1) tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 30%

**METE2100 - DYNAMIC METEOROLOGY I (4 Credits)**

Pre-requisites: (METE1000 Introduction to Physical Meteorology and Weather Observations, METE1100 Introduction to Dynamic Meteorology and Weather Systems and METE1200 Oceans and Climate) OR (METE1010 Introduction to Meteorology I & METE1011 Introduction to Meteorology II), and MATH1120 Calculus I & MATH1130 Calculus II.

Teaching: Two (2) lectures and four (4) hours of practical per week.

Method of Examination: Final Theory Examination (2 hours) 60%  
In-course Tests/Assignments 40%

METE2300 – HYDRO-METEOROLOGY (4 Credits)

Pre-requisites: MATH1120 Calculus I & MATH1130 Calculus II.


Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

Method of Examination: Final Theory Examination (2 hours) 60%  
In-course Tests/Assignments 40%

METE2950 - METEOROLOGY ELECTIVE (4 credits)

Pre-requisites: None

Syllabus: An advanced course in Meteorology taken as an exchange student at an approved institution and pre-approved by the Dean.

LEVEL III METEOROLOGY COURSES

METE3100 - DYNAMIC METEOROLOGY II (4 Credits)

Pre-requisites: METE2100 Dynamic Meteorology I & METE2200 Synoptic Meteorology I

Syllabus: The dynamics of developing synoptic scale systems in mid-latitudes. The theory and behaviour of pure wave motions in the atmosphere. Introduction to numerical weather prediction; barotropic and filtered baroclinic models; primitive equation models. The physical basis of baroclinic instability and cyclogenesis. The energy cycle and momentum budget of the atmosphere.

Teaching: Three (3) lectures and one (1) tutorial per week.

Method of Examination: Final Theory Examination (2 hours) 70%  
In-course Tests/Assignments 30%

METE3200 - SYNOPTIC METEOROLOGY II (4 Credits)

Pre-requisites: METE2100 Dynamic Meteorology I and METE2200 Synoptic Meteorology I

Syllabus: The Polar front jet stream - structure and characteristics and its role in mid-latitude development. The pressure tendency
equation and its applications. Four-dimensional analysis of mid-latitude synoptic systems; use of thickness maps, sounding and cross-sections. Theories of mid-latitude cyclone development; Characteristic and formation of cut-off cyclones, upper level anticyclones, and blocking systems; Development theories associated with polar lows and dry lines; Familiarization with and use of numerical products and satellite and radar data in analysis and forecasting.

Teaching: Two (2) lectures and four (4) hours of practical per week.

Method of Examination: Final Theory Examination (2 hours) 60%  
Examination: In-course Tests/Assignments 40%

**METE3400 - WEATHER RADARS AND SATELLITES**  
*(4 Credits)*

Pre-requisites: METE2000 Physical Meteorology I, METE2001 Physical Meteorology II and METE2200 Synoptic Meteorology I


Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

Method of Examination: Final Theory Examination (2 hours) 60%  
Examination: In-course Tests/Assignments 40%
METE3500 - BIOCLIMATOLOGY (4 Credits)

Pre-requisites: 28 FPAS Level II/III credits and either METE1200 Oceans & Climate or BIOL1051 Biodiversity I.


Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

Method of Examination: Final Theory Examination (2hours) 60%
In-course Tests 10%
Essay Assignments/Computer Exercises 30%

PHYSICS

The Department of Computer Science, Mathematics & Physics offers a Major and Minor in Physics.

MAJOR IN PHYSICS:

LEVEL I
PHYS1100 Mechanics
PHYS1101 Electricity and Magnetism
PHYS1102 Optics, Thermodynamics & Modern Physics
MATH1120 Calculus I

LEVEL II
PHYS2100 Mathematical Methods in Physics
PHYS2101 Quantum Mechanics & Special Relativity
PHYS2103 Classical Mechanics
PHYS2106 Advanced Physics/Technology Laboratory I
PHYS2107 Advanced Physics/Technology Laboratory II

LEVEL III
PHYS3100 Quantum Mechanics
PHYS3101 Electrodynamics
PHYS3105 Statistical Mechanics

AND Four (4) Credits From:
ELET2100 Microprocessors I
ELET2110 Circuit Simulation
ELET2120 Discrete Device Electronics
ELET2130 Digital Communications I
PHYS2102 Solid State Physics
PHYS2104 Neural Networks
PHYS2105 Computational Physics I
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**MINOR IN PHYSICS (Sixteen (16) Credits):**

**At Least Eight (8) Credits From:**

- PHYS2100 Mathematical Methods in Physics
- PHYS2101 Quantum Mechanics & Special Relativity
- PHYS2103 Classical Mechanics
- PHYS2106* Advanced Physics/Technology Laboratory I
- PHYS2107* Advanced Physics/Technology Laboratory II
- PHYS3100 Quantum Mechanics
- PHYS3101 Electrodynamics
- PHYS3105 Statistical Mechanics

**AND At Most Eight (8) Credits From:**

- PHYS2100 Mathematical Methods in Physics
- PHYS2101 Quantum Mechanics & Special Relativity
- PHYS2102 Solid State Physics
- PHYS2103 Classical Mechanics
- PHYS2104 Neural Networks
- PHYS2105 Computational Physics I
- PHYS2106 Advanced Physics/Technology Laboratory I

* Students should note that PHYS2106 and PHYS2107 are Practical Courses that are worth Two (2) Credits each.

**PRELIMINARY PHYSICS COURSES**

**PHYS0070 – PRELIMINARY PHYSICS I (6 P-Credits)**

**Pre-requisite:** None

**Objectives:** An introduction to Mechanics, Heat and Sound.

**Syllabus:** SI system and standard units, dimensional analysis, vectors (graphical and analytical) Equilibrium, Newton's first law, third law, friction, motion in a straight line, average and instantaneous velocity & acceleration, accelerated motion, free fall, relative velocity Motion in a plane, projectiles, circular motion, centripetal force, Newton's second law & applications. Gravitation, mass and weight, satellite motion. Work & kinetic energy, gravitational & elastic potential
energy, dissipative and conservative forces, power, simple machines moments & torque, couples. Stress, strain, elastic moduli, force constant, Hooke's law, simple harmonic motion (basic concepts), SHM & circular motion, mass-spring system, simple pendulum, pressure in a fluid, pressure gauges, Archimedes principle, surface tension, pressure difference across surface film, contact angle and capillaries, Bernoulli's equation (applications), viscosity, Stoke's law, Reynolds's number. The temperature concept, thermometers, scales, thermal expansion and stress. Heat capacity, phase changes, conduction, convection, radiation, Stefan-Boltzman law, ideal radiator, solar energy, ideal gas, equation of state, phase diagrams, triple and critical points, vapour pressure, effect of dissolved substances on freezing and boiling point, first law of thermodynamics, energy and work, work and heat, adiabatic, isochoric, isothermal and isobaric processes, internal energy, molecular theory of motion, kinetic theory of ideal gas. Mechanical waves, periodic waves, wave speed, travelling waves, mathematical representation, waves at boundaries, standing waves, interference of sound waves, beats, sound intensity, the decibel, the ear & hearing, quality and pitch, Doppler effect, ultrasonics and applications.

Teaching: Three (3) lectures, one tutorial and three (3) hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 70%
In-course Tests/Assignments 20%
Practical Reports 10%

PHYS0071– PRELIMINARY PHYSICS II (6 P-Credits)

Pre-requisite: None

Objectives: An introduction to Electricity, Magnetism, Optics, & Modern Physics.


Teaching: Three (3) lectures, one tutorial and three hours of practical per week.

Method of Examination: Final Theory Examination (3 hours) 70%
In-course Tests/Assignments 20%
Practical Reports 10%

LEVEL I PHYSICS COURSES

PHYS1100 – MECHANICS (4 Credits)

Pre-requisite: CAPE Physics Unit 1 or CAPE Pure Mathematics Units 1 & 2.

Objectives: Fundamentals of classical particles and wave mechanics.


PHYS1101 – ELECTRICITY & MAGNETISM (4 Credits)

Pre-requisite: CAPE Physics Unit 1 or CAPE Pure Mathematics Units 1 & 2.

Objectives: Fundamentals of electricity and magnetism.

Syllabus: Electric charge, Coulomb's law, electric field - E. Charge and dipole in an electric Field Motion of charged particles in uniform and non-uniform electric fields. Calculation of E for point charges and charge distributions. Electric flux, Gauss' law. Calculation of E for symmetrical charge distributions using Gauss's law. Electric potential, potential difference, work, potential energy, calculation of potential for point charges and charge distributions.
Capacitance, RC circuits. Magnetic fields, force on charges and currents in a magnetic field, Hall effect, motion of charged particles in uniform and non-uniform magnetic fields, Ampere's law, Calculation of magnetic field B for simple field configurations, Biot and Savart law, induced EMF: Lenz's law, time varying magnetic field and relative motion inductance, LR circuits. Displacement current and Maxwell's equations. EM waves, E & B fields, energy density and energy flow in EM radiation.

Teaching: Two (2) lectures, one tutorial and three (3) hours of practical per week.

Method of Examination:
- Final Theory Examination (2 hours) 70%
- In-class Tests/Assignments 20%
- Practical Reports 10%

PHYS1102 – OPTICS, THERMODYNAMICS & MODERN PHYSICS (4 Credits)

Pre-requisite: CAPE Physics Unit 1 or CAPE Pure Mathematics Units 1 & 2.


Teaching: Two (2) lectures and three (3) hours of practical every other week.

Method of Examination:
- Final Theory Examination (2 hours) 70%
- In-class Tests/Assignments 20%
- Practical Reports 10%

LEVEL II PHYSICS COURSES

PHYS2100 - MATHEMATICAL METHODS IN PHYSICS (4 credits)

Prerequisites: MATH 1120 Calculus I

Objectives: Development of Mathematical Techniques for Physics.
PHYS2101 – QUANTUM MECHANICS & SPECIAL
RELATIVITY (4 Credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1102 Optics,
Thermodynamics & Modern Physics, and
MATH1120 Calculus I

Objectives: Wave mechanical approach to quantum
mechanics: introduction to relativity.

Syllabus: Superposition of states, Wave mechanics,
Matrix mechanics, Uncertainty relations,
Complementarity, Wave-particle duality,
Wave equation, Wave packets. Group
velocity, Momentum and position operators,
operators. Measurement, expectation values,
TISE, Free particle, I-D potentials – square
well, Finite square well, Step potential,
barrier penetration, Numerical solution
of the S.E, Ether hypothesis, Einstein's

Teaching: Three (3) lectures and one tutorial
per week.

Method of Final Theory Examination (2 hours) 80%
Examination: In-class Tests/Assignments 20%

PHYS2103 – CLASSICAL MECHANICS (4 Credits)

Pre-requisite: PHYS1100 Mechanics & MATH1120
Calculus I

Objectives: Rigorous theory of classical mechanics with
vector calculus.

Syllabus: Full treatment of classical harmonic oscillator:
damped and forced oscillations, jerk, coupled
oscillators - normal modes (secular equation,
normal frequencies, normal coordinates),
simulation of 1-D crystal as linear array of
coupled oscillators. General wave equation,
phase and group velocity. Mechanics of
continuous media: waves on a string, surface
waves, sound waves, boundary effects.
Fluids: statics, kinematics and dynamics
of steady flow. Lagrange and Hamiltonian
equations of motion. Non inertial frames of
reference: accelerated and rotating, Coriolis
effect. Rotation of a rigid body: Euler
equations of motion. Dynamics of a particle
in a central field of force, scattering.

Teaching: Three (3) lectures and one tutorial
per week.
PHYS2105 – COMPUTATIONAL PHYSICS I (4 Credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and MATH1120 Calculus I

Objectives: Practical introduction to numerical analysis and computer simulation.


Teaching: Two (2) lectures and four (4) hours of laboratory per week.

Method of Final Theory Examination (2 hours) 80%
Examination: In-class Tests/Assignments 20%

PHYS2106 – ADVANCED PHYSICS / TECHNOLOGY LABORATORY I (2 credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and PHYS1102 Optics, Thermodynamics & Modern Physics

PHYS2107 – ADVANCED PHYSICS / TECHNOLOGY LABORATORY II (2 credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and PHYS1102 Optics, Thermodynamics & Modern Physics

Objectives: Upon successful completion of the course the student should have gained working experience in the essentials of experimental work, including:

• Collection of Data
• Troubleshooting Apparatus
• Application of Theory to Practical Problems
• Error Analysis
• Researching Background for Experiments
• Writing Proper Laboratory Reports

Syllabus: A minimum of five (5) experiments will be performed, researched and written up in a report format specified by the lecturer. Students will not be allowed to repeat experiments carried out in PHYS2107. At least two (2) experiments will be chosen from each of the following two (2) categories:

(i) Classical Physics Experiments
(ii) Experiments in New Technology.

Teaching: Four hours of laboratory per week.

Method of Written Laboratory Reports (5) 80%
Examination: Oral Examination 20%
• Collection of Data
• Troubleshooting Apparatus
• Application of Theory to Practical Problems
• Error Analysis
• Researching Background for Experiments
• Writing Proper Laboratory Reports

Syllabus:
A minimum of five (5) experiments will be performed, researched and written up in a report format specified by the lecturer. Students will not be allowed to repeat experiments carried out in PHYS2106. At least two (2) experiments will be chosen from each of the following two (2) categories:

(i) Classical Physics Experiments
(ii) Experiments in New Technology.

Teaching:
Four hours of laboratory per week.

Method of
Written Laboratory Reports (5)  80%
Examination: Oral Examination  20%

PHYS2950 - PHYSICS ELECTIVE (4 credits)

Pre-requisites: None

Syllabus:
An advanced course in Physics taken as an exchange student at an approved institution and pre-approved by the Dean.

Teaching:
Three (3) lectures and one tutorial per week

Method of
Final Theory Examination (2 hours)  80%
Examination: In-class Tests/Assignments  20%

LEVEL III PHYSICS COURSES

PHYS3100 – QUANTUM MECHANICS (4 Credits)

Pre-requisite: PHYS2101 Quantum Mechanics & Special Relativity

Objectives: An advanced study of quantum mechanics and applications.

PHYS3101 – ELECTRODYNAMICS (4 Credits)

Pre-requisite: PHYS1102 Optics, Thermodynamics & Modern Physics and PHYS2101 Quantum Mechanics & Special Relativity

Objectives: The theory of electromagnetism and applications.
PHYS3102 – OPTICS & LASERS (4 Credits)

Pre-requisite: PHYS2101 Quantum Mechanics & Special Relativity

Objectives: An advanced study of optics and modern applications.


Teaching: Three (3) lectures and one tutorial per week.

Method of Final Theory Examination (2 hours) 80%
Examination: In-class Tests/Assignments 20%

PHYS3105 – STATISTICAL MECHANICS (4 Credits)

Pre-requisite: PHYS2101 Quantum Mechanics & Special Relativity

Objectives: An advanced study of statistical physics and applications.


Teaching: Three (3) lectures and one tutorial per week

Method of Final Theory Examination (2 hours) 80%
Examination: In-class Tests/Assignments 20%

PHYS3106 - PHYSICS RESEARCH PROJECT (4 Credit)

Pre-requisite: Restricted to Final Year students, Majoring in Physics.

Objective: Application of classroom knowledge in a real world or research environment.

Syllabus: In consultation with and under the supervision of a Faculty member, students are expected to define, investigate and report on an applied or theoretical research topic.
in Physics. The project itself is equivalent to a single Faculty course and must therefore reach that standard in terms of content and research effort. The project should contain some originality in material and evidence of extensive reading and comprehension of the subject area. A proposal and literature review must be submitted no later than the fourth week of Semester II and a final written report must be submitted and presented orally to a panel of at least three Faculty members no later than the last week of classes in Semester II.

N.B. Enrolment will be limited to those students who have demonstrated a sound academic background and an aptitude for research.

**Method of Final Written Project Report** 80%

**Examination:**  Oral Presentation 20%

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**PHYS3107 - FUNDAMENTALS OF PHOTOVOLTAIC PHYSICS**

**Pre-requisites:** PHYS1101 Electricity & Magnetism & MATH1120 Calculus I

**Syllabus:** Group III-V semiconductors, p-n junctions, and wide-band-gap metal-oxide semiconductors with good optical properties. Fundamentals of photoelectric conversion, i.e. charge photoexcitation and separation, charge conduction and transport (diffusion and drift), and charge collection. First, second, and third generation photovoltaic technologies. Characterization of photovoltaic cells: open-circuit photovoltage, short-circuit photocurrent, fill factor, photoconversion efficiency, charge recombination, and charge trapping and detrapping are discussed. Photovoltaic cells manufacturing, systems, reliability, life-cycle analysis, and risk analysis. The economics of photovoltaic technology evolution in the context of markets, policies, society, and environment.

**Teaching:** Two hours of lecture, one hour of tutorial and three hours of lab per week.

**Method of Final Examination (2 hours)** 50%

**Assessment:** Laboratory Work 25%

Assignments 25%
CAVE HILL RULES FOR READERS

MEMBERSHIP

1. The Library opening hours are

    Term and Mid-Year Vacation: Weekdays 9.00 a.m.
                               to 11.00 p.m.
                               Saturdays & Sundays
                               9.00 a.m. to 11.00 p.m.

    Break:                     Weekdays 9.00 a.m.
                               to 5.00 p.m.
                               Saturdays CLOSED

    Summer Vacation:           Weekdays 9.00 a.m.
                               to 9.00 p.m.
                               Saturdays 9:00 – 4:00

The Library is closed on Public and University holidays throughout the year.

2. The Library is open to all registered graduate and undergraduate students at the University and to all the academic, research, senior administrative and permanent and non-academic staff of the University.

3. Other persons over 17 years of age requesting use of the Library for reading or reference purposes may be admitted at the discretion of the Librarian. Such persons may be permitted to borrow books only in exceptional circumstances at the discretion of the Librarian, and will then be required to make a cautionary deposit of $50.00 which shall be refunded on satisfactory termination of the membership.

LOANS

General

4. Borrowers will be required to identify themselves. No book, periodical or other Library material may be removed from the Library unless the procedure has been completed at the Circulation Desk. The possession of a library book which has not been properly issued will be treated as a deliberate and serious offence. A reader is responsible to the Library for the items for which he or she has signed. No book, periodical, etc., will be accepted for issue or renewal after the second bell has been rung 15 minutes before closing time. All transactions must be completed fifteen minutes before the published closing time.

Undergraduate

5. Undergraduate students at the University may have on loan a maximum of 10 items, including no more than two items from the overnight collection. For items from the open access shelves the period of loan is normally 21 days but all books are subject to recall at any time during this period. The period of loan may be extended in vacations at the discretion of the Librarian. Undergraduates may not borrow periodicals.

Postgraduates

6. Postgraduate students of the University may have on loan up to 10 items at a time. This quota includes not more than two (2) bound periodicals and not more than two (2) items from the overnight collection. The period of loan is normally 10 weeks. All loans are subject to recall by the Librarian at any time.
Academic and Senior Administrative Staff

7. Academic and senior administrative staff may have on loan up to 15 items at a time. This includes not more than two (2) bound volumes of periodicals and two (2) overnight loans. The period of loan is normally 10 weeks. All books are subject to recall by the Librarian at any time.

Non-Academic Staff

8. Permanent non-academic staff may have on loan up to four (4) books at a time for up to 21 days. They may not borrow overnight books or periodicals.

Other Persons

9. Other persons permitted to borrow books under Rule 3 may have on loan up to four (4) books at a time for up to 21 days.

Departments

10. The Librarian, at his discretion, may lend books to departments/units of the University for such periods as he may decide. Heads of departments/units are responsible for such loans.

Renewals and Requests

11. A book loaned to an undergraduate student may be renewed once only for a further period if it has not already been requested by another reader.

12. A book requested by another reader will be recalled only after it has been on loan for 10 days.

Non-Circulating Items

13. Certain publications may on no account be removed from the Library. These include all reference books, current issues of periodicals and other works of special value. All non-circulating items are clearly marked.

Reserved Books

14. Reserved books may only be borrowed overnight or on weekends. Only two (2) such items may be borrowed at any one time, the loan begins after 5.00 p.m. on weekdays, 11.00 a.m. on Saturdays, and 3.00 p.m. in the summer vacation, and must be returned by 10.00 a.m. or 5.00 p.m. as indicated by the date due stamp.

Reading Room Loans

15. Only two (2) items may be borrowed for use in the Reading Room at any one time.

Periodicals

16. Periodicals will normally be restricted to Reading Room use, but Graduate Students and members of the Academic and Senior Administrative Staff may borrow bound volumes only – to a maximum of two (2) such items – for a period of 14 days. These loans are not normally renewable.

FINES

17.(a) The Librarian is empowered to levy a fine upon all readers who fail to return Library material within the prescribed period.
(b) The fine for late return of library material borrowed from the general collection by academic staff will be 50 cents for each day the loan is overdue.

(c) The fine for late return of library material borrowed from the general collection by postgraduate students will be 50 cents for each day the loan is overdue.

(d) The fine for the late return of library material from the general collection by other borrowers will be 25 cents for each day the loan is overdue.

(e) In determining the number of days by which a loan is overdue in relation to clauses (b), (c) and (d) above, only days in which the Library was closed owing to unforeseen circumstances will be excluded.

(f) The fine for late return of an item from the overnight collection will be charged at 10 cents per hour.

**Maximum Fine**

18. The maximum fine for the late return of Library material shall not exceed Bds. $50.00 in the case of academic staff borrowers, Bds $50.00 in the case of postgraduate student borrowers, and Bds $30.00 in the case of other borrowers.

19. Loss of or damage to any library material on loan to a reader must be reported by him/her immediately. The reader must pay the cost of replacement (or the estimated market price of the book if irreparable) of lost or seriously damaged books or other items in addition to any fine which he/she may have incurred before the loss or damage was reported.

20. The names of all those who are not in good standing with the Library – that is, those who, after due notice, have failed to return overdue items or who fail to pay fines or costs of items lost or damaged – will be submitted to the Principal for further action.

**THEFT AND MUTILATION**

21. The wilful mutilation or defacement of library material, the attempt at, or illegal removal of library material, the attempt to obtain library materials or to gain access to library facilities by false pretences or forgery, will be considered a major offence against the University, and any person who commits such an offence may be reported to the appropriate University authority for disciplinary action which may include a maximum penalty fine of Bds $300.00, suspension or expulsion.

**CONDUCT**

22. The Reading Rooms are for the purpose of study and not for discussions or social gatherings. Any conduct inconsistent with this purpose or detrimental to its pursuit by others shall constitute a breach of the Rules.

23. The Librarian shall at all times have authority to maintain good order in the Library and may exclude from it or suspend form its use any reader who breaks these Rules. He/she may report to the Principal any person responsible for serious or persistent breach f these Rules; such conduct by any student shall be considered a breach of University discipline.

24. Readers must not mark, deface or damage any book or other library material or furnishings in any way.

25. All members of staff are empowered to require readers to comply with these Rules.
26. Silence shall be observed in the Reading Rooms.

27. All bags, briefcases, handbags, etc., must be deposited in the racks provided at the Library entrance. The University accepts no responsibility for loss or damage of any article so left.

28. Eating or drinking is strictly forbidden in the Library.

29. Smoking is strictly forbidden except in those parts of the Library where it is expressly permitted.

30. Except as provided for in Rule 20 above, any breach of these Rules or of the Regulations by a reader may render him/her liable to a fine not exceeding Bds $20.00 at the discretion of the Librarian.
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