**ABOVE THE DEPARTMENT**

The Department of Biological Sciences has as its highest goal providing to our students the basis for a lifetime of intellectual appreciation and development. We aim to foster an environment where our students can learn to examine the world scientifically and apply this knowledge in a manner that is beneficial to both the individual and society. In pursuit of this aim, we create an intellectually stimulating atmosphere and provide our students with a quality education in the Biological Sciences, including theoretical and practical analysis of the most current questions in the field.

The goals of the Department of Biological Sciences are:
- To provide high-quality education in the biological sciences
- To challenge students to examine the world scientifically and apply their acquired knowledge in their examinations
- To foster an environment where students feel intellectually challenged
- To respond to educational and employment needs with the community and region
- To provide individuals with the opportunity to prepare for careers requiring a background in biology

All curricula have been designed to provide a quality education directed to prepare students for their chosen career area and/or the pursuit of a four-year degree.

**Office:** Meister Hall [ME], Room 415
**Phone:** 718.289.5512
**Website:** http://www.bcc.cuny.edu/Biology/

**Professor and Chairperson:** Dr. Martin Fein
**Professors:** M. Gannon, A. Gilman, C. Maliti, C. Mazzatenta, C. Robinson, L. Somenanain
**Associate Professors:** A. Abdullahai, M. Agovic, S. Akkaraju, S. Atamturktur, L. Broughton, S. Khan, K. Lee, N. McDaniel, R. Tian
**Assistant Professors:** Y. Edwards, A. Wolf
**Lecturers:** R. Allen, R. Araya, C. Liachovitzky, L. Rice
**Chief CLT:** L. Rosario
**CLTs:** J. Batiz, O. Littlehawk, A. Robert

**Approximately 20 adjuncts per semester**

**DEGREE AND CERTIFICATE PROGRAMS**

- Animal Care and Management, Certificate
- Biotechnology, A.S.
- Liberal Arts, Biology Option, A.S.
- Medical Laboratory Technician, A.A.S.
- Ornamental Horticulture, A.A.S.

**COURSES**

- Animal Care and Management (ACM)
- Biology (BIO)
- Botany (BOT)
- Floristry (FLO)
- Gardening (GAR)
- Horticulture (HRT)
- Landscape Design (LND)

**ANIMAL CARE AND MANAGEMENT**

Certificate Program
Biological Sciences Department

The purpose of the Certificate Program in Animal Care and Management is to provide access to a career path in the veterinary care of primarily domesticated animals. To accomplish this, partnerships have been established between Bronx Community College and various veterinary clinics and animal hospitals in New York City to enable students to intern at those sites. In preparation for the internship, students in the Animal Care and Management Program will learn techniques for working in a veterinary clinic, including how to properly use and care for the instruments in a laboratory, particularly sterilization techniques, and how to analyze blood and urine samples. As a veterinary assistant, students support veterinarians in their daily tasks, including the restraining and handling of animals, feeding and exercising them, examining them for signs of illness, disease, or injury, cleaning and disinfecting cages and work areas, and sterilizing laboratory and surgical equipment.

This intensive, hands-on program provides BCC students with the technical skills and experience necessary to be competitive in obtaining veterinary assistant jobs in animal hospitals, animal control facilities, veterinary clinics, pet stores and animal rescue facilities. This curriculum also provides a foundation for those who would like to continue their education for an A.S. or B.S. as a veterinary technician or a D.V.M. as a veterinarian. The Certificate Program also fully articulates with Mercy College’s B.S. in Veterinary Technology. A copy of the articulation agreement may be found on the BCC Transfer Planning website.

**Curriculum Coordinator:** Dr. Chris Robinson
Animal Care and Management Curriculum
30 Credits required for Certificate

Core Requirements
• ENG 10 Fundamentals of Composition and Rhetoric OR ENG 11 Composition and Rhetoric I (3 Credits)
• COMM 11 Fundamentals of Interpersonal Communication (3 Credits)
• MTH 12 Introduction to Mathematical Thought OR MTH 21 Survey of Mathematics I (3 Credits)
• PSY 11 Introduction to Psychology OR SOC 11 Sociology (3 Credits)
• BIO 11 General Biology I (4 Credits)
TOTAL 16

Required Areas of Study
• BIO 15 Zoology (4 Credits)
• DAT 33 Microcomputer Applications (2 Credits)
TOTAL 6

Specialization
• BIO 47 Clinical Techniques for Medical Personnel II (2 Credits)
• ACM 90 Animal Care and Management Internship (6 Credits)
TOTAL 8

The following link details information on gainful employment:
http://www.bcc.cuny.edu/Gainful-Employment-Disclosure/?page2=GedtACM

BIOLOGICAL SCIENCES | 2014-2015 COLLEGE CATALOG

BIOTECHNOLOGY
Associate in Science Degree | Joint Degree Program
Biological Sciences Department

Biotechnology can be broadly defined as the use of living organisms in the design of useful products as well as the exploration of the genetic and biomedical basis of how living organisms function. Some of the fields in which biotechnology plays an important role are:
• Forensic Science;
• Medical research involving genetic diseases, cancer, screening and treatment and embryological development;
• Design of novel drugs aimed at specific biological targets;
• Crop design and genetically modified organisms;
• Production of relevant biologicals such as insulin for treatment of disease; and
• Basic research in areas like, genetics, biochemistry, evolution, etc.

Biotechnological techniques allow genes to be isolated, amplified, expressed in different organisms completely chemically characterized (sequenced). These techniques also allow for insight into, the normal as well as and pathological regulation of the genes. This is a rapidly expanding field and trained individuals are needed.

The Biotechnology Program is a joint degree program with the City College of New York (CCNY) leading to a B.S. degree. The first 60 credits, resulting in the A.S. Degree, are taken at BCC. To graduate from the A.S. Degree, students must satisfy course requirements as well as college-wide requirements. Students who successfully complete the A.S. Degree in Biotechnology with a cumulative GPA of 2.0 and 2.75 in the sciences, will be accepted into the CCNY B.S. program.

Curriculum Coordinator: Dr. Martin Fein

Biotechnology Curriculum
60 Credits required for A.S. Degree

Required Core
A. English Composition (6 Credits)
B. Mathematical and Quantitative Reasoning
• MTH 30 Pre-Calculus Mathematics OR MTH 31 Analytic Geometry and Calculus I (4 Credits)
C. Life and Physical Science
• BIO 11 General Biology I (4 Credits)
TOTAL 16

Flexible Core
A. World Cultures and Global Issues (3 Credits)
B. US Experience and its Diversity (3 Credits)
C. Creative Expression (3 Credits)
D. Individual and Society (3 Credits)
E. Scientific World
• BIO 12 General Biology II (4 Credits)
• Additional course from the Flexible Core A, B, C, D, OR E (3 Credits)
TOTAL 19

Specialization Requirements
• MTH 31 Analytical Geometry and Calculus (0-4 Credits)
• MTH 37 Elements of Calculus and Statistics (4 Credits)
• FREE ELECTIVE (3-4 Credits)
TOTAL 7-8

Biotechnology Specialization Requirements
• BIO 55 Genetics (3 Credits)
• BIO 56 Cell and Molecular Biology with an Introduction to Biotechnology (4 Credits)
• CHM 11 General College Chemistry I (4 Credits)
• CHM 12 College Chemistry II (4 Credits)
• PHY 11 College Physics I OR CHM 31 Organic Chemistry I (4-5 Credits)
TOTAL 19-20

1 Students who place into MTH 30 will not have free electives.
2 Students that are required to take MTH 30 can only select PHY 11 so as not to exceed the 60 credit limit for the program.
LIBERAL ARTS AND SCIENCES
Associate in Science Degree | Transfer Degree
Biological Sciences Department

Biology Option

A student interested in the Associate in Science (A.S.) degree in Liberal Arts and Sciences has to choose one of four options that includes Biology. The option prepares students for transfer to a complementary four-year degree program. Students in the Biology option transfer to four-year science programs (biochemistry, biology, chemistry, earth and environmental science, etc.), teacher education programs, pharmacy schools, engineering programs (biomedical, chemical, environmental), or physician assistant or physical therapy programs. Enrichment programs are offered to encourage students to continue their education beyond the bachelor degree by attending graduate or other professional schools.

Curriculum Coordinator: Dr. Charles Maliti

Liberal Arts and Sciences Curriculum (Pathways)
60 Credits required for A.S. Degree

Required Core

A. English Composition (6 Credits)
B. Mathematical and Quantitative Reasoning
   • MTH 30 Pre-Calculus Mathematics OR
   • MTH 31 Analytic Geometry and Calculus I (4 Credits)
C. Life and Physical Science
   • CHM 11 General Chemistry I (4 Credits)

Flexible Core

A. World Cultures and Global Issues (3 Credits)
B. US Experience and its Diversity (3 Credits)
C. Creative Expression (3 Credits)
D. Individual and Society (3 Credits)
E. Scientific World
   • CHM 12 General Chemistry II (4 Credits)
   *Restricted Elective Select one course from Area A-E (3 Credits)

SUBTOTAL 33

Specialization Requirements

• MTH 31 Analytic Geometry and Calculus I** (0 - 4 Credits)
• MTH 32 Analytical Geometry and Calculus II (5 Credits)
• FREE ELECTIVES (0 - 5 Credits)

SUBTOTAL 9

Biology Option

• BIO 11 General Biology I (4 Credits)
• BIO 12 General Biology II (4 Credits)
• CHM 31 Organic Chemistry I (5 Credits)
• CHM 32 Organic Chemistry II (5 Credits)

SUBTOTAL 18

1 This program has obtained a waiver to require STEM variant courses in Required Core Area B and Area C and Flexible Core Area E. If students transferring into this program complete different courses in these areas, they will be certified as having completed the Common Core requirements, but it may not be possible for them to finish their degree within the regular number (60) of credits.

* Restricted Elective: must select one course from Flexible Core A-E. No more than two courses in any discipline or interdisciplinary field.

** For students that take MTH 30 to fulfill the Required Core.

*** See your advisor for the appropriate sequence of specialization courses. Students transferring to a college of pharmacy should complete BIO 11 and 12.

The Biology Option fully articulates with Lehman's B.S. in Physical Anthropology and B.A. in Biology. The Biology Option also articulates with SUNY Empire State College. Copies of these agreements may be found on the BCC Transfer Planning website.

LIBERAL ARTS AND SCIENCES
(PRE-PATHWAYS)
Associate in Science Degree | Transfer Degree
Biological Sciences Department

Biology Option

If you began studying at BCC in or after Fall 2013, Pathways applies. Pathways also applies to students who have returned to CUNY after an absence of more than one semester. If you are a continuing student who entered before Fall 2013, you will be able to choose whether you remain with your existing requirements or change to Pathways. You should consult with an academic advisor.

Curriculum Coordinator: Dr. Charles Maliti

Liberal Arts and Sciences Curriculum
60 Credits required for A.S. Degree

- ENG 10 Fundamentals of Composition and Rhetoric OR
  - ENG 11 Composition and Rhetoric I (3 Credits)
- ENG 12 Composition and Rhetoric II (3 Credits)
- CMS 11 Fundamentals of Interpersonal Communication (3 Credits)
- HIS 10 History of the Modern World OR
  - HIS 11 Introduction to the Modern World (3 Credits)
- PEA Physical Education OR
  - HLT 91 Critical Issues in Health (1-2 Credits)

TOTAL 13-14

Required Areas of Study

- CHM 11 General Chemistry I (4 Credits)
- CHM 22 General Chemistry II with Qualitative Analysis (5 Credits)
- MTH 31 Analytic Geometry and Calculus I (4 Credits)
- MTH 32 Analytic Geometry and Calculus II (5 Credits)
- ART 11 Introduction to Art OR MUS 11 Introduction to Music OR
  - Humanities OR Social Sciences* (3 Credits)
- MODERN LANGUAGE† (0-8 Credits)

TOTAL 21-29
Specialization Requirements

**Biology Option**
- BIO 11 General Biology I (4 Credits)
- BIO 12 General Biology II (4 Credits)
- CHM 31 Organic Chemistry I (5 Credits)
- CHM 32 Organic Chemistry II (5 Credits)

**TOTAL 18**

* See your advisor to determine the appropriate course from an approved list of Humanities or Social Science courses.

† Modern Language is a requirement for students planning to transfer to a CUNY four-year college and major in biology, chemistry, earth science or physics. Students planning to transfer should see the language requirements for the four-year degree program at the senior college.

The Biology Option fully articulates with Lehman’s B.S. in Physical Anthropology and B.A. in Biology. The Biology Option also articulates with SUNY Empire State College. Copies of these agreements may be found on the BCC Transfer Planning website.

**MEDICAL LABORATORY TECHNICIAN**

**Associate in Applied Sciences Degree | Career Program**

**Biological Sciences Department**

Curriculum Coordinator: Dr. Latchman Somenarain

**Medical Laboratory Technician Curriculum**

The Medical Laboratory Technician (MLT) curriculum is a career program in which the student earns the A.A.S. degree. In addition to taking general core courses, certain liberal arts and science requirements, and specialized courses in medical laboratory technology, the student has a requirement to train in state-of-the-art hospital laboratories. Upon completion, students will qualify to sit for the NYS Clinical Laboratory Technician license exam (this technician license is required for employment in NYS diagnostic laboratories).

Some students seek employment upon graduation, while others transfer to a four-year college to pursue a baccalaureate degree in Medical Technology (MT). An articulation agreement allows students to transfer credits and continue their studies at York College and earn a B.S. in Medical Technology. A copy of this agreement is available on the Transfer Planning web site. Graduates who transfer and successfully complete a BS degree in Medical Technology will be eligible for the NYS Medical Technologist license exam. The program also articulates with SUNY Empire State College for a baccalaureate degrees in Interdisciplinary Studies as well Science, Mathematics and Technology

**ERRATA:**

**MISSING INFORMATION ADDED, DECEMBER 2014**

All students wishing to enter the Medical Laboratory Technology curriculum must complete the following pre-MLT sequence with a minimum index of 2.0: BIO 11, ENG 10/11, CHM 17, MTH 13.

To be retained in the program, students must earn a minimum grade of “C” (73-76.9) and an overall GPA of 2.3 (on a 4.0 scale) in each Medical Technology course (BIO 81, BIO 87, BIO 82, BIO 83, BIO 85, BIO 86, BIO 28, BIO 44). Any grade below a “C” (C minus, D plus, D, D minus or F) requires that the student repeat the course. No Medical Technology course may be taken more than twice.

Students must maintain an overall GPA of 2.0 (on a 4.0 scale) and a GPA of 2.3 in MLT courses (listed above) to enroll in BIO 90 (Clinical Internship) and to graduate from BCC.

The MLT courses are integrated and sequenced in a specific manner to enable students to attain program competencies. All required courses must be passed each semester in order to advance to the following semester.

Any two failures (grade below a “C”) in any of the required MLT courses will result in dismissal from the Medical Laboratory Technology program. Because of the critical nature of the profession, deviations from professional conduct may adversely affect the patient’s well-being. Therefore, the MLT Program Director, BCC faculty and Clinical Coordinators reserve the right to immediately remove the student from didactic, laboratory and clinical course work and/or dismiss that student from the program if it is determined that the student has acted in an unprofessional manner or if the student is unable to provide safe laboratory practices.

The minimum acceptable grade in the MLT courses (BIO 28, BIO 44, BIO 81, BIO 82, BIO 83, BIO 85, BIO 86 & BIO 87) each semester shall be the grade of C (73-76.9). Grades of C - or lower must be repeated if the student wishes to receive a degree in MLT. Grades of C -or lower may be repeated subject to the following conditions:

- Students may attempt a given MLT course only twice. An attempt is defined as having been registered in the course and received any grade, academic or administrative.
- The course must be completed with a C or higher grade before the next higher level course may be taken.
- Permission to repeat is subject to the availability of space and at the review of program faculty according to the guidelines indicated below.
- Both grades received in the same course will be used to calculate the student’s cumulative Grade Point Average (GPA).
- The credit for a repeated course may be applied only once toward graduation.
- Any two failures (grade below a C) in any of the required MLT courses will result in dismissal from the MLT program.
- Students must maintain an overall GPA of 2.0 and a
GPA of 2.3 in MLT courses to enroll in BIO 90 (Clinical Internship) and to graduate from BCC

Note that repetition of courses passed may negatively impact on financial aid eligibility

Subject to space availability, the guidelines for reinstatement into the MLT program or repeating a given MLT course are:
• Students with a W in an MLT course during the previous semester that were doing well in the MLT program but withdrew because of illness or personal reasons.
• Students returning after an absence of one or more semesters from the MLT program, who were doing well in the program prior to their absence.
• Students who did not achieve at least a C in their first attempt in any one MLT course will be placed on a waiting list.

Medical Laboratory Technician Curriculum (Pathways)
66 Credits required for A.A.S. Degree

Required Core
A. English Composition
   • ENG 10 Fundamentals of Composition and Rhetoric OR ENG 11 Composition and Rhetoric I (3 Credits)
B. Mathematical and Quantitative Reasoning
   • MTH 23 Probability and Statistics (3 Credits)
C. Life and Physical Sciences
   • BIO 11 General Biology I (4 Credits)

Flexible Core
A. World Cultures and Global Issues
   • HIS 10 History of the Modern World OR HIS 11 Introduction to the Modern World (3 Credits)
D. Individual and Society
   • COMM 11 Fundamentals of Interpersonal Communication (3 Credits)
E. Scientific World
   • BIO 12 General Biology II (4 Credits)
   Additional Flexible Core Requirement - Area E
   • CHM 17 Fundamentals of General Chemistry I (4 Credits)

SUBTOTAL 24

Required Areas of Study
• ART 10 Art Survey OR MUS 10 Music Survey (1 Credit)
• BIO 22 Medical Terminology (2 Credits)
• CHM 18 Fundamentals of General Chemistry II (4 Credits)
• MTH 13 Trigonometry and College Algebra (3 Credits)
• PSY 11 Introduction to Psychology OR SOC 11 Sociology (3 Credits)

SUBTOTAL 13

Specialization Requirements
• BIO 28 Microbiology and Infection Control (4 Credits)
• BIO 44 Diagnostic Microbiology (4 Credits)

MEDICAL LABORATORY TECHNOLOGY
(PRE-PATHWAYS)
Associate in Applied Sciences Degree | Career Program
Biological Sciences Department
If you began studying at BCC in or after Fall 2013, Pathways applies. Pathways also applies to students who have returned to CUNY after an absence of more than one semester. If you are a continuing student who entered before Fall 2013, you will be able to choose whether you remain with your existing requirements or change to Pathways. You should consult with an academic advisor.

Curriculum Coordinator: Dr. Latchman Somenarain

Medical Laboratory Technology Curriculum
66 Credits required for A.A.S. Degree

Core Requirements
• ENG 10 Fundamentals of Composition and Rhetoric OR ENG 11 Composition and Rhetoric I (3 Credits)
• CMS 11 Fundamentals of Interpersonal Communication (3 Credits)
• HIS 10 History of the Modern World OR HIS 11 Introduction to the Modern World (3 Credits)
• MTH 13 Trigonometry and College Algebra (3 Credits)
• BIO 11 General Biology I (4 Credits)

TOTAL 16

Required Areas of Study
• ART 10 Art Survey OR MUS 10 Music Survey (1 Credit)
• BIO 12 General Biology II (4 Credits)
• BIO 22 Medical Terminology (2 Credits)
• CHM 17 and 18 Fundamentals of General Chemistry I and II (8 Credits)
• MTH 23 Probability and Statistics (3 Credits)
• PSY 11 Introduction to Psychology OR SOC 11 Sociology (3 Credits)

TOTAL 21

Specialization Requirements
• BIO 28 Microbiology and Infection Control (4 Credits)
• BIO 44 Diagnostic Microbiology (4 Credits)
• BIO 81 Introduction to Medical Laboratory Technology (2 Credits)
• BIO 82 Clinical Hematology and Coagulation (4 Credits)
• BIO 83 Clinical Chemistry (4 Credits)
• BIO 85 Immunology / Serology (2 Credits)
• BIO 86 Immunohematology (3 Credits)
• BIO 87 Urinalysis and Body Fluids (2 Credits)
• BIO 90 Clinical Internship (4 Credits)

TOTAL 29

NOTE: At least two courses must be taken from a list designated as “Writing Intensive” as published each semester in the Registration Guide and Schedule of Classes.

ORNAMENTAL HORTICULTURE
Associate in Applied Sciences Degree | Career Program
Biological Sciences Department

Horticulturists are skilled in the cultivation of plants and the care of gardens. They may work in public parks and gardens; they may design, install and maintain the interior landscapes in public buildings and corporate headquarters; or they may work as florists, arranging plants and flowers for special occasions.

Recognizing the need for trained horticulturists, Bronx Community College and The New York Botanical Garden (NYBG) have established a joint program in Ornamental Horticulture. Students study liberal arts and sciences at the BCC campus for the first year. They spend the second year at the NYBG for both academic courses and field experience in aspects of ornamental horticulture.

The program offers two areas of specialization: general horticulture and commercial floristry. Graduates earn an A.A.S. degree in Ornamental Horticulture from BCC.

NYBG courses are open only to Ornamental Horticulture (A.A.S.) students and must be approved by both the Program Director at BCC and the Director of Education at NYBG. Additionally, substitution of Ornamental Horticulture courses must have the written approval of the BCC Program Director.

The Ornamental Horticulture program fully articulates with SUNY Empire State College. A copy of the articulation agreement is available on line at the BCC Transfer Planning website.

Program Director: Ms. Rebecca Araya

Ornamental Horticulture Curriculum (Pathways)
60 Credits required for A.A.S. Degree

Required Core

A. English Composition
• ENG 10 Fundamentals of Composition and Rhetoric OR ENG 11 Composition and Rhetoric I (3 Credits)

B. Life and Physical Sciences
• BIO 11 General Biology I (4 Credits)

Flexible Core

A. World Cultures and Global Issues

B. Additional Flexible Core Requirement – Area E

E. Individual and Society
• COMM 11 Fundamentals of Interpersonal Communication (3 Credits)

E. Scientific World
• BIO 12 General Biology II (4 Credits)
• BOT 11 Basic Botany (1 Credit)
• BOT 12 Plant Form and Function (1 Credit)
• BOT 13 Plant Physiology (1 Credit)
• BOT 41 Entomology (1 Credit)
• GAR 11 Horticultural Techniques I (1 Credit)
• GAR 12 Horticultural Techniques II (1 Credit)
• GAR 13 Pruning (1 Credit)
• GAR 21 Soil Science I (1 Credit)
• GAR 23 Soil Science II (1 Credit)
• GAR 31 Preparation for Pesticide Applicator Certification (2 Credits)
• GAR 32 Diseases of Ornamental Plants (1 Credit)

TOTAL 11

NYBG Core Requirements 1

• BOT 11 Basic Botany (1 Credit)
• BOT 12 Plant Form and Function (1 Credit)
• BOT 13 Plant Physiology (1 Credit)
• BOT 41 Entomology (1 Credit)
• GAR 11 Horticultural Techniques I (1 Credit)
• GAR 12 Horticultural Techniques II (1 Credit)
• GAR 13 Pruning (1 Credit)
• GAR 21 Soil Science I (1 Credit)
• GAR 23 Soil Science II (1 Credit)
• GAR 31 Preparation for Pesticide Applicator Certification (2 Credits)
• GAR 32 Diseases of Ornamental Plants (1 Credit)

TOTAL 12

Specialization 1 (Select One)

General Horticulture Specialization

• BOT 61 Woody Plant Identification: Fall Trees and Shrubs (1 Credit)
• BOT 64 Woody Plant Identification: Spring Trees and Shrubs (1 Credit)
• GAR 41 Plant Propagation I (1 Credit)
• GAR 51 Turf and Grounds Maintenance I (1 Credit)
• GAR 81 Plants for Landscaping I (1 Credit)
• HRT 13 Turf and Grounds Management I (2 Credits)
• HRT 14 Arboriculture I (2 Credits)
• HRT 15 Perennials and Flower Borders I (2 Credits)
• HRT 16 Greenhouse Operations I (2 Credits)
• HRT 17 2 Horticulture Field Exp. Electives (1 Credit)
• LND 11 Landscape Design Theory I (1 Credit)
• LND 12 Graphics (1 Credit)
60 Credits required for A.A.S. Degree

Ornamental Horticulture Curriculum

Program Director: Ms. Rebecca Araya

An academic advisor. Requirements or change to Pathways. You should consult with a continuing student who entered before Fall 2013, you will be able to choose whether you remain with your existing specialization or change to Pathways. Pathways also applies to students who have returned as a continuing student. If you began studying at BCC in or after Fall 2013, Pathways applies. Pathways may not be offered every semester. These core and specialization requirements are given at the New York Botanical Garden. The 9 credits of Field Experience I-III in the Commercial Floristry specialization represent 540 hours of practical field work.

Commercial Floristry Specialization

- FLO 11 Basic Centerpieces (1 Credit)
- FLO 12 Holiday Arrangements (1 Credit)
- FLO 13 Funeral Arrangements (1 Credit)
- FLO 15 Wedding Flowers (1 Credit)
- FLO 23 House Plants and Their Care (0.5 Credit)
- FLO 24 Essential Floral Techniques and Arrangements (0.5 Credit)
- FLO 25 Basic Floral Business Techniques (0.5 Credit)
- FLO 26 Intermediate Floral Arrangements (0.5 Credit)
- FLO 61 Commercial Floristry Field Exp. I (3 Credits)
- FLO 62 Commercial Floristry Field Exp. II (3 Credits)
- FLO 63 Commercial Floristry Field Exp. III (3 Credits)
- GAR 44 Commercial Greenhouse Management (1 Credit)

NOTE: At least two courses must be taken from a list designated as “Writing Intensive” as published each semester in the Registration Guide and Schedule of Classes.

1 These core and specialization requirements are given at the New York Botanical Garden.
2 To be chosen from Horticulture with approval of department.
3 This specialization may not be offered every semester.

NOTE: Course numbers are different in the BCC catalog and the NYBG Catalog. The 9 credits of Field Experience I-III in the Commercial Floristry specialization represent 540 hours of practical field work.

ORNAMENTAL HORTICULTURE (PRE-PATHWAYS)

Associate in Applied Sciences Degree | Career Program
Biological Sciences Department

If you began studying at BCC in or after Fall 2013, Pathways applies. Pathways also applies to students who have returned to CUNY after an absence of more than one semester. If you are a continuing student who entered before Fall 2013, you will be able to choose whether you remain with your existing requirements or change to Pathways. You should consult with an academic advisor.

Program Director: Ms. Rebecca Araya

Ornamental Horticulture Curriculum

60 Credits required for A.A.S. Degree

Core Requirements

- ENG 10 Fundamentals of Composition and Rhetoric OR ENG 11 Composition and Rhetoric I (3 Credits)
- CMS 11 Fundamentals of Interpersonal Communication (3 Credits)
- HIS 10 History of the Modern World OR HIS 11 Introduction to the Modern World (3 Credits)

- PEA Physical Education (one activity course) (1 Credit)
- BIO 11 General Biology I (4 Credits)

TOTAL 14

Required Areas of Study

- ART 10 Art Survey OR MUS 10 Music Survey (1 Credit)
- BIO 12 General Biology II (4 Credits)
- CHM 17 Fundamentals of General Chemistry I (4 Credits)
- BUS 11 Business Mathematics (3 Credits)
- BUS 51 Business Organization and Management (3 Credits)
- PSY 11 Introduction to Psychology OR SOC 11 Sociology (3 Credits)

TOTAL 18

NYBG Core Requirements*

- BOT 11 Basic Botany (1 Credit)
- BOT 12 Plant Form and Function (1 Credit)
- BOT 13 Plant Physiology (1 Credit)
- BOT 41 Entomology (1 Credit)
- GAR 11 Horticultural Techniques I (1 Credit)
- GAR 12 Horticultural Techniques II (1 Credit)
- GAR 13 Pruning (1 Credit)
- GAR 21 Soil Science I (1 Credit)
- GAR 24 Soil Science II (1 Credit)
- GAR 31 Preparation for Pesticide Applicator Certification (2 Credits)
- GAR 32 Diseases of Ornamental Plants (1 Credit)

TOTAL 12

Specialization Requirements (Select One)

General Horticulture Specialization

- BOT 61 Woody Plant Identification: Fall Trees and Shrub (1 Credit)
- BOT 64 Woody Plant Identification: Spring Trees and Shrub (1 Credit)
- GAR 41 Plant Propagation I (1 Credit)
- GAR 51 Turf and Grounds Maintenance I (1 Credit)
- GAR 81 Plants for Landscaping I (1 Credit)
- HRT 13* Turf and Grounds Management I (2 Credits)
- HRT 14* Arboriculture I (2 Credits)
- HRT 15* Perennials and Flower Borders I (2 Credits)
- HRT 16* Greenhouse Operations I (2 Credits)
- HRT 17** Horticulture Field Exp. Electives I (1 Credit)
- LND 11 Landscape Design Theory (1 Credit)
- LND 12 Graphics I (1 Credit)

TOTAL 16

Commercial Floristry Specialization

- FLO 11 Basic Centerpieces (1 Credit)
- FLO 12 Holiday Arrangements (1 Credit)
- FLO 61 Commercial Floristry Field Exp. I (3 Credits)
- FLO 62 Commercial Floristry Field Exp. II (3 Credits)
- FLO 63 Commercial Floristry Field Exp. III (3 Credits)
- GAR 44 Commercial Greenhouse Management (1 Credit)

TOTAL 16
• FLO 13 Funeral Arrangements (1 Credit)
• FLO 15 Wedding Flowers (1 Credit)
• FLO 23 House Plants and Their Care (0.5 Credit)
• FLO 24 Essential Floral Techniques and Arrangements (0.5 Credit)
• FLO 25 Basic Floral Business Techniques (0.5 Credit)
• FLO 26 Intermediate Floral Arrangements (0.5 Credit)
• FLO 61 Commercial Floristry Field Exp. I (3 Credits)
• FLO 62 Commercial Floristry Field Exp. II (3 Credits)
• FLO 63 Commercial Floristry Field Exp. III (3 Credits)
• GAR 44 Commercial Greenhouse Management (1 Credit)

TOTAL 16

NOTE: At least two courses must be taken from a list designated as “Writing Intensive” as published each semester in the Registration Guide and Schedule of Classes.

* These core and specialization requirements are given at the New York Botanical Garden.

**To be chosen from Horticulture with approval of department. Note: Course numbers are different in the BCC catalog and the NYBG Catalog.

The 9 credits of Field Experience I-III in the Commercial Floristry specialization represent 540 hours of practical field work.

COURSES

Animal Care and Management

ACM 90 6 cr
Animal Care and Management Internship
This will be a 500-hour hands-on experience for students who successfully complete the prerequisite courses. The internship will provide valuable opportunities through which students will be able to put into action the practices that they learned in the classroom. Students will focus on procedures and specific applications relating to basic veterinary care, feeding and nutrition, animal handling, animal housing, and sanitation procedures.

Prerequisites: BIO 15 with a grade of C+ or better and BIO 47. Students will be permitted two attempts in BIO 15 to achieve the C+ grade. A “W” will not count as an attempt. If a student takes the course two times, the two grades will be averaged into the student’s GPA unless the first grade is an “F” and can be removed under the repeat-failure policy.

Biology

BIO 11 2 lect 4 lab 4 cr
General Biology I
Chemical basis of life; cellular structure, function and reproduction; photosynthesis and cell respiration; human anatomy and physiology; plant structure and function.

Prerequisites: MTH 05 and RDL 02 and ENG 02 if required.

BIO 12 2 lect 4 lab 4 cr
General Biology II
Continuation of BIO 11 with emphasis on plant and animal development; Mendelian and molecular genetics; evolution; animal and plant diversity; and ecology.

Prerequisite: BIO 11.

BIO 15 2 lect 4 lab 4 cr
Zooology
The diversity of the animal kingdom with emphasis on ecology, behavior, and phylogeny with medical and economic implications for humanity

Prerequisite: BIO 11.

BIO 16 3 lab 1 cr
Laboratory Concepts in Biology
This course covers basic biology laboratory skills and concepts. Skills covered will include measurement, record keeping, graphical analysis, microscope use, and dissecting techniques. Topics covered will include the scientific method; the biochemical basis of life; cellular structure, function and reproduction; and biodiversity. This course is intended to be taken with one of the 3-credit biology classes to fulfill the 1-credit laboratory requirement for the Liberal Arts A.A. major, although it may be taken in a subsequent semester.

Prerequisites: ENG 02 and RDL 02 and MTH 05, if required Corequisites: BIO 19 or BIO 150 or BIO 27/PSY 27 or HLT 20/BIO 20 or with departmental approval

BIO 18 4 lect 4 cr
Human Biology
A physiological study of the skeletal, muscular, integumentary, digestive, nervous, circulatory, excretory, respiratory, endocrine and reproductive systems of the human body; special senses.

Prerequisites: ENG 02 and RDL 02, if required

BIO 19 3 lect 3 cr
Food, Sex and Death
This course is designed for non-biology majors and fulfills the Life and Physical Sciences Pathways common core requirement. Topics covered will include the chemical basis of life; cellular structure, function and reproduction; photosynthesis and cellular respiration; nutrition and human health; reproduction; evolution; biodiversity; and ecology.

Prerequisites: MTH 05 and ENG 02 and RDL 02, if required

BIO 20 / HLT 20 3 lect 3 cr
Aspects of Human Sexuality
This course teaches students about physical, sociological, and psychological aspects of human sexuality. Scientific research on gender, sexual arousal, sexual orientation, sexually
transmitted infections, and contraception will be explored. Students will examine cross cultural factors and ethical issues surrounding human sexuality.

**Prerequisites:** ENG 02 and RDL 02

**Flexible Core - Scientific World**

**BIO 21** 3 lect 3 lab 4 cr

**The Human Body**
Anatomy and physiology of the integumentary, digestive, nervous, circulatory, excretory, respiratory, endocrine and reproductive systems of the human body; special senses.

**Prerequisites:** RDL 02 and ENG 02 if required.

**BIO 22** 2 lect 2 cr

**Medical Terminology**
Acquaintance with medical concepts, medical terms and scientific principles; various ailments and diseases; tests used in their analyses; treatments and therapeutic techniques for alleviation and cure.

**Prerequisites:** RDL 02 and ENG 02 if required.

**BIO 23** 3 lect 3 lab 4 cr

**Human Anatomy and Physiology I**
An integrated lab-lecture method for the study of the structure and function of the human organism. Includes basic chemistry, cellular anatomy and physiology, tissues, integumentary, skeletal, muscular, nervous and endocrine systems.

**Prerequisites:** MTH 05 and RDL 02 and ENG 02 if required.

**Flexible Core - Life and Physical Sciences**

**BIO 24** 3 lect 3 lab 4 cr

**Human Anatomy and Physiology II**
An integrated lab-lecture method for the study of the structure and function of the human organism. Includes cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.

**Prerequisite:** BIO 23

**INTRODUCTION TO BEHAVIORAL NEUROSCIENCE**
This course is a survey of the field of Neuroscience including an introduction to the structures and functions of the nervous systems; understanding sensation, perception and movement; sleep and dreaming; learning and memory; and neurological disorders.

**Prerequisite:** PSY 11 or BIO 11

**Flexible Core - Scientific World**

**BIO 27/PSY 27** 3 lect 3 cr

**Introduction to Medical Laboratory Technology**
This course is designed to preview the MLT curriculum coursework and for students to obtain a variety of laboratory skills needed in other MLT courses. It introduces the students to the professional and technical responsibilities of the Medical Laboratory Technician (MLT). Professional topics include...
hospital and laboratory organization, legal and ethical issues, quality assessment and lab math. Preliminary topics in the major technical areas of laboratory science (Microbiology, Immunology/ Serology, Hematology, Immunohematology, and Clinical Chemistry) are explored. The course also includes instruction and practice in phlebotomy techniques.

**Prerequisites:** BIO 11, MTH 13, CHM 17 and departmental approval.

**Corequisites:** BIO 12, CHM 18.

**BIO 82  2 lect 4 lab 4 cr**

**Clinical Hematology and Coagulation**
Principles and practice of clinical laboratory techniques in hematology and coagulation: complete blood count, normal and abnormal smears, sedimentation rate and coagulation studies. Emphasis on both manual and automated techniques, principles and diagnostic implications.

**Prerequisites:** BIO 12, BIO 81 and CHM 18 and departmental approval.

**BIO 83  2 lect 4 lab 4 cr**

**Clinical Chemistry**

**Prerequisites:** BIO 81, CHM 18 and MTH 13 and departmental approval.

**BIO 85  1 lect 2 lab 2 cr**

**Immunology/Serology**
This course is an introduction to the theory and application of basic immunology, including the immune response, principles of antigen-antibody reactions, and the principles of serological procedures. The class includes other areas of study concerning the fundamentals of immunity and the immune response such as antibody structure and interactions, the complement system, hypersensitivity reactions and disorders of the immune response. A student laboratory is used for experiences in fundamental immunology/serology laboratory techniques.

**Prerequisites:** BIO 12, BIO 81, CHM 18 and departmental approval.

**BIO 86  1 lect 3 lab 3 cr**

**Immunohematology**
Immunohematology is the study of blood antigens and antibodies. The course covers principles, procedures and the clinical significance of tests results. Topics in blood banking also include blood group systems, pre-transfusion testing, and adverse effects of transfusions, donor selection, blood components and hemolytic disease of the newborn. The course also explores methods for blood processing, handling, and storage of blood components, and examines cross matching and antibody identification procedures. The class utilizes a student laboratory for experiences in fundamental immunohematology laboratory techniques, including quality control and safety.

**Prerequisites:** BIO 12, BIO 81, CHM 18 and departmental approval.

**BIO 87  1 lec 2 lab 2 cr**

**Urinalysis and Body Fluids**
This course introduces urinalysis and body fluid analysis, including the anatomy and physiology of the kidney, and physical, chemical and microscopic examination of urine, cerebrospinal fluid and other body fluids. The course utilizes a student laboratory for experiences in basic urinalysis and body fluids analysis.

**Prerequisites:** BIO 11, MTH 13, CHM 17 and departmental approval.

**Corequisites:** BIO 12, CHM 18.

**BIO 90  4 cr**

**Clinical Internship**
This 500 hour course is designed to provide the didactic and clinical experience necessary to acquire knowledge in Clinical Laboratory Science. Students practice clinical skills at local cooperating hospitals or private laboratories under the guidance of bench technologists and supervisors. They are evaluated by the person in charge of the laboratory and the faculty member assigned to the course to meet established clinical objectives. Students rotate through the following clinical areas: Hematology, Coagulation, Urinalysis, Serology / Immunology, Blood Bank, Microbiology, and Clinical Chemistry.

**Prerequisite:** Completion of all Medical Laboratory Technology courses and approval by the MLT Program Director.

**BIO 150  3 lect 3 cr**

**Biology, Bioethics and Law**
Basic concepts on structure and function of the human body in conjunction with legal definitions and decisions, and ethical interpretations concerning biological/medical technology. Course includes material on contraception and sterilization, abortion, genetics, DNA manipulations, artificial insemination, in vitro fertilization, surrogate motherhood, death and dying, human experimentation, organ transplantation.

**Prerequisites:** RDL 02 and ENG 02 if required.

**Flexible Core - Scientific World**

**Botany**
Enrollment in Botany is limited to students in the Ornamental Horticulture curriculum or with special permission of the department. Offered at the New York Botanical Garden. Students should contact the program director.
**Floristry**
Enrollment in Floristry is limited to students in the Ornamental Horticulture curriculum with special permission of the department. Offered at the New York Botanical Garden. See curriculum advisor: Ms. Rebeca Araya.

**Gardening**
Enrollment in Gardening is limited to students in the Ornamental Horticulture curriculum or with special permission of the department. Offered at the New York Botanical Garden. Students should contact the program director.

**Horticulture**
Enrollment in Horticulture is limited to students in the Ornamental Horticulture curriculum or with special permission of the department. Offered at the New York Botanical Garden. Students should contact the program director.

**Landscape Design**
Enrollment in Landscape Design is limited to students in the Ornamental Horticulture curriculum or with special permission of the department. Offered at the New York Botanical Garden. Students should contact the program director.