



*Programme
Handbook
2023/24*

The Open University

BIOLOGY

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1. WELCOME AND INTRODUCTION

WELCOME!

Dear Student,

This Handbook is intended to provide a concise reference and guide for all ACT students. Included herein are brief statements of College policies applicable to and of interest to all College constituencies.

This guide is intended to address some of the common academic and student life questions and concerns that are likely to arise during your years at ACT. Its purpose is not merely to lay out the policies of academic life, but also to point out ways of thinking about your education. Planning carefully and looking ahead will enable you to maximize your opportunities at the College. Knowing when and where to find guidance and counsel is important in ensuring that your educational choices are well-considered and make sense in the context of your larger academic goals.

We do assume, however, that you will seek out the help you need. This guide has been designed to help you do just that. Please read it, keep it, and use it as a reference throughout your academic career.

An additional channel of communication is the ACT Viewbook/Catalogue of Study (annual publication consisting of the analytical programs of study, course offerings and course descriptions) and related resources that can be found on the ACT website.

With best regards,

Dr. Stamos Karamouzis
ACT Provost

A BRIEF INTRODUCTION TO ACT

The American College of Thessaloniki (ACT, founded in 1981 as a two-year, Associate-degree granting institution) is the tertiary-level division of Anatolia, a private, non-profit educational institution founded in 1886. It is incorporated in, and chartered by the Commonwealth of Massachusetts, and it is fully accredited by the New England Commission of Higher Education (NECHE). In inspiration, mission, governance, and programs, ACT resembles the traditional New England colleges upon which it has been modeled.

Founded by American Protestant missionaries, Anatolia was originally located in Asia Minor and evolved from a seminary in Constantinople, which began in 1840. The school was closed during the Greek-Turkish War of 1919-1922 and ceased to have a viable mission in Asia Minor when Turkey's minority communities were uprooted under the peace treaties concluding the war. In 1924, Anatolia relocated to Thessaloniki, where the greatest part of the refugee influx from Asia Minor had settled. In the mid-1930s, the school moved to its present location on a forty-five acre campus a few miles from the center of the city.

ACT moved to a four-year college in 1989 and currently offers Bachelor's degrees in the areas of Business, Technology, English, Psychology and Politics & International Relations. Since 2002, ACT introduced graduate programs, the first one in Business (MBA) with concentrations in key disciplines such as Marketing, Management, Entrepreneurship, and Banking & Finance. In 2016, a graduate program in Hospitality & Tourism Management was introduced, followed by an Industrial/Organizational Psychology one in 2020. All graduate programs are designed to accommodate graduates from all disciplines and can be completed on full-time or part-time basis within one or two years. In September 2013, ACT entered a new validation agreement for all its undergraduate programs with one of the top British Universities, the British Open University.

In recent years, ACT has received grants from a number of foundations, notably among which are the Anagnos Foundation, the Andrew Mellon Foundation, the Cleveland H. Dodge Foundation, the N. Demos Foundation, the Minneapolis Foundation, the Pappas Foundation, (US), the J. F. Costopoulos Foundation, and the Stavros S. Niarchos Foundation (Greece). These grants, contributions by many individual donors in Greece and in the US, and most particularly the extraordinary contributions of Mr. George Bissell, Chair of the Board of Trustees, have made possible the creation of a world-class campus and of the Bissell Library, a state of the art facility unique in SE Europe.

2. [LIST OF PROGRAMME DIRECTOR AND ACADEMIC STAFF](http://www.act.edu/academics/faculty)
(www.act.edu/academics/faculty)

CHAIR, Programme Leader

Mr. Emmanuel Maou

Associate Professor (Computer Science, Mathematics)(Reg)

Chair, Division of Science and Technology

BA, Mathematics, Iowa Wesleyan College, USA;

MS, Applied Mathematics, University of Iowa, U.S.A; Oracle Certified Instructor, Oracle Academy, Scotland, UK

ACADEMIC STAFF (Alphabetical order)

Dr. Anestis Andreas

Associate Professor (Biology)

B.A. in Biology, Aristotle University of Thessaloniki, Thessaloniki, Greece

MSc in Applied Genetics and Biotechnology, Aristotle University of Thessaloniki, Thessaloniki, Greece

PhD in biology, Aristotle University of Thessaloniki, Thessaloniki, Greece

Dr. Andonakou Elena

Adjunct Professor (Chemistry)

B.A. in Chemistry, Aristotle University of Thessaloniki, Thessaloniki, Greece

MSc in Environmental Biotechnology, University of the West of England

PhD in Polymer chemistry, Aristotle University of Thessaloniki, Thessaloniki, Greece

Dr. Astaras Alexandros

Assistant Professor (Computer Science) (Reg)

B.A. in Physics, Oberlin College, Oberlin, USA;

PhD in Electronics Engineering, The University of Edinburgh, Edinburgh, Scotland, UK

Dr. Athanasiou Nikos

Assistant Professor (Mathematics)

B.A in Mathematics, University of Cambridge

MSc in Mathematics, University of Cambridge

PhD in Mathematics, University of Oxford

Dr. Kalamaki Mary

Associate Professor (Chemistry)

Doctor of Veterinary Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece

MSc in Preventive Veterinary Medicine, University of California, CA, USA

MSc in Food Science, University of California, CA, USA

PhD in Agricultural and Environmental Chemistry, University of California, CA, USA

Dr. Kanakoglou Kostas

Adjunct Professor (Physics)

BSc in Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece

MSc in Pure Mathematics, Aristotle University of Thessaloniki, Thessaloniki, Greece

PhD in Mathematical Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece

Dr. Karagiannis Kostas

Assistant Professor (Mathematics)

BSc in Mathematics, NKUA, Athens, Greece

MSc in Mathematics, University of Warwick, Coventry, UK

PhD in Mathematics, Aristotle University of Thessaloniki, Thessaloniki, Greece

Dr. Mengoudi Kyriaki

Assistant Professor (Data Science)

Assistant Professor (Computer Science)(Reg)

BSc, Mathematics, Aristotle University of Thessaloniki;

MSc., Applied Statistics and Data Mining, University of St Andrews, Scotland, UK;

Ph.D., Computer Science, University College

London, UK

Dr. Sotiriou elena

Adjunct Professor (Biology)

BSc in Biology, Aristotle University of Thessaloniki, Thessaloniki, Greece

MSc in Biology of human reproduction, University of Thessaly, Larissa, Greece

Ms. Tsoni Sofia

Adjunct Instructor (Chemistry)

BA in Chemistry, Aristotle University of Thessaloniki, Thessaloniki, Greece

MRes in Advanced Molecular Synthesis, Imperial College London, London, UK

Dr. Tsoulfa Georgia

Adjunct Professor (Biology)

BSc in Microbiology, University of London, London, UK

PhD in Immunology, University of London, London, UK

3. LIST OF SUPPORT STAFF

ADMINISTRATIVE OFFICES

Office/Division	Name	Location	Phone No. (2310+No.)	e-mail (name@act.edu)
President	Dr. Panayiotis Vlachos	Stephens Hall, 1 st Floor	398204	pvla
Executive Assistant to the President	Ms. Elena Charalambides	Stephens Hall, 1 st Floor	398204	elenacha
Vice-President for Operations & Planning	Mr. Ioannis Tsorbatzoglou	Stephens Hall, 1 st Floor	398326	yatso
Vice President for Institutional Advancement	Mr. Peter Chresanthakes	Stephens Hall, 1 st Floor	398265	peter
Vice President for Finances & HR/CFO	Mr. Pavlos Floros	Stephens Hall, 1 st Floor	398214	pfloros
Assistant Accountant	Ms. Eva Montiadou	Stephens Hall, Ground Floor	398219	emont
Alumni and Public Relations Officer	Ms. Marina Charitopoulou	Stephens Hall, 2 nd Floor	398220	mcharito
Director of Marketing	Mr. Theodore Papanestoros	Stephens Hall, 1 st Floor	398385	theodore
Director of International Programs	Ms. Heather Funk	Constantinidis Hall, 1st Floor	398215	heather
Study Abroad Coordinator	Ms. Miranda Margariti	Constantinidis Hall, 1st Floor	398205	mmargari
Director of Admissions	Ms. Roula Lebetli	Bissell Library, 1 st Floor	398239	admissions
Head Registrar	Ms. Antigoni Vlachopoulou	Constantinidis Hall, 1st Floor	398207	actreg

Administrative Assistant to the Registrar	Ms. Theodora Zafiriou	Constantinidis Hall, 1st Floor	398224	actreg
Business Liaison & Career Services Officer	Mr. Dimitris Diamantis	Bissell Library, Ground Floor	398337	ddiamantis
Assistant Administrative Officer	Mr. Vassilis Loukidis	Constantinidis Hall, 1st Floor	398216	vloukid

4. NAME, POSITION AND INSTITUTION OF THE EXTERNAL EXAMINER(S) INVOLVED IN THE PROGRAMME

Dr. Lindsay McDermott, University of Bedfordshire

5. INTRODUCTION TO THE PROGRAMME

In the face of global challenges such as climate change and environmental management, population growth and food security, and biotechnology and human health, the Biological Sciences have never been more important.

Recent discoveries in the field have advanced at breath-taking speeds with beneficial outcomes for mankind.

ACT's Biological Sciences degree program is building on the 15-year past experience in developing and delivering STEM curriculum in collaboration with leading American Universities, such as Northeastern University and Washington University. The degree will provide graduates with a solid foundation of scientific knowledge at the molecular, biochemical, cellular, organismal, and ecosystemic level. Furthermore, it will equip graduates with practical laboratory experience and research skills which are essential and valuable in a wide range of advanced studies or employment options.

A key strength of this degree is the exposure to the breadth of biological sciences, reflecting the interdisciplinary nature of modern biology, and the implementation of the scientific methodology in designing and executing experimental investigations, analyzing data, interpreting results, communicating findings via writing scientific papers while critically evaluating relevant literature.

In addition this program aims to prepare student for further studies and/or employment in the areas of:

- Analysis and diagnostics
- Biological and Health education
- Biomedical research, investigation, and reporting
- Cosmetic industry
- Dentistry
- Health and healthcare advising, policy and related professions
- Health bioinformatics/ health informatics
- Health prevention and promotion specialist
- Postgraduate research training
- Public & private research
- Science communication
- Veterinary Medicine

Programme Learning Outcomes (PLOs)

- A. Knowledge and Understanding
- B. Cognitive Skills
- C. Practical and Professional Skills
- D. Key/Transferable Skills

In order to receive the BA degree, the student must have fulfilled all the GER and major requirements and have completed at least 124 US credit hours with an overall G.P.A of 2.0 or better. All Biological Sciences students take a two-semester sequence Senior Thesis I and II course. According to NECHE Standards, students must complete at least one fourth of their undergraduate program, including advanced work in the major or concentration, at the institution awarding the degree. As a consequence, all candidates for an ACT degree must have been in residence at the College during the last two semesters of full time instruction, assuming availability and equivalency of transferable courses.

6. PROGRAMME SPECIFICATION

The Biological Sciences programme offered by the ACT Division of Science and Technology leads to the awarding of two degrees:

- A US BSc degree, accredited by the US NECHE (New England Commission of Higher Education), and
- A UK BSc (Hons) degree, validated by the UK Open University (OU)

Modules in the Programme are designed to broaden students' perspectives on the role of biomolecules, cells, tissues, organs in the structure and function of the living systems, their interactions with and responses to environmental factors, as well as the way they define homeostasis at different levels of biological organization.

A broad range of relevant courses is offered, the majority having a strong laboratory component emphasizing on both descriptive and analytical methodologies, for studying genes to whole organisms, as well as on the accompanied technologies.

ACT Degree Competitive Advantage Areas

An ACT graduate with the BSc (Hons) in Biological Sciences will have obtained a theoretical and practical adequacy in the field of life sciences, having constructed a strong background in the study of biological systems from the simplest molecular to the highest systemic level of organization, having applied advanced laboratory techniques and technologies, to address fundamental research questions, and having practiced in the synthesis of knowledge from data collected from a broad range of different fields including:

- Cellular biology and histology
- Biochemistry and Molecular Biology
- Genetics
- Anatomy and Physiology
- Biodiversity, evolution and systematics
- Microbiology
- Immunology
- Epidemiology and Public Health
- Environmental Hygiene and Toxicology

Special Features

The programme does not concentrate only on theory, which at some point could become outdated, but provides students with excellent critical skills and systematic thinking that will allow them to become lifelong learners and succeed in a wide variety of scientific positions. Students are prepared for a successful career in areas such as:

- Analysis and diagnostics
- Biological and Health education
- Biomedical research, investigation, and reporting
- Cosmetic industry
- Dentistry
- Health and healthcare advising, policy and related professions
- Health bioinformatics/ health informatics
- Health prevention and promotion specialist
- Postgraduate research training
- Public & private research
- Science communication
- Veterinary Medicine

A notable detail is that out of the 19 modules of the proposed program, 14 contain a laboratory component. This ensures that the ACT graduate will master the *Scientific Method* that characterizes natural sciences, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses. These modules are:

- Anatomy and Physiology 115: Integrated Human Anatomy and Physiology I
- BIO 430 - Biotechnology Principles and Applications
- Biology 112: Principles of Biology
- Biology 113: General Biology 2
- Biology 201: Foundations of Microbiology
- Biology 230 - Genetics and Molecular Biology
- Biology 320 - Biochemistry
- Biology 330 - Cell Biology and Histology
- Biology 493 - Thesis I
- Biology 494 - Thesis II
- Chemistry 117: Chemistry for Biological Sciences
- Chemistry 215: Organic Chemistry I
- Chemistry 216: Organic Chemistry II

- Statistics 210: Statistics with R

Laboratory and Teaching Facilities

The program provides its students with able access to laboratory facilities as described in section 7, of the attached document named “2. ACT-Biological-Sciences_Programme-BACKGROUND-document-for-validation-submission.docx”

Campus

It should finally be noted that the ACT graduate will have received their higher education at the ACT campus, a highly international environment with first rate services, facilities and resources afforded to its students.

PROGRAMME OF STUDY AND INTENDED LEARNING OUTCOMES

Programme Structure - LEVEL 4					
Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
SNCB 112 - Biology 112: Principles of Biology	20			no	Varies
SNCB 113 - Biology 113: General Biology 2	20			no	Varies
SNCC 117 - Chemistry 117: Chemistry for Biological Sciences	20			no	Varies
STAT 210 - Statistics 210: Statistics with R	20			no	Varies
SNCH 115 - Anatomy and Physiology 115: Integrated Human Anatomy and Physiology I	20			no	Varies
SNCN 130 - Nutrition 130: Fundamentals of Human Nutrition	20			no	Varies

Intended learning outcomes at Level 4 are listed below:

Learning Outcomes - LEVEL 4	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>A1 Demonstrate an extensive knowledge and understanding of concepts and theories relating to the biological sciences from the molecular and cellular to the whole-organism level</p> <p>A2 Recall, identify and explain terminology, nomenclature and classification systems.</p> <p>A3 Describe biological phenomena with the aid of fundamental principles of other disciplines.</p> <p>A4 Describe chemical phenomena using fundamental principles of chemistry</p> <p>A5. Demonstrate an extensive knowledge and understanding of concepts and theories relating to statistical analysis</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ eLectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement.</p> <p>Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3B. Cognitive skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>B1 Analyse, synthesise and summarise information critically from a variety of sources</p> <p>B2 Obtain, record, collate and analyse data using appropriate techniques in the laboratory and/or field</p> <p>B3 Identify and explain the role of evolution as the unifying theory in biological sciences.</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ eLectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement. Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3C. Practical and professional skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C1 Demonstrate competence and progressive development in basic and core experimental skills on biochemistry, microbiology and molecular biology.</p> <p>C2 Generate a biomedical scientific hypothesis which can be experimentally evaluated</p> <p>C3 Coursework assessments including laboratory & field reports, data handling exercises, essays, tutorial presentations.</p> <p>C4 Laboratory, field work and project reports, data handling exercises.</p>	<p>C1 Coursework assessments including laboratory & field reports, data handling exercises, essays, tutorial presentations.</p> <p>C2 Laboratory, field work and project reports, data handling exercises.</p>

3D. Key/transferrable skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D1 Establish intellectual, personal and team skills necessary for pursuing employment and/or further studies</p> <p>D2 A working knowledge of how to cite and reference work in an appropriate manner, including the avoidance of plagiarism.</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork

3D. Key/transferrable skills

- E-learning & Blended Learning Methods
 - eLectures, Computer-based work, Fieldwork
 - Project and Placement Learning Methods
 - Group project, Site visits, Research project/dissertation
- Assessment Strategy**
 Modules will deploy a combination of the methods below to fully assess student achievement.
- Assessment Methods**
- Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

[Certificate of Higher Education in Biological Sciences (120 credits at Level 4)]

Programme Structure - LEVEL 5

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable ?	Semester runs in
SNCB 201 - Biology 201: Foundations of Microbiology	20			no	Varies
SNCB 230 - Biology 230 - Genetics and Molecular Biology	20			no	Varies
SNCB 320 - Biology 320 - Biochemistry	20			no	Varies
SNCB 330 - Biology 330 - Cell Biology and Histology	20			no	Varies
SNCC 215 - Chemistry 215: Organic Chemistry I	20			no	Varies
SNCC 216 - Chemistry 216: Organic Chemistry II	20			no	Varies

Learning Outcomes - LEVEL 5

3A. Knowledge and understanding

Learning outcomes:	Learning and teaching strategy/ assessment methods
A1 Explain the fundamental principles of molecular biology and integrate them with cellular biology thereby illustrating how homeostasis is maintained at the cellular level. A2 Recall, identify and explain terminology, nomenclature and classification systems.	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods

Learning Outcomes – LEVEL 5

3A. Knowledge and understanding

A3 Describe the structure and function of tissues, organs and organ systems of the human body.

A4. Identify and describe the structure and diversity of microorganisms, including their reproduction, metabolism and ecological niche.

- eLectures, Computer-based work, Fieldwork
- Project and Placement Learning Methods
 - Group project, Site visits, Research project/dissertation

Assessment Strategy

Modules will deploy a combination of the methods below to fully assess student achievement.

Assessment Methods

- Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3B. Cognitive skills

Learning outcomes:

B1 Construct grammatically correct documents in an appropriate academic style and format, using and referencing relevant ideas and evidence

B2 Design and apply the appropriate experimental protocol for addressing a research question, evaluate the outcomes and explain the limitations

B3 Appraise the effects of behavioural patterns and adaptations on the physiology of organisms

Learning and teaching strategy/ assessment methods

Learning and Teaching Methods

Depending on the delivery mode, some or all of the following Learning and Teaching methods

- Scheduled Learning & Teaching Methods
 - Lectures, Tutorials, Laboratory, Seminars, Fieldwork
- E-learning & Blended Learning Methods
 - eLectures, Computer-based work, Fieldwork
- Project and Placement Learning Methods
 - Group project, Site visits, Research project/dissertation

Assessment Strategy

Modules will deploy a combination of the methods below to fully assess student achievement.

Assessment Methods

- Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3C. Practical and professional skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C1 Experimentally evaluate a hypothesis in a professional and systematic manner by performing experiments, with appropriate negative and positive controls</p> <p>C2 Understand and adhere to good laboratory practises, assess risks associated with laboratory chemicals and observe Health & Safety guidelines</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ eLectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement. Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3D. Key/transferrable skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D1 Communicate about their subject appropriately to a variety of audiences, including the general public, using a range of formats and approaches and employing appropriate scientific language</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ E-Lectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement. Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

Programme Structure - LEVEL 6

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable ?	Semester runs in
SNCB 350 - Biology 350 - Microbiology and Infectious Diseases	20		60	no	Varies
SNCB 410 - Biology 410 - Principles of Epidemiology and Public Health	15			no	Varies
SNCB 420 - Biology 420 - Environmental Health and Toxicology	20			no	Varies
SNCB 430 - Biology 430 - Biotechnology Principles and Applications	20			no	Varies
SNCB 450 - Biology 450 - Immunology	15			no	Varies
SNCB 493 - Biology 493 - Thesis I	15			no	Varies

Intended learning outcomes at Level 6 are listed below:

Learning Outcomes – LEVEL 6

3A. Knowledge and understanding

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>A1 Appraise the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment</p> <p>A2 Identify the biological and environmental factors that define the quality and sustainability of life and health and the biological responses to stressors.</p> <p>A3 Describe the diverse cultural and social aspects of bioethical issues.</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ eLectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement.</p> <p>Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3B. Cognitive skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>B1 Evaluate the strength of evidence provided by scientific publications</p> <p>B2 Appraise the ethical, social and legal issues that can be related to applications of biological sciences</p> <p>B3 Identify the significance of biomedical technology for the identification, analysis and manipulation of biological macromolecules.</p> <p>B4 Combine, manipulate and interpret data from biological macromolecules databases</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none">• Scheduled Learning & Teaching Methods<ul style="list-style-type: none">○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork• E-learning & Blended Learning Methods<ul style="list-style-type: none">○ eLectures, Computer-based work, Fieldwork• Project and Placement Learning Methods<ul style="list-style-type: none">○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement.</p> <p>Assessment Methods</p> <ul style="list-style-type: none">• Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3C. Practical and professional skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C1 Demonstrate proficiency in the acquisition, quantitative analysis and interpretation of experimental data, and the ability to trouble-shoot</p> <p>C2 Apply multidisciplinary methodologies for the assessment of the health status of a population and the identification of potential risk factors.</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none">• Scheduled Learning & Teaching Methods<ul style="list-style-type: none">○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork• E-learning & Blended Learning Methods<ul style="list-style-type: none">○ eLectures, Computer-based work, Fieldwork• Project and Placement Learning Methods<ul style="list-style-type: none">○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement.</p> <p>Assessment Methods</p> <ul style="list-style-type: none">• Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

3D. Key/transferrable skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D1 Demonstrate the acquisition of the skills and attributes necessary for lifelong learning, including: intellectual independence, effective time management, the ability to work as part of a team,</p> <p>D2 Employ the use of IT and the capacity to access and utilise a variety of resource materials</p> <p>D3 A working knowledge of how to cite and reference work in an appropriate manner, including the avoidance of plagiarism.</p>	<p>Learning and Teaching Methods Depending on the delivery mode, some or all of the following Learning and Teaching methods</p> <ul style="list-style-type: none"> • Scheduled Learning & Teaching Methods <ul style="list-style-type: none"> ○ Lectures, Tutorials, Laboratory, Seminars, Fieldwork • E-learning & Blended Learning Methods <ul style="list-style-type: none"> ○ eLectures, Computer-based work, Fieldwork • Project and Placement Learning Methods <ul style="list-style-type: none"> ○ Group project, Site visits, Research project/dissertation <p>Assessment Strategy Modules will deploy a combination of the methods below to fully assess student achievement.</p> <p>Assessment Methods</p> <ul style="list-style-type: none"> • Written Examinations, Coursework, Laboratory write-ups, Essays, Reports, Dissertations, Presentations, Individual research project report, Viva

[BSc Ordinary in Biological Sciences / 300 credits (120 at Level 4, 120 at Level 5, 60 at Level 6)]

but not including Biology 493/ 494 – Thesis I / II)

OR

[BSc (Hons) in Biological Sciences / 360 credits (120 at Level 4, 120 at Level 5, 120 at Level 6)]

CURRICULUM MAP

This table indicates which study units assume responsibility for delivering and assessing particular programme learning outcomes.

L e v e l	Study module/unit	Programme outcomes																																				
		A 1	A 2	A 3	A 4	A 5							B 1	B 2	B 3						C 1	C 2	C 3							D 1	D 2							
4	SNCB 112 - Biology 112: Principles of Biology	x	x	x									x	x								x	x							x	x							
	SNCB 113 - Biology 113: General Biology 2	x	x	x									x	x	x								x	x							x	x						
	SNCC 117 - Chemistry 117: Chemistry for Biological Sciences		x		x								x	x									x								x							
	STAT 210 - Statistics 210: Statistics with R					x							x	x											x							x						
	SNCH 115 - Anatomy and Physiology 115: Integrated Human Anatomy and Physiology I	x	x	x									x	x	x								x	x							x	x						
	SNCN 130 - Nutrition 130: Fundamentals of Human Nutrition	x	x	x										x												x						x						

L e v e l	Study module/unit	Programme outcomes																																				
		A 1	A 2	A 3	A 4								B 1	B 2	B 3						C 1	C 2								D 1								
5	SNCB 201 - Biology 201: Foundations of Microbiology	x	x	x									x	x								x	x								x							
	SNCB 230 - Biology 230 - Genetics and Molecular Biology	x	x	x									x	x	x								x	x								x						
	SNCB 320 - Biology 320 - Biochemistry	x	x	x									x	x									x									x						
	SNCB 330 - Biology 330 - Cell Biology and Histology	x	x	x									x	x									x	x								x						
	SNCC 215 - Chemistry 215: Organic Chemistry I		x		x								x	x									x									x						
	SNCC 216 - Chemistry 216: Organic Chemistry II		x		x								x	x									x									x						

Curriculum Map - Biological Sciences

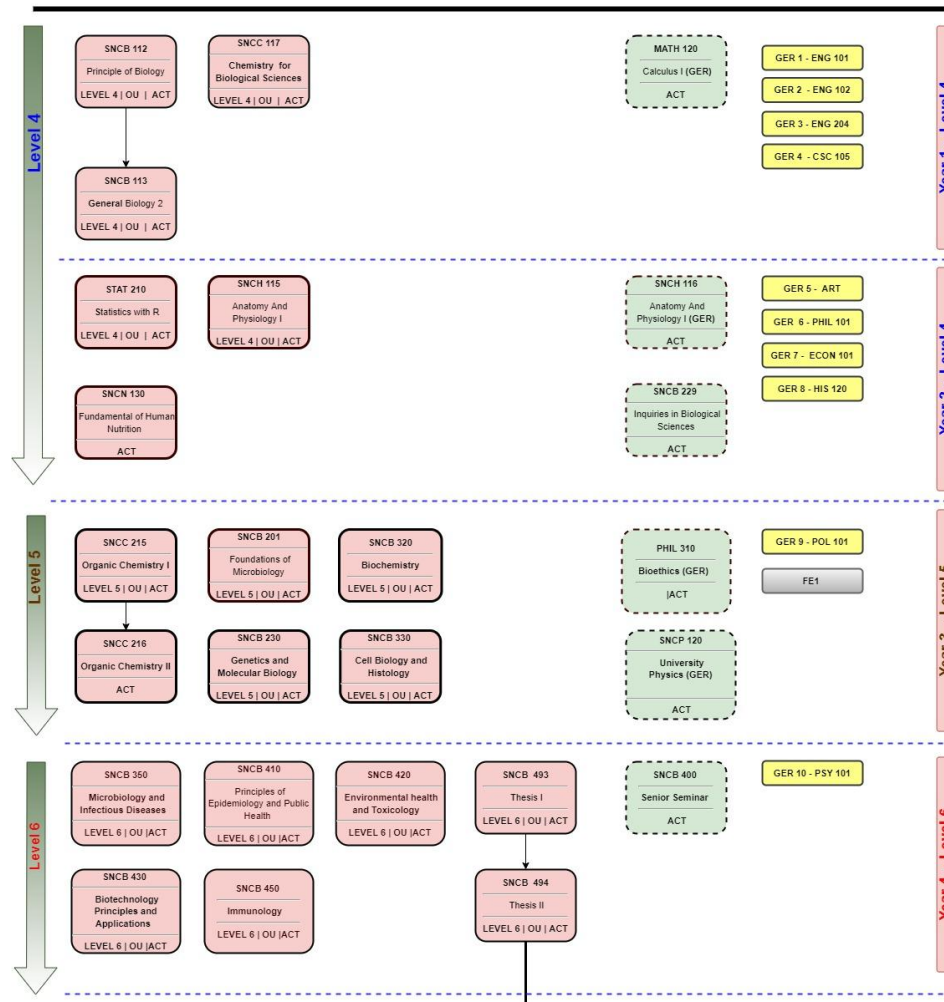
Module Color Key

OU & ACT Major Module

ACT Major Module

ACT - General Education Module

Free Elective



GRADUATION

- 10 x GER Courses (required)**
1. ENG 101 - English I
 2. ENG 102 - English II
 3. ENG 204 - Business English
 4. PHIL 101 - Philosophy
 5. PHIL 310 - Bioethics
 6. POL 101 - Politics
 7. HIS 120 - History
 8. SOC/PSY/ANTH 101 - Social Science
 9. Natural Science
 10. ART/ENG/MUS 120, Art or Literature
- To be completed before graduation*

1x Free Elective (required)
Students can take any course to fulfill their free electives
To be completed before graduation

- Senior Seminar Topics**
- Social Medicine
 - Topics in Development and Differentiation
 - Topics in community health
 - Topics in Neuropathological Mechanisms
 - Topics in Immunology
 - Pharmaceutical Chemistry
 - Human Genetics
 - Evolutionary Medicine

7. MODULE SPECIFICATIONS

1. Factual information			
Module title	SNCB112 – Principles of Biology	Level	4
Module tutor	Andreas Anestis	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. This module is designed to introduce the basic principles of modern biology, the framework within which new discoveries are interpreted, and the relations among various branches of biological research. Students who are interested in careers in biological sciences, biomedical sciences, and biotechnology should find that the course provides a firm grasp on an understanding of the concepts that will serve them well in their academic track that lies ahead.

3. Aims of the module

The goal of this course is to provide students with a firm grasp of the major concepts underlying biological processes. In this context, students are introduced to major structures and functions of the biological systems, essential metabolic processes, principles of genetics and molecular biology and the fundamentals of the evolutionary theory. Additionally, they appreciate that biological processes are manifested in diverge ways in health and disease, and their knowledge and understanding take on greater significance in everyday life more than ever before.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- The scientific method
- Basic chemistry
- Properties of water
- Biological macromolecules
- Cells and cellular organelles
- Cell membrane: structure and role
- Metabolism and energy
- Cellular respiration
- Photosynthesis
- Cell communication
- DNA structure and replication
- Gene expression: Transcription and translation
- Mendelian and non-mendelian genetics
- Biotechnology principles
- Principles of Evolution
- Microscopic examination of cells (lab)
- Spectrophotometry principles (lab)
- DNA extraction and DNA damage (lab)
- Blood typing (lab)

1. Factual information			
Module title	SNCB113 – General Biology II	Level	4
Module tutor	Andreas Anestis	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. This module is designed to introduce fundamental concepts of evolution, history of life, taxonomy, and biodiversity, taking into consideration all the taxa of organisms known. Students who are interested in careers in biological sciences, environmental sciences, and biotechnology should find that the course provides a firm grasp on an understanding of the concepts that will serve them well in the academic track that lies ahead.

3. Aims of the module

The goal of this course is to provide students with a firm grasp of the unity and diversity between all the known forms of life. In this context, students are introduced to the key concepts of evolution, speciation, population genetics, taxonomy, and phylogenetics and they investigate the structural and functional traits and the origins of the organisms of all the domains of life: archaea, prokaryotes, and eukaryotes. Analyzing data from fossil records, constructing phylogenetic cladograms, and quantifying the action of natural selection forces in populations are concepts also included in the purpose of the module.

4. Pre-requisite modules or specified entry requirements

N/A

- 8. Indicative content.**
- Evolution – underlying principles
 - Population evolution and genetics
 - Speciation
 - Taxonomy
 - Origin and history of life
 - Viruses
 - Bacteria and Archaea
 - Protists
 - Fungi
 - Plants
 - Invertebrate animals
 - Vertebrate animals
 - Biodiversity
 - Microscopic examination of cells: bacteria and protists (lab)
 - Plant morphology and anatomy (lab)
 - Invertebrate morphology and anatomy (lab)
 - Vertebrate morphology and anatomy (lab)

1. Factual information			
Module title	SNCB 201: – Foundations of Microbiology	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The goal of this course is to introduce foundational concepts in microbiology and their connection with all the health care fields. The course subjects include the identification of microbes, mechanisms of pathogenicity and microbial disease, structure and response of the host immune system, and prevention against the spread of infectious disease.

3. Aims of the module

Describe bacterial structure and function. Categorize bacteria based on cell wall structure. Describe and explain differences between bacteria and viruses. Explain the mechanisms of antibiotic resistance. Discuss the types of immunity and immune disorders. Elaborate on the advantages of vaccination. Evaluate the role of the human microbiome in health and disease. Emphasize on diagnosis of infectious diseases.

4. Pre-requisite modules or specified entry requirements

Biology 112, Biology 113

8. Indicative content.

Introduction to Microbiology. History of Microbiology. Concepts of Infectious Disease. Living Chemistry: Organic Molecules. Bacterial Cell Biology. Eukaryotic Cell Biology. Microbial growth and nutrition and control. Bacterial Genetics. From DNA to protein. Bacterial Genomes and Evolution. Viruses. Influenza virus and the flu. Antibiotic and Antiviral therapies. Normal Human Microbiota. Intro to the Immune System. Inflammation and Innate Immunity Adaptive Immunity. Immune disorders. Vaccines. Diagnosing Infectious Disease. Microbial Pathogenesis. Systemic bacterial infections. Epidemiology: Tracking Infectious Diseases.

1. Factual information			
Module title	SNCB230 – Genetics and Molecular Biology	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. This module is designed to introduce the basic principles of modern genetics and molecular biology, the framework within which new discoveries are interpreted, and the relations among various branches of biological research. Students who are interested in careers in biological sciences, biomedical sciences, and biotechnology should find that the course provides a firm grasp on an understanding of the concepts that will serve them well in their academic track that lies ahead.

3. Aims of the module

The goal of this module is to provide students with an understanding of fundamental concepts in genetics and molecular biology. In this context, the central dogma in molecular biology, cell division, regulation of gene expression, mendelian, non-mendelian and molecular genetics, genes linkage and mapping, mutations, biotechnology, developmental, evolutionary, and population genetics are examined. Additionally, students develop skills, such as sequence analysis, computational methods, and statistics – all of which they will acquire within the lab session of the module, and all of which are highly valued in today's research environment.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- Mendelian and non-mendelian genetics
- Cell division
- Recombination and gene linkage
- Genetics of bacteria and viruses
- Central Dogma – description and translation
- Regulation of gene expression
- Molecular cloning
- Mutations and DNA repair mechanisms
- Cancer genetics
- Population genetics and molecular evolution
- Multifactorial diseases
- The UCSC Genome Browser (lab)
- Recombinant DNA techniques (lab)
- Homolog searches using NCBI's BLAST tool (lab)
- Phylogenetic analyses (lab)

1. Factual information			
Module title	SNCB 320: – Biochemistry	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This course will provide an introduction to biomolecules in living matter. The simplicity of the building blocks of macromolecules (amino acids, monosaccharides, fatty acids and purine and pyrimidine bases) will be contrasted with the enormous variety and adaptability that is obtained with the different macromolecules (proteins, carbohydrates, lipids and nucleic acids). The nature of the electronic and molecular structure of macromolecules and the role of non-covalent interactions in an aqueous environment will be highlighted. The unit will be delivered through lectures, formative practicals and related feedback sessions to ensure students fully understand what is expected of them. Short tests (formative assessment) will be used throughout the unit to test students' knowledge and monitor that the right material has been extracted from the lectures.

3. Aims of the module

Describe bacterial structure and function. Categorize bacteria based on cell wall structure. Describe and explain differences between bacteria and viruses. Explain the mechanisms of antibiotic resistance. Discuss the types of immunity and immune disorders. Elaborate on the advantages of vaccination. Evaluate the role of the human microbiome in health and disease. Emphasize on diagnosis of infectious diseases.

4. Pre-requisite modules or specified entry requirements

Biology 112, Biology 113, Chemistry 117

8. Indicative content.

I. STRUCTURE AND CATALYSIS

- Water, the Solvent of Life
- Amino Acids, Peptides, and Proteins
- The Three-Dimensional Structure of Proteins
- Protein Function
- Enzymes
- Carbohydrates and Glycobiology
- Nucleotides and Nucleic Acids
- DNA-Based Information Technologies
- Lipids

II. BIOENERGETICS AND METABOLISM

- Glycolysis, Gluconeogenesis, and the Pentose Phosphate Pathway
- The Metabolism of Glycogen in Animals
- The Citric Acid Cycle
- Fatty Acid Catabolism
- Amino Acid Oxidation and the Production of Urea
- Oxidative Phosphorylation
- Photosynthesis and Carbohydrate Synthesis in Plants

III INFORMATION PATHWAYS

- Genes and Chromosomes
- DNA Metabolism
- RNA Metabolism
- Protein Metabolism
- Regulation of Gene Expression

1. Factual information			
Module title	SNCB330 – Cell Biology and Histology	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements
This is a required module for all Biological Sciences majors. This module is designed to provide an understanding of the fundamental aspects of cell biology and tissue organization. The central object of study is the eukaryotic cell, its intracellular molecules, and the interactions between cells that result in the construction of multicellular organisms.

3. Aims of the module
This is a combined lecture and lab module that explores the relationship between structure and function at the cellular and tissue levels. The module will give the students an introduction to the structure and function of cells and cellular structures including the plasma membrane, cytoplasm, intracellular organelles, extracellular matrix, epithelia, and glands. Its overarching aim is to provide students with knowledge of the general organization and functions of the different cellular organelles, the diversity of animal and plant cells, and the cytophysiological characteristics that define the different tissues.

4. Pre-requisite modules or specified entry requirements
N/A

8. Indicative content.
<ul style="list-style-type: none"> ● Cell. Visualization of cells and their components. Microscopy (theory and lab) ● Composition of the plasma membrane. Functions, structure, and composition. ● Cell-cell communication and signaling ● Transport of molecules through the membranes. Passive and active transport (theory and lab) ● Introduction to the endomembrane system: structure and composition. Smooth and rough ER ● Vesicular transport ● Golgi apparatus and secretion routes ● Mitochondria and Chloroplasts. Structure and composition ● Peroxisomes. Structure and composition. ● Nucleus, nuclear envelope ● Cytoskeleton, cell wall, cells interactions ● Epithelial tissue (theory and lab) ● Connective tissue/blood (theory and lab) ● Muscular tissue ● Nervous tissue ● Plant tissues ● Tissue growth and development. ● Histology lab principles (lab)

1. Factual information			
Module title	SNCB 350: - Microbiology and Infectious Diseases	Level	6
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module emphasizes on the microbiology of infectious diseases through analysis of case studies and specific outbreak examples.

3. Aims of the module

The students will be able to critically discuss the virulence and pathogenicity of infectious agents (bacteria, viruses, fungi and other parasites); centered on the interplay of the host – microbe balance; using indicative case studies. Apply theoretical knowledge of identification & classification, epidemiology, pathogenicity & virulence, of infectious agents on the treatment & control of pathogens using selected examples of infectious diseases. Critically discuss the strategies available to control and treat microbial & viral diseases.

4. Pre-requisite modules or specified entry requirements

Biology 112, Biology 113, Chemistry 117, Microbiology 201

8. Indicative content.

Mechanisms of Bacterial Pathogenesis: entry into the human body; adhesion, colonization & invasion; pathogenic actions of bacteria (tissue destruction, toxins, immunopathogenesis); mechanisms for escaping host defenses. The Gram-Positive Cocci, The Gram-Positive Bacilli, The Gram-Negative Cocci & Anaerobic Bacilli, The Gram-Negative Aerobic Bacilli, Transmission of Infectious Microbial Diseases, Mechanisms of Viral Pathogenesis, Basic Biology of Fungi, Commensal & Pathogenic Human Microflora. Identification of human pathogens.

1. Factual information			
Module title	SNCB410 - Principles of Epidemiology & Public Health	Level	6
Module tutor	Staff	Credit value	15
Module type	Taught: Lecture/guided discussion	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements
This is a required module for all Biological Sciences majors. It is designed to cover basic epidemiology principles, concepts, and procedures useful in the surveillance and investigation of health-related states or events. The module will provide students with a basic understanding of the practices of public health and medical statistics required for preventing and addressing population-based health outcomes.

3. Aims of the module
The module explores the basic principles and methods of public health epidemiology. The biological, environmental, sociocultural, and behavioral factors associated with the etiology and distribution of health and disease are also investigated. In this context, topics covered in this module include: basic principles of epidemiology; measures of disease frequency; epidemiologic study designs: experimental and observational; bias; confounding; outbreak investigations. Moreover, the module focuses on providing an understanding of the evolution of public health, so that the students realize the global nature of the discipline, the way historical events and threats have shaped it, and its significance for identifying solutions for public health issues.

4. Pre-requisite modules or specified entry requirements
N/A

8. Indicative content.
<ul style="list-style-type: none"> ● Introduction to Epidemiology – historical evolution ● Descriptive and analytic epidemiology ● Summarizing data ● Measures of risk ● Frequency measures ● Morbidity, mortality, natality measures ● Association measures ● Measures of Public Health Impact ● Public Health Surveillance ● Analysing and interpreting data ● Evaluating and Improving Surveillance ● Steps in outbreak investigation ● What is Public Health ● Public Health Ethics ● Social and Behavioral Theories ● Biological Basis of Public Health ● Community-based Public Health

1. Factual information			
Module title	SNCB420 – Environmental Health and Toxicology	Level	6
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. This module explores the structure and function of ecosystems, the relationship people have with their environment, the risk management choices made, and the resulting associations that affect health and physical well-being for the individual, communities, and susceptible populations. Additionally, it focuses on describing the body's response to drugs, foods, and toxic substances and it examines the biological responses to acute and chronic exposure to environmental, dietary, occupational, and pharmaceutical stress factors.

3. Aims of the module

The goal of this module is to provide students with information about the fundamental principles of organization and function of earth's terrestrial and aquatic ecosystems, the effects of human activities on ecosystems functions, the ways environmental factors impact health outcomes, and the control measures currently used to prevent or minimize the health effects from these negative impacts. Additionally, the module focuses on developing an understanding of how the body's biochemical and physiological mechanisms operate to manage exposure to toxins, poisons, and drugs.

8. Indicative content.

- The earth's environment: Land and water
- Abiotic environment
- Biotic environment
- Populations, communities, ecosystems
- Species interactions and communities structure and balance
- Human-driven disturbances on the environment
- Health effects of exposure to environmental stressors
- Climate change
- Soil degradation
- Food safety
- Solid waste disposal
- Sustainability and green chemistry
- Drinking water quality
- Wastewater treatment
- Indoors and outdoors air quality
- Radiation and Health
- Exposure Classes, Toxicants in Air, Water, Soil, Domestic, and Occupational Settings
- Toxic effects and interactions - dose-response
- Toxicity Testing
- Absorption and Distribution
- Biotransformation and Excretion
- Toxic Effects on the Nervous System
- Carcinogens
- Toxicity of the Liver
- Nephrotoxicity
- Elimination of Toxicants

1. Factual information			
Module title	SNCB 430: – Biotechnology Principles and Applications	Level	6
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module introduces the technology currently used in the analysis and engineering of genes. It also introduces the principles of allied technologies (proteomics, transcriptomics, and cell culture) and exposes students to industry through a site visit to a biotech company and provides an introduction to the use of a model-guided design for experimentation in biotechnology.

3. Aims of the module

Understand modern biotechnology methods used to introduce genes in bacteria, plants and animals. Integrate principles of proteomics, transcriptomics and cell culture and understand their utility and applications in industrial biotechnology. Appreciate the reasons for experimental repetitions and replicates and the importance of appropriate statistical analysis for interpretation of experimental data. Gain practical knowledge of recombinant DNA techniques and basic protein isolation and characterization techniques. Gain an appreciation of the inter-disciplinary nature of modern laboratory-based biological tools and techniques.

4. Pre-requisite modules or specified entry requirements

Biology 112, Biology 113, Chemistry 117, Biology 230

8. Indicative content.

Review of DNA replication, transcription, and translation. Natural and artificial mechanisms of DNA transfer
 Introduction to vectors, Selectable markers, Cloning vectors, Expression vectors, Shuttle vectors, Creation of recombinant DNA molecules, Creation of genomic and cDNA libraries, Library screening, Ligation, Restriction endonuclease digestion and mapping, Gel electrophoresis, Northern blotting, Southern blotting, Polymerase Chain Reaction (PCR), DNA sequencing and sequence analysis, Reverse transcriptase PCR, Real time PCR, Production of monoclonal antibodies, Immunoblotting, DNA microarrays, Protein microarrays, Applications of biotechnology: Genetically engineered foods, Bioremediation, Applications of biotechnology: Medical biotechnology, Applications of biotechnology: DNA fingerprinting, Molecular diagnostics, Molecular forensics, Applications of biotechnology: Transgenic organisms, Ethical issues in biotechnology, The future of biotechnology

1. Factual information			
Module title	SNCB450 – Immunology	Level	6
Module tutor	Staff	Credit value	15
Module type	Taught: Lecture/guided discussion	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. The module is designed to introduce students to the study of the molecular and cellular interactions and principles of the immune system. Topics such as immune system organization and development, humoral & cell-mediated immunity, immunodeficiency, and autoimmunity will provide the students with a broad body of interdisciplinary concepts related to homeostasis at the systemic level.

3. Aims of the module

The goal of this module is to provide students with an understanding of immunological responses to disease factors. Students will learn about the organization, structure, and function of the immune system, how it can fight infection and why in some cases an immune response can fail. In addition, the module focuses on describing the type of immune responses activated by different kinds of factors, and how infectious agents can overcome the natural immune response and cause disease.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- Elements of immunity
- Innate immunity
- Complement
- Adaptive immunity
- Antibody structure
- TCR, BCR, and MHC
- Vaccination and immunological memory
- Hypersensitivity, allergy
- Cancer immunology
- Immunology of infectious diseases
- Coevolution of adaptive and innate immunity
- Transplantation of tissues and organs
- Autoimmunity

1. Factual information			
Module title	SNCC 117: General Chemistry for the Biological Sciences	Level	4
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biology majors. It is designed to introduce biology students to the fundamental principles of chemistry.

3. Aims of the module

Describe atomic structure and how it relates to reactivity of elements. Discuss the periodic trends of elements in relation to chemical bonding and reactivity. Explain solubility, and physical properties in terms of intermolecular forces. Understand the role of thermodynamics and predict spontaneity of reactions. Measure reaction rates using experimental approaches. Describe chemical equilibria and acid base reactions in aqueous systems. Emphasize on applications of chemical principles in biological systems.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- Atoms, Ions and Molecules
- Atomic spectra and atomic structure
- Atomic orbitals & electron configurations
- Periodic trends; Compounds & formulas; chemical bonds
- Lewis structures, resonance and formal charges
- Properties of covalent bonds
- Molecular shape & polarity
- Valence bond theory & hybridized orbitals
- Molecular recognition
- Types of intermolecular interactions
- Trends in solubility
- Properties of water
- Chemical reactions & stoichiometric calculations
- Aqueous solutions, electrolytes, & acid/base reactions
- Precipitation & redox reactions
- Titrations
- Heat, work, & the 1st Law
- Enthalpy
- Heat transfer
- Reaction calorimetry
- Lattice enthalpies
- Spontaneity & entropy
- The 2nd Law & free energy
- Osmosis, dialysis and vapor pressure, Henry's law
- Kinetic molecular theory of gases
- Rates of reaction & rate laws
- Reaction energetics & mechanisms
- Reversible reactions & equilibrium constants
- Equilibrium calculations
- LeChâtelier's Principle
- Acid/base equilibria
- Acid/base calculations
- pH buffers and indicators, acid/base titrations

1. Factual information			
Module title	SNCC 215: Organic Chemistry I	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biology majors. It is designed to introduce biology students to the basic concepts in organic chemistry in order to better comprehend related subjects such as Biochemistry, Biotechnology and Environmental Health and Toxicology.

3. Aims of the module

Describe organic compounds and write molecular formulae from given names. Draw diagrams of molecules indicating the hybridization of individual atoms. Elucidate reaction mechanisms using curved arrows for selected organic reactions. Assign the stereochemistry of simple organic compounds. Explain the mechanisms of substitution and elimination reactions. Describe and explain the reactivity of alkenes and alkynes toward a selection of reagents. Discuss the periodic trends of elements in relation to chemical bonding and reactivity. Explain solubility, and physical properties in terms of intermolecular forces. Understand the role of thermodynamics and predict spontaneity of reactions. Emphasize on applications of chemical principles in biological systems.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- Structure and Bonding
- Acids and Bases
- Alkanes
- chemical reactions
- Chemical Reactions and Stereochemistry
- Stereochemistry
- Alkyl halides: Nucleophilic Substitution, Alkenes, Structure and Synthesis, Alkenes, Synthesis and Reactions, Alkynes, Alcohol Structure and Synthesis, Alcohols Reactions

1. Factual information			
Module title	SNCC 216: Organic Chemistry II	Level	5
Module tutor	Staff	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biology majors. It continues Organic Chemistry I. It is designed to introduce biology students to the basic concepts in organic chemistry in order to better comprehend related subjects such as Biochemistry, Biotechnology and Environmental Health and Toxicology.

3. Aims of the module

Elucidate reaction mechanisms using curved arrows for reactions of ethers, conjugated systems, aromatic compounds. Assign the stereochemistry of more elaborate organic compounds. Explain the mechanisms of reactions of condensations and alpha substitutions of carbonyl compounds. Describe and explain the reactivity of amines and carboxylic acid derivatives toward a selection of reagents. Discuss the use of NMR, IR and MS in the elucidation of organic structure. Emphasize on applications of chemical principles in biological systems.

4. Pre-requisite modules or specified entry requirements

Organic Chemistry I

8. Indicative content.

- Infrared spectroscopy and mass spectroscopy
- Nuclear magnetic resonance spectroscopy
- Ethers epoxides and thioethers, conjugated systems and UV spectroscopy
- Aromatic compounds
- Reactions of aromatic compounds
- Ketones and Aldehydes
- Amines
- Carboxylic acids
- Carboxylic acid derivatives, condensations and alpha substitutions of carbonyl compounds.

1. Factual information			
Module title	SNCN 130 – Introduction to human nutrition	Level	6
Module tutor	Dr. Mary Kalamaki	Credit value	15
Module type	Taught: Lecture/lab	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements
SNCN 130 explores basic concepts of the science of nutrition. Topics include description and role of nutrients, their dietary sources and their fate into the human body (digestion, absorption etc.); energy balance and weight control; eating disorders; nutrition in fitness and sports; nutrition in the development/prevention of human diseases. Emphasis will be given in the use of scientific methodology to explain how nutrients and other food constituents contribute to proper growth, development and health.

3. Aims of the module
This module aims to enable students to: <ol style="list-style-type: none"> 1. Identify the nutrients that are essential for human health, their dietary sources, intake levels and physiological role(s) in the body. 2. Describe the processes of food ingestion, digestion, nutrient absorption, transport, metabolism, storage and excretion. 3. Gain an understanding of the importance of energy balance in the body; learn how to calculate energy needs according to lifestyle (e.g. weight gain/loss, physical activity). 4. Apply current dietary guidelines to provide appropriate nutrition during different developmental stages (e.g. childhood, pregnancy, old age). 5. Make a connection between diet and the development/prevention of chronic diseases. 6. Learn how to critically review nutrition information from a variety of sources (popular media, food-label wellness claims) and assess their validity. 7. Apply nutrition knowledge to make informed lifestyle choices in order to promote health and wellness.

4. Pre-requisite modules or specified entry requirements
Basic high school level chemistry and biology, or instructor's permission.

8. Indicative content.		
Week	Topics	Chapter sections
1	Nutrition, Food Choices, and Health: What influences food choices; How Nutrition Connects to Good Health; Classes and Sources of Nutrients	1.1, 1.2, 1.3
1	Math Concepts in Nutrition; What Can You Expect from Good Nutrition and a Healthy Lifestyle; Eating Well in College	1.4, 1.7, 1.8
2	Designing a Healthy Eating Pattern: A Food Philosophy That Works; Dietary and Physical Activity Guidelines; MyPlate; States of Nutritional Health	2.1, 2.2, 2.3, 2.4
2	Measuring Your Nutritional State; Specific Nutrient Standards and Recommendations; Evaluating Nutrition Information; Food Labels and Diet Planning	2.5, 2.6, 2.7, 2.8
3	The Human Body: Nutrition's Role in Human Physiology; The Cell; Body Systems	3.1, 3.2, 3.3, 3.4, 3.5, 3.6
3	Body Systems (cont.); Nutrient Storage Capabilities; Nutrition and Genetics; Common Problems with Digestion; Carbohydrates: forms; foods; digestion	3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 4.1, 4.2, 4.3, 4.4

4	Carbohydrates: intolerances; needs; diabetes	4.5, 4.6, 4.7
4	Lipids: properties; fats and oils in foods; digestion	5.1, 5.2, 5.3, 5.4, 5.5
5	Lipids: roles in the body; recommendations of intake; Lipids and Cardiovascular Disease	5.6, 5.7, 5.8
5	Proteins: Amino Acids; synthesis; protein in food; digestion; Selected topic presentation	6.1, 6.2, 6.3, 6.4
6	Proteins: function; needs; malnutrition; Vegetarian and Plant-Based Dietary Patterns	6.5, 6.6, 6.7, 6.8
6	Midterm exam	Chapters 1-6
7	Energy Balance and Weight Control: Determination of Energy Use by the Body; Assessing Healthy Body Weight; Obesity; Selected topic presentation	7.1, 7.2, 7.3, 7.4
7	Energy Balance and Weight Control: treatment of obesity; Behavioral Strategies for Weight Management; Treatment of Underweight	7.5, 7.6, 7.7, 7.8, 7.9, 7.10
8	Energy Balance and Weight Control: Popular Diets—Cause for Concern; Selected topic presentation	7.11
8	Vitamins, fat soluble	8.1, 8.2, 8.3, 8.4, 8.5
9	Vitamins, water soluble	8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13
9	Water and Minerals; Selected topic presentation	Chapter 9
10	Nutrition: Fitness and Sports: Energy Sources for Exercising Muscles; Tailoring Nutrient Recommendations for Athletes; Specialized Advice for Endurance, Strength, and Power Athletes; Selected topic presentation	Chapter 10
11	Nutrition: Fitness and Sports(cont); Selected topic presentation	Chapter 10
11	Eating Disorders (invited speaker presentation)	11.1, 11.2, 11.3, 11.4
12	Final exam TBA	Cumulative

1. Factual information			
Module title	SNCH115 – Integrated Human Anatomy & Physiology I	Level	4
Module tutor	Andreas Anestis	Credit value	20
Module type	Taught: Lecture/guided discussion/lab	Notional learning hours	200

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is a required module for all Biological Sciences majors. This module is designed to provide an understanding of the anatomical structures, function, and regulation of integumentary, muscular, skeletal, nervous and endocrine systems. The fundamental concept of homeostasis described elsewhere at the cellular level is here approached as the outcome of the interaction of organs at the systemic level.

3. Aims of the module

This is a combined lecture and lab module that explores the relationship between structure, function, and homeostasis in the human body. It aims to provide students with knowledge of normal function of the organ systems and thereby provide the information base for interpreting data relating to health and disease. This module covers the skeletal, muscular, integumentary, and nervous systems, as well as cytology and histology. For those in health fields, this information will serve as the foundation for most of their courses.

4. Pre-requisite modules or specified entry requirements

N/A

8. Indicative content.

- Organization of the human body
- Anatomical terminology
- Homeostasis
- Chemical basis of life
- Basic biochemistry
- Cells
- Movements through cell membranes
- Tissues
- Bone Tissue and Structure
- Microscopic bone structure for compact and spongy bone
- Bone development and growth
- The skeletal system
- Joints of the skeletal system
- Classification of joints
- Types of joint movements
- Muscle tissue
- Gross and microscopic anatomy of a skeletal muscle
- The neuromuscular junction
- Skeletal muscle contraction physiology
- Smooth and cardiac muscle
- Major skeletal muscles of the body
- Nervous system
- Generation of action potential
- Synapse
- Action potential propagation
- Neurotransmitter and neuromodulator
- Central Nervous System
- Spinal Cord
- Brain
- Cranial nerves

- Autonomic nervous system
- Parasympathetic Nervous system
- Sympathetic nervous system
- The Special senses
- The endocrine system
- Microscopic examination of cells and tissues (lab)
- Membrane transportation mechanisms (lab)
- Dissection labs: brain, eye, muscle (lab)
- Muscular energy metabolism (lab)
- Recordings of muscular and brain functions (lab)

1. Factual information			
Module title	STAT 210 – Introduction to Statistics with R	Level	4
Module tutor	Dr. Kyriaki Mengoudi	Credit value	15
Module type	Taught: Lecture/guided discussion	Notional learning hours	150

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements
An application-oriented introduction to modern statistical analysis using R software that includes: study design, exploratory data analysis; random variables; probability models and sampling distributions; point and interval estimates; hypothesis tests and linear regression. A wide variety of applications are used.

3. Aims of the module
<p>This module is an introduction to descriptive and inferential statistical methods. Students will master problem solving using both manual computations and R statistical software. The student will learn to formulate research questions, design data collection to answer the question, collect and analyse the data and interpret and report the results.</p> <p>The module aims at the following:</p> <ul style="list-style-type: none"> • Give the student the statistical skills necessary to meet the needs of business and the real-world decision-making problems. • Effectively communicate the results of a statistical analysis both orally and in writing. • Provide fundamental statistical knowledge and skills required for a higher-level module in related fields. • Analyze data using R software

4. Pre-requisite modules or specified entry requirements
Math 101. The module is typically taken at the 1st semester of study non-OU validated

8. Indicative content.
Data and Statistics
Descriptive Statistics
Descriptive Statistics: Numerical Measures
Probability
Discrete Probability Distributions
Continuous Probability Distributions
Sampling Distributions
Interval Estimation
Hypothesis Testing
Linear Regression

8. STUDENT SUPPORT, GUIDANCE AND ADVICE

ACADEMIC ADVISING AND MENTORING

During the first 2 weeks of classes, students will be assigned the faculty member who will be their Academic Advisor for their first year at ACT and, in most cases, until graduation. The Academic Advisor helps students to plan their overall program of studies, as well as to select courses each semester. Advisors also provide information about ACT academic and support services, assist students in addressing problems in particular courses within a given semester, and offer ongoing advice concerning the students' long-term academic and career goals.

THE LEARNING HUB

ACT's Learning Hub is located on the upper floor of the Library. Students are invited to meet with the tutors and receive assistance with their English language and Mathematics needs. The Admissions and the Enrollment department offices are also located on the upper floor of the Library. Prospective students may obtain from there all the necessary information concerning their studies and financial support.

HEALTH SERVICES

The resident Anatolia High School nurse accepts student emergency visits as well as regular appointments in her office located on campus. The Anatolia/ACT is also within easy access to both a private clinic and several hospitals, all of which provide emergency services. A resident doctor at ACT is available to students on campus during the doctor's office hours.

9. OPPORTUNITIES FOR PERSONAL DEVELOPMENT PLANNING

CAREER SERVICES AND GUIDANCE

The Career Office equips students with the tools and know-how to successfully kickstart their careers. Specifically, we provide hands-on training on interviewing, resume & cover letter writing. The above are subsidized by guest lectures, which help students get an insight in their field of interest, and company visits, which give students the opportunity to meet company representatives and conduct informational interviews. The office also provides individual consultations in any career related issue, including job search tactics, career planning, resume preparation and mock interviews. Apart from this preparation stage, the career office offers internship and job opportunities, both in Greece and abroad, accessible to all students via the Career Office's job board (jobs.act.edu).

In addition, the Career Office also organizes the annual Career Week, a week-long event with lectures, company presentations, on-campus recruiting, networking opportunities and hands-on workshops.

The Office also serves as Liaison with the Business Community, and works actively with Industry and Academia to identify placement opportunities and keep students informed of local and regional trends. Leading representatives from the private and public sectors visit ACT regularly as guest speakers in classes and events, reinforcing ACT's strong ties with companies, institutions and organizations throughout the local, national and international business environment.

INTERNSHIPS

The Career Office gives special emphasis to students' internships, both with local and international organizations. Every semester there is a visiting program with local organizations with internship opportunities, all relevant to the academic programmes and focusing on enhancing in-class learning. Apart from the on-campus recruiting, we coordinate a series of internship opportunities with

organizations located in other cities or even abroad, either with on-site placement or remote work. The school's Job Board and Facebook Career Group help disseminate the internship opportunities, while the Career Workshops (resume writing, cover letter preparation, mock interviews) prepare students for claiming those opportunities.

10. OPPORTUNITIES AND SUPPORT FOR STUDY ABROAD

ACT STUDENTS STUDYING IN THE US

ACT has signed a number of study abroad exchange agreements with partner colleges and universities that enable students to spend a semester studying in the US. Through these agreements, ACT students may spend a semester, normally in their second or third year of study, at a college in the US, and upon return to ACT receive full transfer credit for all courses successfully completed while abroad. Agreements with partner schools allow ACT students to enroll at collaborating institutions while continuing to be enrolled at the home school and pay tuition and fees at ACT. Students are encouraged to look into study abroad opportunities early in their academic career with the director of the I.P.O. Good academic standing is a pre-requisite for considering such a possibility.

11. WORK PLACEMENT INFORMATION

A number of opportunities for personal development are available to Biology majors on demand and on a voluntary basis within the program, ranging from opportunities for joining extracurricular activities and clubs on campus, serving on the Student Government Association, engaging in Service Learning, acquiring information literacy and CV writing skills to building professional expertise through a term's Internship training in their senior year, thus enhancing self-reflection, PR and communication skills, personal and professional responsibility, learning how to meet deadlines and working with others, etc.

In addition, through ACT's Careers Office, targeted Biology-specific workshops, company visits and presentations further enhance opportunities for personal development. Short term internships are also available.

The programme does not require students to undertake a compulsory work placement but there is the option of internship, if they wish to do so. Through the internship module students will be able to make visible connections between community service, their own learning, personal and professional development and citizenship skills, values and practices.

12. FACILITIES AND SERVICES

BISSELL LIBRARY - GENERAL INFORMATION

The Bissell Library offers a vast collection of books in print, electronic books, videos, and DVDs. Already one of the largest English language libraries in Greece, its collection is rapidly growing into a space designed to accommodate the institution's needs for years to come. The collection includes subscriptions to periodicals in hard copy as well as access to numerous full-text scholarly journals, magazines, and newspapers.

The Bissell Library offers, to currently enrolled students, on site and remote access to research databases to support inquiry and research. Business databases include Ebsco's Business Source Elite, Regional Business News, Hoover's, and ProQuest ABI Inform Global. Databases for research include: Academic Search Premier, E-books collection, Encyclopaedia Britannica, ERIC, GreenFILE, Columbia International Affairs Online (CIAO), JSTOR, Oxford English Dictionary and Oxford Music Online. We also

subscribe to the Ebsco A-Z service, providing listing of all the electronic resources accessible from the library. The EBSCO Discovery Service™ brings together the most comprehensive content providing to users an easy, yet powerful means of accessing all of the library's information resources through a single search.

The Bissell Library shares an integrated library management system with the Socrates Eleftheriades and Olga Mavrophidou-Eleftheriades Library of Anatolia College. Access to both collections is available through the web-based library catalog. Library users can search the catalog, databases or the Internet through public access terminals available on both floors of the library. Network ports are available for laptops and the entire building is Wi-Fi enabled.

COMPUTING SERVICES & NETWORKING FACILITIES

ACT has state of the art computer infrastructure and facilities. All computer facilities are connected to a high-speed campus network, which is based on fiber optic cables connecting all buildings. In addition a large high speed wireless network access (WI-FI) covers large areas of the campus giving students the ability to use the school's resources or access the internet on their laptop.

The computer facilities include the Stavros S. Niarchos Technology Center in Bissell Library and a number of other computer laboratories located in various buildings. Many high-speed servers are present in the network infrastructure, along with Intel® Core™ latest technology workstations, connected to the Internet, available to students in multiple laboratories.

The laboratories are used both as general access and instructional computer labs. They are equipped with data projectors and black and white or color laser printers. All stations are networked with full Internet Access and run the latest software such as MS office, Oracle, Power-builder, Visible Analyst, Java, Visual Basic, 3-D Max, Adobe Photoshop, Adobe CS Production Studio Premium, Macromedia Studio, Macromedia Authorware, PanaView Image Assembler, Mathematica Player, Minitab, MathCad, Daedalus, etc.

SCIENCE LABORATORIES

All science courses are accompanied by laboratory work. The purpose of the laboratories offered is to expose students to hands-on experience regarding concepts and principles learned in classroom. The College's new Science Facilities are located in the ground floor of Constantinidis Hall. The facilities include three laboratories (Biology/Ecology, Physics, Chemistry) covering a total area of 300 square meters.

FOOD SERVICES

The ACT Cafe, rented on a contract to a professional food service provider, is also located in the Constantinidis Hall and operates weekdays from 10:00 - 18:30 (Fall – Spring semesters) and 11:00 - 14:00 (Summer term—hours flexible) when classes are in session. The cafe offers an assortment of cold and hot sandwiches, coffee, salads and beverages.

HOUSING

ACT housing is available on a first come, first served basis and priority is always given to freshmen. Apartments are all shared and have both single and double rooms, common area, kitchen and bathroom. All interested students must complete a Housing Application in order to be considered for on-campus housing.

The Student Services Coordinator will assist students in locating off-campus housing in local residential areas. A list of trusted real estate agencies and property owners who speak English will be made available for interested students. ACT does not have any official relationship with housing agencies and

does not endorse any specific agency. With all off-campus housing, students are responsible for personally contracting with the landlord but ACT will provide guidance and assistance. Regular announcements about available flats around the city are made on the ACT housing Facebook group. Students can also refer to this Facebook group in order to find roommates or shared housing.

13. **DETERMINATION OF RESULTS** ([Link to OU Regulations](#))

MINIMUM REQUIREMENTS FOR PASS

To obtain an Open University award students are required to complete all parts of the programme's approved assessment and comply with all regulations relating to their programme of study.

The minimum aggregate pass marks for The Open University validated awards are:

- 40% for undergraduate programmes
- 50% for postgraduate programmes

These minima apply to assessments, modules, stages and qualifications.

DETERMINING MODULE OUTCOMES

The overall module mark or grade shall be determined as set out in the assessment strategy detailed in the module specification and published in the Programme Handbook.

A student who passes a module shall be awarded the credit for that module. The amount of credit for each module shall be set out in the programme specification and published in the Programme Handbook.

In order to pass a module a student must achieve the requirement of the module as set out in the module specification and published in the Programme Handbook.

Where a student is registered only for a module (rather than a qualification) the resit will apply.

BACHELOR HONOURS DEGREE CLASSIFICATION

Classification of bachelor degrees will be based on the average mark across all modules within Stage 3 (usually Credit Level 6) and Stage 2 (usually Credit Level 5) at a ratio of 2:1 respectively unless the requirements of a Professional, Statutory and Regulatory Body (PSRB) state otherwise.

Honours degrees are classified as:

- First class Aggregate mark of 70% or above
- Upper Second class Aggregate mark between 60% and 69%
- Lower Second class Aggregate mark between 50% and 59%
- Third class Aggregate mark between 40% and 49%

Where students have directly entered a Qualification Level 6 top-up award (e.g. having previously undertaken a Higher National Diploma (HND) or Foundation Degree (FD) award) the calculation for the honours classification will be based solely on all credits at Credit Level 6.

Performance in work for which an award of credit for prior learning has been made is not taken into account in the calculation of the final award.

Where the final result of the classification calculation creates a mark of 0.5% or greater this will be rounded up to the next full percentage point (e.g. 69.5% is rounded to 70; 59.5% to 60%; and so on). Where the calculation creates a mark below 0.5% this will be rounded down to the next full

percentage point (e.g. 69.4% is rounded to 69%; 59.4% to 59%; and so on). For the purposes of rounding up or down, only the first decimal place is used.

All awards recommended by ACT's Examination Boards are ratified by The Open University's Module Results Approval and Qualifications Classification Panel (MRAQCP). Results will not be issued to students until they have been ratified by MRAQCP, and formal notice has been received that they can be released.

14. **ASSESSMENT AND PROGRESSION REGULATIONS** ([Link to OU Regulations](#))

SUBMISSION OF ASSESSED WORK

Work submitted for a summative assessment component cannot be amended after submission, or re submitted.

Student requests for extensions to assessment deadlines will not be approved unless made in accordance with published partner institution guidelines as approved by The Open University.

Where coursework is submitted late and there are no accepted extenuating circumstances it will be penalized in line with the following tariff:

Submission within 6 working days: a 10% reduction for each working day late down to the 40% pass mark and no further.

Submission that is late by 7 or more working days: submission refused, mark of 0. A working day is defined by the partner and submission after the deadline will be assumed to be the next working day.

ASSESSMENT SCORES

All undergraduate assessment will be marked on a percentage scale of 0-100.

% Scale Score	Performance Standard
70+	Excellent pass
60-69	Very Good pass
50-59	Good Pass
40-49	Pass
0-39	Fail

The final grade for an individual assessment component will be determined after completion of a quality assurance process (e.g. moderation, remarking) as detailed in the partner institution's OU approved policy for moderation.

Where the result of the assessment calculation creates a mark of 0.5% or greater this will be rounded up to the next full percentage point (e.g. 69.5% is rounded to 70; 59.5% to 60%; and so on). Where the calculation creates a mark below 0.5% this will be rounded down to the next full percentage point (e.g. 69.4% is rounded to 69%; 59.4% to 59%; and so on). For the purposes of rounding up or down, only the first decimal place is used.

DETERMINING PROGRESSION AND QUALIFICATION OUTCOMES

The paths through which students are required to progress through the programme, and the elements identified as compulsory or optional, are set out in the programme specification and approved in the validation process.

Pathways through any programmes offered by partner institutions may require students to complete prerequisite or co-requisite modules.

STAGE REQUIREMENTS

Each of the stages of an undergraduate programme is expected to consist of a total of 120 credits.

In cases where Programmes are not divided into stages (for example, most postgraduate programmes and undergraduate programmes of 120 credits or less) the provisions below apply to the whole programme.

In order to complete and pass a stage of a programme, a student must acquire the total credit set out in the programme specification at the approved qualification level for the award, or have been exempted through advanced standing, or through the implementation of the processes covering extenuating circumstances (see Section F).

The credit value of each module contributing to a stage determines its weighting in the aggregation of credit for a stage.

Where a student fails a module, the following may apply in the first instance:

- Resit, a second attempt at an assessment component following a failure at first attempt.
- Compensation, the award of credit by the Board of Examiners for a failed module(s) on account of good performance in other modules at the same credit level where the learning outcomes have been met.

RESIT PROVISION

Resit provision is subject to all the following conditions:

- The maximum number of retakes allowed in a programme leading to an Open University award is 10.
- A student who does not complete the resit by the date specified shall not progress on the programme, except in cases where the process for allowing extenuating circumstances has been followed.
- Resits can only take place after the meeting of the Board of Examiners or following agreement by the Chair and the External Examiner of the Board.
- A student who successfully completes any required resits within a module shall be awarded the credit for the module and the result capped at the minimum pass mark for the module.

15. DISSERTATIONS AND PROJECTS

HOW THE BISSELL LIBRARY SUPPORTS STUDENTS WITH THEIR THESES

The Bissell library in its effort to compliment and facilitate the educational process and the curriculum, always strives to provide the best services possible safeguarding that all students across all Divisions receive the same learning experience and support, as well as fair access to all available resources and services. More specifically when it comes to the writing up stage of their theses, the Bissell Library provides the following Resources and Support Services.

Resources :

- A collection of thesis writing books, academic writing and general study skills. This collection is housed in the Learning Hub
- Subject guides corresponding to the Divisions also provide a thematic information gateway of trustworthy information resources (e-journals, databases, etc.) to assist students in their quest for information gathering for their theses.

- The website of the Library, attempts to familiarize and provide introductory guidance on how to use various online tools such as Zotero, EasyBib and Diigo, which can become indispensable tools when it comes managing information and bookmarks, and citing resources.
- Guides have been composed to assist students with the OU Harvard referencing style (available on the library website)
- The Library in conjunction with all Divisions has streamlined the procedure of gathering all theses so as to develop in the near future an Institutional Repository. In the meantime students can drop in any time and can have access to study good examples of theses on site.
- Last but not least a plethora of printed material in a variety of subjects is also available to students.
- The students are able to ask for Interlibrary loans of journal articles we do not have online access to. The service is provided by the British Library. They are also able to suggest books relevant to their research to the library to buy.

Support Services:

- The Learning Hub strives to help students to become strong, independent learners through a variety of services. The assistance stretches through all stages of the learning process whether it is revising thesis writing, math, reading, or just refining those digital skills. Consultation is offered on one to one basis on prearranged meetings, or drop in sessions, as well as via e-mail.
- The allocation of two Academic Liaison Librarians as well as Division Academic staff reps allow for better communication among students, academic staff and the Library. This helps students and academic staff to convey in a more efficient manner their needs to the Library.
- Information Literacy lessons conducted by the Academic Liaison Librarians offer students a reminder of research, evaluation and referencing skills to support them in their project. This comes as a continuation of previous Information literacy teaching offered in the previous years of study, more specifically in English 101 which includes 6-Information literacy sessions. These sessions include: techniques on how to locate formal and informal information sources on subjects, evaluation of resources, plagiarism and paraphrasing, and referencing.
- Finally the Academic Liaison Librarians provide one to one support on how to search, evaluate and locate materials and referencing, either in drop in sessions or after appointments.

16. OTHER INSTITUTIONAL POLICIES AND REGULATIONS ([Link to OU Regulations](#))

ACADEMIC MISCONDUCT

Academic misconduct is defined as any improper activity or behavior by a student which may give that student, or another student, an unpermitted academic advantage in a summative assessment. In investigating and dealing with cases of suspected misconduct, partner institutions will follow the policies and processes approved at Institutional approval or review.

The following is a non-exhaustive list of examples of academic misconduct which will be considered under these Regulations:

- **Plagiarism:** representing another person's work or ideas as one's own, for example by failing to follow convention in acknowledging sources, use of quotation marks, etc. This includes the unauthorized use of one student's work by another student and the commissioning, purchase and submission of a piece of work, in part or whole, as the student's own.

Note: Where a student has an acknowledged learning disability, a proof-reader may be used to ensure that the student's meaning is not misunderstood as a result of the quality and standard of writing, unless a partner institution policy specifically prohibits this. Where permitted, a

proof-reader may identify spelling and basic grammatical errors. Inaccuracies in academic content should not be corrected nor should the structure of the piece of work be changed.

- Collusion: cooperation in order to gain an unpermitted advantage. This may occur where students have consciously colluded on a piece of work, in part or whole, and passed it off as their own individual efforts or where one student has authorized another to use their work, in part or whole, and to submit it as their own.

Note: legitimate input from tutors or approved readers or scribes is not considered to be collusion.

- Misconduct in examinations (including in-class tests).

ACADEMIC OFFENCES

An academic offence (or breach of academic integrity) includes any action or behavior likely to confer an unfair advantage, whether by advantaging the alleged offender or by disadvantaging another or others. Examples of such misconduct are plagiarism, collusion, cheating impersonation, use of inadmissible material and disruptive behavior. Responsibility for reviewing breaches of academic integrity is held by the college's Academic Standards and Performance Committee (AS & PC).

Charges against a student for violating academic integrity may originate from any source: a faculty member, an administrator, a staff member, a fellow student, or from the community at large. The charges are to be submitted in writing to the chair of the AS&PC. If a member of the Committee originates the charge, then that member will be excluded from the decision-making process, and any other process related to the case.

On receipt of the allegation of a breach of academic integrity, the Chair of the AS&PC must inform the Chair of the Board of Examiners that is responsible for the assessment of the course(s) that are affected by the alleged offence. The Board should then suspend its decisions on the candidate's grade(s) until the facts have been established.

The AS&PC will either itself investigate the charge or establish from its own membership a panel to conduct the investigation. In establishing whether a breach of academic integrity has occurred, the Committee (or panel) should consider oral and/or written evidence supplied by the individual(s) making the charge and the alleged offender. The alleged offender shall have the right to appear before the Committee (or panel).

Once the AS&PC has considered the allegation and reached a conclusion on whether an offence has occurred, it should issue a report with a recommendation regarding the outcome for the student to the Chair of the relevant Board of Examiners. If it has been established that an offence has occurred, the Board will judge the significance of the misdemeanor and exercise its discretion as appropriate to the case. If it is established that a student has attempted to gain an unfair advantage, the examiners shall be given the authority to rule that the student has failed part or all of the assessments, and the authority to determine whether or not the student should be permitted to be reassessed.

Independently on the assessment decisions made by the Board of Examiners, the AS&PC is empowered to consider a wider range of sanctions that might be applied when a student is found guilty of a breach of academic integrity. The following list of sanctions is indicative and can be imposed by majority vote of the Committee:

- Admonishment Letter (or Letter of Warning): The student is advised in writing that her/his behavior violates rules of academic and/or personal integrity and that a recurrence will lead to more serious sanctions. The Committee will deliberate on whether the letter should or should not appear in the student's file permanently or for a lesser period of time.

- **First Offense File:** The student's name and a description of the offense is filed in a shared electronic folder, accessible by the Provost, department chairs and area coordinators. Second offenses automatically result in a hearing.
- **Disciplinary Probation:** The student is advised in writing that his/her behavior violates rules on academic and/or personal integrity and is given a probationary period (to be decided upon by the Committee) to show by good behavior that a more stringent penalty should not be imposed. During the period of the probation, the student is required to terminate association with all extra-curricular activities and resign from any student office.
- **Suspension:** The student's relationship with the College will be discontinued until the end of the semester or term. The student will forfeit any fees involved with the College.
- **Dismissal:** The student's relationship with the College will be terminated indefinitely. The right to apply for re-admission shall be denied.

Within five working days of receipt of the decision, either party (plaintiff or student) has the right to make a formal written appeal against the decision of the Committee. The appeal is addressed first to the AS&PC. If the Committee does not deem any change to the decision is warranted subsequent to consideration of the appeal, the appeal may then be brought to the Academic Council, and subsequently to the President whose decision is final.

EXTENUATING CIRCUMSTANCES

The Open University recognizes that students may suffer from a sudden illness, or other serious and unforeseen event or set of circumstances, which adversely affects their ability to complete an assessment, or the results they obtain for an assessment. In such cases the partner institution's extenuating circumstances procedures will be applied, as approved in institutional review.

A student who is prevented from attending or completing a formal assessment component or who feels that their performance would be (or has been) seriously impaired by extenuating circumstances, may submit a deferral request to the AS&PC.

MITIGATING CIRCUMSTANCES

The following regulations distinguish between factors or circumstances which were known to the student in advance of taking an assessment and which affect his or her ability to attend an examination or submit work by the published deadline, and those which have not impaired the student's ability to attend for examination or meet a deadline for the submission of work but which may have affected his or her performance. In all cases, it is the responsibility of the student to ensure the timely disclosure of any factors or circumstances which may affect the assessment of his or her learning and responsibility for the consideration of these factors and circumstances will lie with the AS&PC.

Students whose circumstances may affect (or may have affected) their ability to meet a program's assessment requirements must submit a completed Mitigating Circumstances Extension Form together with verifiable documentation to the Registrar's Office. This form can be completed electronically or in person and may, if necessary, be signed retrospectively.

In the case of factors or circumstances which were known to the student in advance of taking an assessment and which affect his or her ability to attend an examination or submit work by the published deadline:

- the AS&PC will consider the evidence submitted by the student;
- if the mitigating circumstances are accepted by the Committee it will determine the extension to be granted to the student or, in the case of examinations, the date on which the student shall be assessed; in such cases the grades will not be capped at 40%.

- the Chair of the Board of Examiners, the Registrar and the appropriate department head/area coordinator will be informed of the Committee's decision.
- The student will have the right to apply for a further extension, or for a rescheduling of an examination, if the mitigating circumstances persist.

In the case of factors or circumstances having prevented a student from attending for examination or meeting a deadline for the submission of work but which may have affected his or her performance:

- the AS&PC will review the evidence submitted by the student and make a recommendation for consideration by the appropriate Board of Examiners;
- the Board of Examiners is responsible for considering that action that it should take in the light of the recommendations of the AS&PC;
- the actions available to the Board of Examiners include: the deferral of an assessment to a later date; compensation for the failure in a course; agreement that the student should either retake the course or be reassessed with the grade achieved being recorded in the student's transcript and therefore contributing to the classification of the award; and, exceptionally a decision that the student be assigned a higher grade for the course or courses on which his or her performance has been affected.

Students are responsible for ensuring that the partner institution is notified of any extenuating circumstances at the time they occur and for supplying supporting documentation by the published deadline.

If a student is unable to attend an examination or other assessment event because of extenuating circumstances, they must inform the Partner institution as soon as possible and provide supporting evidence before published deadlines or within 7 calendar days, whichever is sooner. If a student cannot submit evidence by published deadlines, they must submit details of the extenuating circumstances with an indication that evidence will be submitted within 7 calendar days.

Medical evidence submitted in support of a claim for extenuating circumstances should be provided by a qualified medical practitioner.

Upon receipt of recommendations from the panel or body responsible for investigating extenuating circumstances, the Board of Examiners, or its subsidiary board, will decide whether to:

- provide a student with the opportunity to take the affected assessment(s) as if for the first time i.e. a 'sit' or 'submit', allowing them to be given the full marks achieved for the examination or assessment, rather than imposing a cap;
- waive late submission penalties;
- determine that there is sufficient evidence of the achievement of the intended learning outcomes from other pieces of assessment in the module(s) for an overall mark to be derived;
- note the accepted extenuation for the module(s) and recommend that it is taken into account at the point of award and classification.

The Board of Examiners, depending on the circumstances, may exercise discretion in deciding on the particular form any reassessment should take. Options are a viva voce examination, additional assessment tasks designed to show whether the student has satisfied the programme learning outcomes, review of previous work, or normal assessment at the next available opportunity. The student will not be put in a position of unfair advantage or disadvantage: the aim will be to enable the student to be assessed on equal terms with their cohort.

The module marks released following the meeting of the Board of Examiners should clearly identify results where extenuation has been considered and applied.

If a student fails, without good cause, to provide the responsible body with information about extenuating circumstances within the timescales specified in the partner institution policy, the responsible body has authority to reject the request on those grounds.

17. STUDENT PARTICIPATION AND EVALUATION

STUDENT PARTICIPATION

A member of the Student Government Association (SGA) must be present at all meetings of the Academic Standards and Performance Committee (ASPC) of the college, and participate in the discussions and voting for all cases examined. Furthermore, there are scheduled weekly meetings between the Associate Dean of Students and the SGA, where students present their views on the operation and development of the College. In addition, ACT may invite students to Academic Council meetings, where they can express their views and opinions to the top-level administration. The SGA is also involved in co-organizing major on-campus events.

MODULE EVALUATION

Module evaluation is conducted through the student evaluation forms. These forms measure the teaching quality and assessment methods, learning materials, delivery methods, course objectives, thought-provoking activities, comprehension of the subject matter, grading, degree of intellectual challenge and stimulation and draw comparisons with other courses.

The collection of student feedback is made at the office of the Associate Dean of Students, who has the general overview of the procedure. Then, modules are classified according to the programme they belong, and the feedback is sent to the corresponding department head. The results are also forwarded to the individual instructors. The outcomes of module evaluations are discussed between the Associate Dean for Academics and the department heads, and also in the departmental meetings of all divisions. In all these meetings, measures that need to be taken to improve student experience in future offerings of the modules are discussed.

COLLEGE-WIDE FEEDBACK

At the college level, ACT is administering another survey to measure both educational and other aspects of student life and behaviors. The survey, named College Student Experiences and Learning Outcomes (CSELOA) is aiming at measuring self-perceptions of students and has two parts. The first part measures student learning outcomes and the second measures student behaviors and experiences. The questionnaire includes a diverse spectrum of variables relating to academics, faculty, student services, student-to-student and student-to-faculty interactions, sense of community, use of campus facilities, academic skills, communication, after-college preparation for graduate studies or work, and off campus study and life behaviors.

18. GENERAL READING LIST (NOT MODULE SPECIFIC), INCLUDING ELECTRONIC RESOURCES

The following list is constantly updated:

- Smith, A., Collene, A., and Spees, C., Wardlaw's Contemporary Nutrition, 12th Edition, McGraw Hill Education, ISBN10: 1259709965, ISBN13: 9781259709968, 2021
- OpenStax Biology, 2nd edition, OpenStax, Rice University, 2018
- J.Foster, Z. Aliabadi, and J. Slonczewski, Microbiology: The Human Experience 2nd edition, ISBN: 978-0-393-53324-8 (print), ISBN: 978-0-393-68079-9 (ebook), Norton, 2019

- Hartl, D., Essential Genetics: A Genomics Perspective, 7th edition, Jones and Bartlett, 2020
- David L. Nelson; Michael M. Cox, Lehninger Principles of Biochemistry, 8th Edition ISBN:9781319322328, MacMillan Learning, 2021\
- Thomas D. Pollard & William C. Earnshaw & Jennifer Lippincott-Schwartz & Graham Johnson, Cell Biology, 3rd Edition, Elsevier, 2017
- Michael Barer, W L Irving, Medical Microbiology, A Guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Investigation and Control, 19th edition, ISBN: 9780702072000, Elsevier, 2018
- An Introduction to Applied Epidemiology and Biostatistics, 3rd edition, CDC, 2012
- Schneider, M., J., Introduction to Public Health, 5th edition, Jones & Bartlett Learning, 2017
- Frumkin, H., Environmental health: From global to local (Third ed.), Jossey-Bass, A Wiley Brand, 2016
- A Textbook of Modern Toxicology, 4th Edition, Wiley, 2011
- Wink, M., An Introduction to Molecular Biotechnology: Fundamentals, Methods and Applications, 3rd Edition, ISBN: 978-3-527-81288-2, Wiley, 2020
- Parham, P., The Immune System, 4th edition, Taylor & Francis, 2015
- Thomas R. Gilbert, Rein V. Kirss, Stacey Lowery Bretz, Natalie Foster, Chemistry: An Atoms-Focused Approach Third Edition, ISBN-13: 978-0393697353, Norton, 2022
- Wade, L.G. and Simek, J.W., Wade Organic Chemistry, 9th Edition, Pearson, ISBN10: 0321971124, Pearson, 2019
- OpenStax Anatomy and Physiology, OpenStax, Rice University, 2017
- Ismay, Chester, and Albert Y. Kim., Statistical inference via data science: A ModernDive into R and the tidyverse., <https://moderndive.com>, 2019
- Online Statistics Education: An Interactive Multimedia Course of Study, <http://onlinestatbook.com/2/index.html>, Open Source, 2014.
- James Stewart, Daniel Clegg, Saleem Watson, Calculus, 9e, International Metric Version, Cengage, 2020
- David B. Massey, Worldwide Differential Calculus, , ISBN-10: 0-9842071-9-8, ISBN-13: 978-0-9842071-9-0, Routledge, 2015
- Manuel C. Molles Jr., Ecology: Concepts and Applications, 8th edit, McGraw-Hill, 2019
- Sandra Laursen, Anne-Barrie Hunter, Elaine Seymour, Heather Thiry, Ginger Melton, Undergraduate Research in the Sciences: Engaging Students in Real Science, ISBN: 978-0-470-62563-7, (eBook), Wiley, 2010

Online Sources:

- www.sciencedirect.com

19. ACT ORGANISATION FLOWCHART

ACT
Organizational Chart
13.01.2022

