THE UNIVERSITY OF THE WEST INDIES
CAVE HILL CAMPUS, BARBADOS

THE FACULTY OF
PURE & APPLIED
SCIENCES

PROGRAMMES & COURSES
HANDBOOK

2011-2012
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) and the Open Campus.

This Guide is intended for students entering the Faculty of Pure and Applied Sciences from academic year 2011 – 2012. Continuing students must refer to 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 Ph.D. 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 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: 2011-2012

### Semester 1

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment of Fees</td>
<td>by Sunday August 28, 2011</td>
</tr>
<tr>
<td>Registration Period</td>
<td>August 29 – September 02, 2011</td>
</tr>
<tr>
<td>Semester Begins</td>
<td>Sunday August 28, 2011</td>
</tr>
<tr>
<td>Teaching Begins</td>
<td>Monday September 05, 2011</td>
</tr>
<tr>
<td>Application for Leave of Absence</td>
<td>by Friday September 16, 2011</td>
</tr>
<tr>
<td>Change in Registration (Add/Drop)</td>
<td>by Friday September 16, 2011</td>
</tr>
<tr>
<td>Teaching Ends</td>
<td>Friday December 02, 2011</td>
</tr>
<tr>
<td>Examinations Begin</td>
<td>Monday December 05, 2011</td>
</tr>
<tr>
<td>Examinations Ends</td>
<td>Wednesday December 21, 2011</td>
</tr>
<tr>
<td>Semester Ends</td>
<td>Wednesday December 21, 2011</td>
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### Semester 2

<table>
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<td>Payment of Fees</td>
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<td>Semester Begins</td>
<td>Sunday January 22, 2012</td>
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<tr>
<td>Teaching Begins</td>
<td>Monday January 23, 2012</td>
</tr>
<tr>
<td>Application for Leave of Absence</td>
<td>by Friday February 10, 2012</td>
</tr>
<tr>
<td>Change in Registration (Add/Drop)</td>
<td>by Friday February 10, 2012</td>
</tr>
<tr>
<td>Teaching Ends</td>
<td>Friday April 20, 2012</td>
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<tr>
<td>Semester Break</td>
<td>April 23 - April 27, 2012</td>
</tr>
<tr>
<td>Examinations Begin</td>
<td>Friday April 20, 2012</td>
</tr>
<tr>
<td>Examinations Ends</td>
<td>Friday May 18, 2012</td>
</tr>
<tr>
<td>Semester Ends</td>
<td>Friday May 18, 2012</td>
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### Graduation

<table>
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<tr>
<th>Location</th>
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<tr>
<td>Cave Hill</td>
<td>October 22, 2011</td>
</tr>
<tr>
<td>St. Augustine</td>
<td>October 27-29, 2011</td>
</tr>
<tr>
<td>Mona</td>
<td>November 4-5, 2011</td>
</tr>
<tr>
<td>Open Campus</td>
<td>October 15, 2011</td>
</tr>
</tbody>
</table>
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 IV

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).

<table>
<thead>
<tr>
<th>LABORATORY COURSES (WEEKLY HOURS)</th>
<th>NON-LABORATORY COURSES (WEEKLY HOURS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECTURE</td>
<td>TUTORIAL</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>PART I</td>
<td></td>
</tr>
<tr>
<td>PRELIM</td>
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<tr>
<td>LEVEL 1</td>
<td>3</td>
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<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>PART II</td>
<td></td>
</tr>
<tr>
<td>LEVELS</td>
<td>2</td>
</tr>
<tr>
<td>2 &amp; 3</td>
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</tr>
<tr>
<td></td>
<td>2</td>
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</table>

APPENDIX V

GRADING SYSTEM

Table 1: Mark-to-Grade Conversion & Quality Points (GPA SYSTEM)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark (%)</th>
<th>QP</th>
<th>Grade</th>
<th>Mark (%)</th>
<th>QP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>86 – 100</td>
<td>4.3</td>
<td>C+</td>
<td>53 – 56</td>
<td>2.3</td>
</tr>
<tr>
<td>A</td>
<td>70 – 85</td>
<td>4.0</td>
<td>C</td>
<td>50 – 52</td>
<td>2.0</td>
</tr>
<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>
<td>1.3</td>
</tr>
<tr>
<td>B</td>
<td>60 – 62</td>
<td>3.0</td>
<td>D</td>
<td>40 – 42</td>
<td>1.0</td>
</tr>
<tr>
<td>B–</td>
<td>57 – 59</td>
<td>2.7</td>
<td>F</td>
<td>0 – 39</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: GPA to Honours Conversion

<table>
<thead>
<tr>
<th>Class of Honours</th>
<th>Cumulative GPA</th>
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<tbody>
<tr>
<td>First</td>
<td>3.60 and above</td>
</tr>
<tr>
<td>Upper Second</td>
<td>3.00 – 3.59</td>
</tr>
<tr>
<td>Lower Second</td>
<td>2.00 – 2.99</td>
</tr>
<tr>
<td>Pass</td>
<td>1.00 – 1.99</td>
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</tbody>
</table>
APPENDIX VI

OPTIONS IN CONJUNCTION WITH OTHER FACULTIES

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 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>COMP1105</td>
<td>Computer Programming I</td>
</tr>
<tr>
<td>COMP1115</td>
<td>Computer Programming II</td>
</tr>
<tr>
<td>MATH1101</td>
<td>Basic Mathematics I</td>
</tr>
<tr>
<td>MATH1110</td>
<td>Applied Statistics</td>
</tr>
<tr>
<td>ACCT1002</td>
<td>Introduction to Financial Accounting</td>
</tr>
<tr>
<td>ACCT1003</td>
<td>Cost and Management Accounting I</td>
</tr>
<tr>
<td>ECON1001</td>
<td>Introduction to Microeconomics</td>
</tr>
<tr>
<td>ECON1002</td>
<td>Introduction to Macroeconomics</td>
</tr>
<tr>
<td>MGMT1001</td>
<td>Principles of Management</td>
</tr>
</tbody>
</table>

AND

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELET1110</td>
<td>Digital Electronics</td>
</tr>
</tbody>
</table>

OR

FOUR (4) Level I Credits from any Faculty

AND

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>FOUN1001</td>
<td>English For Academic Purposes</td>
</tr>
</tbody>
</table>

OR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>FOUN1008</td>
<td>Rhetoric II: Writing for Special Purposes</td>
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</tbody>
</table>

LEVEL II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>COMP2105</td>
<td>Discrete Mathematics</td>
</tr>
<tr>
<td>COMP2115</td>
<td>Information Structures</td>
</tr>
<tr>
<td>COMP2125</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>COMP2145</td>
<td>Software Engineering I</td>
</tr>
<tr>
<td>ACCT2014</td>
<td>Financial Accounting I</td>
</tr>
<tr>
<td>ACCT2015</td>
<td>Financial Accounting II</td>
</tr>
<tr>
<td>MGMT2023</td>
<td>Financial Management</td>
</tr>
<tr>
<td>FOUN1101</td>
<td>Caribbean Civilization</td>
</tr>
</tbody>
</table>
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
- MATH1101 Basic Mathematics I
- 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
- COMP3180 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>FOUN 1008</td>
<td>Rhetoric II: Special Purposes</td>
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<tr>
<td>FOUN 1001</td>
<td>English for Academic Purposes</td>
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<td>AND</td>
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<tr>
<td>FOUN1101</td>
<td>Caribbean Civilization</td>
</tr>
<tr>
<td>FOUN1301</td>
<td>Law, Governance and Society</td>
</tr>
</tbody>
</table>

### COMPUTER SCIENCE AND ECONOMICS

#### LEVEL I
- COMP1105 Computer Programming I
- COMP1115 Computer Programming II
- MATH1101 Basic Mathematics I
- MATH1110 Applied Statistics
- ECON1001 Introduction to Microeconomics
- ECON1002 Introduction 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*

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>FOUN 1008</td>
<td>Rhetoric II: Special Purposes</td>
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<td>OR</td>
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<tr>
<td>FOUN 1001</td>
<td>English for Acad. Purposes</td>
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<tr>
<td>AND</td>
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</tr>
<tr>
<td>FOUN 1101</td>
<td>Caribbean Civilisation</td>
</tr>
<tr>
<td>FOUN 1301</td>
<td>Law, Governance and Society</td>
</tr>
</tbody>
</table>
COMPUTER SCIENCE WITH ECONOMICS

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1101  Basic Mathematics I
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

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 AND MANAGEMENT

LEVEL I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
MATH1101  Basic Mathematics I
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

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
<table>
<thead>
<tr>
<th><strong>LEVEL III</strong></th>
<th><strong>INFORMATION TECHNOLOGY AND ACCOUNTING</strong></th>
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<tbody>
<tr>
<td>COMP3100</td>
<td>Operating Systems</td>
</tr>
<tr>
<td>COMP3180</td>
<td>Algorithm Design and Analysis</td>
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<td>MGMT3017</td>
<td>Human Resources Management</td>
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<tr>
<td>FOUN1301</td>
<td>Law, Governance and Society</td>
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<tr>
<td></td>
<td><strong>AND</strong></td>
</tr>
<tr>
<td></td>
<td><em>One Level III COMP course</em></td>
</tr>
<tr>
<td></td>
<td><em>One Level II/III COMP course</em></td>
</tr>
<tr>
<td></td>
<td><strong>AND</strong></td>
</tr>
<tr>
<td></td>
<td>Fourteen (14) Level II/III credits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>LEVEL I</strong></th>
<th><strong>LEVEL II</strong></th>
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<tbody>
<tr>
<td>COMP1105</td>
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<tr>
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<td>ACCT1003</td>
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<tr>
<td>ECON1001</td>
<td>Introduction to Microeconomics</td>
</tr>
<tr>
<td>ECON1002</td>
<td>Introduction to Macroeconomics</td>
</tr>
<tr>
<td>MGMT1001</td>
<td>Principles of Management</td>
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<td></td>
<td><strong>AND</strong></td>
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<tr>
<td></td>
<td>ELET1110 Digital Electronics</td>
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<td></td>
<td>FOUR (4) Level I Credits from any Faculty</td>
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<tr>
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<td><strong>OR</strong></td>
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<td></td>
<td>FOUN1008 Rhetoric II: Writing for Special Purposes</td>
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<table>
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<tr>
<th><strong>LEVEL II</strong></th>
<th><strong>AND Six (6) Credits From Accounting Electives:</strong></th>
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<tr>
<td>COMP2105</td>
<td>Discrete Mathematics</td>
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<tr>
<td>COMP2115</td>
<td>Information Structures</td>
</tr>
<tr>
<td>COMP2145</td>
<td>Software Engineering I</td>
</tr>
<tr>
<td>COMP2160</td>
<td>Object-Oriented Programming</td>
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<tr>
<td>ACCT2014</td>
<td>Financial Accounting I</td>
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<td>ACCT2015</td>
<td>Financial Accounting II</td>
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<td>MGMT2023</td>
<td>Financial Management</td>
</tr>
<tr>
<td>FOUN1101</td>
<td>Caribbean Civilization</td>
</tr>
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</table>

AND

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
MATH1101  Basic Mathematics I
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
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
MATH1101  Basic Mathematics I
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
- MATH1101  Basic Mathematics I
- 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
- OR
- 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
- MATH1101  Basic Mathematics I
- 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

### LEVEL II
- COMP2105  Discrete Mathematics
- COMP2115  Information Structures
- COMP2145  Software Engineering I
- COMP2160  Object-Oriented Programming
- MKTG2001  Principles of Marketing
- MKTG2006  Management Information Systems I
- MKTG2008  Organisational Behaviour
- MGMT2020  Managerial Economics
- MGMT2023  Financial Management
- MGMT2026  Production & Operations Management
- AND
- FOUN1001  English for Academic Purposes
- OR
- FOUN1008  Rhetoric II: Writing for Special Purposes

### 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
- OR
- FOUN 1001  English for Acad. Purposes
- AND
- FOUN 1101  Caribbean Civilisation
- FOUN1301  Law, Governance and Society
LEVEL III
- COMP3160 Database Management Systems
- 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
- MATH1101 Basic Mathematics I
- 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
ACCT1002  Introduction to Financial Accounting
ACCT1003  Cost & Mangt. Accounting I
ECON1001  Introduction to Microeconomics
ECON1002  Introduction to Macroeconomics
MGMT1001  Principles of Management
MATH1100  Basic Mathematics
MATH1110  Applied Statistics
MATH1120  Calculus I
MATH1130  Calculus II
COMP1105  Computer Programming I

LEVEL II
MATH2100  Abstract Algebra
MATH2110  Linear Algebra
MATH2120  Analysis & Methods I
MATH2130  Ord. Differential Equations
ACCT2014  Financial Accounting I
ACCT2015  Financial Accounting II
MGMT2023  Financial Management

AND Six (6) Credits From:
ACCT2018  Government Accounting
MKTG2001  Principles of Marketing
MGMT2005  Microcomputer Appl. for Business
MGMT2006  Management Inform. Systems I
MGMT2008  Organisational Behaviour
MGMT2020  Managerial Economics
MGMT2021  Business Law I
### LEVEL III

**Two Level III MATH courses**

**Two Level II/III MATH courses**

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

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<td>Advanced Accounting Theory</td>
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<tr>
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<td>Adv. Financial Accounting</td>
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<tr>
<td>ACCT3044</td>
<td>Advanced Auditing</td>
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<td>Taxation and Tax Mangt.</td>
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### MATHMATICS WITH ACCOUNTING

**LEVEL I**

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<td>MGMT1001</td>
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<td>MATH1100</td>
<td>Basic Mathematics</td>
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**LEVEL II**

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<td>Analysis &amp; Methods I</td>
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<td>MATH2130</td>
<td>Ord. Differential Equations</td>
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**LEVEL III**

**Two Level III MATH courses**

**Two Level II/III MATH courses**

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**OR**

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<tr>
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**AND Fourteen (14) Level II/III credits**
**FACULTY OF PURE AND APPLIED SCIENCES**  
**UNDERGRADUATE PROGRAMMES & COURSES HANDBOOK 2011-2012**

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<tr>
<th>FOUN</th>
<th>MATHEMATICS AND ECONOMICS</th>
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<tbody>
<tr>
<td>FOUN 1008</td>
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<td><strong>OR</strong></td>
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<td><strong>Calculus II</strong></td>
</tr>
<tr>
<td>FOUN 1101</td>
<td>Caribbean Civilization</td>
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<td>FOUN1301</td>
<td>Law, Governance and Society</td>
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<tr>
<td><strong>AND Four (4) Level I Credits</strong></td>
<td><strong>Intro. to Microeconomics</strong></td>
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<td><strong>Intro. to Macroeconomics</strong></td>
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<td>Statistical Methods I</td>
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<tr>
<td><strong>Two Level III MATH courses</strong></td>
<td><strong>Two Level II/III MATH courses</strong></td>
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### 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**
- MATH1101 Basic Mathematics I
- 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
- 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 Instit. 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
SCIENCE WITH MANAGEMENT

LEVEL I

Required Level 1 Courses for Science Major plus

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<tr>
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<td>Introd. to Macroeconomics</td>
</tr>
<tr>
<td>MGMT1001</td>
<td>Principles of Management</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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And Fourteen (14) Level II/III Credits

FOUN

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<td>Caribbean Civilization</td>
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<td>FOUN1301</td>
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OR

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<tr>
<td>FOUN1301</td>
<td>Law, Governance and Society</td>
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</tbody>
</table>
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 I**

Sixteen (16) credits from Level I Science Courses plus

- PSYC1003 Introduction to Psychology
- PSYC1004 Introduction to Social Psychology
- PSYC1012 Introduction to Developmental Psychology
- PSYC1013 Introduction to Research Methods
- PSYC1015 Historical Issues in Psychology

**LEVELS II & III**

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

- PSYC2002 Abnormal Psychology
- PSYC2003 Physiological Psychology
- PSYC2004 Personality Theory I
- PSYC2014 Statistics and Research Design II
- PSYC2022 Developmental Psychology II: From Conception to Adolescence
- PSYC3017 Personality Theory II
- PSYC3030 Introduction to Clinical Psychology
- PSYC3011 Research Paper In Psychology* (6 credits)

**FOUN**

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

*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.

**SCIENCE WITH PSYCHOLOGY**

**LEVEL I**

Sixteen (16) credits from Level I Science Courses plus

- PSYC1003 Introduction to Psychology
- PSYC1004 Introduction to Social Psychology
- PSYC1013 Introduction to Research Methods

**LEVELS II & III**

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

- PSYC2003 Physiological Psychology
- PSYC2004 Personality Theory I
- PSYC2012 Developmental Psychology
- 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
- EDMA2111 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
## DEPARTMENT OF BIOLOGICAL AND CHEMICAL SCIENCES

### SEMESTER I

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### YEAR I

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MICR3252  Microbial Ecology
MICR3258  Pathogenic micro-organisms
CHEM3135  Bioinorganic Chemistry
CHEM3145  Bonding in Inorganic Chemistry
CHEM3200  Organic Chemistry II
CHEM3210  Bioorganic & Medicinal Chemistry
CHEM3500  Chemistry Project
ERSC3002  Climate Variability & Predictability

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

DEPARTMENT OF
COMPUTER SCIENCE,
MATHEMATICS AND
PHYSICS

SEMESTER I
PRELIMINARY
MATH0101  Preliminary Mathematics I
PHYS0070  Preliminary Physics I

YEAR I
COMP1105  Computer Programming I
COMP1115  Computer Programming II
COMP1125  Introduction to UNIX
ELET1110  Digital Electronics
ELET1120  Basic Electronics
MATH1101  Basic Mathematics I
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
MATH2140  Probability Theory
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**YEAR I**
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
COMP3930 Computer Science Group Research Project
ELET3041 Microcontrollers & Applications
ELET3120 Communication Circuits
ELET3151 Digital Communications II
ELET3210 Sensors & Actuator Technology
MATH3100 Multivariate Analysis
MATH3120 Numerical Analysis
MATH3150 Complex Variables I
MATH3170 Advanced Algebra
MATH3460 Statistical Theory II
PHYS3101 Electrodynamics
PHYS3105 Statistical Mechanics
PHYS3106 Physics Research Project

METEOROLOGY

SEMESTER I
METE1000 Introduction to Physical Meteorology & Weather Observations
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 and Weather Systems
METE1300 Climate Change, Education and Awareness
METE2001 Physical Meteorology II
METE2200 Synoptic Meteorology I
METE3300 Tropical Meteorology
METE3400 Weather Radars and Satellites
METE3500 Bioclimatology
**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  Bioinorganic 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  
CHEM1010  Fundamentals of Chemistry  
CHEM1020  Introductory Chemistry

**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  
BIOL2151  Genetics I  
MICR2251  General Microbiology  
OR  
BIOC2351  Biochemistry I  
BIOC2352  Biochemistry II  
OR  
ECOL2451  Population Ecology  
ECOL2452  Community Ecology
OR
BIOL2152  General Molecular Biology
BIOC2351  Biochemistry I

OR
MICR2251  General Microbiology
MICR2252  Eukaryotic Micro-organisms

AND Twelve (12) Credits from:
BIOC3053  Cell Signaling
BIOC3251  Microbial Biochemistry
BIOC3254  Biochemical Plant Pathology
BIOC3352  Biochemistry III
BIOC3354  Biochemistry of Human Disease
BIOC3950  Biochemistry Research Project
BIOL3023  Coral Reef Biology
BIOL3152  Bioinformatics
BIOL3053  Developmental Physiology
BIOL3152  Bioinformatics
ECOL3423  Coral Reef Ecology
ECOL3451  Human Ecology and Conservation
ECOL3452  Behavioural Ecology
ECOL3453  Crop Ecology
ECOL3454  Fisheries Biology
MICR3059  Immunobiology
MICR3251  Food Microbiology
MICR3252  Microbial Ecology
MICR3253  Biology of Viruses
MICR3258  Pathogenic Micro-organisms

DOUBLE MAJOR IN BIOLOGY

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

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
BIOL2058  Tropical Ornamental Plants
BIOC2351  Biochemistry I
BIOC2352  Biochemistry II
OR
ECOL2451  Population Ecology
ECOL2452  Community Ecology
OR
BIOC2351  Biochemistry I
BIOL2152  General Molecular Biology
OR
MICR2251  General Microbiology
MICR2252  Eukaryotic Micro-organisms

AND Eight (8) Credits from:
BIOC3950  Biochemistry Research Project
BIOL3950  Biology Research Project
ECOL3950  Ecology Research Project
MICR3950  Microbiology Research Project

AND Forty (40) Credits from:
BIOC2351  Biochemistry I
BIOC2352  Biochemistry II
BIOL2058  Tropical Ornamental Plants
BIOL2151  Genetics I
BIOL2152  General Molecular Biology
BIOL2950  Biology Elective
ECOL2055  Horticulture
ECOL2451  Population Ecology
ECOL2452  Community Ecology
ECOL2453  Caribbean Island Biogeography
ECOL2454  Marine Biology
MICR2251  General Microbiology
MICR2252  Eukaryotic Micro-organisms
BIOC3053  Cell Signalling
BIOC3251  Microbial Biochemistry
BIOC3254  Biochemical Plant Pathology
BIOC3352  Biochemistry III
BIOC3354  Biochemistry of Human Disease
BIOL3152  Bioinformatics
ECOL3423  Coral Reef Ecology
ECOL3451  Human Ecology and Conservation
ECOL3452  Behavioural Ecology
ECOL3453  Crop Ecology
ECOL3454  Fisheries Biology
MICR3059  Immunobiology
MICR3251  Food Microbiology
MICR3252  Microbial Ecology
MICR3253  Biology of Viruses
MICR3258  Pathogenic Micro-organisms

MINOR IN BIOLOGY [Sixteen (16) Credits]:
BIOL2053  Physiology of Plants & Animals
BIOL3053  Developmental Physiology

AND Eight (8) Credits from:
BIOC2351  Biochemistry I
BIOC2352  Biochemistry II
BIOL2058  Tropical Ornamental Plants
BIOL2151  Genetics I
BIOL2152  General Molecular Biology
BIOL2950  Biology Elective
ECOL2055  Horticulture
ECOL2451  Population Ecology

MAJOR IN ECOLOGY
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

AND
- ECOL2055 Horticulture

OR
- ECOL2454 Marine Biology

LEVEL III
- ECOL3451 Human Ecology and Conservation

AND Twelve (12) Credits from:
- ECOL3423 Coral Reef Ecology
- 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
- BIOC2351 Biochemistry I
- BIOL2151 Genetics I
- 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
All incoming students registered to take courses in the Department of Biological and Chemical Sciences must attend a safety seminar usually held during registration week. Students taking laboratory courses in this Department will only be allowed to perform experiments if dressed in an appropriate lab coat, lab goggles and enclosed shoes. Some exceptions may be made in the wearing of safety goggles for lab procedures where there is no risk of eye injury (eg. microscope use).

PRELIMINARY BIOLOGICAL COURSES

BIOL0051 - BIOLOGY I (6-P Credits)

Pre-requisite: None

Syllabus


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%

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. Humanecology - 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).


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.

Method of Final Theory Examination (2 hours) 50%
Examination: In-course test(s) 15%
Tutorial Assignments 10%
Practical reports 25%

BIOL1052 - BIODIVERSITY II (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: 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 Examination: Final Theory Examination (3 hours) 50%
Tutorial essays 10%
Practical Test(s) 15%
Practical reports 25%

LEVEL II BIOLOGICAL COURSES

BIOL1151 - INTRODUCTORY GENETICS (4 credits)

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


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

Method of Examination: Final Theory Examination (2 hours) 50%
Mid-semester test 15%
Tutorial Assignments 10%
Practical reports 25%

BIOC2351 - BIOCHEMISTRY I (4 credits)

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


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.


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

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

BIOC2352 - BIOCHEMISTRY II (4 credits)
Pre-requisite: BIOC2351 Biochemistry I

Chemical classes of hormones. Molecular aspects of hormonal signal transduction.
Integration of metabolic regulation.
Regulation of fuel metabolism.

Biochemical Methods: Molecular spectroscopic methods. Infrared, Raman, NMR, fluorescence UV-vis, circular dichroism.

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%

BIOC2950 BIOCHEMISTRY ELECTIVE (4 credits)
Pre-requisites: None

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

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


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

BIOL2058 - TROPICAL ORNAMENTAL PLANTS
(4 credits)

Pre-requisites: BIOL 1051 Biodiversity I and BL 1052 Biodiversity II
Syllabus: This course is a survey of tropical ornamental plants and their families. Students will learn the identification, horticultural classification, cultural requirements and best horticultural use of the cultivated garden flora. Cultivated, domesticated and wild plants will be compared. Morphological features necessary for plant identification will be taught.
Note: Field sessions will occur at Andromeda Botanic Gardens and other sites of horticultural interest around Barbados.
Teaching: Two lectures, one tutorial and three hours of practical per week.
Method of Examination: Theory Examination (2 hours) 33%
One Practical Examination 34%
Learning Log 33%

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 Examination: Final Theory Examination (2 hours) 50%
Practical reports 25%
In-course Test(s)/Assignment(s) 25%
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 Examination: Final Theory Examination (3 hours) 60%
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 Examination: Final Theory Examination (2 hours) 50%
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 one practical per week.

Method of Final Theory Examination (3 hours) 50%
Examination: Mid-term Test 10%
Field Notebook 40%

ECOL2453 - CARIBBEAN ISLAND BIOGEOGRAPHY (4 Credits)

Pre-requisites: BIOL1051 Biodiversity I & BIOL1052 Biodiversity II

Syllabus: Plate tectonics, island formation and Caribbean geology. Climate patterns (past and present). Equilibrium theory of island biogeography. Species turnover. 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

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

Method of Final Theory Examination (3 hours) 50%
Examination: Mid-term Test 10%
Field Notebook 40%

ECOL2454 - MARINE BIOLOGY (4 credits)


Teaching: Two lectures, one tutorial and three hours of practical per week.
Method of Final Theory Examination (3 hours) 70%
Examination: Practical Reports 20%
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.

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 Final Theory Examination (3 hours) 50%
Examination: Practical Report(s) 35%
In-course Test(s)/Assignment(s) 15%

MICR2252 – EUKARYOTIC MICROORGANISMS (4 credits)
Pre-requisite: MICR2251 General Microbiology
Teaching: Two lectures, one tutorial and three hours of practical per week.
Method of Final Theory Examination (3 hours) 50%
Examination: Practical Report(s) 35%
In-course Test(s)/Assignment(s) 15%

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 reports 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 practicals per week.

Method of Examination:
- Final Theory Examination (3 hours) 60%
- Practical reports 30%

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.

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

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

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

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

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

**Syllabus:**  Plants: Internal and external regulation of flowering plant growth and development including phytohormones.  

**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%

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**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, ECOL3950 Ecology or CHEM3505 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 Examination:**  
- Supervisor’s Assessment  15%
- Seminar  15%
- Project Report  70%
BIOL 3152 - 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%  
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, ECOL3950 Ecology or CHEM 3505 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%

ECOL3423 - CORAL REEF ECOLOGY (4 credits)  
Pre-requisites: ECOL2452 Community Ecology & ECOL2454 Marine Biology  
Syllabus: Environmental conditions required for coral reef formation, geological history of Caribbean reef formation and types of reefs. Dynamics of reef structure formation & erosion; Scleractinian coral biology, including
taxonomy, anatomy, endosymbiosis with zooxanthellae, growth (calcification & skeletal morphology), nutrition, reproduction and recruitment; Ecology of coral communities, including reef community structure, zonation and dynamics, diversity/stability relationships, keystone species, algal-herbivore and predator-prey interactions, inter-specific competition, succession, disturbance, and linked systems from mangroves to deep sea; overview of the major taxonomic groups of reef-associated organisms, including other coelenterates, poriferans, echinoderms, fishes, and algae with attention to their ecological function; value and uses of Caribbean coral reef ecosystems, including coral reef fisheries, tourism and recreation, biodiversity and marine products, and ecosystem services; The threats and future challenges to Caribbean coral reefs, including natural disturbances and anthropogenic activities. Current trends in coral reef research.

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

Method of Final Theory Examination (3 hours) 60%
Examination: Project Report/Essay 40%

ECOL3451 - HUMAN ECOLOGY AND CONSERVATION (4 credits)


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

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

ECOL3452 - BEHAVIOURAL ECOLOGY (4 credits)

Pre-requisites: ECOL2451 Population Ecology & ECOL2452 Community Ecology


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

Method of Final Theory Examination (3 hours) 70%
Examination: 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 Final Theory Examination (3 hours) 60%
Examination: Project Report 20%
Essay 20%

**ECOL3454 - FISHERIES BIOLOGY (4 credits)**


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

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

**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, BIOC3950 Biochemistry or CHEM3505 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.
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%
In-course Test(s)/Assignments 20%

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) 50%
Practical Report(s) 35%
In-course test(s)/Assignment(s) 15%

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%
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

Syllabus: The normal microbial flora of the human
body. Opportunistic infections. The
pathogenesis of infectious diseases. Special
properties of pathogenic micro-organisms.
Virulence determinants - aggressins,
impedins. Identification of pathogenic
microbes and laboratory diagnosis of
infectious diseases. Epidemiology and control
of infections. Principles of anti-microbial
chemotherapy.

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) 50%
Practical Report(s) 15%
In-course test(s)/Assignment(s) 35%

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, ECOL3950
Ecology or CHEM3505 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%
Seminars 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)
CHEM3505 Chemistry Research Project (8 credits) (with special permission)

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-two (32) credits from:
CHEM2950 Chemistry Elective
CHEM3100 Inorganic Chemistry II
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

AND Four (4) Credits From:
BIOC2351 Biochemistry I
ERSC2004 Renewable Energy Sources
All incoming students registered to take courses in the Department of Biological and Chemical Sciences must attend a safety seminar usually held during registration week. Students taking laboratory courses in this Department will only be allowed to perform experiments if dressed in an appropriate lab coat, lab goggles and enclosed shoes. Some exceptions may be made in the wearing of safety goggles for lab procedures where there is no risk of eye injury (eg. microscope use).

PRELIMINARY CHEMISTRY COURSES

CHEM0615 - PRELIMINARY CHEMISTRY I (6 Credits)

Prerequisite: None
Corequisite: CHEM0625 Preliminary Chemistry II or equivalent.
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.
Method of Examination: Final examination (three hours) 60%
In-course test(s) / assignment(s) 20%
Practicals 20%

CHEM0625 - PRELIMINARY CHEMISTRY II (6 Credits)

Prerequisite: None
Corequisite: CHEM0615 (Preliminary Chemistry I) or its equivalent.
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.
Inorganic Chemistry: Periodicity. Properties and reaction of main group elements and their compounds: hydrogen, Group 1 and 2, Al, C and Si, N and P, O and S and the halogens. First row transition metals and coordination...
complexes. Rusting. Industrial processes and environmental considerations.

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

Method of Final examination (three hours) 60%
Examination: 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. Introduction to the chemical kinetics, electrochemistry, fundamentals of 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 Final examination (three hours) 60%
Examination: 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

Teaching: Five hours of practical classes per week.
Method of Practical work 60%
Examination: 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: Three lectures and one tutorial per week.
Method of Final examination (3 hours) 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 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.

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 (3 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 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 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 II (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 (3 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 cations. 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: Three lectures and one two-hour tutorial per week.
Method of Examination: Final Theory Examination (3 hours) 60%
Examination: In-course test(s)/Assignment(s) 40%

**CHEM3145 - BONDING IN INORGANIC CHEMISTRY (4 credits)**

Prerequisites: CHEM3100 Inorganic Chemistry II


Teaching: Two lectures, one tutorial and four hours of practicals per week.
Method of Examination: Final Theory Examination (2 hours) 60%
Examination: In-course test(s)/Assignment(s) 20%
Practicals 20%
CHEM3200 - ORGANIC CHEMISTRY II (4 credits)

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

Syllabus: This course aims to develop an understanding of the basic synthesis reactions used in organic Synthesis. Students will be taught to identify advantages and limitations associated with generally applied methodologies of compound classes and to propose mechanisms for the general reactions covered in the course. General principles of retrosynthetic analysis will be used to design simple synthetic schemes for synthesis of target molecules, including important natural products and drug targets. The teaching approaches used will include lectures, tutorials and student presentations.

Teaching: Three lectures and one tutorial per week.

Method of Examination:
- Final Theory Examination (3 hours) 60%
- In-course test(s)/Assignment(s) 20%
- Weekly assignments 10%
- Presentations 10%

CHEM3210 - BIOORGANIC & MEDICINAL CHEMISTRY (4 credits)

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

Restrictions: Not available to persons who have passed CHEM3225 Natural Products Chemistry or CHEM3235 Bio-organic 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 Examination (2 hours) 60%
- In-Course Tests/Quizzes 20%
- In-Course Assignments 20%

CHEM3300 - PHYSICAL CHEMISTRY II (4 credits)

Pre-requisites: 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 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 (4 Credits)

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

CHEM3500 - CHEMISTRY PROJECT (4 credits)


Restriction: Not to be taken with CHEM3505 Chemistry Research Project

Syllabus: The course consists of a research project carried out under the supervision of a member of staff. Students will be directed to an initial survey of relevant literature and will present brief outlines of their planned research. Duration of the project is one semester, and students are expected to spend at least 72 hours on laboratory and/or computational work. Each student will be required to give a seminar on completion of the project and submit two copies of a typed report.

Method of Examination: Practical Assessment 30%
Examination: Seminar 15%
Project Report 55%
CHEM3505 - CHEMISTRY RESEARCH PROJECT
(8 credits)

Pre-requisites: CHEM2100 Inorganic Chemistry I,
CHEM2200 Organic Chemistry I,
CHEM2300 Physical Chemistry I,
CHEM2400 Analytical Chemistry I,
CHEM2010 Practical Chemistry I and
CHEM2020 Practical Chemistry II

Restrictions: Not to be taken with CHEM3500 Chemistry
Project, BIOC3950 Biochemistry Research
Project, BIOL3950 Biology Research Project,
ECOL3950 Ecology Research Project or
MICR3950 Microbiology Research Project.

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%
Seminar 15%
Project Report 70%

CHEM3515 - ENVIRONMENTAL CHEMISTRY (4 credits)

Prerequisites: 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, otochemical smog, exhaust gases,
precipitation, composition of rain, acid rain.
Atmospheric aerosols. Urban pollution,
indoor air pollution. The chemistry of global
climate – greenhouse gases, climate change.

The hydrosphere: Physical and chemical
properties of water. Distribution of species in
aquatic systems. Acid base chemistry. CO₂
carbonate equilibrium. Organic matter and
metals. Environmental chemistry of colloids
and surfaces. Microbiological processes.
Water pollution and waste-water treatment
chemistry. 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 in conjunction with other Faculties)

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
MATH1101 Basic Mathematics I

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

AND Eight (8) Credits (including at least one Level III course) 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
COMP3210 Electronic Commerce
COMP3220 Human-Computer Interaction
COMP3230 Network and Computer Security
COMP3240 Network and Computer Security
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3290 Computer Science Research Project
COMP3910 Computer Science Research Project
COMP3920 Computer Science Major Research Project
COMP3930 Computer Science Group Research Project

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
COMP3210 Electronic Commerce
COMP3220 Human-Computer Interaction
COMP3230 Network and Computer Security
COMP3240 Network and Computer Security
COMP3260 Computer Graphics I
COMP3270 Computer Graphics II
COMP3290 Computer Science Research Project
COMP3920 Computer Science Major Research Project
COMP3930 Computer Science Group 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
- MATH1101  Basic Mathematics I

**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

**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

**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
COMP3210  Electronic Commerce
COMP3220  Human-Computer Interaction
COMP3230  Network and Computer Security
COMP3240  Introduction to Distributed Computing
COMP3260  Computer Graphics I
COMP3270  Computer Graphics II
COMP3910  Research Project
COMP3920  Computer Science Major Research Project
COMP3930  Computer Science Group Research Project

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
MATH1101  Basic Mathematics I
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

COMP2150  Computer Networks I
COMP2160  Object-Oriented Programming

AND at most Eight (8) Credits From:
COMP2135  Systems Software
COMP2950  Computer Science Elective
ELET2100  Microprocessors I
ELET2130  Digital Communications I

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
COMP3210  Electronic Commerce
COMP3220  Human-Computer Interaction
COMP3230  Network and Computer Security
COMP3240  Introduction to Distributed Computing
COMP3260  Computer Graphics I
COMP3270  Computer Graphics II
ELET3151  Digital Communications II
LEVEL I COMPUTER SCIENCE COURSES

COMP1105 - COMPUTER PROGRAMMING I (4 Credits)

Pre-requisite: None

Syllabus: Basic Computer Architecture (Central processor, main and secondary memory, Input/output devices), Integrated Development Environments (Editors, Compilers, debuggers, libraries), Problem Solving (top-down design, stepwise refinement, sorting and searching), Files (Standard input/output, sequential text files) Data Types (integers, reals, characters, strings), Operators (Assignment, arithmetic, relational, Boolean, precedence rules), control Structures (Sequencing, iteration, selection), Data Structures (Linear arrays) Modules (Functions, Values and reference parameters, scope rules)

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

Method of Final Theory Examination (3 hours) 60%
Examination: In-course Tests/Assignments 40%

COMP1115 - COMPUTER PROGRAMMING II (4 Credits)

Pre-requisite: COMP1105 Computer Programming I

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

Method of Final Theory Examination (3 hours) 60%
Examination: In-course Tests/Assignments 40%

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

COMP1130 - WEB TECHNOLOGY FUNDAMENTALS (4 Credits)

Pre-requisite: None


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

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

COMP2105 - DISCRETE MATHEMATICS (4 Credits)

Pre-requisite: MATH1100 Basic Mathematics

Syllabus: Predicate Calculus (Universal and existential quantifiers, proofs, logical equivalences and inferences), Asymptotic Analysis and Notation (O, Θ and Ω), 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 breadth-first traversals, adjacency and incident matrices), Finite State Machines, (State graphs/tables, regular sets, recognizers, Kleene’s theorem, machine minimization).

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

Method of Final Theory Examination (2 hours) 60%
Method of Examination: In-course Tests/Assignments 40%
COMP2125 - COMPUTER ARCHITECTURE (4 Credits)

Pre-requisites: [COMP1115 Computer Programming II & MATH1100 Basic Mathematics] or ELET1110 Digital Electronics

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

COMP2135 - SYSTEMS SOFTWARE (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

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

COMP2145 - SOFTWARE ENGINEERING I (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

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

COMP2150 - COMPUTER NETWORKS I (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

Syllabus: Data Communication Fundamentals, The ISO References Model, Transmission Media, Interface Standards, Asynchronous and Synchronous Transmission, Communications Control Devices, Data Compression, Error Detection Methods, Framing Methods,
Flow Control, Network Topology, LAN Technologies – including Wireless LANs.

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

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

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.

COMP2160 - OBJECT-ORIENTED PROGRAMMING (4 Credits)

Pre-requisite: COMP1115 Computer Programming II

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

COMP3100 - OPERATING SYSTEMS (4 Credits)

Pre-requisites: COMP2115 Information Structures & COMP2125 Computer Architecture

Syllabus: Evolution of Operating Systems, Characteristics of Modern Operating systems (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, disk-scheduling), 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%
- In-course Tests/Assignments 40%
COMP3115 - INFORMATION SYSTEMS (4 Credits)

Pre-requisite: COMP2145 Software Engineering I

Restriction: Not available to students who have passed MGMT3011 – Management Information Systems II


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

Method of Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%

COMP3135 - PROGRAMMING LANGUAGES (4 Credits)

Pre-requisite: COMP2115 Information Structures

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, nondeterminism and back-tracking), Scripting Languages (Regular expressions), Concurrent Programming (Communication and synchronization).

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

Method of Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%

COMP3125 - ARTIFICIAL INTELLIGENCE (4 Credits)

Pre-requisites: COMP2105 Discrete Mathematics & COMP2115 Information Structures

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 Final Theory Examination (2 hours) 60%

Examination: In-course Tests/Assignments 40%

COMP3140 - SOFTWARE ENGINEERING II (4 Credits)

Pre-requisite: COMP2145 Software Engineering I

Syllabus: Application of Project Management to Software Projects, Approaches to Project Management, Project Selection and
Feasibility Analysis, Project Cost Estimation, Planning and Resource Scheduling, Control Techniques, Quality Assurance, Team Management.

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

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

COMP3155 - COMPUTER NETWORKS II (4 Credits)

Pre-requisite: COMP2150 Computer Networks I


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

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

COMP3160 - DATABASE MANAGEMENT SYSTEMS
(4 Credits)

Pre-requisite: COMP2115 Information Structures

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

COMP3170 - WEB-BASED APPLICATIONS (4 Credits)

Pre-requisite: COMP2160 Object-Oriented Programming

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, one tutorial and two (2) hours of labs per week.

Method of Final Theory Examination (2 hours) 60%
Examination: In-course Tests/Assignments 40%
COMP3180 - ALGORITHM DESIGN AND ANALYSIS
(4 Credits)

Pre-requisites: COMP2105 Discrete Mathematics & COMP2115 Information Structures

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 and one tutorial per week.

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

COMP3210 - ELECTRONIC COMMERCE (4 Credits)

Pre-requisite: COMP2160 Object-Oriented Programming

Syllabus: Internet concepts and technology, Economic foundation of electronic commerce, Storefronts, shopping carts and Landing pages, Order processing, Pricing and payment processing, Security issues, Shipping and handling, Products, Internet marketing and legal issues.

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

Method of 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.

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.

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

COMP3220 - HUMAN-COMPUTER INTERACTION
(4 Credits)

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


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

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

COMP320 - INTRODUCTION TO DISTRIBUTED COMPUTING (4 Credits)

Pre-requisites: COMP2115 Information Structures & COMP2125 Computer Architecture


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

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

COMP3230 - NETWORK AND COMPUTER SECURITY (4 Credits)

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


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

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

COMP3260 - COMPUTER GRAPHICS I (4 Credits)

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


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

COMP3270 - COMPUTER GRAPHICS II (4 Credits)

Pre-requisite: COMP3250 - Computer Graphics I


Teaching: Three (3) hours of lectures and two (2) hours of labs per week.  
N.B. Enrolment will be limited to those students who have demonstrated a sound academic background and an aptitude for research.

COMP3910 - COMPUTER SCIENCE RESEARCH PROJECT (4 Credits)

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

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.

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

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

COMP3920 - COMPUTER SCIENCE MAJOR RESEARCH PROJECT (8 Credits)

Pre-requisite: Restricted to finalists majoring in Computer Science or Information Technology and by permission of the Computer Science discipline

Syllabus: This course provides students with the opportunity to complete a major project utilizing classroom knowledge to solve a realworld or research-based problem. Students are required to realize a significant software application from inception through to implementation or proof of concept.
The project runs throughout the academic year (semesters I and II) giving students the needed time to thoroughly research and solve a problem that can produce usable outcomes with either commercial or research applications.

**Teaching:**

Students are required to meet with their supervisors at least once a week.

**Method of Proposal Presentation**

**Examination:**

10%

**Proposal Report**

10%

**Final Presentation**

15%

**Demonstration**

15%

**Final Report**

50%

**COMP3930 - COMPUTER SCIENCE GROUP RESEARCH PROJECT (4 Credits)**

**Pre-requisite:**

COMP2115, COMP2145 and restricted to finalists majoring in Computer Science or Information Technology and by permission of the Computer Science discipline

**Syllabus:**

This course provides groups comprised of 2-4 students with the opportunity to implement a substantive software system under the supervision of a staff member. The software may address a problem in any domain, but must meet the minimum standards of design and functionality, appropriate for a Computer Science or Information Technology major.
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
ERSC3001 Natural Hazards
ERSC3002 Climate Variability & Predictability
ERSC3900 Earth Science Research Project

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: Theory Examination (3 hours) 60%
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: Theory Examination (3 hours) 60%
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 (3 hours) 60%
Examination: Laboratory 20%
In-course assignments/tests 20%

ERSC2004 - RENEWABLE ENERGY SOURCES (4 credits)

Pre-requisite: 16 Level 1 FPAS credits

Restriction: Available only to FPAS students

Syllabus: 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 bio-energy. Energy systems and sustainability systems in the renewable energy context. Major economic issues of production, storage, transportation, and distribution of energy.
ERSC3001 - NATURAL HAZARDS (4 Credits)

Pre-requisites: ERSC1001: The Dynamic Earth and ERSC2003: Oceanography or ERSC2002: Climatology

Syllabus: The following topics, concepts and issues will be discussed in this course:

1. Hazard, risk and disaster
2. The role of plate tectonics in natural hazards
3. Earthquakes distribution, magnitude, intensity, hazard assessment and mitigation
4. Tsunami causes, speed, amplitude, hazards and mitigation
5. Volcanoes distribution, eruptive styles, hazards monitoring and mitigation
6. Flooding and drought
7. Mass wasting
8. Subsidence
9. Severe weather events
10. Hurricanes distribution, structure, hazards intensity and mitigation
11. Coastal processes waves, vulnerable regions, coastal erosion, mitigation

ERSC3002 - CLIMATE VARIABILITY & PREDICTABILITY (4 credits)

Pre-requisite: ERSC2002 Climatology

Ersc3900 - Earth Science Research Project


Syllabus: This course consists of a research project in Earth Science carried out under the supervision of a member (or members) of staff. Students will be allocated one of the available research projects and are expected to spend not less than 144 hours in field/laboratory/theoretical studies. The project will be presented in the form of a short seminar and a written report.

Teaching: Students will be involved in regular meeting/discussions with their supervisor(s) who will provide training in relevant laboratory/field methods/skills and guide the student in experimental design, data collection and the analysis and interpretation of the data collected.
ELECTRONICS

The Department of Computer Science, Mathematics & Physics offers a Major and 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
ELET2140  Medical Instrumentation
ELET3041  Microcontrollers & Applications
ELET3110  Control and Instrumentation
ELET3120  Communication Circuits
ELET3130  Intro. to Digital Signal Processing (DSP)
ELET3151  Digital Communications II
ELET3152  Mobile Communications and Applications
ELET3160  Electronics Research Project
ELET3210  Sensor and Actuator Technology

LEVEL III
At Most Twenty (20) Credits (Five Courses) From:
ELET3041  Microcontrollers & Applications
ELET3110  Control and Instrumentation
ELET3120  Communication Circuits
ELET3130  Intro. to Digital Signal Processing (DSP)
ELET3151  Digital Communications II
ELET3152  Mobile Communications and Applications
ELET3160  Electronics Research Project
ELET3210  Sensor and Actuator Technology

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
ELET2140  Medical Instrumentation
ELET3041  Microcontrollers & Applications
ELET3110  Control and Instrumentation
ELET3120  Communication Circuits
ELET3130  Intro. to Digital Signal Processing (DSP)
ELET3151  Digital Communications II
ELET3152  Mobile Communications and Applications
ELET3160  Electronics Research Project
ELET3210  Sensor and Actuator Technology

MINOR IN MEDICAL ELECTRONICS

[Sixteen (16) Credits]
ELET2120  Discrete Device Electronics
ELET2140  Medical Instrumentation
ELET3041  Microcontrollers & Applications
ELET3210  Sensor and Actuator Technology

A student with a Minor in Medical Electronics cannot count any of these courses as part of their Major or Minor in Electronics.
LEVEL I ELECTRONICS COURSES

ELET1100 - CIRCUIT ANALYSIS (4 Credits)

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


Teaching: Two (2) lectures, one tutorial per week and 26 hours of practical work.

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

ELET1110 - DIGITAL ELECTRONICS (4 Credits)

Pre-requisite: None


Teaching: Two (2) lectures, one tutorial per week and 26 hours of practical work.

Method of Examination: Final Theory Examination (2 hours) 70%
In-course Tests/Assignments 20%
Laboratory 10%
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Pre-requisite</th>
<th>Syllabus</th>
<th>Teaching</th>
<th>Method of Examination</th>
<th>Examination</th>
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</thead>
<tbody>
<tr>
<td>ELET1120</td>
<td>BASIC ELECTRONICS (4 Credits)</td>
<td></td>
<td>None</td>
<td>Resistors, capacitors, inductors &amp; their applications in circuits. Characteristics and applications of diodes including photodevices. Other semiconductor devices and their applications (SCR, TRIACS, etc...). Transistors (BJT &amp; 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.</td>
<td>Two (2) lectures, one tutorial per week and 26 hours of practical work.</td>
<td>Final Theory Examination (2 hours) 70%</td>
<td>In-course Tests/Assignments 20%</td>
</tr>
<tr>
<td>ELET2100</td>
<td>MICROPROCESSORS I (4 Credits)</td>
<td></td>
<td>ELET1110 Digital Electronics</td>
<td>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.</td>
<td>Two (2) lectures four (4) hours of laboratory per week.</td>
<td>Final Theory Examination (2 hours) 60%</td>
<td>In-course Tests/Assignments 20%</td>
</tr>
<tr>
<td>ELET2110</td>
<td>CIRCUIT SIMULATION (4 Credits)</td>
<td></td>
<td>ELET1100 Circuit Analysis</td>
<td>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.</td>
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</table>
### ELET2120 - DISCRETE DEVICE ELECTRONICS

**Pre-requisite:** ELET1120 Basic Electronics

**Syllabus:**
- Hybrid & hybrid-pi equivalent circuits.

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

**Method of Final Theory 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

**Syllabus:**
- Fundamentals of digital communications, Fourier analysis, Energy and power spectral density, frequency response, Analog to Digital conversion, Information Theory, Baseband Transmission, Error Control Coding (Block).

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

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

**Examination:**
- In-course Tests/Assignments 20%
- Laboratory 20%

### ELET2140 - MEDICAL INSTRUMENTATION (4 credits)

**Pre-requisite:** ELET1110 Digital Electronics

**Syllabus:** The following topics and concepts will be discussed during the course:
- Introduction to Anatomy and Physiology
- Overview of Medical Electronics Equipments
- Preparation of Biosensor
- Types of Biosensors and their Applications
- Electrodes Bio-Medical Recorders
- Patient Monitoring Systems
- Safety Aspects of Medical Instruments

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

**Method of Final Theory Examination:** Final Theory Examination (2 hours) 40%

**Examination:**
- In-course Tests/Assignments 20%
- Laboratory/Mini-Project 40%
**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.

**LEVEL III ELECTRONICS COURSES**

**ELET3041 - MICROCONTROLLERS AND APPLICATIONS (4 credits)**

Pre-requisite: ELET2100 Microprocessors I

Syllabus: A Microcontroller Framework - hardware architecture, instruction set, addressing modes, program memory, register file structure and uses, simple program operations. The Assembler and Its Use – application code source file, list, hex, and object file generation, table use, macros, subroutines, directives. Input and Output Peripherals - ports, displays, buttons, keypads, sensors, actuators, relays, interrupts, timers, counters, pre-scalars, A/D, D/A, motors, PWM, serial communication Protocols. Memory – RAM, ROM, PROM, EPROM, EEPROM, Flash, and Error Correction. Applications – a variety of applications from consumer electronics to research instruments

Teaching: Two hours of lectures, one hour of tutorial and three hours of laboratory each week.

Method of In course test(s) / Assignment(s) 20%

Assessment: Laboratory/ Mini-Project 30%

Final Theory Examination (2 hours) 50%

**ELET3110 - CONTROL & INSTRUMENTATION (4 Credits)**

Pre-requisite: ELET2120 Discrete Device Electronics

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 Final Theory Examination (2 hour) 60%

Examination: In-course Tests/Assignments 20%

Laboratory 20%

**ELET3120 - COMMUNICATION CIRCUITS (4 Credits)**

Pre-requisite: ELET2120 Discrete Device Electronics

Syllabus: High frequency transistors, transformers and filters. HF construction techniques. RF amplifiers, oscillators and frequency

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%

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

Pre-requisite: ELET2130 Digital Communications I


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%

ELET3151 - DIGITAL COMMUNICATIONS II (4 credits)

Pre-requisite: ELET2130 Digital Communications I

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

ELET3152 - MOBILE COMMUNICATION & APPLICATIONS (4 credits)

Pre-requisite: ELET2130 Digital Communications I or COMP2150 Computer Networks I

Syllabus: Radio basics, Electromagnetic energy, frequency and wavelength, Spectrum management, Information theory, Coding theory, Core wireless communications, technologies and standards, FSK, PSK, QAM, TDMA, FDMA, OFDM, CDMA, SDMA, GSM, UMTS, HSPA, LTE, Wi-Fi, WiMAX, Bluetooth, Wireless Networking, Network design, Cellular infrastructure, WAN, MAN, LAN, PAN, HRAN, Mobile Internet and the protocol Stack, Circuit and packet switching TCP/IP, mobile IPv4,
mobile IPv6, Technological convergence and multi-purpose mobile computing, SMS, MMS, VoIP, Video conferencing, Geolocation, Mobile operating systems, Symbian, Microsoft, iPhone, Android, Mobile application development, Mobile application environment, Context-aware mobile applications

Teaching: Two lectures & Four hours of Lab work per week

Method of Final Theory Examination (2 hours) 60%
Examination: Course & Lab work 40%

ELET3160 - ELECTRONICS RESEARCH PROJECT
(4 Credits)
Pre-requisite: Restricted to Finalists Majoring in Electronics

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%

ELET3210 - SENSORS & ACTUATOR TECHNOLOGY
(4 credits)
Pre-requisite: ELET1110 Digital Electronics


Teaching: Two lectures, one tutorial, 3 hours of Practical per week

Method of In course test(s) / Assignment(s) 20%
Examination: Laboratory/ Mini-Project 40%
Final Theory Examination (2 hrs) 40%
MATHEMATICS

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

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

MAJOR IN MATHEMATICS:

LEVEL I
MATH1101 Basic Mathematics I
MATH1102 Basic Mathematics II
MATH1120 Calculus I
MATH1130 Calculus II

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
MATH3160 Number Theory
MATH3170 Advanced Algebra
MATH3180 Introduction to Topology
MATH3450 Statistical Theory I
MATH3460 Statistical Theory II

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
MATH3450 Statistical Theory I
MATH3460 Statistical Theory II

MINOR IN STATISTICS [Sixteen (16) Credits]

MATH2140 Probability Theory
MATH2150 Mathematical Statistics
MATH3100 Multivariate Analysis
## DOUBLE MAJOR IN MATHEMATICS

### LEVEL I
- MATH1101 Basic Mathematics I
- MATH1102 Basic Mathematics II
- MATH1120 Calculus I
- MATH1130 Calculus II

### 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
- 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
- MATH3300 Mathematics Research Project
- MATH3450 Statistical Theory I
- 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.

**Teaching:** Five (5) lectures and one tutorial per week.

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

**Examination:** In-course Tests/Assignments 20%
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Syllabus</th>
<th>Teaching</th>
<th>Method of Final Theory Examination</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH0102</td>
<td>PRELIMINARY MATHEMATICS II</td>
<td>6P</td>
<td>CXC Mathematics or equivalent</td>
<td>Sequences and Series: Use of $\sum$ 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 modeling; Ordinary differential equations of Physics, Biology, Economics, applications of Mathematics.</td>
<td>Five (5) lectures and one tutorial per week.</td>
<td>Final Theory Examination (3 hours) 80%</td>
<td>In-class Tests/Assignments 20%</td>
</tr>
<tr>
<td>MATH1100</td>
<td>BASIC MATHEMATICS (4 Credits)</td>
<td></td>
<td>CAPE Pure Mathematics Units 1 &amp; 2 or MATH0101 &amp; MATH0102 or equivalent.</td>
<td>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.</td>
<td>Three (3) lectures and one tutorial per week.</td>
<td>Final Theory Examination (3 hours) 75%</td>
<td>In-class Test(s)/Assignment(s) 25%</td>
</tr>
<tr>
<td>MATH1101</td>
<td>BASIC MATHEMATICS I (4 Credits)</td>
<td></td>
<td>CAPE Pure Mathematics Units 1 &amp; 2 or MATH0101 &amp; MATH0102 or equivalent.</td>
<td>The following topics, concepts or issues will be discussed in this course: Logic, Sets, Relations, Functions, Number and Mathematical Systems</td>
<td>Three (3) lectures and one tutorial per week.</td>
<td>Final Theory Examination (3 hours) 75%</td>
<td>In-class Test(s)/Assignment(s) 25%</td>
</tr>
</tbody>
</table>
MATH1102 - BASIC MATHEMATICS II (4 Credits)

Pre-requisites: MATH1101 Basic Mathematics I

Syllabus: The following topics, concepts or issues will be discussed in this course:
Vector Spaces, Matrices & Determinants, Equations, Euclidean spaces, Conic sections and quadratic surfaces

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

Method of Final Theory Examination (3 hours)  75%
Examination: 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.


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

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

MATH1120 - CALCULUS I (4 Credits)

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

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.

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

Method of Final Theory Examination (2 hours)  75%
Examination: In-class Tests/Assignments  25%
MATH1130 - CALCULUS II (4 Credits)
Pre-requisite: MATH1120 Calculus I
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
Teaching: Three (3) lectures and one tutorial per week.
Method of Final Theory Examination (2 hours) 70%
Examination: In-class Tests/Assignments 30%

MATH2110 - LINEAR ALGEBRA (4 Credits)
Pre-requisite: MATH1100 Basic Mathematics, MATH1120 Calculus I & MATH1130 Calculus II
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


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, MATH2120 Analysis & Methods I, MATH2130 Ordinary Differential Equations

Syllabus: Types of error, Finite Differences and Interpolation; Numerical Evaluation and Integrals; Numerical solution of Differential equations; Roots of Equations: Linear Systems and Matrices.; Construction of Algorithms for Computation using MATLAB.

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

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

MATH3130 - OPTIMIZATION THEORY (4 Credits)

Pre-requisite: MATH2110 Linear Algebra & MATH2120 Analysis & Methods


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

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

MATH3140 - FOURIER ANALYSIS AND PDE (4 Credits)

Pre-requisite: MATH2130 Ordinary Differential Equations

Syllabus: Orthogonal systems (Fourier, Haar, Bessel, Sturm-Lioville etc.). Periodic functions, Fourier expansion, Fourier coefficients, periodic extension. Fourier series for odd and even functions. Problem of convergence.

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

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

MATH3160 - NUMBER THEORY (4 Credits)

Pre-requisite: MATH2100 Abstract Algebra


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

Method of Final Theory Examination (2 hours) 60%
Examination: In-class Tests/Assignments 40%
MATH3170 - ADVANCED ALGEBRA (4 Credits)

Pre-requisite: MATH2100 Abstract Algebra


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

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

MATH3180 - INTRODUCTION TO TOPOLOGY (4 Credits)

Pre-requisites: MATH2100 Abstract Algebra & 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%

MATH3300 - MATHEMATICS RESEARCH PROJECT (4 Credits)

Pre-requisite: Restricted to Finalists Majoring in Mathematics

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 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%
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Pre-requisite</th>
<th>Syllabus</th>
<th>Teaching</th>
<th>Method of Examination</th>
<th>Examination Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH3450</td>
<td>STATISTICAL THEORY I</td>
<td>4</td>
<td>MATH2120 Analysis &amp; Methods and MATH2140 Probability Theory and MATH2150 Mathematical Statistics</td>
<td>Measure Theory &amp; Law of Large Numbers, Conditional Expectation, Bounding Probability &amp; Expectations, Introduction to Queuing Theory, Renewal Theory</td>
<td>Three (3) lectures and one tutorial per week.</td>
<td>Final Theory Examination (2 hour) 60%</td>
<td>Class tests/computer assignments 40%</td>
</tr>
<tr>
<td>MATH3460</td>
<td>STATISTICAL THEORY II</td>
<td>4</td>
<td>MATH2140 Probability Theory and MATH2150 Mathematical Statistics</td>
<td>Methods of finding estimators and their properties; Bayesian Inference; Regression Analysis; Time Series Analysis; Testing of Hypothesis; Design of Experiments; Sampling Theory.</td>
<td>Three (3) lectures and one tutorial per week.</td>
<td>Final Theory Examination (2 hour) 60%</td>
<td>Class tests/computer assignments 40%</td>
</tr>
</tbody>
</table>
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
METE2300 Hydrometeorology
METE3400 Weather Radar and Satellites
METE3500 Bioclimatology

LEVEL III
METE3100 Dynamic Meteorology II
METE3200 Synoptic Meteorology II
METE3300 Tropical Meteorology

AND Four (4) Credits from:
METE2000 Physical Meteorology I
METE2001 Physical Meteorology II
METE3100 Dynamic Meteorology II
METE3200 Synoptic Meteorology II
METE3300 Tropical Meteorology

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
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 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 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.


Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

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

**METE1300 - CLIMATE CHANGE EDUCATION AND AWARENESS (4 Credits)**

Pre-requisites: None

Restriction: Cannot be taken by majors and minors in Meteorology. Students are not allowed to take BOTH METE1200 and METE1300 for credit.

Teaching: Three (3) lectures, one (1) tutorial hour 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 and MATH1120 Calculus I & MATH1130 Calculus II.


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 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%

Examination: In-course Tests/Assignments 30%
**Teaching:** Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

**Method of Final Theory Examination (2 hours)** 70%

**Examination:** 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 and MATH1120 Calculus I & MATH1130 Calculus II.

**Syllabus:** Elementary vector methods in meteorology. Derivation of the equation of motion from Newton's law. The equation of motion in various co-ordinate systems. Simplification of the equation of motion. The conservation of mass and the conservation of total energy. The basic equations with pressure as the vertical coordinate. Horizontal balanced motions; the geostrophic thermal wind. Concepts of circulation and vorticity; the circulation theorems and the vorticity equation and their applications. Structure and dynamics of the planetary boundary layer.

**Teaching:** Three (3) lectures and one (1) tutorial per week.

**Method of Final Theory Examination (2 hours)** 70%

**Examination:** In-course Tests/Assignments 30%

**METE2200 - SYNOPTIC 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 and MATH1120 Calculus I & MATH1130 Calculus II.


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

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

**Examination:** In-course Tests/Assignments 40%

**METE2300 - HYDRO-METEOROLOGY (4 Credits)**

**Pre-requisites:** MATH1120 Calculus I & MATH1130 Calculus II.

**Syllabus:** The hydrological cycle. Water balance concepts. Precipitation measurement and analysis. Interception and interception loss. Evaporation and evapo-transpiration.

Teaching: Two (2) lectures, one (1) tutorial and two (2) hours of practical per week.

Method of Final Theory Examination (2 hours) 60%
Examination: 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: Two (2) lectures and four (4) hours of practical per week.

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

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: Three (3) lectures and one (1) tutorial per week.

Method of Final Theory Examination (2 hours) 70%
Examination: In-course Tests/Assignments 30%
METE3300 - TROPICAL METEOROLOGY (4 Credits)

Pre-requisites: METE2100 Dynamic Meteorology I and METE2200 Synoptic Meteorology I


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%

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%
- In-course Tests/Assignments 40%

METE3500 - BIOCLIMATOLOGY (4 Credits)

Pre-requisites: METE1200 Oceans & Climate or BIOL1051 Biodiversity 1 and 28 FPAS Level II/III credits.

Syllabus: Characteristics of Caribbean climate; inter-seasonal, inter-annual and inter-decadal climate variability. Role of climate in vegetation distribution. Influence of weather parameters on vegetation and terrestrial

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 10%
Essay Assignments 30%
& Computer Exercises

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
ELET2140 Medical Instrumentation
PHYS2102 Solid State Physics
PHYS2105 Computational Physics I
PHYS2950 Physics Elective
ELET3041 Microcontrollers and Applications
MINOR IN PHYSICS (Sixteen (16) Credits)

At Least Eight (8) Credits From:

PHYS2100  Mathematical Methods in Physics
PHYS2101  Quantum Mechanics & Special Relativity
PHYS2102  Solid State Physics
PHYS2103  Classical Mechanics
PHYS2105  Computational Physics I
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
PHYS2105  Computational Physics I
PHYS2106  Advanced Physics/Technology Laboratory I
PHYS2107  Advanced Physics/Technology Laboratory II
PHYS2950  Physics Elective
PHYS3100  Quantum Mechanics
PHYS3101  Electrodynamics
PHYS3102  Optics and Lasers
PHYS3105  Statistical Mechanics
PHYS3106  Physics Research Project
PHYS3107  Fundamentals of Photovoltaic Physics

* 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

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, Reynold'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, 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 per week and 52 hours of practical work.

Method of Examination:

<table>
<thead>
<tr>
<th>Method of Examination</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Theory Examination (3 hours)</td>
<td>70%</td>
</tr>
<tr>
<td>In-course Tests/Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Practical Reports</td>
<td>10%</td>
</tr>
</tbody>
</table>

PHYS0071 - PRELIMINARY PHYSICS II (6 P-Credits)

Pre-requisite: None


Teaching: Three (3) lectures, one tutorial per week and 52 hours of practical work.

Method of Final Theory Examination (3 hours) 70%
Examination: 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.


Teaching: Three (3) lectures, one tutorial per week and 26 hours of practical work.

Method of Final Theory Examination (2 hours) 70%
Examination: In-class Tests/Assignments 20%
Practical Reports 10%

PHYS1101 - ELECTRICITY & MAGNETISM (4 Credits)

Pre-requisite: CAPE Physics Unit 1 or CAPE Pure Mathematics Units 1 & 2.

Syllabus: Electric charge, Coulomb's law, electric field. 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: Three (3) lectures, one tutorial per week and 26 hours of practical work.

Method of Final Theory Examination (2 hours) 70%
Examination: 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: Three (3) lectures, one tutorial per week and 26 hours of practical work.

Method of Final Theory Examination (2 hours) 70%
Examination: In-class Tests/Assignments 20%
Practical Reports 10%

**LEVEL II PHYSICS COURSES**

**PHYS2100 - MATHEMATICAL METHODS IN PHYSICS (4 credits)**

Prerequisites: MATH 1120 Calculus I

Syllabus: Taylor’s Expansion, Partial Differentiation of Multivariate Functions, diagonalization of Matrices, Eigenvectors, Eigenvalues, Elementary functions of Complex Variables, Divergence Theorem, Stokes’ Theorem,

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

Method of Final Theory Examination (2 hours) 80%
Examination: In-course tests / assignments 20%

**PHYS2102 – SOLID STATE PHYSICS (4 Credits)**

Pre-requisite: PHYS1101 Electricity & Magnetism


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

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,

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

Method of Final Theory Examination (2 hours) 80%
Examination: In-class Tests/Assignments 20%

PHYS2105 - COMPUTATIONAL PHYSICS I (4 Credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and MATH1120 Calculus I


Teaching: Four hours of laboratory per week.
Method of Written Laboratory Reports (5) 80%
Examination: Oral Examination 20%

PHYS2106 - ADVANCED PHYSICS / TECHNOLOGY LABORATORY I (2 credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and PHYS1102 Optics, Thermodynamics & Modern Physics

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.

PHYS2107 - ADVANCED PHYSICS / TECHNOLOGY LABORATORY II (2 credits)

Pre-requisite: PHYS1100 Mechanics, PHYS1101 Electricity & Magnetism and PHYS1102 Optics, Thermodynamics & Modern Physics
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


PHYS3101 - ELECTRODYNAMICS (4 Credits)

Pre-requisite: PHYS1102 Optics, Thermodynamics & Modern Physics and PHYS2101 Quantum Mechanics & Special Relativity

Syllabus: Development of Maxwell's equations. Potentials. E-m waves in free space, conducting medium, plasmas. Reflection of e-m waves from dielectric and metallic
boundaries, waveguides, special relativity and electrodynamics. Transformation of electric and magnetic fields.

**PHYS3105 - STATISTICAL MECHANICS (4 Credits)**

Pre-requisite: PHYS2101 Quantum Mechanics & Special Relativity


Method of Final Theory Examination (2 hours) 80%

Examination: In-class Tests/Assignments 20%

**PHYS3102 - OPTICS & LASERS (4 Credits)**

Pre-requisite: PHYS2101 Quantum Mechanics & Special Relativity


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 Credits)**

Pre-requisite: Restricted to Final Year students, Majoring in Physics.

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. 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%

PHYS3107 - FUNDAMENTALS OF PHOTOVOLTAIC PHYSICS (4 credits)

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 lectures, one hour of tutorial, and 26 hours of practical work.

Method of Assessment: Final Examination (2 hours) 50%  
Laboratory Work 25%  
Assignments 25%