DEPARTMENT OF LIFE SCIENCES – MISSION STATEMENT

To generate new knowledge in the life and environmental sciences and contribute to the sustainable management of living resources through research, education and outreach

In Memory

Professor Dave D. Chadee

Edition 11.3, April 2017
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1. INTRODUCTION

This handbook has been prepared to assist undergraduate students in the Department of Life Sciences of the University of the West Indies, St. Augustine. It is not intended to replace other Faculty and University documentation, but rather should be read in conjunction with these. Although steps were taken to ensure that the information was accurate at the time of printing, the Department reserves the right to make amendments and changes as required. Any suggestions for amendment or addition should be sent to the handbook coordinator, Prof. A. Hailey.

1.1. Welcome to the Department of Life Sciences

It is with great pride and distinct pleasure that I welcome you to the Life Sciences family, on behalf of the graduate students, academic, technical, and support staff. Not only are we committed to providing you with the services required to achieve your academic goals, but with our very “open-door” policy, we are ready to assist you in all matters that concern you and which may hinder you in realizing your full potential. Privacy in confidential matters is ensured.

We recognise that in order to unleash the “capacity to excel” that resides in each one of you, we need to work together. This requires you to:

- Ensure that you have the pre-requisites for the courses you select.
- Familiarise yourself with the office hours of your lecturers and tutors.
- Seek academic advice from tutors, advisors, lecturers.
- Develop a culture of Reading by reading beyond what is assigned or given to you, including Notices on Notice Boards.
- Pay attention to the Section of this handbook which outlines the Department's policy on exemption from Practicals, make-up tests, late submission of lab reports/projects etc.
- Ensure that your comments and suggestions for improving the teaching and learning process reach the lecturer(s) either directly or through the staff/student liaison committee through your various course representatives.

The Department has been recognised by the UWI as the most productive Department in Research on the St. Augustine campus and one of our members has achieved Best Researcher and a Teaching Award. In your quest to achieve life-long learning, I urge you to participate fully in the classroom, ask questions, hold discussions, reflect on what you have learnt, so that the information becomes personalised. The lowest level of learning occurs when the student faithfully memorizes lecture notes/handouts and regurgitates them in exams. To become a successful scientist, you need to enhance your powers of observation, develop skills of accurate and sincere reporting, analysis and interpretation of data and problem-solving skills. We frown on Plagiarism and encourage independent and critical thinking. How well you develop these skills will in large measure determine your future successes.

The disciplines in Life Sciences currently hold the spotlight among the Sciences, in this era of concerns for the sustainable use of living resources which is being impacted upon by climate change and destruction of the environment. It has become more and more important for the other disciplines to engage with the Life Sciences. We therefore look forward to giving you the opportunity to gain more knowledge and practical experiences and to create new knowledge in the disciplines and sub-disciplines of Life Sciences - Biology, Biochemistry, Ecology, Environment, Microbiology, Biotechnology, Botany and Zoology.

We welcome you as a noteworthy and valuable member of the Life Sciences family.

Dr Adesh Ramsubhag
Head of Department
1.2. History of the Department of Life Sciences
The Department of Life Sciences is a direct descendant of the Departments of Botany, Plant Pathology and Zoology of the Imperial College of Tropical Agriculture, founded in 1922. The Department of Plant Pathology was incorporated into the Botany Department in 1955, and the new department named the Department of Botany and Plant Pathology. The site of the I.C.T.A. became the Trinidad campus of the University College of the West Indies in 1960 and the Imperial College was transformed into the first faculty at St. Augustine, the Faculty of Agriculture. In 1968, before the move was made in 1970 to the newly completed John F. Kennedy Science Block, the Zoology Department was merged with the Department of Botany and Plant Pathology to form the Department of Biological Sciences and later the subject area of Biochemistry was added. The Department subsequently split up again into Botany, Zoology, and Biochemistry. In 1996 they were recombined as the present Department of Life Sciences. From August 2012 the department has been part of the new Faculty of Science and Technology.

2. DEPARTMENTAL RESOURCES

2.1. Research Seminars
Research seminars are usually held at 12.00 midday on Thursdays in the Natural Sciences Conference Room (ground floor, new wing). Seminars are advertised on notice boards in the Natural Sciences Building and on the departmental web site. They are open to the public, and undergraduate students are encouraged to attend.

2.2. Departmental Web Site
The departmental web site is at http://www.sta.uwi.edu/fst/lifesciences/. This has news of current events in the department, as well as details of faculty research interests and publications. Electronic teaching materials are provided separately through St Augustine Online and Myelearning (section 4.3).

2.3. Biotechnology Unit
Located on the Northern End of the St. Augustine Campus behind the Centre for Monetary Studies. The Biotechnology Unit consists of a tissue culture laboratory and a well-equipped molecular biology laboratory consisting of microfuges, bench-top centrifuges, a high speed centrifuge, Freezers (−20°C, −80°C), spectrophotometers, DNA fluorimeters, transilluminator with a photodocumentation system, Millipore water system, hybridisation oven, dot-blot and southern blotting apparatus, Incubator/Shakers, programmable water baths, gel apparatus for DNA and isozyme electrophoresis. The tissue culture laboratory, with two transfer rooms (5 Laminar Flow Hoods), four culture rooms and a dedicated hardening facility is capable of undertaking a limited number of commercial projects in addition to research. Other equipment in this facility includes autoclaves, electroporation equipment and an inverted microscope.

The Biotechnology Unit has seven faculty and seven postgraduate students working in diverse areas. Research is carried out in the areas of micropropagation of tropical plant species; transformation of tropical crops; genetic diversity of tropical plant and animal species, detection and characterization of plant pathogenic viruses, bacteria, and fungi; the molecular biology of plant pathogenic organisms and diagnosis of maturity onset diabetes of the young (MODY). In addition the biotechnology unit has embarked on some semi-commercial projects, mainly in the area of tissue culture of some Tropical Crop Species, particularly anthurium and orchids.

The laboratory is funded by INCO/EU/BETOCARIB; EUFORUM/ CARIFORUM (CARTF); MIRCEN; IFAS; UWI Deans Awards; UWI Scholarship; Campus Research and Publication Funds. It has collaborations with the International Laboratory for Genetic Engineering and Biotechnology, Plant Donald Centre, Washington University, USA; Crop and Food Research
Institute, Palmerston North, New Zealand, Howard Hughes Medical Institute at The University of Chicago, INRA (Guadaloupe); CIRAD, Montpellier, France, Natural Resources Centre, UK, CENSA, Cuba; Cocoa Research Unit, The University of the West Indies; Caroni (1975) Ltd; Floricultural Export Association of Trinidad and Tobago; Kairi Blooms Ltd., Central Experimental Station, Ministry of Agriculture (Plant Pathology; Biodiversity). There are also links with REDBIO (Caribbean); CAPGERNET; Biotechnology Centre (UWI, Mona Campus); Department of Biochemistry, Faculty of Medicine, UWI, Mount Hope.

Contact: Telephone extensions 83415, 83569, 83108; Fax 663-9686, 663-5241.

2.3.1. Laboratory use and safety
Research and semi-commercial operations are conducted under strict biosafety guidelines in the laboratory. Laboratory coats, safety glasses and closed shoes are compulsory. Any student (postgraduate or undergraduate) who wishes to work in the biotechnology laboratory should obtain permission from the Coordinator (Prof. Jayaraman). Interested students would have to undergo a biosafety training under the supervision of Ms Verena Gajadharsingh and would have to initially work under the supervision of Ms Gajadharsingh until such time she is satisfied that the student is capable of working safely and independently. Access to the laboratory after working hours is not normally permitted for undergraduate students.

2.3.2. Staff
- Prof. Jayaraj Jayaraman (Plant/microbial biotechnology)
- Prof. Emeritus E.J. Duncan (Plant tissue culture)
- Dr Brian Cockburn (Medical biotechnology)
- Dr Winston Elibox (Genetics and biotechnology)
- Dr Adesh Ramsubhag (Microbial biotechnology)
- Dr Judy Rouse-Miller (Plant tissue culture)
- Ms Verena Gajadharsingh, Molecular Biology Technician

2.4. Microbiology Laboratory
Location: Natural Sciences Building: Ground floor (Rm 118) and 1st floor (Rm. 224). Management:
- Dr A. Ramsubhag
- Professor J. Jayaraman
- Ms D. Ramsaran (Technician)
- Ms Christine Fraser (Laboratory Assistant)
- Ms Renee Ali (Technician).

2.4.1. Major specialized equipment
a) Laminar flow Hoods/Biosafety Cabinets (4)
b) Autoclave
c) Incubators (Rotary and Wrist- action shaking as well as Stationary; d) Spectrophotometer
e) Microscopes (Stereo, Light field/Dark field, Phase contrast, Fluorescence)
f) Colony counters
g) Additional facilities commonly used by researcher/students:
   - Biotechnology Laboratory
   - Histology Laboratory

2.4.2. Major research areas
a) Environmental Microbiology
   - Watershed management and epidemiology of recreational waterborne diseases (Drs A. Ramsubhag and D. Phillip)
   - Bioremediation (Drs A. Ramsubhag, A. Mohammed and D. Beckles)
   - Environmental public health (Dr A. Ramsubhag, Dr D. Phillip)
• Diversity and bioprospecting of environmental microorganisms (Drs A. Ramsubhag and A. Maxwell)

b) Plant Pathology and Plant Biotechnology
• Diversity and epidemiology of plant disease causing organisms (Dr A. Ramsubhag and Prof. P. Umaharan, Ministry of Agriculture)
• Genetics of plant disease resistance (Drs A. Ramsubhag and W. Elibox and Prof. P. Umaharan)
• Plant-microbe interactions, induced resistance, molecular plant disease diagnostics, plant genetic engineering for resistance (Prof. J. Jayaraman and Dr A. Ramsubhag)
• Integrated disease management of Caribbean vegetable crops (Prof. J. Jayaraman, Dr A. Ramsubhag, Dr A. Khan, Prof. P. Umaharan and Dr R. Braithwaite)
• Use of seaweed compounds as biological elicitors and plant growth activators (Prof. J. Jayaraman, Dr A. Ramsubhag, Dr A. Farrell)

Biological control of pests
• Crop pests (Drs. A. Khan and A. Ramsubhag)
• Mosquito (Dr A. Ramsubhag)

d) Diversity and taxonomy of microorganisms (Drs A. Ramsubhag and W. Elibox and Prof. P. Umaharan)

2.4.3. Major international collaborators
Dr Dave Bachoon, Georgia State University and College (Microbial ecology of the Trinidad Pitch Lake); Prof. Jeff Jones, Florida State University (Genetic diversity of the plant pathogen Xanthomonas campestris in Trinidad); Prof. Max Haggblom, Rutgers University, New Jersey, USA (Metabolism of novel species of PAH degrading bacteria from Trinidad Pitch Lake); Dr Emmanuel Wicker, IRNA, Guadeloupe (Genetic diversity and epidemiology of the plant pathogen Ralstonia solanacearum in the region; Collaboration Prof. Umaharan and Ministry of Agriculture); Prof. Dirk Schulze-Makuch, Washington State University (Trinidad Pitch Lake as a model for Life on the Saturn Moon, Titan, together with Dr Shirin Haque, Physics Department); Tamilnadu Agricultural University, Coimbatore, India; IIHR, Bangalore, India; Annamalai University, India; Dr S. Marcuz, U Calgary, Canada, Prof. Z.K. Punja, SFU, BC, Canada, Dr M. Rahman, U., USA (Identification elite disease resistant lines, Mechanism of induced resistance by seaweed elicitors, Plant disease diagnostics and molecular based pathogen identification tools).

2.4.4. Use by undergraduate students
a) Level II students completing research Projects (AGRI 3013 or BIOL3069) are allowed to use the laboratory under supervision from approved staff or graduate students after completion of general and safety training.

b) Students may be allowed to use the lab unsupervised after demonstrating acceptable levels of competence and responsibility.

2.4.5. General safety guidelines
General:
a) In a Microbiology laboratory it is important to take precautions to prevent the possibility of being infected by pathogenic microorganisms;

b) Treat all microorganisms as possible pathogens and all sample materials as containing pathogens;

c) It is important to be immunized against microbial diseases for which vaccines have been developed when risk of infection is high;

Routes of Entry of Microbes into Body:
a) Inhalation - aerosols or toxic fumes;

b) Ingestion - from hand to mouth, improper pipetting, improper washing of hands;

c) Inoculation - from puncture wounds or cuts from sharps such as needles, broken glass etc;

d) Direct contact- splashes to open wounds or mucous membranes of eye, nose or mouth.
**General Safety Practices:**

a) No eating or drinking in laboratory areas;
b) No food is to be stored in laboratory refrigerators;
c) No smoking in laboratory areas;
d) Tie long hair back and wear personal protective equipment (eye protection, coats, gloves, closed shoes; glasses may be preferred to contact lenses) whenever appropriate;
e) Jewellery etc. must be secured in such a manner as to prevent them from coming in contact with contaminated materials or surfaces and also to prevent shedding of organisms in the work area;
f) No application of cosmetics handling contact lenses, or placing objects (fingers, pencils, etc.) in the mouth or touching the face in laboratory areas;
g) Wash hands with soap and water frequently especially after removing gloves and on leaving the lab;
h) Open cuts or wounds must be covered;
i) Use appropriate aseptic techniques and equipment to prevent contaminating surfaces or exposing individuals in the laboratory;
j) Mouth pipetting is prohibited;
k) Handle with proper care all materials, equipment and return all materials to proper locations;
l) Report all spills and accidents to the instructor (lecturer, Teaching Assistant, Technician, Demonstrator);
m) Unnecessary books and magazines should be kept away from the work area;
n) Keep bench tops clear of extraneous materials;
o) Report all breaches of safety guidelines to instructor;
p) Personal protective equipment should not be worn outside the lab.

**Protective Wear and Equipment:**

a) Lab coats should be worn and properly fastened by persons entering the lab;
b) Gloves must be worn whenever potentially infectious specimens or substances are being handled;
c) Face shields/eye wear must be worn when splashing of hazardous chemical or infectious materials is anticipated;
d) Shoes should cover the entire foot;
e) Biological safety cabinets should be used whenever procedures are being carried out with a high potential for generating aerosols such as by vortexing, blending or vigorous mixing;
f) Fume hoods should be used whenever toxic chemicals are being used.

**Decontamination and Waste Disposal:**

a) Work surfaces should be decontaminated with appropriate disinfectant;
b) Spills should be immediately wiped up after dousing with disinfectant;
c) Lab wastes should be immersed in disinfectant or preferably autoclaved or incinerated before disposal (Autoclavable bags are provided to place all culture, Petri-dishes and other materials no longer required);
d) Sharps (needles etc.) must be disposed on a puncture resistant container;
e) All disposed wastes must be properly labeled.

**Chemical Safety:**

a) Unless otherwise known, all chemicals must be treated as hazardous;
b) All chemicals must be properly labeled which should include hazardous properties;
c) Appropriate clothing and equipment such as chemical resistant gloves, aprons, fume hoods etc should be used when handling toxic or corrosive chemicals;
d) Use safety bottle carriers for transporting hazardous chemicals;
e) Flammable liquids should be handled away from ignition sources.
2.5. Greenhouse Facilities and Field-B

Located west of the Frank Stockdale Building, the Department of Life Sciences maintains two greenhouses, a screen house and a gymnosperm collection. In addition, the surrounding grounds house museum plots of plants used in the teaching of Botany. One of the greenhouses has been converted into a shade house and fitted with automatic irrigation and fertigation systems, and is dedicated to research on anthuriums. The remainder is used for general teaching and research activities. The screen house, consisting of eight insect-proof rooms was originally constructed under a yam virus project, but is currently used for studies with geminiviruses and other insect transmitted diseases. The greenhouse maintains a medicinal plant collection and a sweet potato germplasm collection. Another greenhouse is to be constructed this year, behind the biotechnology Laboratory. This will serve as a hardening house for tissue culture plants as well as a GMO house.

Associated to the greenhouse facilities there are limited field facilities just outside the Northern Entrance of the St. Augustine Campus. Limited trials can be carried out in these facilities. This area is irrigated through drip irrigation. More extensive field research has to be carried out at the University Field Station (See section 3.16).

The greenhouse and field-B facilities and activities therein are overseen by a foreman with the assistance of four labourers. The staff member responsible for the greenhouses is Dr Aidan Farrell. Students who wish to conduct their final year projects in the greenhouse should contact Dr Farrell.

2.6. The National Herbarium of Trinidad and Tobago

The National Herbarium of Trinidad & Tobago (NHOTT) was established in 1887 by John H. Hart, superintendent of the Royal Botanic Gardens in Port of Spain. It is an archival collection of dried plant specimens mainly of the flora of Trinidad and Tobago. For sixty years it was managed by the Department of Agriculture in St. Clair, Port of Spain. In 1947 it was transferred to the Imperial College of Tropical Agriculture (I.C.T.A) the forerunner to the Faculty of Science and Agriculture, part of which is now the Faculty of Science and Technology. The Herbarium gained national status in 1972 and operates from the Sir Frank Stockdale Building on the St. Augustine campus of The University of the West Indies. The herbarium is internationally registered by the code TRIN and is listed in the international directory Index Herbariorum published by the International Association for Plant Taxonomy (IAPT) and The New York Botanical Garden (NYBG). The NHOTT is the only institution in the southern Caribbean recognized to give accurate plant identifications.

2.6.1. Herbarium staff

- Mrs Yasmin S. Baksh-Comeau – Curator
- Mrs Prudence Kim Roberts – Accounting Assistant
- Ms Keisha Manaure – Research Technician
- Ms Beverley Adams-Baptiste – Library Assistant

2.6.2. The plant reference collection in the Herbarium

The vascular plant collection is the main collection and estimated at 70,000 specimens with the oldest collections dating from 1842.

a) Vascular Plant collection is comprised of:
   - Indigenous plants of Trinidad & Tobago.
   - Introduced plants of economic and ornamental importance.
   - Collections from other Caribbean islands including Guyana and Belize.
   - Voucher specimens inherited from the Theobroma and Herrania germplasm collections of the ICTA (Imperial College of Tropical Agriculture) Anglo-Colombian Expedition in 1953, brought in for breeding disease resistance in Cacao.
   - Voucher specimens from the Breadfruit germplasm collection at the UWI field station.

b) Lower Plants and Macrofungi, including:
- A well curated collection of marine algae from Trinidad & Tobago with ca. 500 specimens.
- A well curated collection of mosses and liverworts from Trinidad & Tobago ca. 1000 specimens.

Only herbarium staff and bona fide researchers approved by the Curator have direct access to the specimen collection. Requests to view or study specimens are allowed under the supervision of a member of the herbarium staff.

2.6.3. The library

The herbarium library has a specialized collection of ca 10,000 references. These include floras, journals, reprints, monographs, maps, theses mainly on the neo-tropics, but there are a few publications covering other geographic areas. The references are accessible to students and the public for information or research but not available for loan. The collection is currently being catalogued with plans to become the Virtual Herbarium Library for Trinidad and Tobago and the Caribbean. The herbarium staff are on hand to assist visitors with their queries and provide them with the relevant references if needed.

The herbarium staff welcome students, researchers and the general public to use the library collection under the supervision of the herbarium staff. There are no fees for using the library collection. Users are expected to handle the books with care and re-shelve after use, unless otherwise instructed. If information requested involves unpublished research, the inquirer is directed to the relevant researcher who will provide the information at their discretion. We would appreciate acknowledgement of our services in any publication. Users are responsible for obtaining copyright permission where necessary.

2.6.4. Herbarium services

The herbarium is open to students and the general public. It provides a plant identification and information service during normal working hours 8:30am - 4:30pm, closed for lunch, on weekends and public holidays. A fee is charged for plant identification and /or field assistance. Details of the rates are posted up on the front door to the herbarium and subject to revision periodically. Fees are negotiable, and may be waived in some circumstances.

All requests for field assistance, specimen loans, outreach presentations and research projects must be sent to the Curator in writing, stating the name of the person and his/her occupation and associated organization/s. For the loan of materials, the duration and purpose must be stated. For field trips, locality, date/s and duration of the trip, arrangements for transport and collecting permits if required. Requests for the use of the plant drier and/or plant presses or any other assistance must be done through the Office Administrator.

2.7. Animal Room and Aquatic Laboratory

The Animal Room is located on the ground floor of the old wing of the Natural Sciences building. The facility includes several large holding tanks and numerous aquaria of different sizes for research on aquatic and terrestrial animals, a large bat cage and other smaller cages for holding terrestrial animals. Aeration is via air-blowers. The room is not air-conditioned and is used for research on animals by undergraduates, postgraduates, and faculty.

The Aquaculture and Fisheries Research Laboratory is located on the ground floor on the southern end of the Natural Sciences building. The facility includes a recirculating seawater and freshwater system and numerous aquaria of varying sizes for culturing fish, shellfish and algae. There are also facilities for fish behaviour research. Aeration is via air-blowers. Incoming water is passed through ultraviolet filters. There is photoperiod and temperature control, and the laboratory is used for research on aquatic animals by undergraduates, postgraduates and faculty.

2.7.1. Guidelines for use of the Animal Room

a) The facility is exclusively for keeping live animals for teaching and research. The area should not be used for storage of unrelated materials.
b) Undergrad and post-grad students who require space should consult with their supervisor and the coordinator of the animal room, Dr Amy Deacon.

c) All animals are to receive proper care. This requires regular and suitable attention.

d) A student’s work area should be clearly labelled and telephone contacts should be provided in case of emergency.

e) Keep work area and equipment clean and tidy. Place rubbish in plastic bag provided by door.

f) Mop up water spills; do not leave them to create excessive humidity.

g) Remove dead animals from the room and dispose of elsewhere – there is no regular rubbish collection.

h) Dispose of animals properly after an experiment has finished – do not keep them unnecessarily.

i) Do not leave drains blocked, taps running, or hosepipe across pathways.

j) The tiled concrete bench is a general work area and should be kept reasonably clear. Do not set up experiments there.

k) Personal keys will be issued only under certain circumstances. Normally, students requiring access are required to borrow a key from the Zoology Secretary and return the key as soon as the work is completed. The key is not to be kept overnight.

l) Visitors should not be encouraged into the room.

m) Take care not to interfere with another’s experiments.

n) Any unlabelled material or equipment will be removed.

o) The door shall be kept closed at all times.

2.8. Microscopy and Histology

The Histology Laboratory (Rm 120, Ground Floor) houses the Botany and Zoology slide collections, microtomes and other equipment for preparing sections of biological specimens, and the Digital Imaging Facility (DIF).

The DIF is based on a suite of 3 digital cameras, hosted by a graphics intensive computer with image enhancement software, that acquires images from an Olympus BX50 research microscope (with phase contrast, differential interference contrast, and fluorescence imaging systems), and from an Olympus SZX research stereozoom microscope. A copy stand is available for macro digital photography. A Pixera cooled 5.8MP low noise camera permits fluorescence photomicrography as well as routine image recording. An Olympus DP12 3MP camera, with its integrated control module and LCD display, is suitable for standalone applications. Finally, there is a more rugged monochrome Cohu digital video camera which is useful for such things as measuring and counting biological specimens under the microscope and measuring leaf areas on the copy stand. The DIF is available to faculty, and to research students under supervision.

2.8.1 Histology Laboratory Staff

- Vacant

2.8.2 Laboratory Use and Safety

The Histology Laboratory is available for use by staff and students alike with a bona fide need for its facilities. All students must have prior approval from their supervisors, and undergraduate students are not allowed to use the laboratory unless they under direct supervision at all times. Keys are not to be copied, nor is the entry access code to be given out except with direct permission. Postgraduate students, may, under exceptional circumstances, be allowed access after hours or on weekends.

All users must follow the posted safety rules.

2.8.3 Protocol for Using the Digital Microscopy System

Full access to the system is restricted to certain users, who are responsible for its proper care and operation. Abuse of password privileges will result in further restrictions.
a) **Booking.** You MUST book the system ahead of time. Do not book the system unless you are SURE that you will use it, and do not monopolize the time. There are often others wanting to use it too. Ask first.

b) **Falcon Uninterruptable Power Supply.** This must remain on at all times. If there is a power outage it will provide about 20 minutes of microscope and computer time. All system components must be powered by the UPS, not plugged in elsewhere.

c) **Microscope.** The Olympus BX50 microscope provides Brightfield, Phase Contrast, Differential Interference Contrast, and epifluorescence optics. It is impossible to summarize their use here. **DO NOT ATTEMPT TO USE THE MICROSCOPE, COMPUTER, OR CAMERAS WITHOUT MY TUITION.**

d) **Viewing Specimens.** Specimens on slides must be protected by cover glasses. Specimens viewed without a cover glasses of the correct thickness will appear blurry as a result of spherical aberration. Do not use wet mounts unless you are CERTAIN they will not leak fluid onto the stage. If there is a spill, remove the slide and get help to clean up the spilled liquid. The microscope objective lenses are made of UV light transmitting fluorite glass, which is easily scratched. **DO NOT CLEAN LENSES YOURSELF.** There is a great risk of damage.

e) **Cameras.** At this time the Pixera Penguin 5.8 MP colour camera and Cohu PAL monochrome digital video camera must be used interchangeably. Do not attempt to swap cameras yourself. Each camera has its own software packages (Scion Image and Image J for the Cohu, Viewfinder and Studio for the Pixera). IrfanView is the image viewer installed for use at present, and other image viewers are installed on the system.

   The standalone Olympus DP12 3MP camera system is intended for use with the SX70 stereozoom microscope. Other configurations are possible, for example the Pixera camera will fit on the SX70. There is a macrozoom C-mount lens intended for the Cohu camera which will work with the other cameras under certain circumstances.

f) **Computer.** The Dell computer is specifically configured for image acquisition and manipulation. Memory management is dedicated to viewing and manipulating large image files (3-14 MB or more). Also, the LCD display is optimized for viewing images and text quality is mediocre. **DO NOT TOUCH OR ATTEMPT TO CLEAN THE DISPLAY SCREEN.**

g) **Computer access and System settings.** The computer system may be run through the pgrad domain. Most glitches can be solved by simply restarting the computer. To avoid software conflicts there is no antivirus programme installed on this system. **DO NOT CHANGE ANY SYSTEM SETTINGS OR SAVE ANYTHING ON THIS SYSTEM APART FROM DATA AND IMAGE FILES GENERATED WITH THE SYSTEM.** If you attempt to run other software, including screensavers) while using the Pixera or Image J software, the screen will flicker, Windows XP will crash, or worse.

h) **Saving and Storing Images.** The computer system uses two 120 GB hard drives that are RAID 1 configured to provide dependable, mirrored storage. However, do not plan to permanently store what you save on the system. For any number of reasons you might find your saved files are missing. While I endeavor to store as much material as possible, I routinely clean up the system and delete inappropriate files and programmes. It is therefore expected that you will back up your images etc. on CDs. Files must only be stored on new CDs dedicated for use on this system. Use CDRs only, not CDRWs. Memory keys are acceptable only if they have been scanned for malware first. Never use floppies.

i) **High Voltage Supply** for High Pressure Mercury Vapor Lamp. Use only for epifluorescence microscopy.

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2.9. **The UWI Zoology Museum**

The zoological collections of the St. Augustine Campus of the University of the West Indies consist of approximately 90,000 specimens. The collections have a long history, dating from the time of the Imperial College of Tropical Agriculture, with the bulk of the present holdings accumulated
between 1925 and 1960. Since 2010 there has been a full time curator and the collection is starting
to expand again. The collections are currently being catalogued and added to an online searchable
database; find out more on the museum website - http://sta.uwi.edu/fst/lifesciences/zoology.asp or
Like the museums Facebook page at https://www.facebook.com/uwizoolgymuseum

2.9.1. Museum Staff
 Mr Mike Rutherford - Curator
 Mr Rajindra Mahabir – Technical Assistant (Land Arthropods)
 Ms Jennalee Ramnarine – Technical Assistant (Zoology Room)
 Ms Pauline Geerah – Museum Assistant

2.9.2. The Zoological Reference Collections
All the main animal groups are represented with the majority of the specimens coming from Trinidad
and Tobago. The collections are housed in the Department of Life Sciences in two separate
rooms.

The Zoology Room contains around 9,000 specimens of mainly local fauna, including freshwater
and marine fish, reptiles, amphibians, mammals, birds, molluscs, crustaceans, corals,
echinoderms and smaller invertebrate groups. These specimens are divided into the wet
collection (specimens in alcohol) and the dried collections (shells, skeletal remains, skins, etc.)
There are also geological and archaeological objects including the famous Banwari Burial (a 5000
year old Amerindian skeleton).

The Land Arthropod Room contains around 80,000 lots of insects, arachnids and myriapods. The
majority are dried and pinned in entomology cabinets. This room effectively serves as the national
entomological collection of Trinidad & Tobago. In 2012 the collection tripled in size with the addition
of the CABI collection. The collection is particularly strong in the Hymenoptera (social insects),
Coleoptera (beetles) and Lepidoptera (butterflies and moths).

2.9.3 The Teaching Collection
The Teaching Collection services the Department’s undergraduate courses and is housed in the
main laboratory (LS1) on the ground floor of the Natural Science Building. Students are
encouraged to view the material but must exercise care in handling the specimens as they are all
valuable. The specimens here reflect the range of specimens in the other two rooms.

2.9.4. Museum Services
The Zoology Room and the Land Arthropod Room are open for visits and tours generally from
Monday to Friday, 8:30 a.m. to 4 p.m. depending on staff availability. Organised tours can be
booked in advance by contacting the curator. Any zoological specimen can be brought in for
identification during these hours.

2.10. Professor Dave D. Chadee Laboratory
This laboratory is devoted to studying the epidemiology and control of diseases of public health
importance including insect vectors and parasites. Field and laboratory based studies are
conducted in Trinidad and Tobago ranging from head lice in school children to dengue and
climate change. Because the scope of epidemiology and the epidemiologic approach is so wide
and applicable to all major disciplines, often studies are conducted which bear no relationship to
insect vectors and parasites e.g. epidemiology of passive tobacco smoking. The Laboratory is
equipped for both Parasitology and Entomology studies. Some of the current areas of research at
the laboratory include:
 Population genetics of Aedes aegypti in Trinidad.
 Epidemiology of Trichomonas vaginalis in Trinidad.
 Seroprevalence of Dengue Fever in Trinidad.
2.11 Environmental Biology Research Laboratory
This laboratory is devoted to measuring the effect of environmental change on living organisms under experimentally controlled and/or ambient conditions. Field based equipment located on the north-east coast of Trinidad is used for continuously monitoring Sahara dust particulate matter (PM2.5, PM10), microbes, trace organics and pollen. Portable multi-parameter gas analyzers and noise meters are also available in the lab for undergraduate student use. The Laboratory is also equipped with a range of specialized instruments including a Blood Gas Analyzer, Osmometer, Coulter Particle Counter, Flame Photometer and Digital Oscilloscope among others.

2.12. Ecotoxicology Laboratory
Toxicology has often been defined as “A study of the interactions between chemical and biological systems in order to quantitatively determine the potential for chemicals to produce injury which results in adverse effects in living organisms and to investigate the nature, incidence, mechanisms of production, factors influencing their development and reversibility of such effects (Ballantyne et.al. 1999)”. It has only come of age as a science within the last 30 years as concerns for consumer, workers, the public and environmental health increased. However, work in this area only started about 1999. Among the major driving forces for the recent expansion and advancement of the science, were significant increases in the importation, manufacture, and usage of synthetically produced chemicals. More recently, increased effluent discharges into the environment from industries has been shown to have a noticeable impact on ecosystems. However, whether this impact can be described as negative can only be achieved by understanding how organisms within that ecosystem respond to particular stressor in the environment. Some of the current areas of research at the laboratory include:

- Freshwater and estuarine/marine organisms.
- Impacts of chronic oil contamination.
- Impacts of pesticides on selected amphibians.

2.13. Research Laboratory (212B)
The management of this lab is supervised by Dr D. Phillip, and the Chief Technician where necessary, and is under the direct control of Mr Anton Manoo, Laboratory Technician. The Laboratory Technician is responsible for:

- Coordinating all activities in 212B including use of standard lab equipment.
- Coordinating loans of certain specialist environmental equipment housed in 212B.

2.13.1. Description
a) This lab is a multi-purpose ecology lab with a primary focus on water-testing and aquatic ecological studies.

b) It provides a limited amount of laboratory space for approved undergraduate and graduate students and staff.

c) It houses standard laboratory equipment such as microscopes, balances, ovens, refrigerator and freezer.

d) It houses specialist equipment for water testing and analysis.

2.13.2. Use of lab
a) It is essential that ALL activities are coordinated by the Technician in charge so that no conflicts arise. This applies to all staff and students.

b) As our equipment, resources and space are particularly stretched with the large numbers of undergraduate and graduate students, a very tight rein has to be kept on this lab to ensure that it can be available IN GOOD CONDITION to all who need to use these it and its equipment.
c) All users are expected to plan their business well in advance so that the Technician in charge can be kept informed, bookings can be scheduled effectively and the unauthorised use of the lab and equipment is minimised.

d) It is the responsibility of the staff member to brief their graduate and undergraduate students as to the proper use of the lab, general equipment and normal procedures. With prior notice, the Technician can brief students on specialist equipment.

e) It is the responsibility of the users to keep their workplace clean and to clean up after themselves (glassware, etc.). The Technician is not responsible for cleaning up after students or staff.

f) All lab protocols and standard lab etiquette for maintaining a clean and safe work environment will be adhered to. This particularly entails use of toxic or hazardous chemicals which must be used in the fume hood using standard safety procedures. The lab must be fully ventilated using the extractor fans when working with solvents or other non-toxic chemicals and all necessary precautions taken not to expose others.

g) Use of communal resources such as distilled water, alcohol, etc. must take into consideration other users and any replenishment needed brought to the Technician’s attention so other users are not inconvenienced.

h) Any damage to the lab, equipment, etc. must be reported to the Technician immediately.

i) Standard emergency equipment (shower and eye wash) are available immediately left of the exit door.

j) Any keys borrowed for the duration of the work must be signed out in the Secretary’s office.

k) A full list of equipment housed in the Research Lab can be provided.

2.13.3. Use of specialist equipment

a) All equipment requests MUST BE MADE IN ADVANCE and a booking approved by the Technician. Lecturers and other technicians are asked to ensure that lab requisitions that require these items of equipment are submitted early and such needs communicated as soon as possible.

b) If the Technician is not immediately available or the lab is locked, please leave a request in his dip in the Zoology office or with the Chief Technician.

c) DO NOT REMOVE ANY EQUIPMENT FROM 212B WITHOUT FIRST ENSURING A CLEAR BOOKING. This can lead to very unpleasant consequences when equipment is unavailable for teaching and we have very tight schedules for certain combinations of labs.

d) Use of equipment for teaching will take priority over other uses.

e) The time of expected return of equipment must be given at the time of booking and MUST BE ADHERED TO. EQUIPMENT MUST BE RETURNED to the Research Lab or left with the Chief Technician if the Technician is unavailable.

f) Equipment must be returned in clean working order. Any problems, damage or malfunction MUST BE BROUGHT TO THE TECHNICIAN’S ATTENTION IMMEDIATELY ON RETURN. Please ensure that electronic equipment is turned off when you are finished using it to save the life of the batteries.

2.14. Zoology Seminar Room

The Zoology Seminar Room (Rm 229 Natural Science Building (old wing)) is so named to avoid confusion with the Natural Sciences Conference Room on the ground floor (new wing), but serves the whole department, not just the zoology section. It houses the departmental collection of books, journals, articles, brochures, manuals, undergraduate project reports, M.Sc., M. Phil and Ph.D theses, but is now used mostly for small-group teaching and student presentations (undergraduate and postgraduate).
2.15. University Field Station
The University Field Station (UFS) is located in Mount Hope, sandwiched between the Eric Williams Medical Sciences Complex and the Nestlé factory. It is approximately 100 acres in size and consists of livestock pens, pasture lands, a crop museum, green houses, germplasm collections of tree, tuber and field crops, a seed storage facility, and a research laboratory (Denman laboratory). In addition it has teaching facilities and accommodation for limited number of persons.

The UFS provides support services for conducting crop research, such as land preparation, mechanized seeding, overhead irrigation etc. and livestock research such as animals, pens, animal care etc. The University Field Station serves as the field laboratory for teaching and research carried out by members and students of the Faculty of Science and Technology, the Faculty of Food and Agriculture, and the School of Veterinary sciences.

In addition, the UFS has a commercial dairy unit, which supplies pasteurized milk to supermarkets throughout Trinidad, a commercial poultry unit and a swine unit. The UFS sells milk, meat and vegetables on a daily basis to the public, out of an outlet at the UFS. It is anticipated that an additional outlet would be opened within the campus in the near future. The UFS also undertakes demonstration of new varieties and techniques on a regular basis to transfer technology to the farmers. The UFS supplies a small quantity of foundation seeds of varieties developed at UWI, to farmers and organizations upon request. The UFS also facilitates school tours and visits.

A committee manages the UFS, but the responsibility for day-to-day management is in the hands of the UFS Manager (Mr Altman Ragoobarsingh; contact 662-2750 or 662-1483). Anyone who wishes to use the facilities of the UFS should therefore contact the field station manager, well in advance so that facilities can be made available.

2.16. UWI Biological Society
The UWI Biological Society (BioSci) is a non-profit Environmental NGO based in the Faculty of Science and Technology. It has been in existence since 1987, when it was formed in an effort to improve people’s awareness of environmental issues. In its early days, the society was the pioneer for many conservation efforts. For example BioSci undertook turtle patrolling/conservation under the supervision of the late Professor Peter R. Bacon.

The Society’s mission is to promote coexistence between humans and the natural environment via the enablement of individuals within society. Today the society achieves this mission through a broad scope of activities that includes research, education, conservation, and restoration. Over the years the society has formed many strong partnerships with other groups such as Nature Seekers, the Bucco Reef Trust, and the Protectors of the Environment. We have also partnered with a dozen other environmental NGOs under the umbrella body of COPE to increase our outreach.

2.16.1. Current projects
These include:

a) The Recycling Project which will result in an integrated campus-wide recycling policy at UWI.

b) The Heritage Project, which aims at chronicling the society’s history.

c) The Iwokrama Project, in which some of our members will volunteer at the Iwokrama Conservation centre in Guyana, one the largest rainforest conservation sites in the world.

d) Other ongoing education projects which targets the public including business people, school children and the general public.

2.16.2. Membership and contact details
Those interested in being active in the society can become members for the fee of $10 per academic year. Membership to the society is open to everyone, regardless of faculty, area of study or experience. Membership is also open persons outside of the University. Those who are
simply interested in being kept up to date on the society’s activities can join our mailing list which is free and involves updates on the society’s activities.

The society’s office is on the ground floor of the Natural Sciences building opposite the Histology lab. (It can be identified by the turtle painted on the door). The office is open week days between the hours of 12pm and 3pm. The society can also be contacted at 662-2002 ext 82264 or at uwibiosci@yahoo.com.

2.17. Professor Peter R. Bacon Postgraduate Laboratory
This laboratory, which is situated on the first floor, of the Natural Sciences Building, is the centre for more than seventy MPhil and PhD students. These students span the disciplines of Botany, Zoology, Biochemistry and Environmental Biology. The room functions as a common and computer room for the many students presently pursuing Masters level degrees within this department. It is one of the largest departmental facilities for post graduate students and was the model for post graduate room at the St. Augustine campus because of the high level of integration between students within the laboratory.

What makes the post graduate laboratory so great? It is one of the only facilities on campus where students can have a desk for reading, as well as computer, kitchen and bathroom facilities (with hot water) for those grimy fieldtrips. But, most importantly this room serves as a focal point of research and sharing of research ideas, where more senior postgraduates help the newcomers to graduate research by advising and guiding them on research methods and the protocols for requisitioning experimental materials in the department.

The postgraduate lab also serves the undergraduate community since it houses most of the demonstrators for the undergraduate courses. This makes exchange of information between undergraduate and demonstrator easier since there is a meeting area for exchange to occur. The Peter Bacon Postgraduate Laboratory is a very important resource centre for the Department of Life Sciences. The room was officially named after the former head of department, Prof Peter Bacon, as a tribute to his contributions to the department.
3. RESPONSIBILITIES TO UNDERGRADUATES

3.1. Head of Department
The Head, assisted by the Subject Leaders is committed to taking an active interest in the welfare of the students and to maintain and promote high academic standards of all courses offered by the Department by:

- Acting on students’ complaints and suggestions both on an individual basis as well as those channeled through the staff/student liaison committee.
- Ensuring that adequate provisions (financial as well as staff) are made available for the conduct of lectures and practicals.
- Ensuring that notices pertaining to student matters are displayed on Notice Boards.
- Monitoring the progress of the students enrolled in the courses.
- Facilitating timely reviews of the curriculum.

The lines of communication available to students are: Demonstrator, Teaching Assistant, Instructors, Lecturer, Secretaries, Administrative Assistant, Head of Department, Deputy Dean (student matters), the Dean and Deputy Principal. However, depending on the problem, students may approach any of these officers directly.

3.2. Subject Leaders
The life sciences today embrace a great variety of specialized disciplines, many of which are reflected in the Department’s teaching and research. In order to better manage this diversity, subject leaders are designated for various broad areas. These areas are set according to the undergraduate curriculum – one for each of our majors, at present – although subject leaders have responsibility in other aspects as well. A subject leader’s mandate can be briefly defined as to take a central role in planning the undergraduate and graduate curriculum, to strengthen the department by way of recruitment and development of academic staff, and to provide leadership in organizing the department’s research. While it might appear at first glance that such an arrangement would tend to divide the department into separate units, exactly the opposite is intended. The unity of the department is improved by coordinated development of existing areas of strength. The present subject leaders are:

- Biochemistry – Dr A. Lennon
- Biology – Dr A. Khan
- Biotechnology – Prof. J. Jayaraman
- Environment – Dr A. Mohammed
- Microbiology – Dr A. Ramsubhag
- Plant – Dr A. Farrell
- Zoology – Prof. A. Hailey

3.3. Course Coordinators
Each course has a Coordinator, who is usually also the First Examiner. It is the Coordinator’s business to oversee the overall running of the course and ensure that its objectives are met. A great many of our courses are team-taught by two or more lecturers, of which the Coordinator is one. If you have a question or concern about a particular part of the course, you are advised first to speak with the lecturer handling that part (or the Teaching Assistant, if it is an administrative matter). However, you should feel free to approach the Course Coordinator regarding any matter that seems to concern the course as a whole.

3.4. Timetable Representative
Life Sciences courses are scheduled within a common timetable of the Faculty of Science and Technology. Clashes between courses and other problems should be reported to the
Department’s representative on the timetable committee (Dr W. Elibox) at the earliest opportunity to give the maximum chance of solving them.

### 3.5. Teaching Assistants

The duties of the teaching assistant (TA) varies from discipline to discipline and on the specific course considered. What follows is a description of the most common functions of TAs in the Department of Life Sciences. The TA may be responsible for all the administrative duties with respect to the laboratory component of a course. This includes overseeing the compilation of In-Course marks and laboratory marks, at the end of the course, overseeing students' attendance at labs and in some cases the marking of scripts submitted by students for the courses they are reading.

The TA co-ordinates scheduling of lab exercises with lecturers and demonstrators. The TA is the link between the lecturer and the demonstrators. The TA is responsible for the supervision of all demonstrators during that particular lab session. The TAs are responsible for ensuring that the lab has been appropriately set by the Lab Technician and the Lab Assistants. Any accidents that occur within the lab MUST be reported to the TA in charge of that course. The TA is also responsible for the safe running of a lab, ensuring that all rules governing labs be upheld.

With respect to tutorials, the TA assigns students to tutorial sessions. Any changes required by the student, need to go through the TA and NOT the demonstrator or tutor. For most courses, the marking schemes may be done by either the lecturer or the TA. Any queries with respect to lab marks must go through the TA who will then consult with the lecturer of the course.

### 3.6. Demonstrators

Demonstrators are effectively junior instructors who assist in the teaching of laboratory exercises. They are graduates in life-sciences disciplines with the background needed to help you in the course. Most are graduate students in our department. In most of our courses, each demonstrator is assigned to a particular laboratory bench and so deals with the same group of students from one week to the next. Accordingly, in most courses you will get to know your bench's demonstrator personally, and they will be familiar with you. It is expected that demonstrators will be attentive to the needs of their students at all times. Even so, you should feel free to approach your demonstrator if you have a question or difficulty about the exercise.

Your demonstrators are engaged in a small-group peer-teaching capacity to guide you through the practical aspects of your course. They are recent graduates and have more than likely, asked the same questions that you are too shy to ask the lecturer or teaching assistant. They are the youthful, energetic interface of the department who can provide you with peer feedback of your lab reports and recommend improvements. Your association with your demonstrator is not one of a teacher and student, but one of a learning team, where you work together to get the most out of your practical sessions. Administratively, they are responsible for keeping a record of your lab marks, and submitting this to the Teaching Assistant for final compilation. As your team leaders, they are also responsible for your safety in the lab and field. Therefore, they are authorized to impose a penalty if you fail to adhere to safety procedures. Your demonstrator is not authorized to create marking schemes, accept medicals and excuses or amend marks. Always remember that the mandate of a demonstrator is to make you a better student, so they will help you answer your questions on your own, rather than spoon feed you information.

### 3.7. Chief Technician

The Chief Technician works with a team of technicians to deliver services to students that would enhance their knowledge base while offering a rewarding learning experience.

- Responsible for coordinating and executing all the practical sessions for the various undergraduate courses.
• Assists students in purchasing materials and equipment for research projects.
• Schedules make-up labs for students who missed labs.
• Obtains permits and licenses for students to conduct field studies.
• Provides transport and field support for students.
• Offers assistance for preparation of presentation of students’ projects.
• Clearance of Student’s Caution Fee refund.

3.8. Technicians in Teaching Laboratories
Technicians in teaching laboratories are responsible for setting up equipment for practicals and obtaining consumables, live specimens, or transport as required. Technicians may also demonstrate the proper use of instruments and equipment to students, and ensure that students are aware of safety rules and precautions necessary for hazardous materials. On request technicians may also help students outside of practical classes, such as to:
  • Provide and arrange for materials to be made available for students who wish to revise a particular area of study.
  • Arrange for make-up sessions for students who have missed labs due to illness or other emergencies.
  • Assist students to borrow equipment for overnight or weekend use or provide materials for projects.
  • Arrange the use of other labs on campus for use by students for tests that cannot be performed in the Department of Life Sciences.
  • Arrange for outside personnel to assist students in a given area of expertise.
  • Borrow equipment from outside the Department for use by students to complete projects or assignments.
  • Locate and arrange for purchase and delivery of materials for use by students.
  • Assist students to set up and display projects.
  • Other support required e.g. transport if ill; first aid; emergency phone calls.

3.9. Administrative Assistant
The Administrative Assistant provides the following services to students:
  • Receives Medical certificates for absence from classes/laboratories/mid-term examinations and redirects them to the relevant lecturer. It is the student’s responsibility to ensure that his/her name, student identification number and reason for the submission of the medical are clearly written on the medical certificate. All medical certificates for end of semester or final examinations should be submitted to the Examinations Section by the student.
  • Provides general academic information to students.
  • Can be consulted for information concerning the Faculty’s regulations.
  • Provides general consultation concerning the degree programmes.
  • Provides guidance on Change in Registration (Add/Drop).
  • Provides information concerning oral examinations.
  • Provides information concerning requests for exemption from or credit for the practical component of courses.
  • Assists Student in the selection of courses.

3.10. Main Departmental Office
The Main Office (ground floor, New Wing) provides general information to students; deals with requests for exemptions; takes messages for academic staff; makes appointments for Head of Department; facilitates consultations with Head of Department and other staff members; prepares booklists for students; prepares laboratory manuals and handouts; sells laboratory manuals;
provides a limited photocopy service based on the availability of staff; displays in-course pass lists on notice boards; displays relevant notices to students.

The office also deals with in-course medicals. Photocopies should be sent to the department for transmission to the relevant lecturers and teaching assistants. Students are now required to submit the original medical certificates to the University’s Medical Officer at the Health Service Unit, however to speed up the process we are asking students at the same time to submit a copy to the Life Sciences main office. Students should indicate their name, student ID number and the courses which are affected by the medical.

This office also deals with requests for infra structural repairs and maintenance for the offices and laboratories which fall under the authority of the Department of Life Sciences. The office prepares advertisements and accepts applications for posts of instructor, teaching assistant and demonstrator and prepares Proposal Forms for their contracts. These are sent to the Dean of the Faculty for approval and then to Human Resources (Appointments) for preparation of the contracts after funds have been approved. Claims for payment are also processed through the Main Office. This office makes arrangements for the Staff/Student Liaison meetings and services the meetings. It also approves/denies applications for entry of Specially Admitted Students to pursue specific undergraduate courses.

3.11. Secretaries
There are secretaries in each section of the Department. Secretaries should be the first persons contacted by students to solve most specific problems – if they cannot help, they will know who can. Their responsibilities include: to greet students and usher them to staff as required, and provide information on staff availability to students. Provide general information on Life Sciences degree programmes and advise students on protocol for obtaining information needed. Schedule use of the Seminar room and audio-visual equipment, disburse keys to laboratories and other facilities, and report and follow up on maintenance of the building. The sale of dissection kits, reimbursement of funds spent by students on research projects, and in general to facilitate miscellaneous requests by students.

4. TEACHING AND ASSESSMENT

4.1. Role of Lectures, Tutorials and Practicals
Because peoples’ minds work differently, some styles of teaching promote learning and understanding better in some students than in others. That is the reason for the institutionalization of the lecture, tutorial, and practical as the teaching forums used by universities everywhere. Lectures, ranging from traditional chalk and talk to multimedia presentations, are designed to present information to potentially very large groups of students at once. Tutorials provide feedback either directly through question and answer sessions or indirectly through assignments. Practicals give hands on experience and teach skills and present information that cannot be done during lectures. Attendance at tutorials and practicals is mandatory not only because of the need to make the most of the teaching and technical staff’s time but also because of the effectiveness of these forums in enhancing learning. Online access to course materials and to teaching staff through message boards is proving to be another means of enhancing learning.

4.2. Attendance
Regular class attendance, while not obligatory, is strongly advised. Lectures are designed to enhance material available in textbooks and handouts, and online. Do not attempt to take a course without attending most if not all of the classes. If you do, you risk missing important
material covered nowhere else in the course, announcements of assignments and so on, and opportunities to ask the lecturer about clarification of course information.

Practicals and tutorials are compulsory, and if your attendance record is less than 75% you can be barred from writing the final exam.

4.2.1. Absence from mid-term examinations or laboratory exercises
Understandably, during the year you may be absent from a mid-term examination or laboratory exercise due to illness or an extenuating circumstance. Should this arise you are required to submit as soon as possible, and not later than seven days from your absence, a valid medical certificate or a letter of excuse outlining the circumstance for your absence.

The original medical certificate or letter should be submitted to the Assistant Registrar, Student Affairs (Admissions) and copied to the Head, Department of Life Sciences. You must clearly indicate on the document your name, student identification number and the course/s or examination/s for which you were absent.

Students who have submitted medical certificates/letters of excuse are required to liaise with the Lecturer/Teaching Assistant on their first day on return to classes to discuss the possibility of a make-up examination/laboratory exercise. Any student who was inexcusably absent from a practical or test or does not submit a practical report (initial or make-up) will receive 0% for that exercise. Note that a field trip cannot be repeated for a make-up so you should make every effort to attend field trips.

4.2.2. Absence from final examinations
Absence from final examinations should be reported on the prescribed form to the Senior Assistant Registrar, Student Affairs (Examinations) within seven (7) days from the date of the examination. Kindly refer to the “Examination Regulations for Degrees, Diplomas and Certificates” for further information.

4.2.3. Saturday classes
Most courses adhere to the Monday to Friday teaching period. However, Saturday is a recognised teaching day at UWI, and some courses are conducted in part or entirely on this day in order to accommodate, for example, large classes with more than one lab stream during weeks with holidays, or field trips of several hours duration. Students unable to attend Saturday sessions must make arrangements to attend streams on other days or make up for the missed sessions in some other way.

4.3. Online Teaching Resources
Online teaching resources are provided separately from the Departmental web site (section 3.19).

4.3.1. Applications for student use
There are currently three online applications for student use at the St. Augustine campus:

a) **Mylearning** – an integrated set of tools for delivering course content/assessment online.

b) **St Augustine Online** (mySTA) – a comprehensive web platform designed to facilitate Internet communication among the campus body.

c) **Banner** – a query tool designed to give staff and students access to information as regards student admissions, registration and course enrolment and grades.

The online teaching tool, Mylearning, is used extensively for

- formal and informal communication among students and staff (email, discussions)
- official posting of important notices (coursework assessment notices, instructions, and in-course results)
- provision of course details, lecture notes, practical guides, tutorial briefings
- provision of recommended resource materials and links to resources on specific websites
- self-test quizzes, questionnaires, surveys
- interactive activities such as discussions, wikis, glossaries, blogs
Students are strongly advised to check into their myelearning courses and their UWI email on a regular basis so they do not miss any important updates or notices. Students should also ensure that their registration information on Banner Secure area is accurate and their contact information is up to date.

4.3.2. Netiquette
Communication online has its pros and cons. One of the big pros is that you can send e-mail or post questions and comments to discussion forums any time you like. One of the big cons is that the tone or intent of a message can be misinterpreted. To keep the lines of communication open and flowing nicely, all e-mails and posts to discussion forums must observe the following points of 'netiquette':

a) Informative subject lines. Always include the lesson number and at least one or two relevant key words. For example, 'I have a question' is a poor subject line. 'Lesson 3: Question about mitochondria' is much better.

b) Correct grammar, spelling, and punctuation. E-mails and discussion posts should be written just as you would write a letter to the Queen, the Prime Minister, or your grandparents. Use complete sentences and paragraphs. Internet acronyms such as IMHO, ITA, ROTFL, LMAO, etc. are not appropriate for academic discussions.

c) References. Where appropriate, give textbook page numbers, class website page references, etc., when you mention specific items. Be prepared to cite sources in support of your arguments.

d) Correct forum. Take a few seconds to ensure that your post is going in the right forum. If you post to the wrong forum accidentally, move your post to the correct forum.

e) Aggression. Avoid the use of the following styles of writing, which can be interpreted as aggressive behaviour in e-mails and in discussion forums:
   - All Caps. Restrict your use of Caps Lock to EMPHASIZING individual words or creating titles or subheadings in your message. THE USE OF ALL CAPITAL LETTERS IS THE EQUIVALENT OF SHOUTING!
   - Excessive punctuation. Multiple punctuation marks can be read as anger; for example: No!!!! That is not a useful application!!!!!! ????What are you talking about????? Follow the rules of grammar in using punctuation.
   - Negative slapping. This is characterized by brief, unsubstantiated comments in response to another person's e-mail or post. For example, if someone posts a description of the process of mitosis and another person responds with 'Use consistent language', this is a negative slap. The responder has not made it clear what they are referring to, and has not provided reasons for disagreeing or references demonstrating the original post to be incorrect.
   - Flaming. This one is obvious. Out-and-out personal insults are flames, but so are condescending or sarcastic comments. Such posts will be deleted, and appropriate action will be taken against the offender.

f) Tips:
   - Focus on one subject per message.
   - Compose your message off-line in a word-processor, then copy and paste it into a discussion post. You can then take as much time as you need to organize and format your message.
   - For long posts, start with a warning that it is a long post, and organize your message into paragraphs. Consider using subheadings.
   - Humour is encouraged and welcome, but use caution. The absence of face-to-face cues can cause humour to be misinterpreted as criticism or flaming.
   - Always preview your message.

4.4. Submission and Return of Work

4.4.1. Submission of work
Dates for in course tests and handing in of assignments are posted at least one week ahead. Coursework, term papers, and other assignments completed outside the classroom must be submitted by the stipulated date. Late submissions are not accepted without good cause in the form of an approved medical or equivalent document.

4.4.2. Return of marked work
Every effort is made to evaluate and return in course work in a timely manner. While multiple choice and fill in the blank tests are normally not returned, the lecturer will often, upon request, allow students to review their answer scripts. Test and assignment results are likewise posted in a timely manner. It is your responsibility to review the posted results as soon as possible, normally within one week of posting, and to inform the lecturer concerned of any errors or omissions.

4.5. Plagiarism and Cheating
Plagiarism is the misrepresentation of someone else’s work as your own. With the burgeoning amount of information available in print, on TV, and on the internet, the temptation to copy written, graphical or pictorial material into an assignment is very great. Yet this activity is morally and legally wrong. In lieu of formal disciplinary action, assignments containing plagiarized material will either be returned to the student with a mark of zero, or returned for resubmission when rewritten in an original form satisfactory to the lecturer for marking, at the discretion of the lecturer. This does not preclude formal disciplinary action, which may include expulsion from the University. Students discovered cheating on an in course test will normally receive a mark of zero for the test. Again, this does not preclude formal disciplinary action.

The course coordinator may specify that coursework should be accompanied by a completed Department of Life Sciences accountability form, which is available for download at: http://www.sta.uwi.edu/fst/lifesciences/undergraduate.asp.

4.6. Assessment
Courses in Life Sciences are evaluated by in course theory and practical tests, essays, practical reports, and so on, which typically account for 50% of the final mark in the course. A final examination typically accounts for the remaining 50%. As a general principle, medicals only excuse a student’s absence at the original assigned time. Students must still complete any make-up exercise offered in order to obtain the marks for that item of coursework. The student is responsible for liaising with the Course Coordinator or Teaching Assistant to find out any make-up arrangements. Absence from a test or practical must be accompanied by a written excuse or medical submitted to the Health Services Unit and copied to the Main Office, Life Sciences within 7 days of the missed exercise. Students must attend any make-up exercise offered or they will receive 0% for that item of coursework.

4.6.1. Tests and examinations
The purpose of any test is of course to assess your understanding of the subject. Biology is the most fact-intensive branch of natural science, and this often leads to a serious misunderstanding about what is being tested. It is necessary to know the facts in order be a biologist, but the key question is what you do with the facts. Especially in the final theory exam, an answer that simply details a lot of facts - no matter how accurate and relevant - without organizing and focusing these on the question at hand will not impress the examiners very much. In short, the facts are the just the beginning.

Life Sciences theory exams have a standard instruction at the top to use examples and drawings where these are appropriate. For that reason, individual questions seldom ask for examples or drawings, as it is understood that you will use these if they suit the purpose of the question.
An important thing that many students seem not to understand is that there is nothing haphazard about the form and wording of exam questions in Life Sciences. We go over each question carefully in a meeting, in order to make sure that there is no ambiguity and that it clearly asks for what we want. Accordingly, it pays to interpret each exam question quite literally. Almost never does a question amount to “Tell me everything you can remember about ...”, and unfocused answers that interpret a question in such terms, likewise, do not impress the examiners.

4.6.2. Types of question

The main substance of our exams is structured questions, which lay out what is wanted in the manner just described. However, two other types of questions sometimes arise. Short notes are brief treatments of the main points of a topic, usually limited to one page per topic. An essay is a focused discussion of some aspect of a topic. This leaves the student considerable latitude of choice, but it also requires the student to make that choice well. For example, “Write an essay about spiders” leaves the options of treating various predatory habits or various types of webs or the properties and uses of silk or the peculiar habits of communal spiders, among many others. Many students misinterpret “essay” as a general account of a taxon or phenomenon. And it is certainly not a request for every fact you can recall on the topic. If you cannot choose a good theme, it is best not to do an essay question.

The following are some of the terms that commonly come up in our exams:

- **Compare** means to give the important similarities and differences between two things or among more than three things. We usually no longer use “compare and contrast”, as to compare is also to contrast.
- **Define** means exactly what it says: State precisely and concisely what the term means – marks are often allocated specifically for this definition.
- **Describe** requires you to give the main points of a taxon or phenomenon. In so doing, it may be useful to state explicitly how it differs from some other taxon or phenomenon with which it shares some features.
- **Discuss** requires you to give a critical account of the topic, usually at some length.
- **Explain** may require reasoning or reference to theory, depending on the context.
- **Outline** implies brevity, just giving the essential points. We sometimes ask you to outline a larger topic, or to “briefly describe” something, as a prelude to discussing or explaining some part of it at greater length.
- **State** implies a concise answer with little or no supporting argument. For example, to define a term is to state what it means.

4.6.3. Practical coursework

Attendance at practical sessions is compulsory. Any student who was inexcusably absent from a practical or who does not submit a report will receive 0% for that exercise. Students must attend a minimum of 75% of the practical sessions - failure to do so will result in debarment from the final examination.

4.7. Representation and Feedback

4.7.1. Class representatives

Each class (or each stream in large classes) will elect a Class Representative and one Alternate during the first two weeks of the course. Time will be allocated for this by the lecturer during a tutorial or practical, but the conduct of the election may be by students, in the absence of the lecturer if so requested. The Class Representative and/or Deputy will attend the two meetings of the Student-Staff Liaison Committee held each semester, and present feedback from the students attending that course or stream to the lecturing staff. This feedback is normally provided both orally (in the absence of the course lecturer if requested), and in written form for transmission to the lecturers. Course lecturers or other staff will respond at the Student-Staff
Liaison Committee meeting, or later as a result of circulated notes of the meeting. Students may comment on any aspect of the course or facilities.

4.7.2. Standard operating procedure (SOP) for class representatives

Class representatives must:
1. Attend both liaison meetings; at the beginning and near the end of the semester. Should the class rep. be unable to attend a vice class rep must be present in his/her place.
2. Maintain respectful conduct during any interaction with faculty members and/or colleagues at all times.
3. Make certain that issues are unbiased and not personal grievances with the faculty, demonstrators or the course itself; use some degree of critical analysis to distinguish between the two.
4. Ensure that pertinent grievances have been previously reported to the correct chain of authority and follow up on these reports.
5. Present both positive as well as negative feedback at the liaison meetings.
6. IMPORTANT: Bring copies of survey sheets and a diary of meetings with TAs/lecturers to demonstrate transparency of issues for discussion and that proper protocol has in fact been adhered to. These will be verified at the meetings.

What are my functions as a class representative?
- Act as a communication link between the faculty and students and provide an unbiased means by which students can air their concerns without the fear of victimization.
- Make key information available for entire class (CD with sign out sheets, collect money for photocopies, ask external lecturers to put their material on Myelearning if possible or liaise with the TA or course coordinator to see that this is done).

How do I obtain pertinent issues from the class to discuss at the liaison meetings?
- At the beginning of the semester, circulate a sheet for students to write down their email address (or) go to TA and ask for the mysta address of all the students doing the course. Send out an email identifying yourself and the address by which your colleagues can reach you.
- Anonymous survey forms circulated in class and during lab prior to liaison meetings (make sure all streams get this opportunity) – you must then extract relevant vs. non-relevant material, then seek resolution with the correct authority, if unsatisfactory use in discussions at the liaison meetings.

4.7.3. Course evaluation

Feedback on the quality of courses and how they are taught, both in the classroom and the laboratory, is provided by means of evaluation forms which students complete for each course. The evaluations are kept anonymous, so please give your honest opinions, and take these exercises seriously.

4.8. Grades and Repeating

4.8.1. Grades

The current (revised) grading scheme is available at: http://sta.uwi.edu/fst/lifesciences/undergraduate.asp.

4.8.1. Repeating a course

Students who fail a course and who are asked to repeat it may, upon written application to the Dean, be granted exemption from repeating a compulsory practical component which they have previously passed. The mark from the exempted component will normally be carried over from
the previous attempt at the course, but exemptions are not automatic and are considered on a case by case basis.

4.9. Prizes
Prizes are awarded annually to students who excel in their subjects both at a departmental level and at a faculty level. Most prizes are cash prizes and some of the faculty prizes also include trophies. In this department, students are awarded prizes for the best year I performance overall and also best year I performance in botany, zoology, biology and environment and natural resource management. In years II and II the same prizes are awarded and in addition there are prizes for the best student in biochemistry. In addition to the prize winner a proxime is announced and this is the person who placed a close second. The Julian Kenny Prize in Natural History is awarded to a final year undergraduate student majoring in a Life Science discipline and displaying a strong interest in Natural History. Faculty prizes are awarded for all three years for the students who had the best overall average in the faculty. Students who graduate with first class honours are also honoured with a medal at the Prizes Award Ceremony which usually takes place in October, just prior to graduation.

5. STUDENT CONDUCT

5.1. Lectures and Tutorials
Students are expected to be regular, punctual and should at all times adhere to the rules of the room as indicated. Rules forbidding, the use of cell phones, eating and drinking should be followed at all times. Students are also required to be attentive and to participate in discussions especially in tutorial sessions. Additionally, private conversations between and among students while the lecturer, tutor or student is speaking should be avoided at all times.

5.2. Laboratory Rules
The laboratory can be a potentially hazardous place if one is not careful. Some of the chemicals used are very dangerous and care must be taken when handling them. Broken glassware (due to student carelessness) is a potential hazard as flying pieces can come from anywhere. Proper clothing and eye protection is the sensible way to protect oneself against most common lab accidents. A student who is mentally prepared to undertake the lab, has studied the material and understands the procedures is less likely to make a mistake or injure herself or someone else.

5.2.1. Things to do
a) Always wear a long sleeved, calf-length lab coat in the lab. You will not be permitted into the lab without a lab coat, unless the course coordinator informs you otherwise.
b) Wear proper clothing in the lab, this means, wear long pants/skirts and closed toed shoes. The use of protective eyewear is also advised. You will not be permitted into the lab if sandals are worn or your toes are exposed.
c) Be aware of the chemicals you will be using. This means, consulting texts, which list toxicity and safety, concerns. Two such texts are “Prudent Practices in the Laboratory” and “The Merck Index”. Additionally the Material Safety Data Sheets (MSDS) for the chemicals that you will be using can be obtained online using a Google search (www.google.com).
d) Familiarize yourself with the layout of the lab. Know where the exits are, the fire extinguishers, the first aid kit, eye wash stations etc.
e) Maintain a complete research lab notebook containing all data, calculations, tables and results for each lab session. This book will be reviewed randomly throughout the semester.
5.2.2. Things you should NEVER DO

a) **Never eat, drink or smoke in the lab.** Many types of experiments are run in the lab. Consider that fumes may be lingering in the lab. **If you are discovered attempting to eat, drink or smoke in the lab you will be evicted immediately.**
b) Mouth pipetting is prohibited. Mechanical pipettes are provided.
c) Never work alone. You must always have someone else, i.e., a lab partner working with you.

5.2.3. Breakage fees

All broken glassware is reported and recorded and the individual or laboratory partners are held responsible and the appropriate deductions are made at the end of the academic year. Students pay an upfront caution fee when they register for the first time as freshmen. If no glassware breakage is attributed to the student when they graduate the full amount of caution money is returned.

5.3. Field Classes

Field classes or field practicals are a vital part of your undergraduate education. They illustrate the concepts that have been covered in the theory part of the course and will allow you to gain skills that you will use in your future University courses and your career. An integral part of studying the Life Sciences and in particular Ecology, involves looking at organisms in their natural environment be it terrestrial or aquatic. By looking at these organisms in the field, you can see much more readily how they are adapted to their particular environment, what their specific habitat preferences are, and also any interactions between them. It is important therefore if you are to make a good field biologist that certain general guidelines be followed.

All students taking field classes in the Department of Life Sciences should complete a departmental medical record form and lodge this with the Main Office (ground floor, New Wing). The form is available for download at: [http://www.sta.uwi.edu/fsa/lifesciences/undergraduate.asp](http://www.sta.uwi.edu/fsa/lifesciences/undergraduate.asp).

5.3.1. Teamwork

a) You will often be working in a team or group to gather data while on a fieldtrip. This is an important skill in the world of work so take it seriously and learn from your experiences.
b) Pull your weight. If you do not the marks for your group will reflect this. Demonstrators are also on the lookout for non-performers and often marks are attached to contributions to teamwork.
c) Assess the work to be done and divide it up as appropriate. In some cases a task will be more appropriately done by all the members of the group at once. If in doubt ask advice from your demonstrator.
d) Make sure everyone has a copy of the data gathered before you split up from the field trip. Blaming others in your team for late reports is not an acceptable excuse.

5.3.2. Before the field trip

a) Read the handout and make sure you know what you are doing. This is often subject to assessment by lecturers and demonstrators during the field trip. It is easy to tell who has prepared for the lab and who has not by asking a few questions.
b) Be on time for the scheduled departure. It is your responsibility if you miss the field trip and subsequently incur any penalties. The maxis will leave on time, if you are there or not.
c) It is also important that students keep in mind that field trips are meant to be educational experiences, not endurance tests. Any student who is uncertain about the types of hazards that may exist should consult the lecturer, teaching assistant or demonstrator. Also, any student who feels that a particular activity exceeds his/her physical capabilities should alert the instructor of this IMMEDIATELY.
5.3.3. What to wear

a) You must be comfortable if you are to appreciate the things around you.
b) Wear comfortable but protective clothing. Shorts are generally not a good idea except for aquatic work. Remember you will get dirty, so old clothes are best.
c) Raincoat or sheet of plastic. This is the wet tropics, so it will rain on you occasionally.
d) Hunger and thirst. Particularly thirst. Carry food and drink - water is the best drink.
e) Insect repellant. Mosquitoes are often present in field sites. They can be held at bay by wearing light-colored long pants and long sleeved shirts in combination with some form of insect repellant. Tucking pants legs into socks or wearing tall boots may be warranted at some sites. Sunscreen is recommended for trips in open boats or in areas without adequate tree cover.
f) A whistle is very useful for attracting attention and simple codes for different emergencies may even be developed.
g) Strong, comfortable closed shoes with slip-proof soles are essential to avoid falls and cuts on most terrestrial and some aquatic field trips.
h) A torchlight.

5.3.4. Environmental Hazards

a) Stings from venomous arachnids or insects, such as ants, bees, wasps and scorpions. Medication for immediate relief from stings may be carried in the first aid kit, but students who know they react severely to such stings should be advised to carry any special medication they might need. The most usual culprit is probably the honey bee *Apis mellifera*, whose stingers often autotomize on account of the barbs on the sting lancets. It is a good idea to remove the stinger from the victim's skin, as otherwise it keeps pumping venom into the wound. The best thing is simply to scrape it out with a fingernail - a honey bee sting has little effect if one can scrape it out within a couple of seconds. A sting on any part of a hand should be followed by immediately removing all rings. The effect of a sting can usually be mitigated by applying wet salt to the wound very soon afterward. A labelled vial of NaCl has been placed in the field first-aid kit for this purpose. In fact, sugar or honey or other hygroscopic substance will do, but salt does not encourage ants and bees on to the wounded area.
b) Bites from venomous snakes. Although far less likely to occur than insect stings, snakebites are a risk. Care should be taken to note and avoid poisonous snakes as far as possible in the field. Lecturers should instruct students on field recognition of common snakes. In case someone is bitten, the best plan is to return to the vehicle and seek medical attention immediately. Even if medical assistance is many hours away, amateurs should NOT apply such field treatments as tourniquets and cutting.
c) Poisonous or harmful plants. Students should be shown how to identify common poisonous plants and should be instructed to avoid them. Many plants are poisonous if ingested (eg. Jumby bead (*Abras precatiorius*), red-head (*Asclepias curassavica*), shac-shac (*Crotalaria sp.*), castor oil (*Ricinus communis*). Some cause blisters or rashes from oils, resins or saps when in contact on the skin eg. Manchineel (*Hippomane mancinella*), cashew (*Anacardium occidentale*), mango (*Mangifera indica*), milkweeds (*Euphorbia sp.*). Others have thorns or fine irritating hairs that cause scratches, itching, burning, blisters or allergic reactions eg. Zootie (*Tragia volubilis, Dalechampia scandens* or *D. tiliifolia, Laportea aestsuans*), stinging nettle (*Laportea aestuans*), cowitch (*Mucuna pruriens*). Not all fruits eaten by birds or animals are safe for humans. Avoid mushrooms as most are very toxic. As a general rule very few plants in the forest are edible.
d) Ectoparasites (ticks, mites and chiggers). Tick-borne diseases constitute a serious threat to individuals conducting fieldwork. Students should be instructed to inspect their entire bodies carefully after returning from a day in the field, and to remove any ticks found. A physician should be consulted if suspicious symptoms (fever, joint aches, swollen glands, reddish flushing of skin) occur in the weeks following a tick bite. Chiggers (bêtes rouges) are annoying, although not likely to threaten health. In areas known to
have either ticks or chiggers (practically any wooded or shrubby area in our region),
students should be advised on means of avoiding contact (tucking and taping pant legs,
using repellents, frequent tick checks, etc.).

e) **Endoparasites.** Students should be instructed to exercise care to avoid contact with
water- or soil-borne parasites (*Giardia*, tapeworms, etc.). Never drink untreated water.
Always carry enough drinking water for anticipated personal needs. Water obtained from
sources in the field should be boiled, filtered, or chemically treated before consumption.
Wash hands after handling soil, especially before eating.

f) **Lightning.** If a thunderstorm threatens, the best response is to seek shelter in a building
or vehicle. When this is not feasible, care should be taken to minimize the risk of being
struck by lightning. Avoid open areas and exposed portions of the landscape (peaks,
hilltops, ridges). Boaters should seek shelter on shore immediately. Never stand near or
under isolated tall objects, such as trees or power poles. The safest places outdoors are
in topographically protected areas (valleys or ravines), away from the tallest trees. Avoid
sheltering under rock overhangs or in other situations where an individual could become
part of the shortest path of lighting to ground.

g) **Steep topography.** Some trips may involve hiking in areas of steep topography, where a
real risk of injury caused by accidental falls may exist. Lecturers should remind students
to exercise caution when hiking in steep terrain (such as rock outcrops). Similar
precautions should be exercised in other areas where falls could occur (overlooks,
observation towers, waterfall areas, etc.). Even wet or mossy rocks on a path can be a
serious hazard. Students should also be cautioned not to dislodge rocks or other objects
that could endanger those below.

h) **Aquatic field exercises.** Special precautions should be taken for any field trips around
or in water. Non-swimmers should identify themselves and wear appropriate personal
flotation devices (PFDs) at all times. On trips using boats, all Coast Guard regulations
must be observed. Appropriate numbers and types of PFDs must be supplied and must
be worn by trip participants. If hip or waist waders are in use in water greater than 1-2
feet deep, PFDs must be worn also. On trips to fresh water bodies, students with cuts or
broken skin should not enter the water on account of the danger of leptospirosis infection.

i) **Industrial field trips.** All guidelines provided on the industrial site must be strictly
adhered to.

j) **Farm animals.** The handling of farm animals must only be attempted under the
guidance of the lecturer in charge or the designated instructor.

k) **Hot weather.** Special precautions should be observed to avoid hazards of heat
exhaustion and heat stroke. Lecturers should instruct students on the symptoms of these
two hazards and the field treatment should someone be affected. The first aid kit should
include specific directions for determining and treating heat stroke, and needed supplies
to do so.

5.3.5. While in the field

a) You are in the field to work and learn so prepare yourself to do so.

b) **Always** carry a notebook that has a water resistant cover (or a plastic bag to slip it into if
it starts to rain), a pencil (pens run if the paper gets wet). Do not expect any sympathy if
you fail to carry these essential items on any field trip.

c) Carry equipment relevant to the exercise at hand. You should have some idea of what is
to be collected or recorded from reading up on the laboratory beforehand. If the
equipment is provided then make sure that you or your group have the equipment.

d) Disturb the study area as little as possible. When collecting, do not take excessive
amounts of material, take only what is necessary. Do not litter or leave anything behind.

5.3.6. Safety in the field

a) The field is not your normal environment so be careful and do not take undue risks.

b) Keep in visual or voice contact with your group at all times. Do not venture off by yourself.
c) Minor cuts, scratches and jabs occur all the time when undertaking field work. Make sure and clean the cut after you return from the field and put on a little antiseptic. These cuts can easily turn septic if not kept clean.

d) If you should incur a more serious injury such as severe laceration or broken bones or twisted joint, inform the other members of your group and your demonstrator if they are not already alerted to your plight. Your demonstrator, TA or lecturer will apply the appropriate first aid, do not allow anyone else apply first aid (other students or members of the public) other than making you more comfortable. They may not be first aid trained. Your demonstrator, TA or lecturer will arrange to move you to the maxis and on to the appropriate medical treatment.

e) Chigger (bête rouge) and mosquito bites can be very irritating for several days especially to the unaccustomed. They are not harmful or permanently disfiguring however continued scratching can break the skin at the bite and can easily lead to septic sores that can leave scars. To avoid this try not to scratch and apply topical or systemic antihistamine medication to reduce the irritation.

f) If you have any allergies or special medications that may be relevant to your safety while on a field trip, be sure your demonstrator, TA and lecturer knows prior to the field trip.

5.3.7. Snakes and snake bite

a) If you encounter a snake, move away from the immediate vicinity and alert others to its presence. Let your demonstrator know. Do not touch or poke the animal or go too close to get a better look or photograph.

b) Small snakes can be poisonous too, so respect them just as much.

c) Snake bites are extremely rare. However if you are bitten by a snake or suspect you have been bitten, stay calm. Inform an instructor or classmates. If no instructor is present, send a classmate to find her/him. Do not go yourself or attempt to walk back to the maxis by yourself.

d) Your demonstrator, TA or lecturer will apply appropriate first aid for the bite. Do not let anyone else try to apply first aid (other students or members of the public). They may not be first aid trained. You will walk from the field site calmly and be taken to the appropriate hospital in one of the maxis.

5.3.8. After the field trip

a) Make sure all the equipment used by you or your group is returned to the appropriate person. Do this before you travel back to campus in the maxis so that any missing equipment can be retrieved from the study site. Loss of equipment may incur loss of caution money.

b) If working in a group, make sure everyone has the data. It is best to do this immediately rather than later because you don’t know when you are going to see the rest of your group again. Not being able to get the data from a classmate is not a valid excuse for late field reports.

5.4. General Safety and Operational Rules

The following are some basic general laboratory safety rules to safeguard your health and the health of your co-workers. These are the minimum requirements for persons working in the Department of Life Sciences.

5.4.1. General rules of safety

a) The use of cellular phones is strictly prohibited in the teaching laboratories.

b) During practical exercises, students should seek permission from their demonstrators, teaching assistants or lecturer before leaving the laboratory.

c) Students should conduct themselves properly in the laboratory and no running, jumping or skipping would be allowed.

d) No food or drink should be consumed in the laboratory.
e) The application of cosmetics or lip balms is prohibited in all laboratories.

f) The insertion or removal of contact lenses, and any other manipulations that could transfer hazardous materials to your eyes or mouth is a potential source of contamination. For the same reason it is not advisable to apply cosmetics or lip balm in the laboratory.

g) Smoking is prohibited in laboratories. The proximity to hazardous toxic, infectious and flammable substances makes smoking in laboratories a risk of ingestion and a fire hazard.

h) Departmental staff have the authority to exclude from the laboratory anyone whom they have good reason to believe is intoxicated or otherwise impaired.

i) Students should be familiar with the procedures, protocols and equipment they will use. If in doubt, consult someone in authority.

j) Wear appropriate clothing that offers protection to your body. Clothing which does not offer protection will not be allowed (no short pants, short skirts, sleeveless shirts, etc.)

k) If spills or breakages occur, immediately report it to those in-charge.

l) It is the responsibility of everyone working in the laboratory to make certain that their work space is tidy and un-cluttered.

m) Animals, except for those that are the subject of experimentation are to be excluded from all University laboratory areas.

n) Dispose of waste chemicals (chemical waste, expired chemicals, biological waste, radioactive waste, etc) as per proper procedures. Do not dump waste down the sink. No laboratory materials shall be disposed of by placing it in the regular bins. This is especially important when dealing with animals. These should be placed in the designated collection bins.

o) Occupants should be familiar with the locations of safety and emergency equipment such as fire extinguishers, first aid kits, emergency eye wash stations and emergency showers, fire alarm pull stations, emergency telephones, and emergency exits. In case of an emergency, inform those in charge.

p) Unauthorized people shall not be allowed in a laboratory.

q) Procedures involving the liberation of volatile or toxic or flammable materials shall be performed in a fumehood. Do not expose yourself or your colleagues to hazardous materials - use the fumehoods to eliminate the risk at the source.

5.4.2. Personal hygiene

a) Students are required to wear laboratory coats when conducting practical exercises, unless told otherwise by the course coordinator. Disposable gloves and safety glasses should also be worn when necessary. Safety garments should be removed before leaving the laboratory.

b) No sandals or open-toed shoes shall be worn during laboratory exercises. Shoes should provide full foot cover.

c) Dangling jewelry and excessively long loose hair pose a safety hazard. These should be properly secured. Long nails also pose a risk as materials may be caught under them.

d) Finger rings or other tight jewelry which are not easily removed should be removed because of the danger of corrosive, contaminated or irritating materials getting underneath the piece and producing irritation.

f) Wash promptly whenever a chemical has contacted the skin. Know what you are working with and have the necessary cleaning/neutralization material on hand and readily available. Inform those in charge. Wash hands before leaving laboratories.

g) Clothing worn in the laboratory should offer protection from splashes and spills, and should be easily removable in case of accident.

h) Inhalation is one of the four modes of entry for chemical exposure. "Sniff-testing" should not be done.

i) Never pipette by mouth. Always use pipette fillers.

j) Do not use ice from laboratory ice machines for beverages.
5.4.3. Housekeeping
   a) Work area must be kept as clean as the work allows. Each person will be responsible for maintaining the cleanliness of his/her area.
   b) Reagents and equipment items should be returned to their proper place after use. This also applies to samples being processed. Contaminated or dirty glassware should be placed in specific cleaning areas and not allowed to accumulate. Broken glassware should be placed in the appropriate collection bins.
   c) Counter tops should be kept neat and clean and not used for storing bags.
   d) Stairways, hallways, passageways/aisles and access to emergency equipment and/or exits must be kept dry and not obstructed.

6. STUDY SKILLS

This section of the handbook is largely common sense, but here are some practical tips which we hope will prove useful. It is adapted from the University of Bristol School of Biological Sciences student handbooks, which were produced in response to their students’ requests.

6.1. Timetable
It is important to make a comprehensive weekly timetable (divided into hours). Include lectures, practicals, essays, reading, tutorials, meals, recreation, meetings, travel time, cooking, shopping, sport, cinema, pub, cleaning, charity marathon runs, TV, sleep, unplanned time, etc., as applicable.

6.2. How to Study
   a) Study in a few places only, so you associate them with work: e.g. own room, library, preferably at the same spot at the same times in the week.
   b) In your own room clear a study area with a table or desk facing a blank wall with no posters. Make sure your chair is at the right height.
   c) Good illumination of papers, not in your eyes.
   d) Clear work surface.
   e) Getting started: most difficult! Ritual helps: sharpen pencils, assemble work materials, books, rulers etc.
   f) Set realistic goals. Take a break after each 50-60 minutes. Reward yourself; drink, something to eat, something else you enjoy, etc. when you have achieved a work target.
   g) Tidy work surface when finished.
   h) We all have a best time of day for working coupled to our biological clocks. Time your most demanding work to coincide with this if feasible.

6.3. Note-Taking
   a) Purpose: to record the author or lecturer's main ideas and supporting detail: to make information available for later use.
   b) Outline format is more efficient than continuous prose: it will be easier to follow, and will show relationships more clearly. Make use of numbers, letters, headings. Use graphic devices: boxes, circles, underlining, colour. Make use of abbreviations.
   c) Head and date notes. Loose leaf file allows insertions and rearrangement. Spacing work out makes possible later additions, and the notes are easier to revise.
   d) If you are missing notes (for instance you slept through a lecture), make sure you fill in the gaps by borrowing from a friend or colleague.
6.4. Reading
Be aware of some different categories of reading:
   a) Enjoyment: light reading.
   b) Overview: broad but superficial coverage.
   c) Search: detailed approach to specific topic.
   d) Mastery: trying to grasp the whole of what an author says.
   e) Criticism: questioning the author's views.
Decide which approach is relevant for a particular purpose. To sample a book you can scan it.
Read the preface, blurb, chapter-heads, diagrams, chapter summaries, conclusions. Spot sections or paragraphs which appeal to you, but do not mark books that do not belong to you personally, including library books. Decide which category of reading is appropriate: you have to be selective because biological science is the widest subject of all.

6.5. Learning
It is established that information remains in the memory longer if you (a) read something, and then (b) close the book and 10-20 minutes later try actively to recall the main points. It may help to move about whilst you do this. (The same applies incidentally if you are preparing to give a talk or lecture.) Incorporate this approach when taking notes from books. Stop reading every 10 to 15 minutes or so, recall mentally, write notes from memory, then check and complete by reference back to the text. This increases reading efficiency and long-term recall. After you feel confident, discussion of the subject with other people can also reinforce your knowledge.

7. WRITING SKILLS
This section is also based on the University of Bristol School of Biological Sciences student handbooks. During three years as an undergraduate, you will be assessed extensively from your written work, essay-style in examinations or for tutorials, and report-type in practicals. Factual and intellectual content is most important, but you should also learn how to present your knowledge and understanding in the best way. For scientific writing, this means accurate and detached reporting, clear, succinct and legible writing, the rational development of a theme, and giving credit where it is due (see the notes on plagiarism, section 7.7). In addition, reports of projects - like scientific papers - should conform to a particular format. These notes are to help you develop the customary style of scientific writing. Remember that legible handwriting is still needed in the examinations, and that content of your word-processed work is more important than presentation.

7.1. Composition
An essay communicates an assemblage of facts and opinions about a certain topic. Improve it by observing some simple rules. Scientific considerations (your understanding of the topic, the comprehensiveness and depth of the essay and the clarity of expression) are of primary importance; style is less important but you should aim for correct grammatical presentation, spelling and the accurate use of terms. Books giving advice on how to write a scientific essay or paper are available in the Main Library.

7.1.1. Understand the title
Identify command words (such as "outline", "evaluate"), and apply them to the question. Note any limitations of coverage.

7.1.2. Plan the essay
It should have a concise introduction to the topic and a statement of the aims of the essay, then logical development of the central theme, and finish the text with a definite concluding part. A
critical approach in essay writing is preferred: it shows that you are thinking about what you write. Report the work of others accurately, and do not misrepresent their results or opinions. Word-for-word quotations should be placed in quotation marks, and the source indicated by placing the name of the author and the date of publication in parentheses at the end of the quotation. Details of the sources in the literature should be listed alphabetically at the end of the essay (see section 10.3), though not in examination answers. Your own opinions and conclusions should be justified by the facts that you present. Remember that the opinion of someone else is not a fact.

7.1.3. Assemble material
If possible, assemble material, such as facts, pictures, diagrams, etc. When taking notes from the literature, write on one side of the paper so that you can subsequently cut out and rearrange the data to suit your final plan. As you locate them, make a note of all references.

7.1.4. Write the essay
Avoid the temptation to digress into irrelevant areas by asking yourself if a particular section really does relate to the subject as defined in the title. Break the essay into paragraphs for each main point. Like all modern sciences, biology uses a specialized terminology, including scientific (not "Latin") names for the different kinds of animals and plants. You should become fluent in this, as part of your professional credibility. It is naive to avoid "big words" when they can convey a precise meaning much more conveniently than a whole sentence of simpler ones. Nevertheless, in writing, employ complex terms only when necessary and always explain their meaning when first used. Always credit your sources and list references at the end of the essay, except in examination answers. Remember to aim your essay at an intelligent but uninformed reader. Seek to cultivate simple expression and the use of plain, grammatical English.

7.1.5. Revise the essay
You will now have produced a first draft. If there is time, think further about the subject for a few days before you commence revision of the text. Then write the final version. Don't be alarmed if this differs greatly from the first draft. Many people suffer revelations at the last minute.

7.1.6. Practical reports
These depend on the nature of the practical work and you will be told about any special requirements. In general, such reports should include sections on Introduction (why you did it), Material and Methods (how you did it), Results (what you found), and Discussion (what it means). Don't repeat the results in the Discussion.

7.2. Presentation
Apart from scientific and intellectual content, your written work makes an impression by its appearance, neatness, and literacy. These factors may seem trivial but they make a surprisingly strong impact on the reader who will be assessing the overall value of the work. Again, simple measures can be taken to improve this aspect of the product.

7.2.1. Language
To have reached the University of The West Indies, you must have achieved a qualification in English. We will expect you to have, and to develop, a sound knowledge of the rules of spelling, grammar, punctuation and style. There are numerous pitfalls: we can only list the most obvious here:

a) Split infinitives ("to boldly go").

b) Non-agreement between subject and verb ("he were...", "data was"; "data" is the plural form of the rarely used "datum", so it should always be "data were").

c) Changing tense, case, or gender within a section of text.

d) Confusion between punctuation marks (use semi-colons and commas correctly).
e) Misuse of apostrophes (bones belonging to two dogs are never "two dog's bones" but "two dogs' bones").

f) Use "it's", "its" and "it is" properly; note that plurals never have apostrophes - it is not two dogs bone's.

g) Confusion between "composed" and "comprised" ("composed of" = "comprised") careless hyphenation ("the-rapist").

If in doubt, consult a dictionary, a thesaurus, or books like Fowler's Modern English Usage or Gower's Plain Words. When you word-process, you can usually spell-check your text and consult a built-in thesaurus, but do not pay too much attention to the programme's comments on grammar.

7.2.2. Format
Use standard letter paper, and leave wide margins for the reader's comments. Double-space your work and use only one side of the paper. Don't hesitate to start new paragraphs, and use different sections or sub-headings to subordinate the essay. Number the pages. Write carefully, and train yourself to make sure your handwriting is legible.

7.2.3. Illustrations
Diagrams, of reasonable size, labelled, and with their own self explanatory title, are of great use in essays, and often save much descriptive text. As well as your own drawings, it is possible to scan or photocopy illustrations from elsewhere and paste these in, but the source from which they were taken must be acknowledged. Give each figure a number and a descriptive title. Label it clearly. It should occur at the point in the essay where it is most relevant. You should refer to all illustrations in the text.

7.2.4. Scientific names
Make sure that all scientific names (genera and species, but not higher taxonomic categories) are underlined or italicized. In your text you may use bold or italic for emphasis. The word processing programs produce bold and italic readily, and you can adopt these styles for your section headings. Note that it is best to avoid underlining in computer-generated text, but if you produce your work by hand you should use underline to indicate italics.

7.2.5. Units
Use the SI system of units for mass (kg), length (m), time (s), etc., except on the rare occasions where general usage warrants otherwise.

7.3. References
In scientific writing, it is essential to cite the source of any information taken from other publications. Cite all of your sources, usually both at the appropriate place in the written text and in a list (the 'references') at the end. Check that the references listed have all been cited in the text, and that all cited in the text are listed in the references. See how other scientific writers use references, and follow their style. There are some basic conventions.

7.3.1. In the text
Other workers are cited in the text with date of publication. Note the use of the comma and the position of parentheses in these alternative ways to quote the same source: "Jones (1988) said that birds have feathers." or "Birds have feathers (Jones, 1988)." It is also possible to use another method: "Birds have feathers (1)", with references numbered at the end of the essay, but this usage is less frequent.

7.3.2. Reference list
References are listed in full at the end of your essay, usually in alphabetical order of author's name. Some fairly standard ways to do this are shown in the following examples:
a) A paper in a periodical:
Note the sequence of author, date, and title of paper; the title of the journal is abbreviated (from Journal of Natural History), "26" indicates the volume number (usually in bold type), and "1413-1419" the page numbers.

b) A book:
Here, there is the same sequence of author (or editor), date, and title, followed by number of pages, place of publication and publisher; if the book is part of a series, as here, this can be indicated in parentheses.

c) A chapter in a book:
The book title is quoted as if it were a journal, but without abbreviation, followed by the names of the editors and the chapter pagination; because the publication is a book, place of publication and publisher are also noted.

7.3.3. Incomplete or unseen references
You may need to refer to a paper which you have only been able to find as an abstract, for example online. This should be indicated in the reference list:
You may also need to refer to a work which you have not been able to obtain in any form, for example one quoted in another work. The source should be given in the text, and the original reference should be indicated as unseen in the list. For example, if you read Miller (1996) and need to refer to his 1984 chapter which you have not seen, the text reference would be of the form (Miller, 1984: quoted by Miller, 1996), and the reference in the list would be qualified: Miller, P. J. 1984. The tokology of gobioid fishes. In Fish Reproduction: Strategies and Tactics (Potts, G. W. & Wootton, R. J., eds), 119-153. London: Academic Press. [Not seen]

8. LIFE SCIENCES IN THE MAIN LIBRARY

General rules and instructions for use of the library are available at their web site http://www.mainlib.uwi.tt/. The following sections describe resources available in life sciences in the library.

8.1. Location
Most of the printed information resources for the life sciences are located in the Agriculture and Life Sciences Division (ALS) on the 2nd Floor of the Main Library. Essential texts and booklist items are placed in the Reserve Section on the first floor. Material specific to the West Indies can be found in the ALS Division and also in the West Indiana and Special Collections Division.

8.2. Books
There are approximately 10,414 books in the collection. The call numbers of main relevance to you are QH to QR as follows:
8.3. Periodicals
There are approximately 123 serial titles in the collection and these are interfiled with the books.

8.4. Electronic Resources
The library subscribes to several online databases covering the life sciences. The most useful is Biological Abstracts, available from EBSCO Host, covering the period 1969 to the present. Ensure that the "Full Text" checkbox is unchecked before searching, or this will only retrieve articles held by the library, not full search results. Other electronic resources include: Basic Biosis; Electronic Collections Online (ECO); WorldCat from OCLC First Search. In addition there is access to the full text of journals to which we subscribe available from EBSCO, SWETSWISE and the Electronic Collections Online. All of these links are located on the Library's website www.mainlib.uwi.tt/online.html. From the Library’s homepage there is a link to other electronic resources, click on the "e-resources finder" for access. To help you effectively use these resources the library provides training to all users. There are formal training sessions for groups, or individuals can request training from the Librarian. Contact the ALS Division on extension 83359 or 83596 or in person.

9. FACULTY ACADEMIC ADVISING SUPPORT SYSTEM
These guidelines were prepared by the Faculty of Science and Technology.

9.1. Philosophy and Guidelines
Academic Advising is an important part of Faculty commitment to helping students attain their educational goals. Academic Advisors provide information regarding degree programs, courses, resources, university policies/procedures, and may facilitate the students’ search for career information and opportunities.

The advisor (faculty member) helps the student coordinate his/her academic plan, and can assist in helping the student to solve academically related concerns, either through providing advice and direction or through referral to other individuals and campus resources. Both the advisee and the advisor share the responsibility of being active participants in the advisement process.

The success of the academic advising process hinges on the extent to which both students and faculty meet their individual responsibilities. Faculty Advisors must be prepared to offer students accurate and timely information and advice, and students must be prepared to use the information and advice in ways that will help them establish and meet their own educational goals.

The foundation of the advising process is the relationship between the advisor and the student. The advisee should try to maintain regular contact with his/her advisor in order to foster a comfortable and honest relationship. By meeting with the advisor regularly, students will be better able to…
• Become well informed about policies and procedures, curricular options, and academic program requirements;
• Define their educational objectives;
• Plan a program of study that incorporates their interests, abilities, and career goals;
• Make full use of the facilities and resources available at Faculty of Science & Technology and the University.

9.2. Student Responsibilities in Advising
These include:
• Discussing your long-range goals with your advisor, including possible job opportunities;
• Discussing your choice of a major with the advisor;
• Making final decisions about choices concerning academic matters;
• Being able to ask intelligent questions about your degree program;
• Keeping your advisor informed about things like schedule changes, academic problems, change of major, etc;
• Making regular appointments with your advisor;
• Preparing in advance for every meeting with your advisor, including having possible course options outlined for registration advising;
• Keeping advising appointments and being on time;
• Gathering all decision-making information;
• Following through on referrals;
• Asking questions when you don’t understand;
• Knowing who your advisor is.

Although the academic advisor may assist the student with decisions throughout his/her academic career, the student is responsible for making final decisions regarding personal and educational goals. Students are ultimately responsible for satisfying all graduation requirements, so it is vital that they take an active role in their academic planning. Faculty advisors are willing and able to facilitate that planning, but completing the necessary steps is up to the students.

The most important thing to remember is that you are responsible for your decisions and academic choices.

9.3. Your Role in the Advising Process
The Faculty of Science & Technology is committed to providing quality advising services to students in all academic programs. However, attaining this goal requires that the student understand his/her role in the advising process.

One of the roles of an academic advisor is to help you assume responsibility for your actions. Students come to advisors at varying states of development. As you and your advisor develop a relationship based on honest communication, he/she will become aware of the level of connection, attention, and information you need.

9.3.1. Advisors have a responsibility to:
• Know the students assigned to them and have up-to-date records for each one.
• Provide students with correct, up-to-date information about University, school, and departmental graduation requirements for their selected degree programs.
• Help students become aware of their academic and personal needs and how these needs affect their educational and career goals.
• Help students develop courses of study, including electives that reflect their academic background, personal situation, and educational goals.
• Inform students about alternatives, limitations, program changes, and the consequences of academic decisions.
• Serve as a mentor to foster students’ academic progress.
• Be available to students through office hours, e-mail, and appointment times.
• Use campus and community resources to advise students.
• Encourage students to review their progress toward degree completion with their advisor to assure early detection of problems.

9.3.2. Students’ general responsibilities include:
• Know their advisors.
• Accept responsibility for their academic choices developing and clarifying values and goals.
• Clarifying values and goals.
• Becoming familiar with campus resources.
• Know basic University, school, and departmental graduation requirements for their major or minor well enough to plan their own progress towards degree completion.
• Owning Faculty catalogue/Booklet and being familiar with it.
• Understanding the information in the class schedule.
• Following departmental or school requirements.
• Keeping copies of relevant academic records.
• Knowing about University policies, procedures and requirements.
• Keeping copies of schedule transactions, including registration records and withdrawal forms, and correspondence.
• Seeking out-of-class activities relevant to their major.
• Abiding by published deadlines.
• Meeting course prerequisites.
• Registering and obtaining appropriate signatures on forms.
• Providing Admissions with official transcripts of coursework taken at other institutions.

10. IF YOU NEED HELP

Difficulties with course work should first be directed to the lecturer or course coordinator. Academic problems of a broader nature should be taken to the Subject Leader of your major programme, or to your personal tutor. Finally, you can consult the Head of Department or Dean of the Faculty if appropriate.

Your first source of help for personal difficulties, including those originating from academic life, will probably be your peers, friends and family. If they are unable to meet your needs, you should contact your Academic Advisor (section 12). Every student at UWI is allocated an Academic Advisor by their faculty. If you do not know who your advisor is, ask in the Faculty of Science and Technology office (Chemistry Building 2). Your advisor is there to help you, and their advice is confidential. If your problems are more serious, or you wish for independent support from outside the Faculty, you should contact the UWI Counselling and Psychological Service where students can access free and confidential counselling for a range of emotional and personal issues. You can also see their leaflets for further information, available online as pdf files at http://sta.uwi.edu/fsa/lifesciences/caps.asp.

10.1. The Counselling and Psychological Service (CAPS)
The mission of the Counselling and Psychological Service (CAPS) at St Augustine campus is to provide a professional service exclusively for students to promote emotional well-being, allowing students to make the most of the opportunities available at the UWI.

Our goals are:
• To assist those students experiencing personal, emotional, and/or developmental difficulties to clarify and work towards their personal goals; to enhance coping skills and individual resources within a confidential and secure environment,
• To offer both individual, couples, and group therapy as required,
• To promote mental health awareness among students and staff within the wider campus community.

10.1.1 How can I see a counsellor?
ALL registered students at the University of the West Indies are eligible to be seen by a counsellor at the Counselling and Psychological Service. Students can email, telephone, or walk in to make a time to speak with a counsellor. The counsellors work by appointment but aim to see students in emergencies as soon as possible.

10.1.2 CAPS location and hours
The Counselling and Psychological Service is located in the Health Services Unit (HSU), near the Learning Resource Centre.

**During semesters:**
Mondays-Fridays: 8:30am to 7pm
Saturdays: 9am to 1pm

**During vacation:**
Mondays – Fridays: 8:30am to 4:30pm
Saturdays: closed

10.1.3 How can CAPS help me?
Adjusting to university can be challenging. The academic and social pressures can be fierce and you may find that adjusting is harder than you expected. Many students experience common problems such as depression, anxiety, and stress-related health problems. Some may experience bereavement, begin and end relationships, be a victim of crime, or face other unexpected traumas. Students can speak with a counsellor about all sorts of issues including relationship problems; addictions; coping with trauma/conflict; family issues, and so on.

Therapy provides an opportunity to think through some of the reasons why you feel the way you do. It offers ways of coping with stress, managing symptoms, or relationships problems, through changes in your behaviour and the way you think about things. Whether you see the counsellor for one or two sessions, or on a more regular basis, depends on what you find most helpful.

We also offer several information leaflets covering a range of topics including:
• coping with stress; anger management
• depression; understanding bipolar disorder
• coping with anxiety
• understanding deliberate self harm; posttraumatic stress
• sexual assault
• eating disorders
• coping with grief
• relationships; recognising abusive relationships; moving on.

10.1.4 Confidentiality
What you speak with your counsellor about is kept strictly confidential, in accordance with our professional guidelines. None of your personal details, including the fact of your attendance, can be shared with anyone outside of the CAPS without your explicit consent. An exception to this is if you are, or someone else is, at significant risk of harm.

If you wish your counsellor to liaise with someone on your behalf, you will be asked to sign a consent form, giving your counsellor permission to share information regarding your situation with specified persons.
10.2. Important Telephone Numbers

a) **Counselling and Psychological Service:**  
   662-2002 Ext 82491, 82151, 83584

b) **Student Advisory Services:**  
   662-2002 Ext 82096-8, 82325, 82326, 82100  
   Offers a diverse group of support services and student development programmes which  
   influences all aspects of student life. Office hours: Monday to Friday between the hours  
   of 8.30 am and 4.30 pm

c) **Chaplaincy - Sister Monique**: 663-1615 / 662-7663  
   University chaplains are available for consultation on a range of issues, from religious  
   practice to personal concerns. All religions welcome.

d) **University Health Services Unit:**  
   662-2002 Ext 82149 Nurse  
   662-2002 Ext 82153 Secretary  
   662-2002 Ext 82449/82150 Pharmacy  
   728-2408 Medical Transport  
   Offers a range of health services including walk-in clinics, wellness profiles, family  
   planning advice, free HIV testing....

10.3. Emergency Situations
Students requiring immediate help because of life threatening or severe psychological difficulties  
are seen the same day during weekday office hours. Caller should tell Secretary the matter is  
urgent.

a) **Counselling and Psychological Service**:  
   662-2002 Ext 82491, 82151, 83584

b) **Health Services Unit**:  
   662-2002 Ext 82149, 82153  
   728-2408 Medical Transport

10.3.1. After hours emergencies

a) **University of the West Indies Police**:  
   662-2002 Ext 82120, 83510 or the HOTLINE 662-4123

b) **The Eric Williams Medical Science Complex, Emergency Service**  
   This is open 24 hours, 7 days a week for physical or psychiatric emergencies. All  
   services are free.

10.4. **Academic Support/Disabilities Liaison Unit (ASDLU)**  
The Unit was established in 2006 to ensure that no student is left behind. It has become the first  
and most important stop for high quality academic support for the diverse populations of students  
throughout the University including full-time, part-time and evening students and international  
students, but especially students with disabilities.

10.4.1. Providing support for all students  
The functions/operations of ASDLU are twofold:
1. Providing academic support to students of The UWI, St. Augustine at all levels of their academic career.
2. Providing and ensuring equal access (infrastructure/academic) to all students who enter the University system with a disability.

10.4.2. Academic support for all students
- Educational Assessment
- Time Management
- Examinations Strategies
- Workload Management
- Academic Workshops
- Career Planning
- Study Skills
- Tutoring
- Extended working hours – Evening University Students

10.4.3. Students with disabilities (temporary and permanent)
- Provision of Aids and Devices
- Liaison with Faculties and Departments
- Special Accommodations for Examinations
- Classroom Accommodations
- Academic Support

10.4.4. Contacts
**Address:**
Academic Support/Disabilities Liaison Unit
Quadrangle – South of the Alma Jordan Main Library
The University of the West Indies
St. Augustine

**Tel:** 662-2002 ext. 83866, 83923, 84254

**Fax:** 662-2002 ext. 83922

Ms. Jacqueline Huggins – Co-ordinator, ASDLU: 662-2002 ext 83921

**Email:** ASDLU.Office@sta.uwi.edu

**Website:** www.sta.uwi.edu/asdlu

10.4.5. Hours of duty

*Visit ASDLU and let your needs be heard in a safe and confidential environment*

Mondays, Wednesdays and Fridays
8:30 a.m. to 4:30 p.m.

Tuesdays and Thursdays
8:30 a.m. to 6:00 p.m.
(Late hours to accommodate Part-Time and Evening University Students)
11. AFTER YOUR DEGREE

11.1. Transferable Skills
The latest buzz-word in the area of job-hunting is 'competencies', i.e. the state or quality of being adequately or well qualified to perform a task. You gain competence through education, training, experience or natural abilities.

Competency in conjunction with the right attitudes will result in high performance at any task you perform. Competencies can be observed and measured as Knowledge, Skills and Abilities (KSA):

- Knowledge is an organized body of information usually factual or procedural, which you apply, e.g. the nature and functions of cells.
- Skills are manual, verbal or mental manipulation of data or things, e.g. writing a well organised scientific report on cells.
- Abilities refer to whether you can perform an observable activity at the present time, e.g. ability to plan and organize your work and write that report on cells. Abilities are not the same as aptitudes which are only the potential for performing the activity.

However, even if you are well endowed with these capabilities, if you do not have the right attitude or motivation you may not do the job properly or well. For example, work overload, stress, debt, family problems can reduce your performance level if you don't deal with these issues. Or you may have to conduct a research project in a team; individuals are not pulling their full weight or you're paired with someone you do not care for so you resent your role and your enthusiasm (motivation) is low.

Now that may apply to performance at UWI. How about performance outside in the world of work? It’s much the same except there will be additional demands for more than just technical skills, knowledge and abilities. The International Labour Organisation defines 5 levels of competence:

**Level 1**: Competency in performing a broad scope of activities, mostly routine and predictable ones.
**Level 2**: Competency in a significant and broad scope of activities, carried out in different contexts. Some activities may be complex or not routine. You may have to work independently and carry individual responsibilities. It may often require cooperation with other people, being part of a group or doing team work.
**Level 3**: Competency in a broad scope of different activities in very complex contexts that are not routine. You may carry great responsibility and be expected to work independently and it often requires controlling and providing guidance to other people.
**Level 4**: Competency in a broad scope of professional or technically complex activities, carried out in a great variety of contexts and with a substantial degree of independence and personal responsibility. It may often require being responsible for the work of others and the distribution of resources.
**Level 5**: Competency which involves applying an important range of fundamental principles and complex techniques in a broad and sometimes unpredictable variety of contexts. It requires a high degree of personal independence and, frequently, great responsibility regarding the work of others and the distribution of substantial resources. Furthermore, it requires personal responsibility regarding analysis, diagnoses, design, planning, implementation and assessment tasks. [http://www.ilo.org/public/english/region/ampro/cinterfor/temas/complab/xxxx/23.htm](http://www.ilo.org/public/english/region/ampro/cinterfor/temas/complab/xxxx/23.htm)

Graduates would be expected to function immediately at middle competency levels (Levels 2-3 possibly 4) in the work environment. So what activities or experiences contribute to the development of competencies while at UWI that will make you more suited to the work environment or further training?

Obviously technical knowledge and skills are imparted in the lecture and practical content of courses, however, much more is being taught alongside these subject-specific competencies.
Computing, information management, research techniques, reporting, data management and analysis - all of these are essential skills and abilities that can be applied elsewhere or are transferable.

It is very important for you to become conscious of these training opportunities that are provided and to make the most of them while you are in a position to make mistakes and gain feedback from more experienced lecturers, demonstrators and peers. Fumbling on the job or asking for detailed instructions while you are doing a Master's project is bad planning - these are not the places to learn basics.

Look at the following checklist of competencies (they are in no particular order) and honestly evaluate your own status in each (from low-high). Indicate whether each is Knowledge/ Skills/ Ability (KSA) or Attitude. Evaluate how well you rank overall in terms of KSA or attitudes.

<table>
<thead>
<tr>
<th>Can you/ Do you/ Are you?</th>
<th>KSA / attitude</th>
<th>Your rank</th>
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<tbody>
<tr>
<td>You can add more at the bottom if you need...</td>
<td></td>
<td>Low</td>
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<tr>
<td>1. Learn quickly</td>
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<td>OK</td>
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<tr>
<td>2. Disciplined</td>
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<td>High</td>
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<tr>
<td>3. Meticulous (as opposed to sloppy)</td>
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<td>4. Can stick with a problem until it is solved</td>
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<tr>
<td>5. Have a sense of humour</td>
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<tr>
<td>6. See the glass half-full (as opposed to half-empty)</td>
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<tr>
<td>7. Personally independent and responsible for yourself and your daily needs</td>
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<tr>
<td>8. Well organised (in space as well as time)</td>
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<tr>
<td>9. Cope with a short timeframe, tight deadline</td>
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<tr>
<td>10. Rise to a challenge</td>
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<td>11. Work with several assignments, deadlines at once</td>
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<tr>
<td>12. Use computer applications (Word, Excel)</td>
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<td>13. Surf the internet, upload, download files as needed</td>
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<td>14. Use Instant Messenger services (with video?)</td>
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<tr>
<td>15. Solve basic internet connection problems, troubleshoot printer problems</td>
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<tr>
<td>16. Know how to back up data and manage your hard drive space</td>
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<td>17. Use Google (including Google Scholar, Images)</td>
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<td>18. Conduct searches in the Main Library on-line catalogue for books, journals</td>
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<tr>
<td>19. Conduct searches in the Main Library’s on-line databases e.g. Biological Abstracts</td>
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<td>20. Use email regularly</td>
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<td>21. Have a professional email address</td>
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<tr>
<td>22. Aware of problem-solving techniques e.g. SWOT analysis</td>
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<tr>
<td>23. Solve complex novel problems</td>
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<tr>
<td>24. Deal with complexity, ambiguity and uncertainty</td>
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<td>25. Give effective presentations</td>
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<td>26. Take criticism of own work without becoming defensive</td>
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<td>27. Listen carefully and answer questions on own work</td>
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<td>28. Adapt your communication to different audiences</td>
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<tr>
<td>29. Practical in approach (what is achievable) as opposed to theoretical (what is desirable)</td>
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<tr>
<td>30. Resourceful (can draw on yourself and others for innovative solutions)</td>
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<td>31. Analyse, evaluate complex issues, situations</td>
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<td>32.</td>
<td>Know how to obtain information from books</td>
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<td>33.</td>
<td>Critically review technical papers and reports</td>
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<td>34.</td>
<td>Communicate effectively (writing, verbally) in standard English, clear, concise, logical, persuasive expression</td>
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<td>35.</td>
<td>Write technical reports of high quality</td>
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<tr>
<td>36.</td>
<td>Organise, analyse and synthesise masses of information</td>
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<td>37.</td>
<td>Open to new ideas</td>
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<td>38.</td>
<td>Creative and can think ‘creatively’</td>
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<td>39.</td>
<td>Generate new ideas and explore their validity by researching them</td>
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<td>40.</td>
<td>Aware of and responsive to diversity of cultural and social backgrounds of people around you</td>
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<td>41.</td>
<td>Have a good work ethic, integrity, professionalism</td>
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<td>42.</td>
<td>Show respect and have good personal manners</td>
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<td>43.</td>
<td>Have a personable character</td>
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<td>44.</td>
<td>Use your initiative</td>
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<td>45.</td>
<td>Work independently without detailed, frequent guidance</td>
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<td>46.</td>
<td>Have good judgement and make sound decisions</td>
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<td>47.</td>
<td>Fluent in a foreign language</td>
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<td>48.</td>
<td>Have a valid driver’s permit</td>
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<td>49.</td>
<td>Have highly developed analytical skills</td>
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<td>50.</td>
<td>Self-motivated</td>
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<tr>
<td>51.</td>
<td>Results-oriented</td>
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<td>52.</td>
<td>Have leadership qualities (be very honest!)</td>
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<td>53.</td>
<td>Good bearing and dress appropriately</td>
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<td>54.</td>
<td>Function harmoniously in a team</td>
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<tr>
<td>55.</td>
<td>Aware of strategic planning methods</td>
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<tr>
<td>56.</td>
<td>Think strategically</td>
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<tr>
<td>57.</td>
<td>Engage in systems thinking (complex interrelationships)</td>
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<tr>
<td>58.</td>
<td>Possess a vision for yourself and your community</td>
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<td>59.</td>
<td>Aware of and value other people’s viewpoints</td>
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<td>60.</td>
<td>Know basic project management techniques</td>
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<td>61.</td>
<td>Use basic budgeting procedures</td>
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<tr>
<td>62.</td>
<td>Prioritise objectives and make work plans, contingency plans (Plan B)</td>
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<td>63.</td>
<td>Manage time to meet objectives and deadlines</td>
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<td>64.</td>
<td>Accountable and responsible for quality of own work</td>
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<td>65.</td>
<td>Evaluate risks of various options and their impacts on others</td>
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<td>66.</td>
<td>Flexible and adaptable in the face of change</td>
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<td>67.</td>
<td>Appreciate others and their work and can tell them so</td>
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<td>68.</td>
<td>Manage or influence the quality of work produced by others</td>
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<td>69.</td>
<td>Share responsibilities and benefits with others</td>
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<td>70.</td>
<td>Aware of conflict resolution and mediation techniques</td>
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<td>71.</td>
<td>Deal with conflict in a mature productive way</td>
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<td>72.</td>
<td>Coordinate a variety of viewpoints to achieve common goals</td>
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<td>73.</td>
<td>Open to others challenging your points of view or work</td>
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<td>74.</td>
<td>Engage in constructive challenge of others’ work and views</td>
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<td>75.</td>
<td>Establish and work with networks of persons</td>
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</tbody>
</table>
76. Effectively interface with organisations and groups

77. Aware of own strengths, weaknesses and motivations

78. Identify own and others’ learning and developmental needs

79. Keep own skills up to date

80. Successfully motivate, mentor or coach others

81. Encourage others to show initiative and self-evaluation

82. Analyse problems, propose solutions and implement those in the context of a team

83. Effectively bring attention to and take fair action on poor performance in others

84. Demonstrate commitment to a group, institution or corporation

85. Exercise duty of care (the responsibilities of your position even if they are not spelt out)

86. Compromise your ideals based on technical knowledge with what is possible due to financial and institutional limits

Based on your overall score you may need to do a lot of work or you might be fairly well off. If the latter, then you are well on your way to being very suitable for any further endeavour. Either way, make sure to take advantage of all aspects of the UWI experience to add to this list or improve your ratings. You only need to see the potential training opportunities in the various activities you are currently engaged in and not just meet the demands of each, but challenge your capabilities.

In addition there are special opportunities presented that you should seriously consider such as specialist training and vacation classes in other faculties or outside of UWI, and internships such as the Cooperative Training Programme (one year of work experience after your second year) and summer internships. Check the Student Advisory Services for more information on these (http://sta.uwi.edu/sas/index.asp).

11.2. Careers and Placement

Student Advisory Services is located on the 1st Floor of the New Student Administration Building. Contacts are:

- Mr. Chandar Gupta Supersad, Careers and Placement Officer
  Chandar.Supersad@sta.uwi.edu ext. 82360
- Ms. Kathy-Ann Lewis, Career Coordinator
  Kathy-Ann.Lewis@sta.uwi.edu ext. 84187
- Mrs. Marva Belfast, Student Services Assistant
  Marva.Belfast@sta.uwi.edu ext. 82098
- Ms. Sabrina Pierre, Clerical Assistant
  Sabrina.Pierre@sta.uwi.edu ext. 82325

11.2.1. World of Work (WOW) programme

The WOW programme is an initiative geared primarily toward equipping final year UWI students with the necessary tools for succeeding in today’s work environment. The WOW programme is also highly anticipated by first and second year students, who have the opportunity for vacation employment with companies who attend the Recruitment Fair. Since its inception, WOW has attracted an ever increasing number of participants over its twelve years of existence. Students are provided with the opportunity to get advice from employers and leading experts, practice their interviewing skills and meet recruiters from international and local organisations. World of Work is a three-part programme consisting the following: Interview Preparation, Seminar, Networking Workshop, Mock Interview Session and Recruitment Fair. Students must attend Interview Preparation, Seminar and the Mock Interview sessions in order to participate in the Recruitment Fair.
The precursor to the WOW programme is the Career Advice Programme (CAP), which helps UWI students identify and embark on their career paths. Students should make every effort to attend these sessions as it can be considered another step in their continued growth and development.

11.3. Becoming a Graduate Student

Many students continue their science education after the B.Sc. in various forms of postgraduate study, either within the Department of Life Sciences, in other departments at UWI, or at other institutions both within Trinidad and Tobago and overseas. This section gives advice on what to do while still an undergraduate if considering further study. Additional advice should be sought on particular fields of study, for example from the American Society for Biochemistry and Molecular Biology (http://www.asbmb.org/CareersAndEducation.aspx?id=196, from which this section draws, with acknowledgement) or similar organisations.

11.3.1. While you are an undergraduate

a) **Get research experience as soon as possible.** An undergraduate taking classes in physics, chemistry, biology, etc. is a science student. That same person conducting investigative research is transformed into a **scientist** (chemist, biologist, etc.). The sooner you experience this transition, the better equipped you will become both to decide if this is the right career choice for you and to make choices about how to develop your career. Research experience as an undergraduate is a key factor in developing any scientific career. Your experience and skills will enhance your employment opportunities if you choose to enter industry after college. Your undergraduate research experience will provide a tremendous boost toward being prepared for graduate school. Undergraduate research will also enhance your professional relationship with your mentor and increase your visibility in the department, which will lead to better letters of recommendation for whatever career choices lie before you. The Research Project BIOL 3069 is therefore normally a requirement for entry into postgraduate programmes in the Department of Life Sciences.

b) **Take appropriate courses.** For example in biochemistry and molecular biology these would include chemistry, physics and mathematics as well as appropriate biology courses; courses in these fields provide the language in which molecular science is understood and the concepts which form the foundation of the subject.

c) **Additional qualifications.** Make sure that you will have all the qualifications necessary for entry into the program. For example, many programs in the USA require that you have taken the Graduate Record Examination (GRE), administered by the Education Testing Service (www.ets.org), and you must provide them with your scores as part of your application.

11.3.2. Preparing graduate school applications

a) **The application process.** This process can be daunting and the sooner you get through it the better. Keep in mind that deadlines vary and some may be in December or earlier. Furthermore, the more schools you apply to, the larger this task becomes. There is a lot of overlap, however, between most applications. Many graduate programs also have an online application process that requires you to enter text on web forms and/or upload word processor or .pdf files. You can often prepare and save your answers to essay questions as text documents, then cut and paste your answers into the appropriate areas of each application with minor modifications. You should try to directly answer each question on each individual application, and you may need to tailor your answers to each specific institution. Expect to give a full (but concise) account of your career goals and your research experience. You will probably also need to discuss other extracurricular activities you have been involved in along with any teaching experience you might have.
It is helpful to have publications, presentations at scientific meetings, fellowships, scholarships, awards, distinctions, etc. that you can list or mention.

b) **Recommendation letters.** Ask for recommendation letters as soon as possible. These letters can be an extremely important part of your application. A glowing letter from a research advisor could be a huge factor in getting invited to interview for or accepted into graduate programs. Your advisor and other professors are very busy and last minute requests for recommendation letters are a very bad idea. Ideally, your recommendation letters should be mailed (some may even be electronically submitted) a week or more before the application deadline. So, giving your professors at least a few weeks to a month before that time is a good idea. Some programs may be forgiving if letters arrive slightly after the application deadline, or they may have a separate deadline for letters of recommendation, but this is not always the case!

c) **Contacts at the schools you are applying to.** It may be worthwhile to make one or more personal contacts with a member of the department most closely associated with the graduate program you are applying to. In some cases admissions committees will feel that this shows initiative and that you are really interested in the program. One approach is to choose a faculty whose research matches your interests and send an e-mail asking about methodology used in the lab, where the research is going, and what projects might be available for new students.

11.3.3. Interviewing for graduate programs
The interview process generally occurs from January through March. It will help you narrow down which graduate school is your top choice. It also is one last hurdle before acceptance into most programs (some programs will tell you that you are in before the interview). Typical interview trips to any one institution will last 2-3 days and may be on either side of a weekend. Most schools will have 2 or 3 possible interview dates and once you have been invited to interview, it is up to you to pick the dates that work in your schedule for each of the schools you plan to visit. You should realize that this is a time consuming process and the travel can be very tiring. You may have to make special arrangements for class time missed at your undergraduate institution. It helps to plan your schedule such that the spring semester of your senior year will not be overloaded.

Interviews will include meetings with PIs either individually or in a group—this is a chance to learn about their work and tell them a little about what you have done as an undergrad—you can usually request which PIs you want to meet with. Interviews may also include tours of the campus, the town, housing options and/or social gatherings with PIs and graduate students.

At each interview/school visit, you want to ask all the questions you can think of that might impact your decision. These could include (but are not limited to) any of the following:

a) **Questions to ask current students in the program:**
   1. What are some of the things you like best about studying at this university?
   2. What are some typical problems that graduate students run into here?
   3. Which lab are you in, what research do you do, and do you enjoy it? Would you recommend any new student to rotate in your lab?
   4. Can students in this program join labs in any of a number of departments or just one?
   5. What are the options for lab rotations (how many, how long) in order to choose a thesis lab?
   6. How many semesters are graduate students required to serve as Teaching Assistants in this program?
   7. How did/do you enjoy the required courses for this program? Is there a broad range of elective courses available and how well do you like them?
   8. If I want to join a lab but the PI does not have enough grant money does the school have any programs that provide stipend support throughout my graduate career?
   9. How does the cost of living in the area compare with the graduate student stipend? What proportion of your income do you spend on rent? Do you have any money each month left to do something fun?
10. What is the availability of housing near the university? How good is public transportation and/or will I need a car to get around the city? What kinds of things do you do for fun in the city or surrounding area?

In general you will have at least a few opportunities to meet with faculty during your visit. Always be prepared to answer questions about your background, research experience, and interests. Furthermore you should use these opportunities to ask about the type of research done in the faculty member's lab to help gauge whether or not it is something you are interested in. Many campus visits will include times when you are being formally interviewed by faculty along with less formal opportunities to speak with faculty and ask questions. Try to be as outgoing as possible and make it apparent that you are excited about any research you have done so far and about what you think your interests might be in graduate school. However do not go overboard in terms of dominating the conversation by talking too much or coming across as insincere. Answer questions fully yet concisely. Being attentive and interested for each faculty member when he/she is telling you about his/her research is good, but you do not have to make unnecessary or untrue remarks about how wonderful you think it is. You want to impress the people you meet during your visit and they want to impress you as well.

b) **Additional questions to ask faculty at the institution:**
   1. Ask about the faculty's research (see above). Faculty enjoy talking about what they do and if you are interested in their work they are likely to be interested in you.
   2. If I want to join a lab but the PI does not have enough grant money does the school have training grants or programs that provide stipend support throughout my graduate career?
   3. What percentage of graduate students from this program go on to careers in academia? In industry?
   4. Do many students in this program have external funding (fellowships, etc.)?

11.4. **Postgraduate Programmes**

11.4.1. **Postgraduate study at UWI**
   a) **General.** Prospective students should contact the School for Graduate Studies and Research ([http://sta.uwi.edu/postgrad/](http://sta.uwi.edu/postgrad/)) for details of application procedures, and the faculty postgraduate prospectus ([http://data.sta.uwi.edu/ScienceAgriPostgrad.pdf](http://data.sta.uwi.edu/ScienceAgriPostgrad.pdf)) for information on programmes available.
   b) **Department of Life Sciences.** The department offers M.Sc., M.Phil., and Ph.D. degrees in life sciences. Prospective students should contact the postgraduate coordinator or potential supervisors in their field of research interest.

11.4.2. **Postgraduate study elsewhere**
There are numerous opportunities for UWI graduates to take postgraduate education. Prospective students should search by sponsor (including the Government of Trinidad and Tobago), by institution offering courses, and by subject.

11.5. **Completing Your Curriculum Vitae**
This advice is adapted from the University of Bristol student handbook. Your C.V. is not simply a record of subjects studied, coupled with your examination results at school and university. It is also a valuable source of information on you as a person, your interests, and how you might fit into an existing organization. Thus, it is a valuable source of information for members of staff who are asked to write references for you. Here are some headings which might trigger relevant information. Do not include trivial information, but do not be too modest - advertise your achievements.

- Clean driving licence?
- Photographic experience or artistic ability?
- Underwater diving qualifications?
- Languages, oral and written?
- Specialist knowledge of groups of plants or animals?
- Relevant societies?
- Treasurer or secretarial experience?
- Job experience?
- Skills learned in a project?
- Computing?
- Relevant hobbies?
- Other - give some thought to this.

11.6. Requesting a Reference
Most job applications will ask for one or more references. It is usually specified whether these are to be obtained by you and forwarded with the application, or will be obtained by the employer from contact details provided on the application form. In the latter case you should first check that the person(s) you indicate are willing and able to provide a reference for you. Naturally, you want referees who will say positive things about you and your potential, but is just as important that they be in a position to be precise, to show that they know you reasonably well. Unduly vague letters of reference can be misinterpreted as holding back, not wanting to tell what the referees know.

11.6.1. Who to ask?
There are several possibilities:
- Head of Department or director of major programme.
- Project supervisor.
- Academic advisor.
- Other - someone you know in the appropriate organization or in a specific field, e.g. someone who knows you through vacation work.

11.6.2. Have the referees the relevant information?
To ensure this, hand in a copy of your C.V. to the Administrative Assistant for inclusion in your records. You should also give your referees a copy. After you graduate keep your referees updated on your experiences if further references are required, and provide them with an up-to-date C.V.

11.7. When You Are Employed
Please let the Department know (write to the Administrative Assistant). We are interested in your career.

12. ACKNOWLEDGEMENTS
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