

UNIVERSITY OF SANTO TOMAS  
COLLEGE OF SCIENCE  
*BACHELOR OF SCIENCE IN BIOLOGY – COURSE PROSPECTUS WITH DESCRIPTIONS*

Effective Academic Year 2009-2010

**First Year – First Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BIO 101	Concepts in Biological Sciences I	3	0	None
BIO 101L	Concepts in Biological Sciences I (Laboratory)	0	2 (6 hrs.)	None
ENG 1	Introduction to College English	3	0	None
FIL 1	<i>Komunikasyon sa Akademikong Filipino</i>	3	0	None
MATH 101	College Algebra	3	0	None
PHIST	Philippine History	3	0	None
PHL 2	Logic	3	0	None
THY 1	Contextualized Salvation History	3	0	None
PE	Physical Education 1	(2)	0	None
ROTC	Military Science I (Reserve Officers' Training Corps) <i>* This is an elective. In case students will not choose ROTC in the first year, they will take NSTP in the second year.</i>	(3)	0	None
<b>TOTAL</b>		21	2	

**BIO 101 CONCEPTS IN BIOLOGICAL SCIENCES I**

**Description** This 3-unit lecture course for B. Sc. Biology students deals with the unifying concepts of the structural and functional organizations of living organisms. The overview of the properties, origin, and chemical basis of life, cell structure and intercellular communications, metabolism associated with energy production and utilization, cell cycle and cell division, mitosis and meiosis, and tissues and organs will be presented. The learning process will be enhanced by lectures and active participation of the students during the discussion process. At the end of the course, the learners are expected to develop their knowledge on the general principles of biology, techniques that are used in biology, and reinforce their thinking skills.



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#### **BIO 101L CONCEPTS IN BIOLOGICAL SCIENCES I (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students deals with the experimental and observation-based approach to help better understand and appreciate the science of life. Exercises on microscopy, biomolecules, cellular structure and diversity, cellular transport, mitosis and meiosis, bioenergetics involving photosynthesis and respiration, plant and animal tissues, organs and organ systems are performed. At the end of the course, the learners are expected to discuss the basic structural components and physiological activities of plants and animals.

#### **ENG 1 INTRODUCTION TO COLLEGE ENGLISH**

**Description** The course enhances the students' mastery of the basic communication skills in listening, speaking, reading, and writing.

Interactive activities have been designed to develop critical thinking and collaboration among students.

#### **FIL 1 KOMUNIKASYON SA AKADEMIKONG FILIPINO (Communication for Academic Filipino)**

**Description** *Ang Filipino I ay isang metalinggwistik na pag-aaral ng wikang Filipino. Nakatuon ito sa estruktura, gamit, katangian at kahalagahan ng wikang Filipino sa akademikong larangan.*

*Sa lapit multidisiplinaryo at paraang interaktibo, inaasahang matutukoy at matatalakay ang mga pangunahing kaalaman sa wikang ito.*

*Malilinig dito ang mga kasanayan sa paggamit ng wikang Filipino tungo sa lalong mataas na komunikasyon sa kritikal na pagdidiskurso.*

Filipino 1 is a metalinguistic study of Filipino language which focuses on the structure, usage, nature and its value in the academic field.

Using the interactive and multidisciplinary approach, it is expected to identify and discuss the fundamental concepts of Filipino and to develop the higher language / communication skills in a critical discourse.



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#### **MATH 101 COLLEGE ALGEBRA**

**Description** This is a Mathematics course for freshmen, dealing with the fundamental principles and applications of algebra. It begins with sets, the number system, and algebraic expressions.

Focus is given on operations on polynomials, one-variable linear equations and inequalities, quadratic equations, two-variable linear equations, systems of linear equations, and functions and relations.

At the end of the course, students should develop the values of accuracy, analytical thinking and logical reasoning.

#### **PHIST PHILIPPINE HISTORY**

**Description** This course discusses important events in the history of the Philippines from the earliest period to the contemporary.

The courses focuses on the interrelationship of important factors that were responsible for the formation of Philippine, nationhood, the state and the country's economy; how the past affected the country's present and how will it help contribute to its future.

The students are expected to develop an awareness of how events and factors affected the development of the nation and to appreciate how events in the past affected their daily lives.

#### **PHL 2 LOGIC**

**Description** This course exposes the students with the fundamental concepts and principles in the study of human behaviour, sensory modalities, perception, consciousness, and motivation, emotion, stress and health and personality theories

This course provides the students with a broad, eclectic understanding on the importance of understanding human behaviour by addressing the wide range of issues and problems encountered in everyday life.

Each student is expected to apply basic psychological concepts and principles in understanding and enhancing human behaviour.



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## **THY 1 CONTEXTUALIZED SALVATION HISTORY**

**Description** This Course is a critical and reflective look into the different moments of God's intervention in the history of humanity, gradually disclosing Himself and His plan of salvation through persons and events, until this revelation reached its fullness in the incarnation of His Son, our Lord Jesus Christ.

The whole history of salvation has for its central figure the person of Jesus Christ. Hence, salvation history, in its very nature, is Christocentric. It is in Jesus that the entire history of humanity finds meaning. It is also to him that history tends. Because of this, all events and persons in the history of salvation are seen in the light of the person of Jesus, apart from whom they have no value. The course shall make use of the Sacred Scriptures as its primary source since it is the Bible that contains the record of God's interventions with humanity and the testimonies of the members of early Church about their encounters with Jesus.

The course, therefore, inevitably involves the actual reading of Sacred Scriptures in class in order to discover how God's Word, enveloped in human words, continues to communicate to humanity today; and at the same time to facilitate a dialogue between the text of the Bible and the day-to-day life of the Thomasian students.



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**First Year – Second Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BIO 102	Concepts in Biological Sciences II	3	0	BIO 101, BIO 101L
BIO 102L	Concepts in Biological Sciences II (Laboratory)	0	2	BIO 101, BIO 101L
ENG 2	Reading and Thinking Skills for Academic Study	3	0	ENG 1
FIL 2	<i>Pagbasa at Pagsulat tungo sa Pananaliksik</i>	3	0	FIL 1
MATH 102	Trigonometry	3	0	MATH 101
PSY 1	General Psychology	3	0	None
SA	Sociology and Anthropology	3	0	None
THY 2	Church and Sacraments	3	0	THY 1
PE	Physical Education 2	(2)	0	
ROTC	Military Science II (Reserve Officers' Training Corps) <i>* This is an elective. In case students do not take ROTC in the first year, they will take NSTP in the second year instead.</i>	(3)	0	
<b>TOTAL</b>		21	2	

**BIO 102 CONCEPTS IN BIOLOGICAL SCIENCES II**

**Description** This 3-unit lecture course for B. Sc. Biology students deals with the organ system dynamics, with emphasis on vertebrates. It also includes organismic reproduction and development with emphasis on humans, genetics which includes the mechanisms of mutations, inheritance and evolution, and ecology which includes a discussion of current issues regarding the effects of the changes caused by man in the environment and how it affects living organisms. At the end of the course, the learners are expected to relate the different biological processes of the body with the structures that participate in the functioning of the body and solve analytical problems involving probabilities.



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## **BIO 102L CONCEPTS IN BIOLOGICAL SCIENCES II (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students deals with organ histology of frogs, external anatomy and internal morphology of frogs including its organs, physiological activities of the selected organs of plants and animals, concepts on reproduction, growth and development, genetics and ecology. The course includes hands-on group experiments, and oral reporting of experimental results. Dissection of preserved and live frogs is done to strengthen the students' knowledge of the external and internal morphology of frogs. The use of wooden models, culture of fruit fly, and field works simulate real processes in life. At the end of the course, the learners are expected to show an in-depth understanding on the concepts of biology by integrating the concepts learned in the lecture with that in the laboratory and appreciating the roles of the organs and the functioning of an organism.

## **ENG 2 READING AND THINKING SKILLS FOR ACADEMIC STUDY**

**Description** The course aims primarily to develop students' reading and thinking skills for academic study.

It equips students with an understanding of the reading skills and thinking processes; and effective higher order reading strategies for understanding academic texts.

It also aims to prepare them for academic writing.

## **FIL 2 PAGBASA AT PAGSULAT TUNGO SA PANANALIKSIK (Reading and Writing Towards Research)**

**Description** *Ang Filipino 2 ay 3-yunit na kurso at ikalawa sa serye ng mga kurso sa ilalim ng kurikulum sa Filipino sa antas kolehiyo.*

*Nakasentro ang kursong ito sa paglilinang sa kasanayan at kahusayan ng mga mag-aaral sa matalino at makatuwirang pagbabasa at pagsusulat ng mga akademikong babasahin/sulatin upang makabuo ng mga makabuluhang pananaliksik sa kanilang larangang kinabibilangan gamit ang wikang Filipino.*

Filipino 2 aims to develop the proficiency of students in critical reading and academic writing that will guide them to do meaningful researches related to their discipline using the Filipino language.



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#### **MATH 102 TRIGONOMETRY**

**Description** This is a course aimed to develop and enhance the student's mathematical concepts and improve their logical and critical thinking.

It focuses on two-coordinate coordinate system, circular/trigonometric functions, angles, right and oblique triangles, fundamental identities, trigonometric equations, inverse trigonometric functions, logarithmic and exponential functions.

At the end of the course, the students are expected to appreciate and demonstrate mastery in understanding the basic concepts and principles in trigonometry and apply these concepts and principles to solve problems in some fields where trigonometry is involved.

#### **PSY 1 GENERAL PSYCHOLOGY**

**Description** This course exposes the students with the fundamental concepts and principles in the study of human behaviour, sensory modalities, perception, consciousness, and motivation, emotion, stress and health and personality theories

This course provides the students with a broad, eclectic understanding on the importance of understanding human behaviour by addressing the wide range of issues and problems encountered in everyday life.

Each student is expected to apply basic psychological concepts and principles in understanding and enhancing human behaviour.

#### **SA SOCIOLOGY AND ANTHROPOLOGY**

**Description** The course introduces the discipline of Sociology and Anthropology as social sciences, as professions and as ways of life.

It explores selected fundamental concepts in the study of Philippine society and culture and its relation to the global world using basic theories, research methodologies, and substantive issues defining the scientific practices of Sociology and Anthropology.

The course exposes students to the unique use of the sociological imagination and anthropological perspective in understanding the world they live in so that they may find it useful, relevant, practical, and meaningful to their lives, no matter what life choices and trajectories they would take or endure in the future.



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## **THY 2 CHURCH AND SACRAMENTS**

**Description** The course deals with the Church and Sacraments. The first part is about the nature, origin, characteristics, and mission of the Church, as having originated from the Trinitarian Community of God Whose love was revealed in the incarnate Son, Jesus Christ Who accomplished God's plan of salvation. The second part of the course deals with the liturgical life of the Church celebrated specifically through the Sacraments as visible signs of God's grace in the believing, worshipping and serving community.



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Code	Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
004001	CHEM 100	General Inorganic Chemistry	3	0	
004002	CHEM 100L	General Inorganic Chemistry (Laboratory)	0	2	
001055	ENG 3	Academic Writing Skills	3	0	ENG 1, ENG 2
002026	MATH 108C	Calculus	3	0	MATH 101, MATH 102
901003	PHL 5	Christian Ethics	3	0	THY 1, THY 2
016001	PHLSCI	Philosophy of Science	3	0	
003019	ZOO 201	Invertebrate Zoology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L
003020	ZOO 201L	Invertebrate Zoology (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L
	PE	Physical Education 3	(2)	0	
	NSTP	Literacy Training Service (LTS) I <i>or</i> Civic Welfare Training Service (CWTS) I <i>* This is an elective. Either LTS or CWTS is chosen by the student who has not elected to take ROTC in the first year.</i>	(3)	0	
<b>TOTAL</b>			18	4	

**CHEM 100 GENERAL INORGANIC CHEMISTRY**

**Description** A 3 unit one-semester course on General Inorganic Chemistry designed for the College of Science and Rehabilitation Science students. It emphasizes on the stoichiometric relationships of substances; gases and energy changes in a chemical reaction; basic concepts and principles on atomic structure; periodicity; chemical bonding and molecular geometry; intramolecular and intermolecular forces of attraction; solutions, acid-base concepts and chemical equilibria.



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#### **CHEM 100L GENERAL INORGANIC CHEMISTRY (LABORATORY)**

**Description** This two-unit introductory laboratory course allows students to conduct observation and perform fundamental experiments on chemical reactions, stoichiometry, thermochemistry, and the periodic table. As in any laboratory course, the students are likewise expected to carry out experiments safely and carefully in the laboratory and to obtain data accurately.

#### **ENG 3 ACADEMIC WRITING SKILLS**

**Description** This course centers on honing college students' writing and research skills for academic study.

It equips students with effective techniques in writing expository, persuasive, and argumentative compositions and any other academic texts, e.g., library, term, and research papers.

This course engages also students to craft academic papers with strong, effective, and clear theses, body paragraphs, and conclusions. It likewise helps them edit their writing to be more formal and appropriate. It also provides the students with various strategies for generating ideas about a topic and teaches them organizational patterns, topic development, and methods for making their writing more coherent. Additionally, this course helps the students develop revision strategies that can be used in other courses and trains them to use and cite references properly in their writing to avoid plagiarism.

#### **MATH 108C CALCULUS**

**Description** Introductory Calculus is designed for students in the Biological Sciences. This course provides the mathematical content of a Calculus course in a biological context.

Topics include analytic geometry, functions, limits and continuity, exponential functions, composite and inverse functions, differentiation and its applications, integration and its applications, mathematical modeling commonly used in biological sciences, and discrete dynamical systems.

At the end of the course, the students are expected to appreciate the power of calculus and its importance in some fields where mathematics plays an important role, and to apply some of the theories in calculus which are relevant in life sciences.



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#### **PHL 5 CHRISTIAN ETHICS**

**Description** The course provides an overview of Christian Ethics which is designed to help students begin answering some fundamental questions about Christ-centered life and what makes it worth living.

It is divided into three parts: Human Person's Ethics of Being and Doing, introduces one to the realities of moral life, to an analysis of the moral process (constituents, sources and modifiers of human acts), to the relationship of ethics and morality to religious faith, and to the specific nature of Christian morality; Unit 2, Realizing Human Dignity and Genuine Freedom, deals with the human person as a moral agent, human freedom, conscience, sin and moral obligation in the light of the Word of God in the Sacred Scriptures and in the teachings of the Church enshrined in Her Traditions, Pronouncements and Documents; and, Unit 3, the Christian Response to some Special Contemporary Moral Issues, gives special attention to the Ten Commandments in highlighting the moral principles and virtues vis-à-vis some contemporary moral issues.

The course seeks the formation of a Christian conscience of the students to enable them to make correct judgments in their everyday moral decisions and choices especially about specific moral issues they are encountering and thus lead them towards committed moral living.

#### **PHLSCI PHILOSOPHY OF SCIENCE**

**Description** This course deals with the logical and historical analysis of the methodology, theories, aim of science, as well as its function in the society.

It surveys the history of science and looks at it from the different philosophical views as a kind of knowledge and a way of explaining the world. It also deals with the ethical value of scientific exploits in general and medical practice in particular. Thus, it emphasizes the interrelationships of NATURE, SCIENCE, and VALUES.

Students are expected to become familiar with the different methodologies and theories of science and how they impact the society they live in.



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#### **ZOO 201 INVERTEBRATE ZOOLOGY**

**Description** This 3-unit lecture course is designed for B. Sc. Biology students deal with an introduction to the principles and concepts of classification and nomenclature of invertebrates. It discusses the taxonomy, morphology, and physiology of representative animals from the simplest (*Amoeba*) to the most complex of all invertebrates (Echinoderms). At the end of the course, the learners are expected to have an in-depth understanding of the basic concepts in Invertebrate Zoology and the important roles of invertebrates in nature and society.

#### **ZOO 201L INVERTEBRATE ZOOLOGY (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students deals with the biology and taxonomy of invertebrate organisms. It discusses comparative invertebrate anatomy and morphology, and how these are used in naming and classifying organisms, ecological roles, and inter/intraspecific relationships are also studied. At the end of the course, the learners are expected to have a comprehensive understanding of Invertebrate Biology, their evolutionary histories, and their ecological significance.



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Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BOT 201	Systematic Botany	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L
BOT 201L	Systematic Botany (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L
CHEM 300	Analytical Chemistry	3	0	CHEM 100, CHEM 100L
CHEM 300L	Analytical Chemistry (Laboratory)	0	2	CHEM 100, CHEM 100L
ENG 4	Oral Communication in Context	3	0	ENG 1, ENG 2, ENG 3
LIT 101A	World Literatures	3	0	None
MICR 200	General Microbiology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 100, CHEM 100L
MICR 200L	General Microbiology (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 100, CHEM 100L
PE	Physical Education 4	(2)	0	
NSTP	Literacy Training Service (LTS) II <i>or</i> Civic Welfare Training Service (CWTS) II <i>* This is an elective. Either LTS or CWTS is chosen by the student who has not elected to take ROTC in the first year.</i>	(3)	0	
<b>TOTAL</b>		14	6	



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#### **BOT 201 SYSTEMATIC BOTANY**

**Description** This 3-unit lecture course for B. Sc. Biology students deals with systematic botany. It discusses the evolutionary overview of plant diversity, from club mosses and ferns to conifers and flowering plants. It explores practical aspects of taxonomy, phylogenetic inference, major themes in the evolution of plant diversity, and modern biosystematics approaches. At the end of this course, the learners are expected to have an in-depth understanding of the principles of plant evolutionary biology and their phylogenetic relationships.

#### **BOT 201L SYSTEMATIC BOTANY (LABORATORY)**

**Description** This 2-unit laboratory course for B.Sc. Biology students deals with the identification and classification of plants through the use of morphological characters and recognition of the various plant forms and classes. It discusses the diverse group of plants starting from the “traditionally” known ones (fungi, some algal groups) to the true plants (green algae, non-vascular, lower and higher vascular plants). It also includes the plant distribution and its economic relevance to man and the environment. At the end of this course, the learners are expected to become competent in the identification and classification of plants.

#### **CHEM 300 ANALYTICAL CHEMISTRY**

**Description** CHEM 300 Lecture is a three-unit course that is designed to introduce life science majors to the fundamentals of Analytical Chemistry. The coverage includes topics in classical methods, e.g. gravimetric & volumetric methods of analyses and instrumental methods in analytical chemistry.

#### **CHEM 300L ANALYTICAL CHEMISTRY (LABORATORY)**

**Description** A two-unit introductory laboratory subject in Analytical Chemistry. Includes correct logbook documentation of laboratory results as observed in analytical laboratory practice with results presentation following accepted statistical treatment. Dissemination of laboratory results as a formal report patterned after the format of scientific journals. The laboratory course includes the application of the principles of chemistry in qualitative and quantitative methods. Experiments cover classical (gravimetric and volumetric) and instrumental methods (pH meter, UV-VIS spectrophotometer and chromatography).

#### **ENG 4 ORAL COMMUNICATION IN CONTEXT**

**Description** The course aims to develop students’ speaking skills for effective communication in diverse contexts.

It likewise endeavors to enhance their listening skills in carrying out meaningful transactions needed in real communication situations making them communicatively competent.



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#### **LIT 101A WORLD LITERATURES**

**Description** The course develops among the students the ability to read, understand and appreciate the literatures of the world in order to deepen their knowledge of the complexities of human life and nature, and to inculcate among them the respect for people and cultures, love of nature, desire for peace and passion for truth and justice, which will eventually contribute to the enhancement of a compassionate, competent and committed global Thomasian.

It is focused on a survey of world literatures representing a gamut of human experiences as exemplified in different literary types and forms.

The students are expected to produce scholarly discourse – either through written examinations or long papers - that will exhibit their knowledge of literatures from two or more countries. They are expected to demonstrate their skill in making comparative analysis and interpretation using basic theoretical constructs. In addition, the student may be expected to transform or adapt selected literary texts into other art forms or media.

#### **MICR 200 GENERAL MICROBIOLOGY**

**Description** This 3-unit lecture course for B. Sc. Biology students deals with the basic principles and concepts in microbiology. It covers cellular structure, nutrition, metabolism, growth, and genetics of microorganisms. As applied to microbial diversity, systematics, evolution, and ecology. Roles and applications of microorganisms in our daily life will also be studied. At the end of the course, the learners are expected to differentiate Achaea and bacteria and describe their applications in agriculture, medicine, and the environment.

#### **MICR 200L GENERAL MICROBIOLOGY (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students deals with the basic techniques in microbiology. Experiments that will be conducted deals with the study of microorganisms, particularly bacteria, with emphasis on the techniques for their isolation, cultivation, preservation, characterization, and identification. Techniques in quantifying these organisms as well as their control will also be conducted. At the end of the course, the learners are expected to apply basic microbiological techniques in the study of microorganisms.



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**Third Year – First Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BIO 310L	Biological Techniques (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 100, CHEM 100L
CHEM 200	Organic Chemistry	3	0	CHEM 100, CHEM 100L
CHEM 200L	Organic Chemistry (Laboratory)	0	2	CHEM 100, CHEM 100L
COMP 102	Computer Applications	2	0	None
COMP 102L	Computer Applications (Laboratory)	0	1	None
LIT 102A	Philippine Literatures	3	0	None
MATH 600	Biostatistics	3	0	MATH 101
RC	Rizal Course	3	0	None
SPN 1	Elementary Spanish I	3	0	None
ZOO 302	Histology	2	0	BIO 101, BIO 101L, BIO 102, BIO 102L
<b>TOTAL</b>		19	5	

**BIO 310L BIOLOGICAL TECHNIQUES (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students uses a hands-on approach for the understanding of the different laboratory techniques. It includes the preparation of microscopic slides like whole mount, smears, squash, and serial sectioning. The different laboratory exercises range from simple to complex microscopic preparations. At the end of the course, the learners are expected to perform skills and biological techniques that will be helpful in the pursuit of their professional life in their field of work.



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#### **CHEM 200 ORGANIC CHEMISTRY**

**Description** This course is designed for biological sciences majors and deals with important concepts of organic chemistry as applied to the biomedical and health sciences. It is centered on acquiring a conceptual understanding of the structure, bonding and chemistry of organic molecules. It will be assumed that students recall principles of general chemistry. It focuses on the relation of organic structure to chemical and physical properties. This includes the study of the different functional groups. The content is classified as structure and reactivity. This will cover how atoms are joined together in organic compounds and how their *structure* affects their *properties* and *reactivity*.

#### **CHEM 200L ORGANIC CHEMISTRY (LABORATORY)**

**Description** CHEM 200 L (2 credits) is a one semester course in organic chemistry designed to develop in students the skills in using laboratory techniques basic in organic chemistry, concerned with the formation of proper practices and habits, including laboratory and chemical safety, waste minimization and proper disposal, and the preparation of proper laboratory reports. Furthermore, students are able to independently perform analysis, isolation, purification and synthesis of selected organic compounds. The experiments chosen for the laboratory component of this course hope to keep students motivated as they try to discover connection between organic chemistry with everyday living.

#### **COMP 102 COMPUTER APPLICATIONS**

**Description** This course provides a multifaceted background on understanding computers from both technical and practical fronts, which is necessary for the holistic development in this technological age of a student in the College of Science under its Biology, Microbiology, and Applied Mathematics degree programs.

#### **COMP 102L COMPUTER APPLICATIONS (LABORATORY)**

**Description** This course is a study of basic computer skills and their application to practical settings that are considered necessary for the holistic development a student in the College of Science under its Biology and Microbiology degree programs. Major topics include Microsoft Word, Microsoft PowerPoint, Microsoft Excel and Statistics using Microsoft Excel and SPSS.



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#### **LIT 102A PHILIPPINE LITERATURES**

**Description** The course is designed to develop among students an awareness, appreciation, and critical view of the depth and breadth of our country's literature in order to foster among them the desire for truth, love for country and nature, and respect for peoples and cultures, which will eventually constitute a competent, compassionate, and committed Thomasian.

The course is focused on representative literatures from the regions, tackling the wide array of Filipino encounters and experiences that are expressed through themes such as gender, racial identity, class and history.

The students are expected to write a critique on a Filipino novel, epic, drama or any other genre. They are also expected to transform or adapt Philippine literary texts into other art forms or media.

#### **MATH 600 BIOSTATISTICS**

**Description** This course introduces students to the basic concepts, logic, and issues involved in statistical reasoning. It covers descriptive and inferential statistics. It includes Description of Data with Graphs, Description of Data with Numerical Measures, Description of Bivariate Data, Probability and Probability Distributions, Some Discrete Probability Distributions( Binomial Probability Distributions, Poisson Probability Distributions and Hyper Geometric Probability Distributions), The Normal Probability Distribution, Sampling Distributions, Large-Sample Estimations, Large-Sample Tests of Hypotheses, Inferences from small samples, The Analysis of Variance, Linear Regression and Correlation, Analysis of Categorical Data.

#### **RC RIZAL COURSE**

**Description** This course discusses the life, ideas and ideals of Jose Rizal. It aims to provide an in-depth discussion on how Rizal contributed to the development of Filipino nationhood.

The focus of this course is to depict Rizal, along with the other national heroes in the context of Philippine national history and that Rizal as the foremost Filipino hero helped inspire a national movement that reawakened Filipino nationalism

It is expected that the students develop a critical and analytical understanding of Rizal and his achievements along with other heroes. This understanding will be in the context of Philippine national history.



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## **SPN 1 ELEMENTARY SPANISH**

**Description** This basic course integrates listening, speaking, reading and writing functions.

It includes an intensive vocabulary enrichment to enable the students to carry on a conversation and dialogue in the Spanish language.

Students are introduced to the use of regular and irregular verbs in the present tense.

## **ZOO 302 HISTOLOGY**

**Description** This 2-unit lecture course for B. Sc. Biology students presents the field of histology as a science, its nature, scope, and importance. It presents the basic facts and interpretation of the morphological and functional features of cells and tissues. It introduces the procedure for tissue preparation, staining, and basic microscopy. The core discussions focus on the general and specific types, morphology and the function of the epithelial, connective, muscular, and nervous tissues. At the end of the course, the learners are expected to differentiate the morphology and spatial arrangements of basic tissue types, gain insights on the relationship between structure and function, and appreciate cellular organization forming a functional unit.



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Effective Academic Year 2009-2010

**Third Year – Second Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BIO 601	Biology Research I	2	0	BIO 101, BIO 101L, BIO 102, BIO 102L, BOT 201, BOT 201L, CHEM 100, CHEM 100L, CHEM 200, CHEM 200L, ENG 1, ENG 2, ENG 3, ENG 4, MATH 101, ZOO 201, ZOO 201L
CHEM 600	Biochemistry	3	0	CHEM 100, CHEM 100L, CHEM 200, CHEM 200L
CHEM 600L	Biochemistry (Laboratory)	0	2	CHEM 100, CHEM 100L, CHEM 200, CHEM 200L
PHYS 201	General Physics	4	0	MATH 101, MATH 102
PHYS 201L	General Physics (Laboratory)	0	1	MATH 101, MATH 102
SCL 3	The Social Teachings of the Church	3	0	THY 1, THY 2, PHL 5
SPN 2	Intermediate Spanish	3	0	SPN 1
ZOO 301	Comparative Vertebrate Anatomy	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L
ZOO 301L	Comparative Vertebrate Anatomy (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L
<b>TOTAL</b>		18	5	

**BIO 601 BIOLOGY RESEARCH I**

**Description** This 1-unit research course for B.Sc. students deals with the orientation of students with the basic methods and principles involved in the creation of quality research proposals. It involves the discussion on various components of research papers and proper selection procedures on selection of research topics. It also includes orientation on the policies of the department on group/member selection and assignment of faculty adviser. At the end of this course, the learners are expected to develop the skills in writing research proposals and should have defended their research proposals in preparation for full implementation for the next semester.



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#### **CHEM 600 BIOCHEMISTRY**

**Description** A 3-unit one semester course in Basic Biochemistry designed for College of Science students. Biochemistry is chemistry applied to biological systems. It involves the study of structure and function of molecules that make up living cells and organisms. Understanding the structural properties of a molecule enables the students to understand its interaction with other molecules and its function in a cell.

In CHEM 600, the molecular aspects of the four major types of biological molecules: proteins (including enzymes), carbohydrates, lipids and nucleic acids will be discussed. Further topics include the assembly of these molecules into cellular structures such as membranes and organelles.

#### **CHEM 600L BIOCHEMISTRY (LABORATORY)**

**Description** A 2-unit one-semester laboratory course that emphasizes on the isolation and characterization of the biomolecules designed for BS Biology and Microbiology majors. The course consists of experiments that teach students the techniques and methods used in the extraction, isolation, purification, characterization and quantitative determination of the primary metabolites found in biological samples namely proteins (including enzymes), nucleic acids, lipids and carbohydrates. Moreover, chemical analysis of metabolic products in urine samples is also included.

#### **PHYS 201 GENERAL PHYSICS**

**Description** Physics 201 (Lecture) is a 4-unit general physics course for Biology students aimed to develop both an understanding of fundamental concepts and principles in general physics, and logical problem-solving skills. Topics include mechanics, heat and temperature, electricity and fluids, and sound waves. Selected topics on magnetism, optics, and modern physics may be included by the professor in the course if time permits. At the end of the course, students are expected to identify and explain the fundamental concepts and principles in those topics, apply these concepts and principles in solving problems, appreciate the role of physics in understanding life processes, and the world and the universe where we live, and demonstrate positive attitudes towards the study of natural phenomena and their causes.



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#### **PHYS 201L GENERAL PHYSICS (LABORATORY)**

**Description** PHYS201L which accompanies and supplements the lecture PHYS201 is one-unit laboratory course for B.S. Biology students intended to guide and help the students verify and apply some of the basic concepts and principles/theories in physics through experiments. This course covers experiments on mechanics, fluids, heat and temperature, electricity, sounds, and optics. At the end of the course, students are expected to demonstrate mastery in understanding some basic concepts and theories in those topics and to appreciate that any theory in physics to be accepted must be supported by experiments.

#### **SCL 3 THE SOCIAL TEACHINGS OF THE CHURCH**

**Description** The course is an in-depth thematic study of Catholic social thought as found in the Gospel, in the tradition of primitive Christianity, the Fathers of the Church, the official documents of the social teachings of the Church and the lived experience of peoples.

As Mother and Teacher, the Church keeps alive in the personal and collective memory of the people the saving mission of Christ, who became all things to all human beings except sin, and its implication to the final destiny of the human person. She proposes individual and societal life witnessing in the very real experiences of the human person and the communities of peoples in the socio-cultural, economic, political, technological and ecological environments.

As a true disciple of the Risen Christ and moved by the Spirit, the human person is empowered and challenged to bring about social transformation and development by practical competent acts of compassion and commitment to truth in love.

#### **SPN 2 INTERMEDIATE SPANISH**

**Description** In this level, the students are expected to have an adequate stock of vocabulary to enable them to perform exercises and carry on everyday conversations.

Consequently, students will be able to develop competence and confidence in the use of all kinds of verbs especially radical changing verbs.

Focus will be on the study of tenses like the present tense, immediate future, recent past and the present perfect.



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## **ZOO 301 COMPARATIVE VERTEBRATE ANATOMY**

**Description** This 3-unit lecture course designed for B. Sc. Biology students in their junior year presents the basic principles and concepts in the gross anatomy of representative types of vertebrates. It covers vertebrate structure in the light of evolutionary history with the view of understanding the structural and functional changes undergone by the vertebrates. At the end of the course, the learners are expected to recognize the significance of the course in the evolution of vertebrate and the main significance of diversity of life.

## **ZOO 301L COMPARATIVE VERTEBRATE ANATOMY (LABORATORY)**

**Description** This 2-unit laboratory course is designed for B. Sc. Biology students in their junior year presents the basic concepts in understanding and comparing the anatomical similarities and differences among protochordates and vertebrates. It also includes a series of representative vertebrates that are dissected to familiarize students with the specific components of the various systems, with emphasis placed on the dissection of shark, turtle, pigeon, and cat. At the end of the course, the learners are expected to recognize the anatomical changes in all representative vertebrates organ systems using the different animals dissected.



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**Fourth Year – First Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
APP	Art Appreciation	3	0	None
BIO 201	Cell and Molecular Biology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 600, CHEM 600L
BIO 201L	Cell and Molecular Biology (Laboratory)	0	1	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 600, CHEM 600L
BIO 205	Fundamental Genetics	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 600, CHEM 600L, MATH 600
BIO 205L	Fundamental Genetics (Laboratory)	0	1	BIO 101, BIO 101L, BIO 102, BIO 102L, CHEM 600, CHEM 600L, MATH 600
BIO 602	Biology Research II	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L, BIO 601, BOT 201, BOT 201L, CHEM 100, CHEM 100L, CHEM 200, CHEM 200L, ENG 1, ENG 2, ENG 3, ENG 4, MATH 101, ZOO 201, ZOO 201L
SCL 9	Marriage and Family	3	0	THY 1, THY 2, PHL 5, SCL 3
ZOO 303	Comparative Vertebrate Embryology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, ZOO 301, ZOO 301L
ZOO 303L	Comparative Vertebrate Embryology (Laboratory)	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L, ZOO 301, ZOO 301L
<b>TOTAL</b>		15	6	

**APP ART APPRECIATION**

**Description** This course introduces the students to the origins, functions and genres of art constituted in the intersecting nexi of history and geography. Thus, careful attention is given to the nature, and value of art as both social artifact and cultural signifier that synoptically inform the mode of production and the mode of reception. We interrogate further, the complex webwork of economic and political regimes agencies and institutions that dynamically affect the creative and critical processes of organization, distribution and consumption of art objects.



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### *BACHELOR OF SCIENCE IN BIOLOGY – COURSE PROSPECTUS WITH DESCRIPTIONS*

#### **BIO 201 CELL AND MOLECULAR BIOLOGY**

**Description** This 3-unit lecture course for B.Sc. Biology students deals with the major biomolecules and subcellular structures. It covers structural functions of biomolecules, enzymes and bioenergetics, cellular membrane, mitochondrial and catabolic pathways, chloroplasts and photosynthesis, extracellular matrix, endomembrane system, cytoskeletal structures and signal transduction. At the end of the course, learners are expected to acquire an in-depth understanding of basic concepts of the structures and functions of subcellular components and organelles.

#### **BIO 201L CELL AND MOLECULAR BIOLOGY (LABORATORY)**

**Description** This 1-unit laboratory course for B.Sc. Biology students deals with concepts and molecular techniques used in the study of cell and molecular biology. It covers principles of accuracy and precision, use of micropipettors, spectrophotometry and cell counting chambers, cell rupturing and organelle isolation, restriction endonucleus for DNA splicing, Gel electrophoresis and Polymerase Chain Reaction technology. At the end of the course, learners are expected to carry out basic investigative methods in cell and molecular biology.

#### **BIO 205 FUNDAMENTAL GENETICS**

**Description** This 3-unit lecture course for B. Sc. Biology students introduces the principle of heredity and variation. It deals with basic information on Medelian genetics and its modifications, molecular genetics and its application including the nature of the gene and gene action; and its transmission in organisms and population, population genetics and the current trends and developments in the study of genes and genomes. At the end of the course, the learners are expected to show understanding and appreciation of patterns of inheritance, the factors affecting expression of genes, and the application of genetic principles and processes in everyday life.

#### **BIO 205L FUNDAMENTAL GENETICS (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students aimed at developing a cohesive understanding of genetics concepts through the introduction of basic hands-on activities related to genetic events such as mitosis, meiosis, karyotyping chromosome structure, genotype and phenotype, breeding experiments, and population genetics simulations. At the end of the course, the learners are expected to apply basic principles of genetics in simple laboratory experiments or simulations.



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#### **BIO 602 BIOLOGY RESEARCH II**

**Description** This 1-unit research course for B.Sc. Biology students involves the experimental work of the students involving their assigned topics. It involves, depending on the nature of the topics, laboratory work and/or field work. Regular consultation with their adviser/s are also required during this course. At the end of this course, the learners are expected to have finished their experimental work, even have begun to analyze and interpret their data in preparation of writing their manuscripts.

#### **SCL 9 MARRIAGE AND FAMILY**

**Description** The course Marriage and Family is an inter-disciplinary approach to preparation for and understanding of love, marriage and family life includes the Biblical, theological, sacramental, canonical, legal, psychological and sociological dimensions.

It is rooted in the Catholic spirituality that promotes the culture and transmission of life, faithful to the teachings of the Church, it includes education in human sexuality and responsible parenthood based on the magisterial documents.

#### **ZOO 303 COMPARATIVE VERTEBRATE EMBRYOLOGY**

**Description** This 3-unit lecture course for B. Sc. Biology students deals with the study of the perpetuation of life and the establishment of tissue diversity among animals. It has a broad presentation of the descriptive, experimental, and biochemical approach in the study of the different representative vertebrate embryonic development from fertilization to birth and other developmental processes therein. It includes also the knowledge of the evolutionary origin of the species. At the end of the course, the learners are expected to be able to understand and discuss the developmental processes of specific organism and be able to explain how tissues undergo differentiation to become an organ to a system and to whole living organism.

#### **ZOO 303L COMPARATIVE VERTEBRATE EMBRYOLOGY (LABORATORY)**

**Description** This 2-unit laboratory course for B. Sc. Biology students deals with a broad presentation of different vertebrate animals in their embryonic stage. It deals with the observation of different stages of embryonic development of different vertebrate animals from fertilization to birth with the inclusion of other developmental processes therein. It is a comprehensive study of the developmental stages as well as morphological structures of representative vertebrate taxa such as amphibians, birds, and mammals from gametogenesis to organogenesis done through microscopic examination of histological materials which emphasizes on the differentiation of organ systems. At the end of the course, the learners are expected to discuss the sequence of developmental events of the representative embryos.



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**Fourth Year – Second Term / Semester**

Abbreviation	Title	Lec. Units	Lab. Units	Pre-Requisites
BIO 203	Principles of Ecology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, ZOO 201, ZOO 201L, BOT 201, BOT 201L
BIO 203L	Principles of Ecology (Laboratory)	0	1	BIO 101, BIO 101L, BIO 102, BIO 102L, ZOO 201, ZOO 201L, BOT 201, BOT 201L
BIO 603	Biology Research III	0	2	BIO 101, BIO 101L, BIO 102, BIO 102L, ZOO 201, ZOO 201L, BOT 201, BOT 201L, CHEM 100, CHEM 100L, CHEM 200, CHEM 200L, ENG 1, ENG 2, ENG 3, ENG 4, MATH101, MATH 600, BIO 601, BIO 602
ETAR	Economics with Taxation and Agrarian Reform	3	0	
PGC	Philippine Government and Constitution	3	0	
ZOO 401	General Animal Physiology	3	0	BIO 101, BIO 101L, BIO 102, BIO 102L, PHYS 201, PHYS 201L CHEM 600, CHEM 600L
ZOO 401L	General Animal Physiology (Laboratory)	0	1	BIO 101, BIO 101L, BIO 102, BIO 102L, PHYS 201, PHYS 201L CHEM 600, CHEM 600L
<b>TOTAL</b>		12	4	



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#### **BIO 203 PRINCIPLES OF ECOLOGY**

**Description** This 3-unit lecture course for B. Sc. Biology students presents the basic principles and concepts in ecology and the process of ecological inquiries. Herein, the students will discuss how ecologists seek to describe ecological patterns, understand how they are influenced by evolution and the physical environment, and determine the interactions between organisms and the physical environment, among species, and human actions. Topics include adaptation, physiological ecology, life history, population dynamics and interactions, community structure, and ecosystem processes. The course will likewise provide in-depth lectures that will explain the various laboratory activities aimed at improving general understanding of ecological concepts. Much of the class will focus on application of concepts from documented 'experimental' situations and will involve reading, writing, analysis of data and presentations. Aspects of both plant and animal ecology will be presented and discussed. At the end of the course, the learners are expected to have a synergistic mindset on all concepts learned in organism-centric biology courses, and have the skill to provide plausible explanations on various interactions of organisms with each other and with the environment.

#### **BIO 203L PRINCIPLES OF ECOLOGY (LABORATORY)**

**Description** This 1-unit laboratory course designed for B. Sc. Biology students provides experiments and simulations to reinforce the concepts covered in the ecology lecture course. It is designed to guide biology majors into the processes of research in ecology and likewise as an introduction to methods used in ecology, which allows them to practice these methods both as an individual and/or through group research projects. This course covers topics in examining the purpose of research, experimental design, and techniques used to measure and detect patterns in the environment to enable the students to participate in this process through a research project. At the end of the course, the learners are expected to have the skills to format ecologically-integrative experiments, gather unbiased data and determine what the results tell them, and interpret the results in a meaningful way.



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#### **BIO 603 BIOLOGY RESEARCH III**

**Description** This 1-unit research course for B.Sc. Biology students deals with the opportunity to process and analyze the data they have gathered from the conduct of their experiments/ sampling. Furthermore, this course provides the students the chance to write their thesis manuscripts and present and defend their thesis in front of a panel of examiners. This is done in close coordination and supervision of their faculty adviser/s. At the end of the course, the learners are expected to have successfully completed their research project that has been scrutiny of their proposal advisors and panelists which may be deemed ready for presentation in national/ international scientific conferences and even publication in peer-reviewed journals.

#### **ETAR ECONOMICS WITH TAXATION AND AGRARIAN REFORM**

**Description** It is an introductory course in Economics that deals with Microeconomics and Macroeconomics plus taxation and agrarian reform. Part I introduces the students to scarcity, factors of production, needs and wants essentials and non-essentials, economic systems, models and theories. Part II includes demand and supply analysis both graphical and mathematical approaches, elasticity explained in slope, price, point, income, and cross. The latter part deals on the important factors in taxation and agrarian reform.

At the end of the course the students are expected to be able to explain and discuss with eloquence, theories on scarcity, factors of production, needs and wants, essentials and non-essentials, economic systems, opportunity costs, production possibilities curve, models, theories, normative and positive economics, different kinds of goods, trade off, models and theories.

#### **PGC PHILIPPINE GOVERNMENT AND CONSTITUTION**

**Description** This course is designed to introduce to the students the importance of a national charter in the development of a nation and its government. The subject is designed to provide fundamental information on how the present Philippine constitution reflects the historical and systemic forces that interplay in Philippine politics.

This course will tackle the evolutionary trail of the Philippine charter starting from the Biak na Bato constitution up to the 1987 Charter in order to provide a more detailed understanding of the evolutionary and revolutionary character of all the Philippine Republics.

The course hopes to widen the knowledge and appreciation of political science students in the constitutional history of the country and how it shaped the current systemic character of the Philippine government.



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## **ZOO 401 GENERAL ANIMAL PHYSIOLOGY**

**Description** This 3-unit lecture course for B. Sc. Biology students presents the basic principles of animal form and function drawing ideas from cell and molecular biology, chemistry, mathematics, and physics to explore the nature of similarity and diversity in physiological systems. It focuses on nerve and muscle physiology, the interactive role of lungs and kidneys in homeostasis, the circulatory and digestive systems. At the end of the course, the learners are expected to design experiments about the control and regulation of physiological processes within group of cells and how the combined activities of these cell groups affect the functions of the animal in its environment.

## **ZOO 401L GENERAL ANIMAL PHYSIOLOGY (LABORATORY)**

**Description** This 1-unit course for B. Sc. Biology students is designed to introduce a variety of techniques used in physiological experimentation and to provide the students with hands-on experience in studying phenomena discussed in the lectures so that they will gain some insights into the principles and methodology of experimental physiology. Experiments, which are supplemented with computer simulation, focus on cell water potential, physiology of the nerve and muscle as well as on the other organ systems. At the end of the course, the learners are expected to analyze and evaluate information and data for the correct interpretation of the metabolic reactions in the body and their role in animal physiology,

