
BACHELOR OF SCIENCE

Biology

Program Description

The Bachelor of Science in Biology program is structured as a generalized framework of study with the end view of grounding students with the fundamental concepts and principles and theories of the biological, natural and physical sciences and the conduct of research. This includes the acquisition of appropriate skills and training to prepare them for either medical studies, biological research, tertiary teaching, environmental & microbiological works. The curriculum consists of course work in the classroom, laboratory and field/community as well as on- the- job trainings.

Program Educational Objectives:

Within three to five years after obtaining a bachelor's degree in BS Biology graduates are expected to:

1. Practice their scientific skills and knowledge as professionals in their fields of specialization in the service of the country and humanity as a whole through research, innovation and social engagement.
2. Pursue post -graduate studies or continuing education for professional development and /or actively engaged in pro-active organizations that are committed to the shared mission of caring for the peoples and the Earth.
3. Assume managerial and influential roles as persons of excellence and integrity in their organizations and communities.

Program Outcomes

By the time of graduation, the students of the program shall have developed the ability to:

1. Competently communicate orally and/or in writing, their acquired breadth of fundamental biological concepts and technical/analytical competencies using both Filipino and English in different settings and for various audiences to convey a message that is significant to society and the Church.
2. Engage in the generation of new knowledge and/or development projects in the field of biological sciences through involvement in the evidence-based processes of science, in search of a solution to a specific problem and subsequently disseminating results to individuals within and outside the biological discipline.
3. Collaborate with multi-disciplinary and multi-cultural teams to critically assess contemporary issues in biological thought and research, the contributions of biology to the resolution of diverse issues in human affairs, and the impact of these solutions in a global and societal context.
4. Preserve and promote Filipino historical and cultural heritage by conserving and protecting our natural resources, in the context of La Sallian spirituality.

Admission Requirements

Admission to the program starts at the freshman year. To be admitted, a student should:

1. meet the requirements for general admission to the university;
2. manifest serious interest in the natural sciences; and
3. demonstrate diligence, dedication and determination.

Retention Policies

To be retained in the BS Biology Program, a student should:

1. not incur failures in two major subjects in one semester; and
2. not have accumulated failures of 18 units or more.

**BACHELOR OF SCIENCE
Biology**

FIRST YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO101	General Botany	3	3	2	6	5	9
BBIO102	General Zoology	3	3	2	6	5	9
USELF	Understanding the Self	3	3	0	0	3	3
MATHMW	Mathematics in the Modern World	3	3	0	0	3	3
PED1	Physical Education 1 (Wellness & Fitness)	2	2	0	0	2	2
IRS1	La Sallian Spirituality	3	3	0	0	3	3
NSTP1	National Service Learning Program 1	3	3	0	0	3	3
	Total	20	20	4	12	24	32

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO103	Systematics	3	3	2	6	5	9
BBIO104	Chemical Biology 1 (Organic Molecules)	2	2	1	3	3	5
BBIO105	Statistical Biology	2	2	1	3	3	5
PCOM	Purposive Communication	3	3	0	0	3	3
KKFIL	Kalinangan sa Kalikasang Pilipino	3	3	0	0	3	3
PED2	Physical Education 1 (Team Sports & Rhythmic Activities)	2	2	0	0	2	3
IRS2	Christian Morality	3	3	0	0	3	3
NSTP2	National Service Learning Program 2	3	3	0	0	3	3
IGG	Group Guidance	1.5	1.5	0	0	1.5	1.5
	Total	22.5	22.5	4	12	26.5	35.5

SECOND YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO106	Chemical Biology 2 (Analytical Methods)	2	2	1	3	3	5
BBIO113	General Physiology	3	3	2	6	5	9
BBIO108	General Ecology	3	3	2	6	5	9
CWRLD	The Contemporary World	3	3	0	0	3	3
ETHICS	Ethics	3	3	0	0	3	3
IRS3	Spirituality in the WorkPlace	3	3	0	0	3	3
PED3	Physical Education 3 (Swimming & Recreation)	2	2	0	0	2	2
STS	Science, Technology & Society	3	3	0	0	3	3
	Total	22	22	5	15	27	37

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO109	Chemical Biology 3 (Biomolecules)	3	3	2	6	5	9
BBIO110	Evolutionary Biology	3	3	2	6	5	9
BBIO114	BioPhysics	3	3	1	3	4	6
GENSOC	GE Electives 3(Gender & Society)	3	0	0	0	3	3
LOGIC	Logic	3	0	0	0	3	3
PED4	Physical Education 4 (Individual & Dual Sports)	2	0	0	0	2	2
PSPEAK	Public Speaking in the Discipline	3	0	0	0	3	3
	Total	20	9	5	15	25	35

THIRD YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO112	Cell and Molecular Biology	3	3	2	6	5	9
BBIO107	Microbiology	3	3	2	6	5	9
RHIST	Readings in Philippine History	3	0	0	0	3	3
ARTAP	Art Appreciation	3	0	0	0	3	3
RIZAL	Life and Works of Rizal	3	0	0	0	3	3
LITE	Living in the IT Era	3	0	0	0	3	3
	Total	18	9	4	12	22	30

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO111	Genetics	3	3	2	6	5	9
BBIO115	Developmental Biology	3	3	2	6	5	9
BBIO117	Thesis 1	2	2	0	0	2	2
BBIO*		3	3	2	6	5	9
GBOOKS	Great Books	3	3	0	0	3	3
	Total	14	14	6	18	20	29

Summer

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
	Practicum	3	3	0	0	3	3
	Total	3	3	0	0	3	3

FOURTH YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO*		3	3	2	6	5	9
BBIO*		3	3	2	6	5	9
BBIO118	Thesis 2	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO*		3	3	2	6	5	9
BBIO*		3	3	2	6	5	9
BBIO119	Thesis 3	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

**SUMMARY OF REQUIRED COURSES
BS Biology**

	No. of Course Required	Unit Equivalent	Total Units
General Education Courses			
Languages			
Purposive Communication	1	3	
Kalinangan sa Kalikasang Filipino	1	3	
Great Books	1	3	9
Mathematics			
Mathematics in the Modern World	1	3	
Statistics in Biology	1	3	6
Social Sciences			
Understanding the self	1	3	
Art Appreciation	1	3	
GE Electives (Gender and Society)	1	3	9
Mandated Courses			
Physical Education	4	8	
Institutional Religious Studies	3	9	
National Service Training Program	2	6	
Institutional Group Guidance	1	1.5	
The Contemporary World	1	3	
Ethics	1	3	
Science, Technology and Society	1	3	
Logic	1	3	
Public Speaking	1	3	
Rizal	1	3	
Readings in Philippine History	1	3	
Living in the IT Era	1	3	48.5
Major Courses			
BBIO101 General Botany	1	5	
BBIO102 General Zoology	1	5	
BBIO103 Systematics	1	5	
BBIO107 Microbiology	1	5	
BBIO108 General Ecology	1	5	
BBIO110 Evolutionary Biology	1	5	
BBIO111 Genetics	1	5	
BBIO112 Cell and Molecular Biology	1	5	
BBIO113 General Physiology	1	5	
BBIO115 Developmental Biology	1	5	
Thesis	3	6	56
Tool Courses			
BBIO104 Chemical Biology 1	1	3	
BBIO106 Chemical Biology 11	1	3	
BBIO109 Chemical Biology 111	1	5	
BBIO114 Biophysics	1	4	15
* Specialization Courses			
BBIO*	1	5	
BBIO*	1	5	
BBIO*	1	5	
BBIO*	1	5	
BBIO*	1	5	25

Specialization Courses

BIO Elective (Specialization Elective)

2

3

6

TOTAL

174.5

**BACHELOR OF SCIENCE
Biology
with Specialization in Ecology**

FIRST YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO101	General Botany	3	3	2	6	5	9
BBIO102	General Zoology	3	3	2	6	5	9
USELF	Understanding the Self	3	3	0	0	3	3
MATHMW	Mathematics in the Modern World	3	3	0	0	3	3
PED1	Physical Education 1 (Wellness & Fitness)	2	2	0	0	2	2
IRS1	La Sallian Spirituality	3	3	0	0	3	3
NSTP1	National Service Learning Program 1	3	3	0	0	3	3
	Total	20	20	4	12	24	32

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO103	Systematics	3	3	2	6	5	9
BBIO104	Chemical Biology 1 (Organic Molecules)	2	2	1	3	3	5
BBIO105	Statistical Biology	2	2	1	3	3	5
PCOM	Purposive Communication	3	3	0	0	3	3
KKFIL	Kalinangan sa Kalikasang Pilipino	3	3	0	0	3	3
PED2	Physical Education 1 (Team Sports & Rhythmic Activities)	2	2	0	0	2	3
IRS2	Christian Morality	3	3	0	0	3	3
NSTP2	National Service Learning Program 2	3	3	0	0	3	3
IGG	Group Guidance	1.5	1.5	0	0	1.5	1.5
	Total	22.5	22.5	4	12	26.5	35.5

SECOND YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO106	Chemical Biology 2 (Analytical Methods)	2	2	1	3	3	5
BBIO113	General Physiology	3	3	2	6	5	9
BBIO108	General Ecology	3	3	2	6	5	9
CWRLD	The Contemporary World	3	3	0	0	3	3
ETHICS	Ethics	3	3	0	0	3	3
IRS3	Spirituality in the Workplace	3	3	0	0	3	3
PED3	Physical Education 3 (Swimming & Recreation)	2	2	0	0	2	2
STS	Science, Technology & Society	3	3	0	0	3	3
	Total	22	22	5	15	27	37

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO109	Chemical Biology 3 (Biomolecules)	3	3	2	6	5	9
BBIO110	Evolutionary Biology	3	3	2	6	5	9
BBIO114	BioPhysics	3	3	1	3	4	6
GENSOC	GE Electives 3(Gender & Society)	3	0	0	0	3	3
LOGIC	Logic	3	0	0	0	3	3
PED4	Physical Education 4 (Individual & Dual Sports)	2	0	0	0	2	2
PSPEAK	Public Speaking in the Discipline	3	0	0	0	3	3
	Total	20	9	5	15	25	35

THIRD YEAR

First Semester

		Lec	# of	Lab	# of	Total	Total
		Units	hrs/wk	Units	hrs/wk	Credit	Assessed
						Units	Units
BBIO112	Cell and Molecular Biology	3	3	2	6	5	9
BBIO113	General Physiology	3	3	2	6	5	9
RHIST	Readings in Philippine History	3	0	0	0	3	3
ARTAP	Art Appreciation	3	0	0	0	3	3
RIZAL	Life and Works of Rizal	3	0	0	0	3	3
IT	Living in the IT Era	3	0	0	0	3	3
	Total	18	6	4	12	22	30

Second Semester

		Lec	# of	Lab	# of	Total	Total
		Units	hrs/wk	Units	hrs/wk	Credit	Assessed
						Units	Units
BBIO111	Genetics	3	3	2	6	5	9
BBIO115	Developmental Biology	3	3	2	6	5	9
BBIO117	Thesis 1	2	2	0	0	2	2
BBIO201	Terrestrial Ecology & Limnology	3	3	2	6	5	9
GBOOKS	Great Books	3	3	0	0	3	
	Total	14	14	6	18	20	29

Summer

		Lec	# of	Lab	# of	Total	Total
		Units	hrs/wk	Units	hrs/wk	Credit	Assessed
						Units	Units
	Practicum	3	3	0	0	3	3
	Total	3	3	0	0	3	3

FOURTH YEAR

First Semester

		Lec	# of	Lab	# of	Total	Total
		Units	hrs/wk	Units	hrs/wk	Credit	Assessed
						Units	Units
BBIO202	Marine Ecology	3	3	2	6	5	9
BBIO203	Biogeography	3	3	2	6	5	9
BBIO118	Thesis 2	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

Second Semester

		Lec	# of	Lab	# of	Total	Total
		Units	hrs/wk	Units	hrs/wk	Credit	Assessed
						Units	Units
BBIO204	Molecular Ecology	3	3	2	6	5	9
BBIO205	Biological Resource Management	3	3	2	6	5	9
BBIO119	Thesis 3	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

**SUMMARY OF REQUIRED COURSES
BS Biology
with Specialization in Ecology**

	No. of Course Required	Unit Equivalent	Total Units
General Education Courses			
Languages			
Purposive Communication	1	3	
Kalinangan sa Kalikasang Filipino	1	3	
Great Books	1	3	9
Mathematics			
Mathematics in the Modern World	1	3	
Statistics in Biology	1	3	6
Social Sciences			
Understanding the self	1	3	
Art Appreciation	1	3	
GE Electives (Gender and Society)	1	3	9
Mandated Courses			
Physical Education	4	8	
Institutional Religious Studies	3	9	
National Service Training Program	2	6	
Institutional Group Guidance	1	1.5	
The Contemporary World	1	3	
Ethics	1	3	
Science, Technology and Society	1	3	
Logic	1	3	
Public Speaking	1	3	
Rizal	1	3	
Readings in Philippine History	1	3	
Living In the IT Era	1	3	48.5
Major Courses			
BBIO101 General Botany	1	5	
BBIO102 General Zoology	1	5	
BBIO103 Systematics	1	5	
BBIO107 Microbiology	1	5	
BBIO108 General Ecology	1	5	
BBIO110 Evolutionary Biology	1	5	
BBIO111 Genetics	1	5	
BBIO112 Cell and Molecular Biology	1	5	
BBIO113 General Physiology	1	5	
BBIO115 Developmental Biology	1	5	
Thesis	3	6	56
Chemistry			
BBIO104 Chemical Biology 1	1	3	
BBIO106 Chemical Biology 11	1	3	
BBIO109 Chemical Biology 111	1	5	
BBIO114 Biophysics	1	4	15
Specialization Courses			
BBIO201 Terrestrial Ecology and Limnology	1	5	
BBIO202 Marine Ecology	1	5	
BBIO203 Biogeography	1	5	
BBIO204 Molecular Ecology	1	5	
BBIO205 Biological Resource Management	1	5	25

Specialization Courses			
BIO Elective (Specialization Elective)	2	3	6
TOTAL			174.5

MAJOR COURSE DESCRIPTION
BS Biology
with Specialization in Ecology**BBIO101
GENERAL BOTANY****5 units**

Deals with the study of plants' external and internal form, organization, structure and function from cellular, histological up to organismic levels. The phylogenetic and ecological perspectives of plant study is used as the foundation for emphasizing the role of plants in our diverse environment and consequently elicit responsible attitude towards plants.

Students are expected to be able to confidently and thoroughly explain the morphoanatomy and physiology of plants. As Biology students, they are also expected to practice the scientific method in identifying problems in the ecosystems adopted by the class. Part of this exercise is to conduct a plant survey in selected areas and to generate scientific informations from the processed data, such as a list of plants that are valuable to people in the locale and to the ecosystem where the plants belong. Hence, as a way of communicating their findings to others within the La Sallian community, the students will be required to organize an event that will promote awareness of plant biodiversity and encourage advocacies for the conservation of our national resources and protection of our natural heritage.

**BBIO102
GENERAL ZOOLOGY****5 units**

Preparatory subject to higher biology and allied fields, it provides the foundation for exploration of the animal (structure and function), of which humans are part of. Highlights the understanding of lower forms of organisms to see the development of the human body.

Students will have awareness and interest of Philippine wildlife, particularly the endemic and endangered species. Each group will take photos of three animals of interest. Each of these animals will be studied in details through research, which the students will have to write up as background information of the animals they have selected. Both the photograph and the write up will be mounted on boards that will be displayed as an exhibit.

**BBIO103
SYSTEMATICS****5 units**

Systematic study of the kinds and diversity of organisms (populations, species and higher taxa) and the relationships among them, determination by means of comparison of what the unique properties of each species and higher taxa are, properties certain taxon have in common and the biological causes of the difference or shared characteristics, study of variation within taxa.

Students will conduct field research to enhance their skills in critical thinking and scientific inquiry which will broaden their capacity to address environmental issues
Prerequisite: BBIO101, BBIO102

**BBIO104
CHEMICAL BIOLOGY
(ORGANIC MOLECULES)****3 units
1(ORGANIC**

Deals with the fundamentals of Organic Chemistry, the study of carbon and its various compounds. It covers structure writing and structure nomenclature of the different classes of organic compounds as well as their properties and derivatives. It helps them to think critically and logically and apply scientific concepts to any phenomenon that occurs in nature.

The students will master the skills required in the manipulation of apparatus as well as techniques employed in chemical analyses and to apply the roles played by organic chemistry in the daily life.

**BBIO105
STATISTICAL BIOLOGY****3 units**

Includes a review of statistics and the appropriate statistical tools needed for biological /medical research.

Students will easily apply statistical tools needed for specific research problems that they propose as part of their subject requirements.

**BBIO106
CHEMICAL BIOLOGY II (Analytical methods)****3 units**

Covers the theory and practice of chemical analysis. It includes the qualitative analysis of cations and anions as well as gravimetric and volumetric methods of analysis.

Given a set of unknown solutions, the students are expected to correctly perform laboratory laboratory procedures for chemical analysis to enable them to predict the substances present in their sample.

**BBIO107
MICROBIOLOGY****5 units**

Covers anatomy, physiology and genetics of microorganisms such as bacteria, fungi algae and protozoans. It also involves the study of the roles of microorganism in the environment and their applications in industry and medicine. Experiments are designed to include techniques for identification of microorganisms. Students will be trained in the use of aseptic techniques for basic microbial applications.

The students are expected to participate in the community service learning program wherein they act as lecturers about disease, health and sanitation and medical mission organized by students themselves.

BBIO108 **5 units**

GENERAL ECOLOGY

An introductory course on the biology of ecosystems. It consists of laboratory work dealing with basic principles and methodologies pertaining to population and community structure and the assessment of environmental quality.

Students will have technical skills in environmental assessments, conduct field assessment of a selected site to highlight an environmental issue and exhibit research skills and write a scientific paper which will be presented orally as a course output.

Prerequisite: BBIO103, BBIO105

BBIO109 **5 units**

CHEMICAL BIOLOGY III (BIOMOLECULES)

Focuses on the study of the structures, functions, reactions, and metabolism of the four major classes of biomolecules namely, carbohydrates, lipids, nucleic acids, and proteins.

Students will master chemical interactions that are taking place within the body of the living organisms in general and recognize the significance and the beauty of life processes. They should be able to explain the emergence of certain diseases in the context of disruption and imbalances in the different metabolic pathways and suggest ways to prevent them.

Prerequisite: BBIO104

BBIO110 **5 units**

EVOLUTIONARY BIOLOGY

Deals with evolutionary relationships among different biological organisms.

Students will clearly communicate evolutionary relationships among different biological organisms and predict possible linkages between and among the different organisms.

Prerequisite: BBIO108

BBIO111 **5 units**

GENETICS

Includes mechanism of heredity and variation, cytogenetics, mutation, nature of genetics, population genetics, human genetics and evolutionary genetics as well as biometrical procedures.

Students will collaborate on organizing a local support group for families with members afflicted with a genetic disease. They will also create an e-group detailing its medical interventions and specialists for the consultation

BBIO112 **5 units**

CELL AND MOLECULAR BIOLOGY

This course covers discussions on the cell, the basic unit of life. Emphasis will be placed on the structural features of the different cellular organelles, connections of the basic cellular processes and the importance of biomolecule properties for their control and regulation.

Students are required to write and orally report a synopsis of current relevant literature material on selected topics on cell and molecular biology.

Prerequisite: BBIO109

BBIO113 **5 units**

GENERAL PHYSIOLOGY

Deals with the fundamental principles of biological functions observed for the members of the plant and animal kingdoms. Particular emphasis is placed on the processes involved with regulation and adaptation to different stimuli.

Students will come up with a model showing how an organ looks and works and present this to the class as well to a chosen group in the community or school.

Prerequisite: BBIO101, BBIO102

BBIO114 **4 units**

BIOPHYSICS

Deals with the basic principles of mechanics, electricity, magnetism, optics and other important physical concepts and their applications to Biology.

Students will develop critical thinking ability on any phenomenon which occurs in nature by being able to link the concepts being studied to the everyday world and to the wider scientific world.

BBIO115 **5 units**

DEVELOPMENTAL BIOLOGY

Comparative survey of the development of representative animals from several phyla, with emphasis on vertebrate gamete formation, fertilization, embryonic development, organogenesis, growth, and biological aging. The course is streamlined to integrate salient morphological, experimental, molecular and conceptual approaches to the study of developmental biology.

Students will be able to demonstrate cognitive and psychological attributes essential to forming intelligent decisions when confronted with prevailing ethical and political issues affecting human life.

BBIO201 **5 units**

TERRESTRIAL ECOLOGY AND LIMNOLOGY

In depth study of terrestrial ecosystems and fresh water ecosystem with field studies/work.

Students are expected to submit research outputs from their field works. Participation in the field trips and lectures/seminars given by invited resource speakers are also required.

BBIO202 **5 units**

MARINE ECOLOGY

In depth study of marine ecosystems with field work/studies.

Students are expected to submit research outputs from their field works. Participation in the field trips and lectures/seminars given by invited resource speakers are also required.

BBIO203 **5 units**

BIOGEOGRAPHY

In depth study of freshwater ecosystems with field work/studies.

Students are expected to write a review paper on selected topics. Students are required to submit research outputs from their fieldworks. They are also required to participate in the field trips, lectures/seminars given by resource speakers.

BBIO204 **5 units**

MOLECULAR ECOLOGY

Applies molecular genetic data to answer ecological questions related to biogeography and genetic diversity within populations and genetic similarities among populations.

Students are expected to write review paper on selected topics.

BBIO123 **4 units**

BIOLOGICAL RESOURCES MANAGEMENT

Focuses on scientific and technical understanding of natural resources and ecology and the life –supporting capacity of those resources. It brings together land use and planning, water management, biodiversity conservation and the future sustainability of industries like agriculture, forestry, mining, tourism and fisheries. It puts strong emphasis on humanity's moral obligation as stewards of the land in maintaining a healthy and productive landscape towards sustainable development.

Students should be able to present a case study on any relevant issues affecting their province or an adopted community and to recommend solutions to address these issues. Furthermore, students should be able to concretely show support to an advocacy geared towards sustainable development, present a thesis related to this course to a larger group or conduct seminars or workshops on relevant environmental issues.

SPECIALIZATION ELECTIVE

Includes subjects that will reinforce students' knowledge and skills in Ecology (such as Environmental Journalism, Forestry, Natural Reserve/Park Management etc.)

THESIS (1, 2 & 3)

Research proposal making, data gathering and research final defense as well presentation of students' thesis, attendance to trainings, community service learning program, workshops related to research and other relevant issues in their specializations(such as proposal making for external funding, organic farming technology, bio entrepreneurship among others).

PRACTICUM

Maximum of 150 hours of work immersion in institutions/industries related to their field of specializations.

**BACHELOR OF SCIENCE
Biology
with Specialization in Medical Biology**

FIRST YEAR
First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO101	General Botany	3	3	2	6	5	9
BBIO102	General Zoology	3	3	2	6	5	9
USELF	Understanding the Self	3	3	0	0	3	3
MATHMW	Mathematics in the Modern World	3	3	0	0	3	3
PED1	Physical Education 1 (Wellness & Fitness)	2	2	0	0	2	2
IRS1	Lasallian Spirituality	3	3	0	0	3	3
NSTP1	National Service Learning Program 1	3	3	0	0	3	3
	Total	20	20	4	12	24	32

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO103	Systematics	3	3	2	6	5	9
BBIO104	Chemical Biology 1 (Organic Molecules)	2	2	1	3	3	5
BBIO105	Statistical Biology	2	2	1	3	3	5
PCOM	Purposive Communication	3	3	0	0	3	3
KKFIL	Kalinangan sa Kalikasang Pilipino	3	3	0	0	3	3
PED2	Physical Education 1 (Team Sports & Rhythmic Activities)	2	2	0	0	2	3
IRS2	Christian Morality	3	3	0	0	3	3
NSTP2	National Service Learning Program 2	3	3	0	0	3	3
IGG	Group Guidance	1.5	1.5	0	0	1.5	1.5
	Total	22.5	22.5	4	12	26.5	35.5

SECOND YEAR
First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO106	Chemical Biology 2 (Analytical Methods)	2	2	1	3	3	5
BBIO113	General Physiology	3	3	2	6	5	9
BBIO108	General Ecology	3	3	2	6	5	9
CWRLD	The Contemporary World	3	3	0	0	3	3
ETHICS	Ethics	3	3	0	0	3	3
IRS3	Spirituality in the WorkPlace	3	3	0	0	3	3
PED3	Physical Education 3 (Swimming & Recreation)	2	2	0	0	2	2
STS	Science, Technology & Society	3	3	0	0	3	3
	Total	22	22	5	15	27	37

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO109	Chemical Biology 3 (Biomolecules)	3	3	2	6	5	9
BBIO110	Evolutionary Biology	3	3	2	6	5	9
BBIO114	BioPhysics	3	3	1	3	4	6
GENSOC	GE Electives 3(Gender & Society)	3	0	0	0	3	3
LOGIC	Logic	3	0	0	0	3	3
PED4	Physical Education 4 (Individual& Dual Sports)	2	0	0	0	2	2
PSPEAK	Public Speaking in the Discipline	3	0	0	0	3	3
	Total	20	9	5	15	25	35

THIRD YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO112	Cell and Molecular Biology	3	3	2	6	5	9
BBIO107	Microbiology	3	3	2	6	5	9
RHIST	Readings in Philippine History	3	0	0	0	3	3
ARTAP	Art Appreciation	3	0	0	0	3	3
RIZAL	Life and Works of Rizal	3	0	0	0	3	3
LITE	Living in the IT Era	3	0	0	0	3	3
	Total	18	6	4	12	22	30

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO111	Genetics	3	3	2	6	5	9
BBIO115	Developmental Biology	3	3	2	6	5	9
BBIO117	Thesis 1	2	2	0	0	2	2
BBIO401	Microbial Physiology	3	3	2	6	5	9
GBOOKS	Great Books	3	3	0	0	3	3
	Total	14	14	6	18	20	29

Summer

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
	Practicum	3	3	0	0	3	3
	Total	3	3	0	0	3	3

FOURTH YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO402	Medical Microbiology	3	3	2	6	5	9
BBIO403	Microbial Ecology	3	3	2	6	5	9
BBIO118	Thesis 2	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO404	Food Microbiology	3	3	2	6	5	9
BBIO405	Industrial Microbiology	3	3	2	6	5	9
BBIO119	Thesis 3	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

**SUMMARY OF REQUIRED COURSES
BS Biology
with Specialization in Medical Biology**

	No. of Course Required	Unit Equivalent	Total Units
General Education Courses			
Languages			
Purposive Communication	1	3	
Kalinangan sa Kalikasang Filipino	1	3	
Great Books	1	3	9
Mathematics			
Mathematics in the Modern World	1	3	
Statistics in Biology	1	3	6
Social Sciences			
Understanding the self	1	3	
Art Appreciation	1	3	
GE Electives (Gender and Society)	1	3	9
Mandated Courses			
Physical Education	4	8	
Institutional Religious Studies	3	9	
National Service Training Program	2	6	
Institutional Group Guidance	1	1.5	
The Contemporary World	1	3	
Ethics	1	3	
Science, Technology and Society	1	3	
Logic	1	3	
Public Speaking	1	3	
Rizal	1	3	
Readings in Philippine History	1	3	
Living In the IT Era	1	3	48.5
Major Courses			
BBIO101 General Botany	1	5	
BBIO102 General Zoology	1	5	
BBIO103 Systematics	1	5	
BBIO107 Microbiology	1	5	
BBIO108 General Ecology	1	5	
BBIO110 Evolutionary Biology	1	5	
BBIO111 Genetics	1	5	
BBIO112 Cell and Molecular Biology	1	5	
BBIO113 General Physiology	1	5	
BBIO115 Developmental Biology	1	5	
Thesis	3	6	56
Tool Courses			
BBIO104 Chemical Biology 1	1	3	
BBIO106 Chemical Biology 11	1	3	
BBIO109 Chemical Biology 111	1	5	
BBIO114 Biophysics	1	4	15
Specialization Courses			
BBIO301 Medical Microbiology	1	5	
BBIO302 Human Anatomy & Physiology	1	5	
BBIO303 Medical Parasitology	1	5	
BBIO304 Medical Histology	1	5	
BBIO305 Human Genetics	1	5	
Specialization Courses			
Free Elective (Specialization Elective)	2	3	6
TOTAL			163.5

**MAJOR COURSE DESCRIPTION
BS BIOLOGY WITH SPECIALIZATION IN MEDICAL BIOLOGY****BBIO101 5 units
GENERAL BOTANY**

Deals with the study of plants' external and internal form, organization, structure and function from cellular, histological up to organismic levels. The phylogenetic and ecological perspectives of plant study is used as the foundation for emphasizing the role of plants in our diverse environment and consequently elicit responsible attitude towards plants. Students are expected to be able to confidently and thoroughly explain the morphoanatomy and physiology of plants.

As Biology students, they are also expected to practice the scientific method in identifying problems in the ecosystems adopted by the class. Part of this exercise is to conduct a plant survey in selected areas and to generate scientific informations from the processed data, such as a list of plants that are valuable to people in the locale and to the ecosystem where the plants belong. Hence, as a way of communicating their findings to others within the La Sallian community, the students will be required to organize an event that will promote awareness of plant biodiversity and encourage advocacies for the conservation of our national resources and protection of our natural heritage.

**BBIO102 5 units
GENERAL ZOOLOGY**

Preparatory subject to higher biology and allied fields, it provides the foundation for exploration of the animal (structure and function), of which humans are part of. Highlights the understanding of lower forms of organisms to see the development of the human body.

Students will have awareness and interest of Philippine wildlife, particularly the endemic and endangered species. Each group will take photos of three animals of interest. Each of these animals will be studied in details through research, which the students will have to write up as background information of the animals they have selected. Both the photograph and the write up will be mounted on boards that will be displayed as an exhibit.

**BBIO103 5 units
SYSTEMATICS**

Systematic study of the kinds and diversity of organisms (populations, species and higher taxa) and the relationships among them, determination by means of comparison of what the unique properties of each species and higher taxa are, properties certain taxon have in common and the biological causes of the difference or shared characteristics, study of variation within taxa.

Students will conduct field research to enhance their skills in critical thinking and scientific inquiry which will broaden their capacity to address environmental issues.

Prerequisite: BBIO101, BBIO102

**BBIO104 3 units
CHEMICAL BIOLOGY 1(ORGANIC
MOLECULES)**

Deals with the fundamentals of Organic Chemistry, the study of carbon and its various compounds. It covers structure writing and structure nomenclature of the different classes of organic compounds as well as their properties and derivatives. It helps them to think critically and logically and apply scientific concepts to any phenomenon that occurs in nature.

The students will master the skills required in the manipulation of apparatus as well as techniques employed in chemical analyses and to apply the roles played by organic chemistry in the daily life.

**BBIO105 3 units
STATISTICAL BIOLOGY**

Includes a review of statistics and the appropriate statistical tools needed for biological /medical research.

Students will easily apply statistical tools needed for specific research problems that they propose as part of their subject requirements.

**BBIO106 3 units
CHEMICAL BIOLOGY II (Analytical Methods)**

Covers the theory and practice of chemical analysis. It includes the qualitative analysis of cations and anions as well as gravimetric and volumetric methods of analysis.

Given a set of unknown solutions, the students are expected to correctly perform laboratory laboratory procedures for chemical analysis to enable them to predict the substances present in their sample.

**BBIO107 5 units
MICROBIOLOGY**

Covers anatomy, physiology and genetics of microorganisms such as bacteria, fungi algae and protozoans. It also involves the study of the roles of microorganism in the environment and their applications in industry and medicine. Experiments are designed to include techniques for identification of microorganisms. Students will be trained in the use of aseptic techniques for basic microbial applications.

The students are expected to participate in the community service learning program wherein they act as lecturers about disease, health and sanitation and medical mission organized by students themselves.

**BBIO108 5 units
GENERAL ECOLOGY**

An introductory course on the biology of ecosystems. It consists of laboratory work dealing with basic principles and methodologies pertaining to population and community structure and the assessment of environmental quality.

Students will have technical skills in environmental assessments, conduct field assessment of a selected site to highlight an environmental issue and exhibit research skills and write a scientific paper which will be presented orally as a course output.

Prerequisite: BBIO103, BBIO105

BBIO109 **5 units** **CHEMICAL BIOLOGY III (BIOMOLECULES)**

Focuses on the study of the structures, functions, reactions, and metabolism of the four major classes of biomolecules namely, carbohydrates, lipids, nucleic acids, and proteins.

Students will master chemical interactions that are taking place within the body of the living organisms in general and recognize the the significance and the beauty of life processes. They should be able to explain the emergence of certain diseases in the context of disruption and imbalances in the different metabolic pathways and suggest ways to prevent them.

Prerequisite: BBIO 104

BBIO110 **5 units** **EVOLUTIONARY BIOLOGY**

Deals with evolutionary relationships among different biological organisms. Students will clearly communicate evolutionary relationships among different biological organisms and predict possible linkages between and among the different organisms.

Prerequisite: BBIO108

BBIO111 **5 units** **GENETICS**

Includes mechanism of heredity and variation, cytogenetics, mutation, nature of genetics, population genetics, human genetics and evolutionary genetics as well as biometrical procedures.

Students will collaborate on organizing a local support group for families with members afflicted with a genetic disease. They will also create an e-group detailing its medical interventions and specialists for the consultation

BBIO112 **5 units** **CELL AND MOLECULAR BIOLOGY**

This course covers discussions on the cell, the basic unit of life. Emphasis will be placed on the structural features of the different cellular organelles, connections of the basic cellular processes and the importance of biomolecule properties for their control and regulation.

Students are required to write and orally report a synopsis of current relevant literature material on selected topics on cell and molecular biology.

Prerequisite: BBIO109

BBIO113 **5 units** **GENERAL PHYSIOLOGY**

Deals with the fundamental principles of biological functions observed for the members of the plant and animal kingdoms. Particular emphasis is placed on the processes involved with regulation and adaptation to different stimuli.

Students will come up with a model showing how an organ looks and works and present this to the class as well to a chosen group in the community or school.
Prerequisite: BBIO101, BBIO102

BBIO114 **4 units** **BIOPHYSICS**

Deals with the basic principles of mechanics, electricity, magnetism, optics and other important physical concepts and their applications to Biology.

Students will develop critical thinking ability on any phenomenon which occurs in nature by being able to link the concepts being studied to the everyday world and to the wider scientific world.

BBIO115 **5 units** **DEVELOPMENTAL BIOLOGY**

Comparative survey of the development of representative animals from several phyla, with emphasis on vertebrate gamete formation, fertilization, embryonic development, organogenesis, growth, and biological aging. The course is streamlined to integrate salient morphological, experimental, molecular and conceptual approaches to the study of developmental biology.

Students will be able to demonstrate cognitive and psychological attributes essential to forming intelligent decisions when confronted with prevailing ethical and political issues affecting human life.

BBIO301 **5 units** **MEDICAL MICROBIOLOGY**

Provides in-depth study of microbiology especially those that are significant in the medical field.

Students will manifest skills in microbiological techniques pertaining to medicine as well as apply biotechnology in doing microbiological researches with medical applications.

BBIO302 **5 units** **HUMAN ANATOMY & PHYSIOLOGY**

Provides a basic foundation for medicine. It focuses on the gross anatomical structures and functions and is approached either regionally or systematically using models preserved specimens or pictures.

Students should be able to locate and identify the different components of an anatomic system or region and the different parts of an organ. They are required to submit creative projects to demonstrate knowledge in anatomy and physiology.

BBIO303 **5 units** **MEDICAL PARASITOLOGY**

Deals with the study of the host-parasite relationships affecting man and other animals. The course deals with the study of four medically important parasites such as the protists, nematodes, cestodes and trematodes. Detailed emphasis is put on their distinctive morphological features, life cycles, pathogenesis and clinical manifestations, laboratory diagnosis, treatment, prevention and control, and epidemiology.

Students are expected to manifest mastery of the medically important host –parasite relationships affecting man and be able to propose research-based remedies/cures for them.

BBIO304 **5 units**
MEDICAL HISTOLOGY

A systematic study of the microanatomy of the human body starting with cells and working through the complete organ systems as preparation for medical studies.. It includes the principal methods employed in the microscopic examination of human tissues.

Students will prepare their own histological sections of an assigned organ which will be scanned and uploaded to a website and collectively, they will develop a free web-based microscope system for the viewing of histological images for medical purposes.

BBIO305 **5 units**
HUMAN GENETICS

An in depth study of human population genetics as applied to the study of medicine.

Students are expected to critically assess medical cases on human population genetics and provide possible explanations and management plans for certain genetically acquired diseases.

SPECIALIZATION ELECTIVE

Includes subjects that will reinforce students' knowledge as they prepare for the College of Medicine (Pharmacology, Abnormal Psychology, Principles of Teaching, Radiology & Basics of Medical Diagnosing)

THESIS(1, 2 & 3)

Research proposal making, data gathering and research final defense as well presentation of students' thesis, attendance to trainings, community service learning program workshops related to research and other relevant issues in their specializations(such as proposal making for external funding, organic farming technology, bio entrepreneurship among others).

PRACTICUM

Maximum of 150 hours of work immersion in institutions/industries related to their field of specializations.

**BACHELOR OF SCIENCE
Biology
with Specialization in Microbiology**

FIRST YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO101	General Botany	3	3	2	6	5	9
BBIO102	General Zoology	3	3	2	6	5	9
USELF	Understanding the Self	3	3	0	0	3	3
MATHMW	Mathematics in the Modern World	3	3	0	0	3	3
PED1	Physical Education 1 (Wellness & Fitness)	2	2	0	0	2	2
IRS1	Lasallian Spirituality	3	3	0	0	3	3
NSTP1	National Service Learning Program 1	3	3	0	0	3	3
Total		20	20	4	12	24	32

Second Semester

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO103	Systematics	3	3	2	6	5	9
BBIO104	Chemical Biology 1 (Organic Molecules)	2	2	1	3	3	5
BBIO105	Statistical Biology	2	2	1	3	3	5
PCOM	Purposive Communication	3	3	0	0	3	3
KKFIL	Kalinangan sa Kalikasang Pilipino	3	3	0	0	3	3
PED2	Physical Education 1 (Team Sports & Rhythmic Activities)	2	2	0	0	2	3
IRS2	Christian Morality	3	3	0	0	3	3
NSTP2	National Service Learning Program 2	3	3	0	0	3	3
IGG	Group Guidance	1.5	1.5	0	0	1.5	1.5
Total		22.5	22.5	4	12	26.5	35.5

SECOND YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO106	Chemical Biology 2 (Analytical Methods)	2	2	1	3	3	5
BBIO113	General Physiology	3	3	2	6	5	9
BBIO108	General Ecology	3	3	2	6	5	9
CWRLD	The Contemporary World	3	3	0	0	3	3
ETHICS	Ethics	3	3	0	0	3	3
IRS3	Spirituality in the WorkPlace	3	3	0	0	3	3
PED3	Physical Education 3 (Swimming & Recreation)	2	2	0	0	2	2
STS	Science, Technology & Society	3	3	0	0	3	3
Total		22	22	5	15	27	37

Second Semester

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO109	Chemical Biology 3 (Biomolecules)	3	3	2	6	5	9
BBIO110	Evolutionary Biology	3	3	2	6	5	9
BBIO114	BioPhysics	3	3	1	3	4	6
GENSOC	GE Electives 3(Gender & Society)	3	0	0	0	3	3
LOGIC	Logic	3	0	0	0	3	3
PED4	PE 4 (Individual& Dual Sports)	2	0	0	0	2	2
PSPEAK	Public Speaking in the Discipline	3	0	0	0	3	3
Total		20	6	5	15	25	35

THIRD YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO112	Cell and Molecular Biology	3	3	2	6	5	9
BBIO107	Microbiology	3	3	2	6	5	9
RHIST	Readings in Philippine History	3	0	0	0	3	3
ARTAP	Art Appreciation	3	0	0	0	3	3
RIZAL	Life and Works of Rizal	3	0	0	0	3	3
LITE	Living in the IT Era	3	0	0	0	3	3
	Total	18	6	4	12	22	30

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO111	Genetics	3	3	2	6	5	9
BBIO115	Developmental Biology	3	3	2	6	5	9
BBIO117	Thesis 1	2	2	0	0	2	2
BBIO401	Microbial Physiology	3	3	2	6	5	9
GBOOKS	Great Books	3	3	0	0	3	3
	Total	14	14	6	18	20	29

Summer

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
	Practicum	3	3	0	0	3	3
	Total	3	3	0	0	3	3

FOURTH YEAR

First Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO402	Medical Microbiology	3	3	2	6	5	9
BBIO403	Microbial Ecology	3	3	2	6	5	9
BBIO118	Thesis 2	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

Second Semester

		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
BBIO404	Food Microbiology	3	3	2	6	5	9
BBIO405	Industrial Microbiology	3	3	2	6	5	9
BBIO119	Thesis 3	2	2	0	0	2	2
BIOELECT	Specialization Elective	3	3	0	0	3	3
	Total	11	11	4	12	15	23

**SUMMARY OF REQUIRED COURSES
BS Biology
with Specialization in Microbiology**

	No. of Course Required	Unit Equivalent	Total Units
General Education Courses			
Languages			
Purposive Communication	1	3	
Kalinangan sa Kalikasang Filipino	1	3	
Great Books	1	3	9
Mathematics			
Mathematics in the Modern World	1	3	
Statistics in Biology	1	3	6
Social Sciences			
Understanding the self	1	3	
Art Appreciation	1	3	
GE Electives (Gender and Society)	1	3	9
Mandated Courses			
Physical Education	4	8	
Institutional Religious Studies	3	9	
National Service Training Program	2	6	
Institutional Group Guidance	1	1.5	
The Contemporary World	1	3	
Ethics	1	3	
Science, Technology and Society	1	3	
Logic	1	3	
Public Speaking	1	3	
Rizal	1	3	
Readings in Philippine History	1	3	
Living In the IT Era	1	3	48.5
Major Courses			
BBIO101 General Botany	1	5	
BBIO102 General Zoology	1	5	
BBIO103 Systematics	1	5	
BBIO107 Microbiology	1	5	
BBIO108 General Ecology	1	5	
BBIO110 Evolutionary Biology	1	5	
BBIO111 Genetics	1	5	
BBIO112 Cell and Molecular Biology	1	5	
BBIO113 General Physiology	1	5	
BBIO115 Developmental Biology	1	5	
Thesis	3	6	56
Tool Courses			
BBIO104 Chemical Biology 1	1	3	
BBIO106 Chemical Biology 11	1	3	
BBIO109 Chemical Biology 111	1	5	
BBIO114 Biophysics	1	4	15
Specialization Courses			
BBIO401 Microbial Physiology	1	5	
BBIO402 Industrial Microbiology	1	5	
BBIO403 Microbial Ecology	1	5	
BBIO404 Food Microbiology	1	5	
BBIO405 Industrial Microbiology	1	5	25

Specialization Courses

Bio Elective (Specialization Elective)

2

3

6

TOTAL

174.5

MAJOR COURSE DESCRIPTION
BS BIOLOGY WITH SPECIALIZATION IN MICROBIOLOGY

BBIO101 5 units**GENERAL BOTANY**

Deals with the study of plants' external and internal form, organization, structure and function from cellular, histological up to organismic levels. The phylogenetic and ecological perspectives of plant study is used as the foundation for emphasizing the role of plants in our diverse environment and consequently elicit responsible attitude towards plants.

Students are expected to be able to confidently and thoroughly explain the morphoanatomy and physiology of plants. As Biology students, they are also expected to practice the scientific method in identifying problems in the ecosystems adopted by the class. Part of this exercise is to conduct a plant survey in selected areas and to generate scientific informations from the processed data, such as a list of plants that are valuable to people in the locale and to the ecosystem where the plants belong. Hence, as a way of communicating their findings to others within the La Sallian community, the students will be required to organize an event that will promote awareness of plant biodiversity and encourage advocacies for the conservation of our national resources and protection of our natural heritage.

BBIO102 5 units**GENERAL ZOOLOGY**

Preparatory subject to higher biology and allied fields, it provides the foundation for exploration of the animal (structure and function), of which humans are part of. Highlights the understanding of lower forms of organisms to see the development of the human body.

Students will have awareness and interest of Philippine wildlife, particularly the endemic and endangered species. Each group will take photos of three animals of interest. Each of these animals will be studied in details through research, which the students will have to write up as background information of the animals they have selected. Both the photograph and the write up will be mounted on boards that will be displayed as an exhibit.

BBIO103 5 units**SYSTEMATICS**

Systematic study of the kinds and diversity of organisms (populations, species and higher taxa) and the relationships among them, determination by means of comparison of what the unique properties of each species and higher taxa are, properties certain taxon have in common and the biological causes of the difference or shared characteristics, study of variation within taxa.

Students will conduct field research to enhance their skills in critical thinking and scientific inquiry which will broaden their capacity to address environmental issues

Prerequisite: BBIO101, BBIO102

BBIO104 3 units
CHEMICAL BIOLOGY 1(ORGANIC MOLECULES)

Deals with the fundamentals of Organic Chemistry, the study of carbon and its various compounds. It covers structure writing and structure nomenclature of the different classes of organic compounds as well as their properties and derivatives. It helps them to think critically and logically and apply scientific concepts to any phenomenon that occurs in nature.

The students will master the skills required in the manipulation of apparatus as well as techniques employed in chemical analyses and to apply the roles played by organic chemistry in the daily life.

BBIO105 3 units**STATISTICAL BIOLOGY**

Includes a review of statistics and the appropriate statistical tools needed for biological /medical research.

Students will easily apply statistical tools needed for specific research problems that they propose as part of their subject requirements.

BBIO106 3 units**CHEMICAL BIOLOGY II (Analytical methods)**

Covers the theory and practice of chemical analysis. It includes the qualitative analysis of cations and anions as well as gravimetric and volumetric methods of analysis.

Given a set of unknown solutions, the students are expected to correctly perform laboratory laboratory procedures for chemical analysis to enable them to predict the substances present in their sample.

BBIO107 5 units**MICROBIOLOGY**

Covers anatomy, physiology and genetics of microorganisms such as bacteria, fungi algae and protozoans. It also involves the study of the roles of microorganism in the environment and their applications in industry and medicine. Experiments are designed to include techniques for identification of microorganisms. Students will be trained in the use of aseptic techniques for basic microbial applications.

The students are expected to participate in the community service learning program wherein they act as lecturers about disease, health and sanitation and medical mission organized by students themselves.

BBIO108 **5 units**

GENERAL ECOLOGY

An introductory course on the biology of ecosystems. It consists of laboratory work dealing with basic principles and methodologies pertaining to population and community structure and the assessment of environmental quality.

Students will have technical skills in environmental assessments, conduct field assessment of a selected site to highlight an environmental issue and exhibit research skills and write a scientific paper which will be presented orally as a course output.

Prerequisites: BBIO103, BBIO105

BBIO109 **5 units**

CHEMICAL BIOLOGY III (BIOMOLECULES)

Focuses on the study of the structures, functions, reactions, and metabolism of the four major classes of biomolecules namely, carbohydrates, lipids, nucleic acids, and proteins.

Students will master chemical interactions that are taking place within the body of the living organisms in general and recognize the significance and the beauty of life processes. They should be able to explain the emergence of certain diseases in the context of disruption and imbalances in the different metabolic pathways and suggest ways to prevent them.

Prerequisites: BBIO104

BBIO110 **5 units**

EVOLUTIONARY BIOLOGY

Deals with evolutionary relationships among different biological organisms.

Students will clearly communicate evolutionary relationships among different biological organisms and predict possible linkages between and among the different organisms.

Prerequisites: BBIO108

BBIO111 **5 units**

GENETICS

Includes mechanism of heredity and variation, cytogenetics, mutation, nature of genetics, population genetics, human genetics and evolutionary genetics as well as biometrical procedures.

Students will collaborate on organizing a local support group for families with members afflicted with a genetic disease. They will also create an e-group detailing its medical interventions and specialists for the consultation

BBIO112 **5 units**

CELL AND MOLECULAR BIOLOGY

This course covers discussions on the cell, the basic unit of life. Emphasis will be placed on the structural features of the different cellular organelles, connections of the basic cellular processes and the importance of biomolecule properties for their control and regulation.

Students are required to write and orally report a synopsis of current relevant literature material on selected topics on cell and molecular biology.
Prerequisites: BBIO 109

BBIO113 **5 units**

GENERAL PHYSIOLOGY

Deals with the fundamental principles of biological functions observed for the members of the plant and animal kingdoms. Particular emphasis is placed on the processes involved with regulation and adaptation to different stimuli.

Students will come up with a model showing how an organ looks and works and present this to the class as well to a chosen group in the community or school.

BBIO114 **4 units**

BIOPHYSICS

Deals with the basic principles of mechanics, electricity, magnetism, optics and other important physical concepts and their applications to Biology.

Students will develop critical thinking ability on any phenomenon which occurs in nature by being able to link the concepts being studied to the everyday world and to the wider scientific world.

BBIO115 **5 units**

DEVELOPMENTAL BIOLOGY

Comparative survey of the development of representative animals from several phyla, with emphasis on vertebrate gamete formation, fertilization, embryonic development, organogenesis, growth, and biological aging. The course is streamlined to integrate salient morphological, experimental, molecular and conceptual approaches to the study of developmental biology.

Students will be able to demonstrate cognitive and psychological attributes essential to forming intelligent decisions when confronted with prevailing ethical and political issues affecting human life.

BBIO404 **5 units**

FOOD MICROBIOLOGY

Deals with microbial flora of food as affected by preservation techniques with special attention on beneficial groups.

Students will master the preservation techniques and demonstrate the skill by applying these to research that benefits the community.

BBIO405 **5 units**

INDUSTRIAL MICROBIOLOGY

Focuses on physiology, nutrition and growth of microorganisms important to various industries with emphasis on biotechnology.

Students will manifest knowledge of applications of microbiology to the industry and propose creative ways to improve industrial techniques.

BBIO401 **5 units**

MICROBIAL PHYSIOLOGY

Deals with microbial structure function, and response of microbial activity to environmental changes: covers the study of viruses, bacteria, fungi and parasites.

Students are expected to identify the effects of the environment in the growth and metabolism of the microorganisms. In the lab, they should explain observed growth patterns and metabolic activities given a particular condition.

BBIO403 **5 units**

MICROBIAL ECOLOGY

Deals with the different types of microorganisms in their different habitats across the environments and assess the roles they play in sustaining our biodiversity.

Students will recognize the roles played by microorganisms and design a research-based management plan for sustainable environment as well as public health with microorganism playing a very significant role.

BBIO402 **5 units**

MEDICAL MICROBIOLOGY

Deals with the infectious microorganisms which include parasites, fungi, bacteria, viruses and prions.

Students are expected to apply knowledge in medical microbiology in disease states given clinical examples and determine the relevance of using microbiological investigations and therapeutics to guide in the diagnosis and treatment of infectious diseases.

SPECIALIZATION ELECTIVE

Includes subject that will reinforce students' knowledge and skills in Microbiology such as Epidemiology (,-deals with incidence, distribution and possible control of diseases caused by microbes), Biotechnology, Foundations of Public Health among others.

THESIS (1, 2 & 3)

Research proposal making, data gathering and research final defense as well presentation of students' thesis, attendance to trainings, community service learning program workshops related to research and other relevant issues in their specializations(such as proposal making for external funding, organic farming technology, bio entrepreneurship among others).

PRACTICUM

Maximum of 150 hours of work immersion in institutions/industries related to their field of specializations.