2024-2027

SEQUENCE PLAN

Department of Biological Sciences

Associate of Science Degree

WELCOME *to the Department of Biological Sciences*

On behalf of the entire faculty and Staff of the Department of Biological Sciences, I WELCOME you to the University of the Southern Caribbean (USC) located in Maracas Valley, Trinidad.

Biology is the Science of life, therefore, anyone interested in the world around them, or in themselves, will be interested in biology. Biology supports an application to many degrees, including medicine, veterinary science, dentistry and physiotherapy. It also supports careers in industry, local government, the health service, and teaching in school or higher education institutions.

In the Department of Biological Sciences, everything we do is directed towards academic excellence and student success. Students are provided the support and encouragement so necessary to help them attain their goals- and the overwhelming majority of those who do are successful in their future educational or professional pursuits.

The Department of Biological Sciences at USC is truly a family and we strive to sustain an environment where all students feel valued and are nurtured spiritually, personally and intellectually.

Again, let me welcome you with these words of wisdom:

"If you can imagine it, you can achieve it; if you can dream it, you can become it. Just keep trying, never give up because the only person that can stop you is you."

Welcome,

Dr. Camille Mitchell
Chair
Department of Biological Sciences

COURSE SEQUENCE

First Year – 1st Semester		
Course Code	***Course Title***	***Credits***
BIOL165	*Foundations of Biology I*	*4*
CHEM131	*General Chemistry I*	*4*
PHYS141	*General Physics I*	*4*
ENGL125	*Academic Writing I*	*3*
	Total Credits	***15***

First Year – 2nd Semester		
Course Code	***Course Title***	***Credits***
BIOL166	*Foundations of Biology II*	*4*
CHEM132	*General Chemistry II*	*4*
PHYS142	*General Physics II*	*4*
PSYC101	*Introduction to Psychology*	3
	Total Credits	***15***

Summer		
STAT120	*Introduction to Statistics for Social Sciences*	*3*
ENGL225	*Academic Writing II*	*3*
RELT100	*God and Human life*	3
RELT360	*Religion & Ethics in Modern Society*	3
	Total Credits	**12**

Second Year - 1st Semester		
Course Code	***Course Title***	***Credits***
CHEM231	*Organic Chemistry I*	*3*
CHEM241	*Organic Chemistry Laboratory I*	*1*
BIOL373	*Cellular and Molecular biology*	3
BIOL460	*Human Anatomy*	*3*
PSYC212	*Methods of Social Research*	3
BIOL302	*Biostatistics*	*2*
	Total Credits	***15***

Second Year - 2nd Semester		
Course Code	**Course Title**	**Credits**
CHEM232	*Organic Chemistry II*	*3*
CHEM242	*Organic Chemistry Laboratory II*	*1*
BIOL375	*Microbiology*	*3*
BIOL374	*Genetics*	*3*
ZOOL464	*System Physiology*	*4*
BHSC220	*An Interdisciplinary Approach to Contemporary Social Issues*	*3*
	Total Credits	***17***

Summer		
BCHM423	*Clinical Biochemistry*	4
PSYC460	*Psychology of Abnormal Behavior*	*3*
	Total Credits	***7***

PLEASE TAKE NOTE OF THE COURSES WHICH HAVE PRE-REQUISITES.

COURSES **CREDITS**

BIOL 165 Foundations of Biology, I 4

Prerequisite: CXC Biology or its equivalent or BIOL091 and 092

BIOL165 is the first part of the two-semester course Foundations of Biology, which cover topics in Zoology and Botany that are designed to form a firm foundation for students majoring in Biology. BIOL165 consists of six units: Introduction to Biology, Biochemistry, Cell Biology, Bioenergetics, Genetics, and Evolution. The course provides a firm foundation for students majoring or minoring in the biological sciences. *Weekly: three lectures and one 3-hour lab.*

BIOL 166 Foundations of Biology II 4

***Pre-requisite**: BIOL 165*
BIOL 166 is the second part of the two-semester foundation course, which provides students with general content in Zoology and Botany, and is designed to form the platform for students majoring in Biology. The course introduces students to classroom and laboratory studies of The Structure and Life Processes of Plants and Animals, The Diversity of the Plant and Animal Kingdom, and The Concepts of Ecology and Animal Behavior. This course is also a core requirement for Freshman Biology Majors.
Weekly: three lectures and one 3-hour lab.

BIOL 302 Biostatistics 2

***Pre-requisite**: MATH 167*
BIOL 302 introduces statistical concepts and analytical methods as applied to data encountered in biomedical sciences. It emphasizes the basic concepts of experimental design, quantitative analysis of data, and statistical inferences. Topics include probability theory and distributions; population parameters and their sample estimates; descriptive statistics for central tendency and dispersion; hypothesis testing and confidence intervals for means, variances, and proportions; the chi-square statistic; categorical data analysis; linear correlation and regression model; analysis of variance; and nonparametric methods. The course provides a foundation for the critical evaluation of information to support research objectives and product claims and a better understanding of the statistical design of experimental trials for biological products/devices.
Weekly: two lectures

BIOL 372 Cellular and Molecular Biology 3

***Pre-requisite**: BIOL 166, CHEM 132*
BIOL 371 covers the basic properties of cells and cell organelles. This course examines properties of differentiated cell systems and tissues and how cells produce energy and photosynthesize. Cell organelles are studied to determine how cells function in harmonious ways while molecular biology examines how genetic information is passed on and how genes create and control the structure of living cells.
Weekly: two lectures and one 3-hour lab

BIOL 374 **Genetics** **3**

***Pre-requisite**: BIOL371*
BIOL 372 provides an in-depth, background in all areas of classic Mendelian genetics, population and evolutionary genetics and molecular genetics. The final goal for the student who successfully completes this course is to be conversant in all areas of genetics. *Weekly: two lectures and one 3-hour lab*

BIOL 375 **Microbiology** **3**
***Pre-requisite**: BIOL 166*
BIOL 375 is designed to convey general concepts, methods, as well as applications of microbiology and the role of microorganisms in the environment and in human disease. Topics include: immunology, bacteriology, virology, and mycology; the morphology, biochemistry, and physiology of microorganisms including bacteria, viruses, and fungi; the diseases caused by these microorganisms and their treatments, and the immunologic, pathologic, and epidemiological factors associated with diseases. The laboratory component of the course provides first hand experiences that informs, illustrates, expands, and reinforces major concepts discussed in lecture.
Weekly: two lectures and one 3-hour lab

BIOL 460 **Human Anatomy** **3**
***Pre-requisite**: BIOL 166*
BIOL 460 is designed for the development of an understanding of the human body. Students will lean the anatomical position, terms, planes, and region pertaining to the human body. Regional approach will be used to cover the following seven topics: general concepts, upper extremity, head and neck, back, thorax, abdomen and pelvis, and lower extremity**.**
Weekly: two lectures and one 3-hour lab

ZOOL 464 **Systems Physiology** **4**
***Pre-requisite**: BIOL 166*
***Co-requisites**: CHEM 132*
ZOOL 464 is the study of functional processes used by animals in adjusting to their external environment and controlling their internal environment. Labs involve first-hand analysis of selected aspects of major functional systems.
Weekly: three lectures and one lab

CHEM131 ***General Chemistry I*** **4**
Prerequisite: CHEM091, CHEM092 or CSEC Chemistry Grade I-II
Co-requisite: MATH165
CHEM131 is the first in a two-semester fundamental course in chemistry and its related areas for Science Majors. Topics include Stoichiometry, Atomic and Molecular Structure, Bonding, States of Matter, Solutions, Chemical Kinetics, and Chemical Equilibrium.
Weekly: three lectures and one 3-hour lab

CHEM132 ***General Chemistry II*** **4**
Prerequisite: CHEM131
CHEM132 is the second in a two-semester fundamental course in chemistry and its related areas for Science Majors, with topics including Thermochemistry, Acid and Base Chemistry, Descriptive and Nuclear Chemistry.
Weekly: three lectures and one 3-hour lab

CHEM231 ***Organic Chemistry I*** **3**
Prerequisite: CHEM132
Co-requisite: CHEM241
CHEM231 is the first in a two-semester course which deals with the fundamental study of the chemistry of carbon-containing (organic) compounds with emphasis on Nomenclature, Molecular structure and Spectrochemical relationships.
Weekly: three lectures

CHEM232 ***Organic Chemistry II*** **3**
Prerequisite: CHEM231
Co-requisite: CHEM242
CHEM232 is the first in a two-semester course which deals with the fundamental study of the chemistry of carbon-containing (organic) compounds and provides students with an understanding of the mechanistic approach to organic reactions.
Weekly: three lectures

CHEM241 ***Organic Chemistry Laboratory I*** **1**

Prerequisite: CHEM132 **Co-requisite:** CHEM231
CHEM241 is the laboratory component of the course CHEM231 and involves experiments related to the course contents thereof; consequently, it is a requirement that both courses be taken simultaneously.
Weekly: one 4-hour lab

CHEM242 ***Organic Chemistry Laboratory II*** **1**

Prerequisite: CHEM241
Co-requisite: CHEM232
CHEM242 is the laboratory component of the course CHEM232 and involves experiments related to the course contents thereof; consequently, it is a requirement that both courses be taken simultaneously. *Weekly: one 4-hour lab*

BCHM423 Clinical Biochemistry **4**
Prerequisites: BIOL165, CHEM232, CHEM242

Broad survey of chemical classes and metabolic processes that is consistent with the normal functions of these processes in human metabolism to provide a foundation for understanding the chemistry of disease states when discussed in the second-year programme. *Weekly: 3 lectures and one 3-hour lab.*

PHYS141 ***General Physics I*** **4**
Prerequisite: PHYS090 or CXC/CSEC Physics Grade I- II or equivalent, MATH167
PHYS141 is the first in a two-semester fundamental course in physics and its related areas for Science Majors and provides an algebra-based introduction to force and motions; conservation laws, properties of matter and oscillations of waves. *Weekly: three lectures and one three-hour lab*

PHYS142 ***General Physics II*** **4**

Prerequisites: PHYS141

PHYS142 is the second in a two-semester fundamental course in physics and its related areas for Science Majors and provides an algebra-based introduction to Physical and Geometrical Optics, Modern Physics, Electricity and Magnetism

Weekly: three lectures and one three-hour lab

ENGL125 ***Academic Writing I*** **3**

Prerequisites: *One of the following: (a) GCE O-level pass in English Language (b) CXC/CSEC General Grade I & II in English A*

An introduction to the fundamental principles of composition as they pertain to the use of current standard English. Emphasizes short essay writing based on personal explorations of memory, observation, conversation, and reading.

ENGL225 ***Academic Writing II*** **3**

Prerequisite: ENGL125 An introduction to text-based academic writing, including practice in summarizing, analyzing, synthesizing, and reading from a critical perspective. Tasks include summary, abstract and précis construction, critical analysis and response papers, and a minimum of one extended text-based writing project.

BHSC220 ***An Interdisciplinary Approach to Contemporary Social Issues*** **3**

Issues to be discussed may include drug abuse, the family, crime/violence and punishment, AIDS, poverty, and health care. Integrates foundational social science with a Christian perspective to help students understand the origins of current societal issues and strategies of addressing those issues.

PSYC101 ***Introduction to Psychology*** **3**

Covers principles of psychology including the study of growth, perception, learning, thinking, motivation, emotion, personality, and mental health.

PSYC460 **Psychology of Abnormal Behavior**

The study of deviant human behavior and theories of causation and remediation

RELT100 ***God and Human Life*** **3**

The study of how God confronts human beings – includes the process of Revelation, principles of interpreting Scripture and similarly inspired material, the nature of God and His expectations for humans, and the evaluation of these concepts as presented in Scripture and the classic literature of various religions.

RELT340 ***Religion and Ethics in Modern Society*** **3**

Considers how the Judeo-Christian tradition confronts the moral complexities of a highly technical society. Are there universal absolutes that cut across all cultural boundaries, or are all values relative? Designed to help students articulate what molded their value system, and what should help to shape it.

STAT120 **Introduction to Statistics for Social Sciences** **3**

This is an introductory course in Behavioural Statistics. It focuses on basic statistical procedures. It covers a range of concepts associated with research methods and statistical analysis. Students are expected to approach this course with an open mind so that they can be objective in their analysis. The course will provide students with an understanding and use of concepts and models associated with statistical analysis and testing. Students will be exposed to probability, frequency distributions, measure of central tendency, measures of variation, using frequency distributions, confidence intervals, sampling distribution, levels of significance in hypothesis testing, t and z tests, correlation, regression, chi-square, and ANOVA.