

University of Greenwich

School of Science

in partnership with

October University for Modern Sciences and Arts

Faculty of Biotechnology

Curriculum

BSc (Hons) Biotechnological Sciences

Programme Submission Document

2015

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October university for Modern Sciences and Arts

Faculty of Biotechnology

Vision

Faculty of Biotechnology in October University for Modern Sciences and Arts seeks to provide an outstanding biotechnology program and research that is recognized on the local, regional and international levels.

Mission

Faculty of Biotechnology is a comprehensive learning and teaching institution offering high quality innovative biotechnology instruction. Faculty of Biotechnology mission is to offer well-educated biotechnology graduates with scientific background and laboratory skills to render them competent to solve problems, conduct research, and create goods and services in the various fields of Biotechnology on the national, regional and internationally levels.

1. Programme Details

Host School : Faculty of Biotechnology
Award Titles : B.Sc. Biotechnological Sciences
Mode of Study : Full time

2. Supporting statement

The main aim of the Biotechnology programme at MSA is to graduate well-educated biotechnologists with the scientific background and laboratory experience necessary for employment in the fields of biotechnology including Medical, Pharmaceutical, Agricultural, Environmental and industrial biotechnology. It is tailored to comply with the requirements of the Committee Sector for Biotechnology Education (CSBE) and the Egyptian Supreme Council of Universities (ESCU).

3. Introduction

3.1 Introduction to MSA University

October University for Modern Sciences and Arts (MSA) was established under Presidential Decree No. 244 in 1996 to introduce state-of-the-art technologies and concepts in all disciplines.

As an institution, MSA is a natural outcome of over 40 years of experience in the field of education, at local and international levels. Dar El Tarbiah was the first Language School founded by Egyptians in 1956. The institution has maintained an excellent reputation based on the high quality of teaching and facilities; it has been recognized locally and internationally

for the excellent results of its GCE, IGCSE, GCSE as well as the Egyptian General Certificate of Education and the American Diploma programmes. Our success in teaching all AL (Advanced Level) and AS (Advanced Subsidiary) subjects for almost 12 years with outstanding results in the IGCSE has been the driving force in the establishment of the MSA University.

The Bachelor degree in Biotechnological Sciences is a four year full time programme of study aimed primarily at educating and training graduates for the medical, pharmaceutical, agricultural, environmental, and industrial biotechnology as well as advanced applications of biotechnology. The Faculty of Biotechnology at the MSA aims at fulfilling an urgent academic and national need for establishing faculties that cater for a growing demand for graduates in the scientific and technological fields.

MSA Faculty of Biotechnology introduces a solid basis and hands-on experience needed in this field, through work on campus and internships with biotechnology-related firms, allowing students to grasp the latest trends in biotechnological sciences. MSA University believes that such knowledge is essential for Egypt to take the lead in biotechnological fields on both the domestic and regional levels. This is important for the development of Egyptian economy under the World Trade Organization (WTO) regulations taking effect in 2005.

MSA aims to provide its students with an exceptional and enjoyable learning experience that will enable them to successfully compete in the highly competitive global job market. Furthermore, the long experience of Dar El Tarbiah Institution and MSA University in the field of education has made us determined to adopt the British system of education because of its unique characteristics of providing a "well rounded" student able to face the exciting challenges of the future.

3.2 The Faculty of Biotechnology at MSA

MSA Faculty of Biotechnology offers state-of-the-art courses covering a wide spectrum of biotechnological sciences applications in health, agriculture, industry, pharmaceuticals and environment, in fulfillment of the rules and regulations of the Supreme Council for Egyptian Universities. MSA Faculty of Biotechnology offers up-to-date courses that cover a wide spectrum of biotechnological sciences, within the framework of the rules and regulations of the ESCU as well as of our British partner.

These courses are carefully tailored to cover the knowledge gap in fields like gene therapy, drug design, genomics, proteomics, genetic engineering for plants, animals, microorganisms, bioinformatics and fermentation technology.

Biotechnology students at MSA University are exposed to the rapidly growing information revolution in the biotechnological sciences, and are supplied with the latest laboratory equipment worldwide. Huge investments are geared to provide excellence in scientific education.

MSA Faculty of Biotechnology trains biotechnologists to play an active and creative role in their profession. Graduates may take up a career in medical gene therapy, pharmaceutical; production of genetically engineered drugs, microbiology, virology, agricultural, environmental science and forensic science.

4. Introduction to Biotechnological Sciences

Biotechnology is the vocational discipline of molecular biology, which is related to:

- A-** Medical and pharmaceutical aspects of health care for the benefit of patients. Thus, it is defined by the application in a health care setting through:
 - I. Gene Therapy (Genetic Disorders, Gene Target Selection, Gene Delivery Methods, Viral vectors)
 - II. Stem Cells (Therapeutic Cloning and Embryonic Stem Cells)
 - III. Production of vaccines
 - IV. Monoclonal Antibodies.
 - V. Drug discovery and drug development.
- B-** Agricultural sector; aiming at :
 - I. Producing transgenic plants resistant to indigenous biotic and abiotic stress.
 - II. Reducing the use of agrochemicals and pesticides, and their environmental risks.
 - III. Tissue culture for producing plant-free virus and for plant propagation.
- C-** Environmental: through studies of the applications of biotechnology to solve environmental problems:
 - I. Waste water purification, potable water production, solid waste treatment and soil and sediment clean-up.
 - II. Newer developments; biopesticides, bioremediation of recalcitrant pollutants and biosensors for environmental monitoring.
- D-** Industrial: by use of “clean” technologies to make fundamental changes in pollution levels and resource consumption:
 - I. Renewable energy as in the use of bioethanol.
 - II. Green plastics to replace petroleum derived polymers with biological polymers derived from grain or agricultural biomass.
 - III. Manufacturing of biotechnological products
- E-** Homeland defense and National Security:

- I. Vaccines for infectious agents (eg. Anthrax) that may be used in biological assaults.
- II. DNA fingerprinting for the use in forensic science and identifying the true biological parents; Paternity.

Biotechnology students gain insight into the precise details of cell processes: the specific tasks assigned to various cell types; the mechanics of cell division; the flow of materials in and out of cells; the path by which an undifferentiated cell becomes specialized; and the methods cells use to communicate with each other, coordinate their activities and respond to environmental changes.

Their education takes four years, in which they will:

- develop in-depth knowledge and skills in the fields of biochemistry, instrumental chemical analysis, bioprocess engineering and manufacturing processes
- complete projects using the latest in bioinformatics computer technology
- learn how to work in a safe and ethical manner recognizing the importance of biosafety and industry regulations
- study theoretical core subjects such as biology, Microbiology, chemistry, Biochemistry, physics and mathematics. Other foundation topics will include genetics, molecular biology.
- develop problem-solving abilities and important communication skills including seminar presentation and report writing and courses in Marketing / IPR

5. Career prospects

The career outlook in the field of biotechnology is very promising. The proliferation of new technologies is expanding employment opportunities in research, production, development and manufacturing.

- Clinical Human Genetics (molecular & cancer genetics and gene therapy)
- Genetic counseling
- Clinical molecular diagnostic laboratories (public and private)
- Pharmaceutical industry
- Biotech industry
- Plant genetics and tissue culture
- Food industry
- Forensic sciences
- Bioinformatics and biostatistics companies
- Environmental biotechnology organizations
- Research institutes (Lab Assistant, Research Associate, Postdoctoral Research Scientist, Scientist, Associate Scientific Director, Scientific Director, Project Manager and Technical Services Manager)
- Academic careers

The breadth and multi-disciplinary character of the biotechnology degree, along with the ever-changing nature of biotechnological services, places biotechnologist in a pivotal place for unlocking the mystery of life and improve the quality of life.

6. Themes and concepts underpinning biotechnology education:

Biotechnology is a burgeoning force in the national and global economy in this century. We are witnessing a biotechnological revolution that has grown to encompass almost every aspect of our daily lives: health and medicine, food and agriculture, the environment, business, and industry. Rapid advances in genome science are opening up a multitude of new business opportunities in the life sciences-related industries. To accompany this growth, manpower appropriately trained and educated in biotechnology is certainly needed.

The B.Sc. degree in Biotechnology program was designed not only in anticipation of this need but to provide an alternative graduate program to students who desire a short time-to-degree, and whose career objectives go beyond academic research. It aims to provide students with a broad training and education in biotechnology encompassing the science, business, legal, social and ethical aspects to enable students to explore wide career opportunities. Learning is multidisciplinary, innovative and emphasizes hands-on learning of the basic principles and techniques that are very important to

biotechnology. The required core courses are designed to cover the broad aspects of biotechnology and the elective courses are dependent on the student's particular interest or area of specialization. Intensive laboratory courses in molecular biology techniques and bioprocessing techniques are part of the core requirements.

7. Programme aims

This undergraduate programme is designed for students who are intrigued by the opportunity to work in a world of stem cells, DNA, xenobiotics and molecular science.

MSA seeks to graduate an army of Biotechnologists, armed not only with the academic knowledge but also with the skills and abilities to invade the challenging Biotechnology industries & a strong will and sheer motivation directed towards the improvement of life.

Graduates keen on making a difference in the world, by treading into the unventured realms of Biotechnology, and insistent upon reaching their goal and influencing the world around them.

Our aim is to prepare bright young scientists for a challenging career in medical, pharmaceutical, agricultural, industrial and environmental biotechnology.

8. Programme Specification

(A) BSc Biotechnological sciences

1. Awarding institution: October University for Modern Sciences and Arts (MSA).
2. Teaching institution: Faculty of Biotechnology, MSA.
3. Programme accredited by: ESCU and CSBU.
4. Final Qualification: BSc Biotechnological Sciences.
5. Academic year: 2012/2013
6. Years of study: 4 years
7. Reference Points.

The following references were used in designing the programme:

- Supreme Council of Egyptian Universities (ESCU) regulations.
- QAA Guidelines for programme specifications.
- MSA University Council.
- Faculty of Biotechnology Board Council.

9. Access policy

MSA is an equal opportunity education institution that accepts students from diverse backgrounds, so long as they fulfill the requirements set by the ESCU.

Minimum Entry Requirements

MSA has to follow the regulations and requirements of the Egyptian Supreme Council and the Egyptian Admission Office for Students Recruitment, which are subjected to changes on a yearly basis. However, the students have to pass the English placement test that is required by MSA University before getting enrolled.

	Thanaweya Amma (Egyptian secondary education certificate)	I.G.C.S.E	American Diploma
Minimum Requirement	As per national standards	Eight "O" levels or Seven "O" levels + (One "AS" / One A level), Including the required subjects.	SAT (1) 800, eight subjects, including the required subjects.
Subjects Required	Science section	English (Language or Literature), Math, Biology, Chemistry and Physics.	English, Math, Biology, Chemistry and Physics.

Equivalence Committee

An Equivalence Committee, comprising two Faculty members in addition to the programme leader has been established. The committee is responsible for reviewing the transferable course descriptions and takes decisions regarding students transferring from other universities to MSA and reports to the university president and the admission office.

10. Programme Structure

The BSc in Biotechnology degree requirements are designed for completion in four years. Students admitted to the program start in the Fall semester and proceed through the required courses as a cohort. Graduates of this program are expected to have the knowledge and skills needed to assume roles in various areas of biotechnology: as academic educators, as scientists in both academic and industry settings, as members of decision-making business and management teams in government and biotechnology firms, as bioentrepreneurs, and as members and leaders of governmental, public, and private organizations that deal with social, ethical and legal issues in biotechnology.

11. The overall programme structure

Programme structure and requirements, levels, courses, credits and awards:

- Number of credits: minimum of 140 credit hours.
- Levels: 1, 2, 3 and 4 Levels.
- Award: B.Sc. Biotechnological Sciences.

MSA Faculty of Biotechnology offers a four-year programme inclusive of a preliminary year. During this preliminary year the Faculty provides intensive training in English, the language of instruction of courses. It also provides computer skills that are essential to introduce students to the technological revolution that continually produces fresh information, and help them monitor such breakthroughs on the internet and universities worldwide.

The degree is awarded upon successful completion of the Biotechnology programme comprising 169 credit hours, normally completed in four academic years (8 semesters). Each semester is composed of 14 weeks excluding the final examination period.

The programme is divided into study units called courses. Each course on average has a load of 3 credit hours. Courses are designated at levels 1,2,3 and 4 indicating progressively more advanced studies. A system of prerequisites is used to ensure that a student taking a course has undertaken the necessary preparatory work.

The BSc Biotechnological Sciences degree is granted to students who successfully complete a minimum of 140 credit hours divided as follows:

- 19 credit hours of University requirements.
- 9 credit hours of collateral requirements.
- 112 credit hours of core requirements.

* The 19 credit hours of University requirements are English Language, Computer Science and Mathematics courses.

** The 9 credit hours of collateral requirements are courses that tackle aspects in Marketing & Management Sciences, Regulatory & Ethical aspects of Biotechnology and Research and Seminar.

*** The 112 credit hours of concentration requirements are the courses that cover aspects like: Biology, Chemistry, Genetics, Biotechnology, Microbiology, Physics, Biochemistry, and Biochemical Engineering & Instrumentation.

12. Teaching and learning Strategy

A series of lectureships and seminars from leading scientists and academic and industry mentors expose students to cutting edge science and to the business, legal, social and ethical issues in biotechnology. Team working and communication skills are encouraged through the various courses and through the required industry internship and research project. Although a thesis is not required, students are expected to submit a written report of their research project to develop their ability for scholarly research and writing.

The programme is delivered through the use of:

- Lectures (including visual aids, audio and audio-visual materials): mainly designed as presentations, providing knowledge and guidance in learning. External visiting lecturers are encouraged to demonstrate the practical applications of the theoretical studies to students.
- Group Tutorials: linked to lecture topics and requiring directly taught and independently acquired information from primary and secondary information sources.
- One to one tutorials: for advice and feedback on assignments, supervision of final year projects and personal tutoring.
- Laboratory Classes: for developing practical skills associated with the subject matter.

- Seminars: an interactive way of teaching including a variety of presentations, discussion groups, simulation and role-play. They emphasize and demonstrate the ideas gained and concepts comprehended. They also develop communication and problem solving skills.
- Guided independent Study: includes researches and assignments associated with lectures, laboratory classes and seminars. It is based on the library references given by the lecturers and the internet. It represents an effective independent way of learning.
- Academic counseling: it informs students of the rationale, content, aims and objectives of the programme as a whole through open discussion of timetables and activities especially in the early stages of the course.
- Visits: The MSA University programme aims at having links with the Biotechnology industry. Students are allowed to have visits to Biotechnology Research labs under supervision of staff members. The University also invites distinguished speakers in the field of biotechnology. MSA is planning in the future to establish an employer's advisory panel to help students find good career.

Students are required to work individually (typically whilst collating and researching information for the research project, tutorial work and laboratory classes and reports) and cooperatively in pairs and small groups (problem solving work in workshops and laboratory classes). At the beginning of their undergraduate studies, students are provided with handbooks on the departmental infrastructure and procedures, programme and module information and examination structure.

Students progress through their programme by successfully completing tasks ranging from descriptive understanding, data analysis and interpretation and problem solving. Each stage of the programme is supported by laboratory classes which provide training in the acquisition of manual practical skills and in the collection of good quality and consistent data from different instrumentations and other sources. The complexity of tasks, planning required to complete laboratory work and scope for individual interpretation increases as time progresses, culminating in the research project allowing for independent thought.

Discussion is prompted by worked problems included in lectures and tutorial sessions to promote understanding within the subject area. Directed reading (including material on the learn server and internet) provides the opportunity to broaden subject knowledge and put information in context. Scientific measurements are performed in laboratory sessions under supervision to provide training in the acquisition of good quality data using different methods

and different instruments. Tutorial groups develop skills associated with the development of scientific argument and problem solving by oral discussion with their peers and tutor. Computational and data processing skills are tested through the use of graphical drawing, presentation packages, numerical problems, the use of spreadsheets, chemical analyses and data processed reports (compulsory in final year projects).

13. Assessment guides and regulations

The rules and regulations for assessment and progression are as follows:

13.1 Assessment strategy

The assessment measures the outcome of students' learning in terms of knowledge acquired, understanding developed, and skills gained. The assessment strategies encompass diagnostic assessment (to provide an indicator of the student's aptitude and preparedness for a programme of study and identifies possible learning problems), summative assessment (to provide a measure of achievement or failure made in respect of the student's performance in relation to the intended learning outcomes of the programme of study) and formative assessment (to provide students with feedback on progress and informs development. But it does not contribute to the overall assessment). Coursework is commented upon critically and constructively with written and verbal feedback accompanying the returned work in order to allow the students to improve their understanding and intellectual development.

Assessment of knowledge and understanding is by:

- Written unseen examination (which may contain short-answer questions, essay-type questions and/or calculations).
- Assessed coursework (including problem solving, essay writing, multiple choice tests, essays and/or laboratory report writing, and final year research project reports, poster and oral presentation).

The assessment method changes as the student gains confidence and competence in higher levels. Thus, at level 1, 2 and 3 the students will be extensively assessed through written examination while there is a greater weighing on individual planning and reporting of project work at level 4 to assess the acquisition and application of student's knowledge.

Deadlines for assessed coursework are produced by the internal examiner for each module and distributed to the students within the first two weeks of each semester. Assessed coursework is submitted at allotted times with coversheets with receipt slips, which are signed by a responsible person.

The MSA grading scheme is as follows:

Letter Grade	Marks	GPA	UK Classes
A	≥ 90 %	4	1 st Class
A-	85 - < 90 %	3.67	
B+	80-- < 85 %	3.33	Upper Second (2:1)
B	75 - < 80 %	3	
B-	70 - < 75%	2.67	Lower Second (2:2)
C+	65 - < 70 %	2.33	
C	60 - < 65 %	2	3 rd Class
C-	56- < 60%	1.67	Fail
D+	53- < 56%	1.33	Fail
D	50- < 53%	1	Fail
F (Fail)	< 50 %	0	Fail

The general pattern of assessment for levels 1, 2 and 3 is as follows:

40 %	Course work (Quizzes + Assignments + Lab. Work)
20 %	Midterm exam
40 %	Final exam

13.2 The calendar of assessment

There are 5 main periods of assessment and progression during the academic year:

- ✓ At the middle of the Fall Semester.
- ✓ At the end of the Fall Semester.
- ✓ At the middle of the Spring Semester.
- ✓ At the end of the Spring Semester.
- ✓ At the end of the Summer Semester.

The period of final assessment includes a deadline for submitting all work to be assessed as well as concluding all the examinations.

13.3 Assessment Boards

At the end of each assessment period, the University Assessment Board (UAB) meets to approve the results of all courses and award qualifications.

There are 2 Assessment Boards:

A. UAB:

1. University President, Vice President, Deans of Faculties, Programme Leaders, Head of Quality Assurance and Audit Unit.
2. Secretary: to be appointed by the Chair.

B. Faculty Assessment Board:

1. Chair: Dean of the Faculty.
2. Members: Programme Leaders and Quality Assurance Auditor, a minimum of one external examiner normally recommended by the Dean of the Faculty and approved by the University Board.
3. Secretary: to be appointed by the Chair.

14. General Rules and Regulations

Students who get a minimum of 55% in a course may be condoned by a maximum of 5% by the University Assessment Board. Students who get <55% fail and cannot be condoned.

- The academic load is the number of registered credit hours per student each semester.
- Credits acquired by the student are based on the credits of the passed courses from the academic load registered.
- Repeated courses will be counted once toward the calculation of accumulated credit hours. The best achieved GPA will be used for calculating GPA.
- The cumulative GPA calculation starts from the first semester for each student and is updated each semester till his/her graduation.
- The semester GPA of the student is the weighted average of the grade points acquired in the courses passed in that specific semester. It is calculated as follows:

Semester GPA =

$$\frac{\text{Sum of the product of the no. of credit hours of each course in the current semester load times the corresponding GP}}{(\text{Semester Total Credits in the current semester load})^*}$$

$$= \frac{\Sigma (\text{No. of credit hours in the current semester load} \times \text{corresponding GP})}{(\text{Semester Total Credits in the current semester load})^*}$$

The number of credits used to calculate the Cumulative GPA is the number of credits registered by the student up to this date.

Cumulative GPA =

$$\frac{\text{Sum of the product of the no. of credit hours of each course times registered up to this date the corresponding GP}}{\text{Total Credits in the current semester load}^*}$$

$$= \frac{\Sigma (\text{No. of credit hours of each course in the current semester load} \times \text{corresponding GP})}{\text{Total Credits in the current semester load}^*}$$

*Excluding pass-fail courses credit and transferred courses from Universities other than MSA.

Levels of the Cumulative GPA are as follows:

Excellent	A, A ⁻ and B ⁺
Very Good	B and B ⁻
Good	C ⁺ and C
Satisfactory	C ⁻

14.1 Progression of Students

Progression of Students

The progression of Biotechnology students at MSA is based on pre-requisite system. The student cannot progress to the next course without having passed its pre-requisite course. Courses of the first semester have no pre-requisites except the English course ENG 101, that requires passing the MSA English placement exam.

Graduation

Students shall automatically receive the award of the University for which they are registered and qualify for upon completion of the requisite number of credits with a GPA equivalent to C⁻ or above at the end of the semester during which the total was achieved.

Graduation Ceremonies for each year are usually held in September (includes the previous Fall, Spring and Summer Semesters).

14.2 Failure in Courses

Students must meet the deadline for submission of all coursework components and according to the requirements of the University and course teaching staff.

The student is considered a failure in the following cases:

- Students who fail to attend the final exam.
- Students who fail to achieve 30 % of the marks in the final exam.
- Students who fail to achieve 60% of the total marks.

Students who fail to attend the midterm exam will not be deprived from completing the course. However they will lose all the marks which are equivalent to 15 % of final grade unless the University President considers the extenuating circumstances that arise and decides that the midterm grades are to be added to the grades of the final exams.

14.3 Incomplete

If a student fails to attend the final exam for any emergency or exceptional circumstances, the University President may approve an incomplete (I) grade. Midterm grade as well as course work grades are transferred to students who are given an (I) grade

14.4 Repeat Policy

A student who fails to maintain a minimum cumulative GPA of C- for six consecutive semesters or total ten semesters is requested to transfer to another Faculty. Once a student's cumulative GPA falls below C-, he/she is placed under academic probation. Due to this constraint, students who are under probation are allowed to repeat courses with a grade of C, C- and F during this period under the supervision of an academic advisor in order to improve their cumulative GPA. Students who are not under academic probation are not allowed to repeat previously passed courses. The higher grade of any repeated course is used in the GPA calculation. Senior students are allowed to repeat failed courses until they fulfill the graduation requirements.

14.5 Condoning Failure

The University Assessment Board on the recommendation of the Faculty may condone failed students to a maximum of 2% of the total marks of a student's registered courses for the academic semester, on condition that no individual course is condoned by more than 5% of the total marks of that course.

For example, in the case of a student who failed 4 courses out of the 6 he was registered in, scoring: 55/100, 56/100, 57/100, and 58/100, condoning failure requires $(5+4+3+2=14)$

marks in order for the student to pass in all of them. This student may be condoned by a maximum (2 x 6 =12) marks that can be distributed among the failed courses on condition that no individual course is condoned by more than 5 marks. In this case, only 3 courses can be condoned, where the pass grade is 60/100.

14.6 Grade Appeals

Staff corrects the answer sheets with secret codes in both midterm and final examinations so that the identity of the student remains completely anonymous. This insures that the assessment is truly objective and undoubtedly reflects the students' true academic standard. Each answer sheet is marked by two examiners.

Despite these accurate grading procedures, students are allowed to appeal their final grade. Students fill a Grade Appeal Form (GAF) at the Faculty Registrar. The Faculty Registrar sends all grade appeals to the Examination Unit (EU). The EU recalculates the total grade of the student from the records available and also makes sure that the examiner has not missed any questions during the grading of the answer sheet.

14.7 Publication of Results

Grades will be announced on notice boards and on the MSA web-site at the end of each semester and before the beginning of the next semester.

Students are allowed to submit grade appeals to the registrar office requesting the re-checking of the sum of coursework, midterm and final marks.

14.8 Dismissal from Class

Students dismissed from classes for insubordination or other disciplinary reasons are not to return to class until the Dean of Faculty permits it. MSA Management cooperates with the teaching staff to maintain proper discipline.

14.9 Academic Dishonesty and Plagiarism

MSA students are expected to be honest in their academic endeavors. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an examination, or to allow another to commit an act of academic dishonesty corrupts the basis of the academic process. All plagiarism cases are reported to the President's Office and are dealt with very severely. The minimum penalty for such cases is failing the course where this offence was committed. In some cases, the penalty may reach dismissal from the University for one semester or more based on the circumstances of the case. Academic dishonesty includes- but not limited to- the following cases:

1- Plagiarism is the inclusion of someone else's words, ideas or data as one's own work. When students submit their work for credit that includes the words, ideas or data of others, the source of that information must be acknowledged through complete, accurate, and specific references. If verbatim statements are included, quotation marks must be used. By placing their names on work submitted for credit, the students certify the originality of all work not otherwise identified by appropriate acknowledgements. Plagiarism covers unpublished as well as published sources.

Plagiarism includes, but not limited to, the following cases

- Quoting another person's actual words, complete sentences or paragraphs, or entire piece of written work without acknowledgement of the source.
- Using another person's ideas, opinions, or theory even if it is completely paraphrased in one's own words, without acknowledgement of the source.
- Borrowing facts, statistics or other illustrative materials that are not clearly common knowledge without acknowledgement of the source.
- Copying another student's essay test answers.
- Copying, or allowing another student to copy, a computer file that contains another student's assignment, and submitting it, in part or in its entirety, as one's own.
- Working together on an assignment, sharing the computer files and programmes involved, and then submitting individual copies of the assignment as one's own individual work.

When in doubt about rules concerning plagiarism, students are urged to consult individual Faculty members, academic departments, or recognized handbooks in their field.

2- Fabrication is the use of invented information or the falsification of research or other findings. Fabrication includes -but not limited to- the following examples:

- Citation of information not taken from the source indicated. This may include the incorrect documentation of secondary source materials.
- Listing sources in a bibliography that is not directly used in the academic exercise.
- Submission in a paper, lab report or other academic exercise of falsified, invented, or fictitious data or evidence, or deliberate and knowing concealment or distortion of the true nature, origin or function of such data or evidence.
- Submitting as one's own any academic exercises prepared totally or in part by another.

3- Cheating is an act or an attempted act of deception by which a student seeks to misrepresent that he/she has mastered information on an academic exercise that he/she has not mastered. Cheating includes -but not limited- to the following examples:

- Copying from another student's test paper.

- Allowing another student to copy from a test paper.
- Unauthorized use of course textbook or other material such as a notebook to complete a test or other assignment.
- Collaborating on a test, quiz or other project with any other person(s) without authorization.
- Using or possessing specifically prepared materials during a test, e.g., notes, formula lists, notes written on the student's clothing, that are not authorized.
- Using electronic instruments, such as cell phones, pagers, etc., to share information, when prohibited, and
- Taking a test for someone else or permitting someone else to take a test for him.

4- Academic misconduct includes other academically dishonest acts such as tampering with grades or taking part in obtaining or distributing any part of an un-administered test.

Plagiarism

The FAB shall take action against any student who plagiarizes whether through negligence, foolishness or deliberate intent. Students have to make sure that written material is acknowledged through the use of quotation marks, references and bibliographies. Information on the correct way of acknowledging work from other sources is available from campus learning resource centers, the English Language Support Unit (ELSU).

15. Professional and/or Statutory Body Requirements

MSA programmes are accredited by the Supreme Council for Higher Education (SCHE). Students who graduate from MSA can automatically join the appropriate Syndicate for this profession with no additional exams.

This membership provides a license for MSA graduates to work in these professions. This advantage is a huge asset to graduates in the job market.

16. Timetables and Accessing Records

16.1 Timetables

The University schedule is published on the MSA web-site at the beginning of each semester and students can access this schedule anytime.

Students are provided with a detailed timetable at the end of the registration period at the beginning of the semester. A student can take a replacement copy from the Faculty Registrar at anytime. Printed copies of the Examination schedule is available one week before exam periods.

16.2 Accessing records

Students can access their own grades either by taking an informal copy of their five year plan or by ordering a formal transcript from the Faculty Registrar.

16.3 Feedback to Students

Feedback on assessment performance is a vital communication process between instructor and student. Constructive feedback facilitates learning and subsequently enhances marks and grades. It should be used in conjunction with the University's Assessment Handbook, in which feedback is considered an integral element of the assessment process.

Provision of feedback for a certain assessment must be provided before students undertake another. Although the subsequent assessment component will probably not (and perhaps should not) assess the same learning outcomes as other course assessments, feedback on technique may be just as important as the particular subject content.

16.4 Feedback on Coursework

Oral and written feedback will be given following the submission of assignments and during group meetings. Feedback on coursework takes the form of written comments and a grade. Feedback will also be provided through group discussions and group work. Student's contribution to class discussion will be noted according to evidence relating to participation, preparation and attendance.

Feedback on group case studies will be given during group sessions and on the day of the presentation.

16.5 Feedback on Examinations

Generally, students may not be given specific feedback on written midterm and final examinations. The instructor may generally discuss with the whole class the model answer for each examination after it has been held as a means of improving future performance.

16.6 Proposition Courses/Dissertations/Projects

Dissertations are a form of coursework that involves the submission of a substantial report on a major project. Different approaches are taken in different subject areas.

Writing projects is very challenging for the following reasons. Many students

- May have been asked to write for the first time such an extensive document,
- May have difficulty in selecting a topic,

- May be unsure of the standard expected,
- May be unsure of the definition and the parameters of the specific topic;
- May have Teamwork problems; and
- May have problems on deciding on which specific aspect(s) of the topic to concentrate on.

In most courses the dissertation occurs at the end and forms the major part of the final grade. Effective and continuous feedback must be provided for each step of the students' work.

Students need guidance to plan and monitor their progress. Generally if the proposal and action plan is realistically developed and approved, this will provide excellent support for the student; therefore, time spent at the initial stage to get this right will pay benefits later on.

Students need guidance and support during the process of writing a dissertation; this usually takes the form of individual/group tutorials with the instructor. Generally students require more and longer meetings at the beginning of the process, to discuss and receive guidance on challenging issues. A supervisor may hold open meetings with his/her dissertation students to solve the initial general/common problems of getting started.

Feedback in performance is given to the students during the final presentation.

16.7 Viewing Scripts

According to the regulations of the ESCU, students are not allowed to view the scripts of the midterm and final exams.

17. Marking

17.1 Marking and Marking Moderation

All assessments are moderated to ensure that grades have been recorded accurately. Teaching staff correct the answer sheets with secret codes in both midterm and final examinations so that the identity of the student remains completely anonymous. This insures that the assessment is objective and undoubtedly reflects the student's true academic standard. Each answer sheet is marked by two examiners.

Model answers are provided by Course Co-coordinators/Leaders as a guide for moderation. In the event that discrepancy arises between a student's midterm or final examination marks, whereby such student passes his/her examinations and fails his/her session marks or vice versa, or in the event that there is a high mean difference of 25% or more between the session work grade and the examination grades, such events are investigated by the Faculty Assessment Boards (FAB).

External examiners review exams and answer sheets with Staff to insure the fairness and objectivity of the assessment process.

17.2 Second Marking

A minimum sample of 10% of all answer sheets shall be remarked including 5% of all passed papers and all failures. Remarking is undertaken by an internal examiner other than the course examiner. In the event that a second marker decides upon different marks for any of the papers remarked, s/he consequently submits a report addressed to the FAB to such effect for a conclusive arbitration by the Board. A rationale is provided in both cases of approval or changing of grades.

18. Copies of Past Examination Papers and Other Forms of Assessment

Past examination papers are a good guide to the sort of examination question that a student might encounter in the exams. Copies of past examination papers and other forms of assessment are available to all students at MSA Library. Students order a copy and pay the required fee for photocopying the set of past examinations for each course. They receive it one week later. Sometimes, the syllabus for the examination may have changed, and is certainly not determined by what has appeared in past papers. Students are required to consult with their teaching staff concerning the validity of these samples.

19. Attendance

19.1 Attendance Requirements

The contact between the teaching staff and student is the most effective method of learning. Class discussions and comments enhance students' understanding for the course content and give a new dimension to the learning experience. For these reasons, students are required to satisfy certain attendance requirements. Students who fail to attend 75% of all lectures and tutorials for a certain course are deprived from the final exam and automatically fail the course. The maximum number of absences allowed for any student is 9 times including all lectures and tutorials. This includes absences for medical reasons and emergencies.

19.2 Policy on Late Arrival

Late arrivals disrupt the class and deprive other students from the required degree of concentration. Students are only allowed into the class during the first five minutes. Otherwise, they miss the class and are recorded as absent.

During the midterm and final examination periods, students are allowed to step in during the first 15 minutes of the exam time.

20. Feedback from students

20.1 Boards of Study

The purpose of the Board of Study is to provide a forum for discussion between the student and staff involved in all aspects of the programme.

The membership includes:

- Chair (Programme Leader/Curriculum Leader/Academic Group Chair).
- Relevant Curriculum Leaders.
- All Course Leaders (or their representatives) wherever feasible.
- Student representatives (at least two for each year).
- Placement Unit representative (where appropriate).
- Careers representative (where appropriate).
- Support services representatives.

A member of the Academic Groups' administrative support team will also be present as the minute taker.

Frequency of Meetings

At least one meeting should be held during each semester normally in weeks six to eight.

Dates of the Boards of Studies should be published in all programme handbooks. In addition information on the meetings is on MSA webpage.

Preparation for the Meeting

It is advisable to book a room well in advance of the meeting. A booking for appropriate hospitality should also be arranged.

Notification of the intention to hold the meeting, together with an invitation to submit agenda items, should be sent to all members and student representatives at least two weeks prior to the meeting.

Formal notice of the meeting, including the agenda and all appropriate papers, should be sent to all members and student representatives not less than one week before the date of the meeting. The formal notice should include the names of all members as a circulation list.

Documentation for the Meeting

- Attendance list to be signed by those present.
- Minutes of the previous meeting.
- The annual monitoring report for the areas of work which the Board covers should be presented to the Board at first available opportunity.
- External Examiners' Reports where appropriate.

Agenda and report of the Meeting

The agenda must include all obligatory items, but further items suggested by the student representatives and members of the committee should be added where appropriate.

The minutes should cover all agenda items and include a summary of the main points of discussion and an action/outcomes list. Any actions required should include the time scale, the name of the person responsible, and when a report back to the Board is expected. They should also include progress on actions from the previous minutes.

After the Meeting

Within 48 hours of the meeting a Chairs' Action List must be published and circulated to all those with action points to deal with and to the QAA Unit Head.

Unconfirmed minutes of the meeting should be circulated no later than two weeks after the meeting has taken place to:

- All members who were entitled to attend,
- Student representatives,
- All persons from whom the meeting required action,
- Student Union (Academic officer) and
- QAA Unit Representative.

In addition, copies should be put on appropriate student notice boards; the minutes will also be made available on MSA web page.

20.2 Course evaluation forms and programme evaluation questionnaire

Both Course and programme feedback forms are distributed throughout the academic year. The aim of this feedback process is to elicit views on the quality of all the courses taken. Course forms, which examine each course in some detail, will be distributed at the end of each semester. Programme questionnaires, which invite comment on the programme in general, will be distributed at the end of the final year. Both sets of forms will be completely anonymous.

A report is to be received on any issues that have been identified. The report would also describe the measures taken to resolve any problems. All reports will be an item for discussion during Boards of Study and will, where necessary, be reported upon during the

annual monitoring process. The whole feedback process will also be reviewed on a regular basis, to ensure that that it is effective in helping provide a good quality experience for students.

21. Career's Advice and Opportunities/Placement/Mentoring/Voluntary Work

MSA is keen to provide its students with competitive programmes that aim to prepare them to compete effectively in the job market. The academic advisers and tutors co-operate closely with the Career Placement Office which provides feedback on the skills required by the job market in a specific programme. The office also provides feedback on points of strengths of MSA graduates and comments on areas that require improvement. This continuous effort ensures that programmes are up-to-date and relevant to the needs of both national and international employers.

The Career Placement Office organizes periodical job fairs that aim to provide students with exceptional work opportunities. The office also contacts new employers to increase the number and to improve the standard of the portfolio of companies recruiting MSA graduates.

22. Student Support

MSA considers one of its main goals is to provide a unique, friendly and pleasant atmosphere for its students. Staff members and students interact together constantly as members of one large family. Support and guidance is provided to students mainly from the Faculty Registrar and Student Affairs. The services include:

- Advice on solving problems and the procedures to be followed.
- Enrolment and fees payment.
- Registration procedure.
- Advice on career placement and training opportunities.
- Disability support and guidance.
- Attendance excuses.
- Receive appeals and complaints.
- Counseling.
- Enrolment/Graduation Certificates.
- Providing advice on any issue that concerns students' welfare other than the above.

22.1 Subject Advice and Educational Guidance

MSA's main mission is to provide a well-rounded unique learning environment for the students. MSA has introduced many methods to provide academic advice and aid to all students through the following channels:

22.2 Academic Adviser

Academic advisers are available for students to offer advice and guidance during and after registration of courses. Each student will be assigned a Faculty mentor within the Faculty in addition to an academic adviser in the Student Services Office (SSO). The Faculty mentor will help the student explore career and educational goals, establish an appropriate plan of study, and develop suitable internship opportunities. The academic adviser from SSO will help in planning schedules and the courses which each student selects at registration. Students in this programme are required to meet with their adviser every semester as part of the regular registration process to ensure fulfillment of University and departmental requirements and to remain aware of any changes programmes and requirements.

22.3 Student “Families”

Students are divided into small families of at most 25. Each staff member is responsible for one small family. He/she is always there for his/her students to offer academic, social and personal advice. Their relation often extends to activities outside the University as they usually organize group outings and trips. Every 3 families have one leader from the senior staff members to supervise their activities.

22.4 Individual/Group Study

Teaching assistants are available to offer extra help to students. They work with students either individually or in small groups according to their individual needs.

22.5 Information for students with disabilities

As an educational institution and employer, MSA recognizes the equal rights of individuals and groups to be free from discrimination on the bases of sex, marital status, nationality, disability, and political and religious belief. The University accepts its responsibility in relation to these rights for people who are undertaking activities as part of their study or employment with MSA.

Thus, within this context, MSA supports any student with any form of physical disability who would require special tutorial help in academic reading and writing. Students with physical disabilities are taken into consideration not only in respect to examination arrangements but

also in attendance and in the marking of coursework and examination papers, provided that the student has reported it at an early stage. In cases of disability that may require consideration and when necessary, MSA offers one to one deemed tutorial help.

MSA is committed to a continuous programme of upgrading its estate in order to improve accessibility for the disabled by incorporating provisions for wheelchair users (new campus in the 6th of October City). Thus this new campus includes the establishment of ramps, lifts, and toilets for disabled persons.

22.6 English Language and Learning Support

MSA is an English Language medium instruction University. Students are required to sit for an English Language Placement Exam. Students who fail to meet the standard required join an Intensive English Language Programme at the beginning of their studies at MSA. To fulfill the University requirements of English language, the students should successfully pass English for Academic Purpose and Medical Terminology course (ENG 101) and English Language for Study Skills course (ENG 102) before progression to level 3. Students should also pass the higher level of English course, English Language for Research Purposes (ENG201b), by level 3. Students who need additional help and who have finished all the University language requirements are urged to contact the English Language Department to arrange for extra help or to attend the extra group sessions.

23. Information and Learning Resources Services

Learning resources and support are provided by MSA through different channels:

23.1 IT Central Services

It controls and monitors the work of different Faculty IT Services Units. It also co-ordinates between these units in the use of shared resources. The unit is also responsible for maintaining the IT infrastructure in the University.

23.2 Faculty IT Services Unit

This unit is responsible for providing hardware and software packages for the Faculty requirements as well as maintenance of equipment. It is also responsible for equipping all computers with different operating systems platforms, database management systems, programming languages, software development kits, and education software tools to provide suitable training for different fields of specialization.

It is also responsible for providing support to all teaching staff and students in using the audio-visual aids provided by the University.

23.3 Library Services

The MSA library contains 21547 copy of text books of which about 1031 titles belong to the Faculty of Biotechnology and 110000 e-book through electronic library. The library also has a wide collection of journals and popular periodicals. Video and cassette tapes are available for all subjects. All books are supplemented with transparencies, CDs, diskettes, and/or video tapes etc.

The Library has 2 full-time librarians working Sunday to Thursday from 9:00 to 3:00 pm. The librarians are always available till 5:00 pm or on Saturdays if there are student projects or assignments that require using the library facilities.

The MSA library website (<http://www.msa.eun.eg/library.htm>) offers the following:

- E-books link: which offers a lot of links to free electronic books categorized according to different fields.
- OPAC Search.
- Medical and Drug Information Center (MDIC) that offers the following:
 - 1-Clinical Guidelines
 - 2-Clinical Trials
 - 3-General Drug Information
 - 4-Patient Drug Information
 - 5-Government Agencies
 - 6-Internet Search Engines
 - 7-Organizations
 - 8-Statistics
 - 9- Dictionaries and Encyclopedias
 - 10- Clinical Calculators and On-line ECG
 - 11- e-Books
 - 12-Journals
 - 13- Best Medical Links

The library is continuously updated through contact with international publishers. A certain budget is allotted each semester for the library.

Abbreviations and acronyms

CH	Credit Hours
CPS	Credit Points
CS	Computer Science
ELSU	English Language Support Unit
ESCU	Egyptian Supreme Council of Universities
EU	Examination Unit
GPA	Grade Point Average
GAF	Grade Appeal form
MIS	Medical Insurance System
MSA	October University for Modern Sciences and Arts
GRE	Greenwich University
SCHE	Supreme Council for Higher Education
UAB	University Assessment Board

24. Health and safety

The student has the same health and safety responsibilities as any other employee at MSA and must take reasonable care of his/her own health and safety and those of other people.

25. The Overall Programme Curriculum

Subject	Course Status	Courses			
		Course code	Course title	Credits	
Computer Science	University Requirement	CSB101b	Introduction to Information Technology	3	
		CSB102b	Computer Programming I	3	
		2 courses			6
English	University Requirement	ENG101b	English for academic purposes	3	
		ENG102b	English Language for studying skills	3	
		ENG201b	English for Research Purposes	3	
		3 courses			9
Mathematics & Statistics	University Requirement	MTH101b	Elementary Calculus	2	
		MTH201b	Biostatistics	2	
		2 courses			4
Biotechnology	Core	BT202b	Molecular Biology	4	
		BT203b	Cell & Tissue Culture	4	
		BT204b	Bio-informatics	3	
		BT301b	Introduction to Biotechnology	3	
		BT302b	Advanced Genetic Engineering: Gene Transfer	4	
		BT305b	Animal Cell Biotechnology	2	
		BT311b	Molecular Biology of Cancer	3	
		BT321b	Industrial Microbiology and Fermentation or (Microbial Biotech)	3	
		BT401b	Introduction to Biosafety and Risk Assessment	2	
		BT411b	Regulatory & Ethical aspects of Biotechnology	2	
		10 courses			30
Microbiology	Core	MB102b	Microbiology	4	
		MB201b	Immunology	3	
		2 courses			7

Biochemistry	Core	BCHM102b	Biochemistry 1 (Structure and Metabolism)	4
		BCHM201b	Biochemistry II	3
		2 courses		
Biology	Core	BIO101b	Biology 1 (Botany)	3
		BIO102b	Biology 2 (Zoology)	3
		BIO201b	Cell biology and Physiology	4
		3 courses		
Chemistry	Core	CHM101b	General Chemistry	3
		CHM102b	Physical Chemistry	2
		2 courses		
Physics	Core	PHY101b	Physics	2
		PHY102b	Biophysics	2
		2 courses		
Genetics	Core	GEN201b	Introductory Genetics	3
		GEN202b	Microbial Genetics	3
		GEN301b	Molecular Genetics & Genetic Engineering	4
		GEN302b	Complex Genome Analysis	3
		GEN303b	Proteomics and Protein Engineering	3
		GEN402b	Molecular & Genetic Diagnosis	3
		6 courses		
Marketing / IPR	Collateral	MARK302b	Management & Marketing in Biotechnology	2
		MARK401b	Intellectual Property Protection	2
		MARK402b	Business Communication	2
		3 courses		
Biochemical Engineering and Instrumentation	Core	BCE202b	Biochemical Engineering	2
		BCE301b	Instrumentation for Biotechnologists	2
		2 courses		
Research & Seminar	Collateral	SEM202b	Literature Survey	1
		SEM302b	Industrial Projects	2
		2 courses		

		MB303b	Advanced Immunology	4
		GEN304b	Pharmacogenetics	4
		BT304b	Food Biotechnology	4
		BT306b	Environmental Biotechnology	4
		BT307b	Nanotechnology	4
		BT309b	Molecular Drug Design	4
		BT310b	Host plant resistant	4
		BT312b	DNA Forensics	4
		BT322b	Bioremediation of contaminated sites	4
		BT402b	Stem Cell Technology	4
			Any other relevant course	4
		Only 4 courses required		16
Project	Core (Select one topic only)	RS400b/RS401b	Industrial Biotechnology	
			Environmental Biotechnology	
			Agricultural Biotechnology (Plant)	
			Agricultural Biotechnology (Animal)	
			Gene Therapy (Human / Animal)	
			Drug Engineering	
			Molecular and Genetic Diagnosis	
			Medical Biotechnology	
			Forensic Science	
			Bio Pharmaceuticals	
			Biofarming	
		Credits awarded as 5cr. Per semester		
Total		44 courses		140

26. List of Courses

For the B.SC. Degree in Biotechnology by Semester

First Year – First Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	BIO101b	Biology 1 (Botany)	3	Biology	-	2	2		4
2	BI O102b	Biology 2 (Zoology)	3	Biology	-	2	2		4
3	MTH101b	Elementary Calculus	2	Mathematics	-	2			2
4	CHM101b	General Chemistry	3	Chemistry	-	2	2		4
5	ENG101b	English for Academic Purposes	3	English	-	3			3
6	PHY101b	Physics	2	Physics	-	1	2		3
7	CSB101b	Introduction to Information Technology	3	Computer	-	2	2		4
			19			14	10		24

First Year – Second Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	PHY102b	Biophysics	2	Physics	PHY101b	2	-		2
2	CHM102b	Physical Chemistry	2	Chemistry	-	2	-		2
3	BCHM102b	Biochemistry 1 (Structure and Metabolism)	4	Biochemistry	CHM 101b	3	2		5
4	MB102b	Microbiology	4	Microbiology	BIO101b	2	4		6
5	ENG102b	English Language for studying skills	3	English	ENG101b	3	-		3
6	CSB102b	Computer Programming I	3	Computer	CSB 101b	2	2		4
			18			14	8		22

Second Year – First Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	GEN201b	Introductory Genetics	3	Genetics	BIO101b, BIO102b	2	2		4
2	MTH201b	Biostatistics	2	Mathematics	MTH101b	2		1	3
3	MB201b	Immunology	3	Microbiology	BIO102b, MB102b	2	2		4
4	BIO201b	Cell Biology and Physiology	4	Biology	BIO101b, BIO102b	3	2		5
5	ENG201b	English for Research Purposes	3	English	ENG102b	3	-		3
6	BCHM201b	Biochemistry II	3	Biochemistry	BCHM102b	2	2		4
			18			14	8	1	23

Second Year – Second Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	BT202b	Molecular Biology	4	Biotechnology	GEN201b, MB102b	2	4		6
2	GEN202b	Microbial Genetics	3	Genetics	GEN201b, MB102b	2	2		4
3	BT203b	Cell and Tissue Culture	4	Biotechnology	BIO201b	2	4		6
4	BT204b	Bioinformatics	3	Biotechnology	CSB102b	2	2		4
5	BCE202b	Biochemical Engineering	2	Biochemical Eng. & Instr.	BCHM201b	2			2
6	SEM202b	Literature Survey	1	Seminar & Research	-	1		1	2
			17			11	12	1	24

Third Year – First Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	GEN301b	Molecular Genetics & Genetic Engineering	4	Genetics	GEN201b, BT203b	3	2		5
2	BT301b	Introduction to Biotechnology	3	Biotechnology	BT202b	2	2		4
3	BT311b	Molecular Biology of Cancer	3	Biotech	BIO201b	2	2		4
4	BCE301b	Instrumentation for Biotechnologists	2	Biochemical Eng. & Instr.	BCE202b	2	-		2
5	BT321b	Industrial Microbiology and Fermentation or (Microbial Biotech)	3	Biotechnology	MB102b	2	2		4
Elective Courses (Choose one Topic)									
	MB303b	• Advanced Immunology	4	Microbio.	MB201b	2	4		6
	BT304b	• Food Biotechnology		Biotech.	BT202b				
	BT306b	• Environmental Biotechnology		Biotech.	BT202b				
	BT307b	• Nanotechnology		Biotech	BT202b				
	BT312b	• DNA Forensics		Biotech	BT202b				
			19			13	12		25

Third Year – Second Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	GEN302b	Complex Genome Analysis	3	Genetics	BT204b, BT202b	2	2		4
2	GEN303b	Proteomics & Protein Engineering	3	Genetics	GEN201b, BT202b	2	2		4
3	SEM302b	Industrial Projects	2	Seminar & Research	SEM202b	2			2
4	MARK302b	Management & Marketing in Biotechnology	2	Marketing /IPR	-	2	-		2
5	BT302b	Advanced Genetic Engineering: Gene Transfer	4	Biotech.	BT202b, BT301b	2	4		6
Elective Courses (Choose one Topic)									
6	BT309b	Molecular Drug Design	4	Biotech	GEN303b	2	4		6
	BT310b	Host plant resistant		Biotech.	BT301b				
	BT402b	Stem Cell Technology		Biotech.	BT202b				
	BT322b	Bioremediation of contaminated sites		Biotech.	BT306b				
	GEN304b	Pharmacogenetics		Genetics	GEN201b				
			18			12	12		24

Fourth Year – First Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	BT401b	Introduction to Biosafety and Risk Assessment	2	Biotech.	BT301b	2	-		2
2	MARK401b	Intellectual Property Protection	2	Marketing	BT301b	2	-		2
3	BT411b	Regulatory & Ethical aspects of Biotechnology	2		BT301b	2	-		2
4	Elective	Elective	4			2	4		6
5	RS400b	Research Project	5		SEM302b	-	10	2	12
			15			8	14	2	24

Fourth Year – Second Semester

S/N	Course Code	Course Title	Total Credits	Subject Group	Pre-requisite	Weekly Contact Hours			
						Theor.	Pract.	Tutorial	Total
1	MARK402b	Business Communication	2	Marketing	-	2	-		2
2	GEN402b	Molecular & Genetic Diagnosis	3	Genetics	BIO201b& GEN301b	2	2		4
3	BT305b	Animal Cell Biotechnology	2	Biotech.	BT203b	2	-		2
4	Elective	Elective	4			2	4		6
5	RS401b	Research Project	5		RS400b	-	10	2	12
			16			8	16	2	26

Fourth Year – Research Project

Project	Core (Select one topic only)	RS400b/RS401b	Industrial Biotechnology	
			Environmental Biotechnology	
			Agricultural Biotechnology (Plant)	
			Agricultural Biotechnology (Animal)	
			Gene Therapy (Human / Animal)	
			Drug Engineering	
			Molecular and Genetic Diagnosis	
			Medical Biotechnology	
			Forensic Science	
			Bio Pharmaceuticals	
			Biofarming	

27. Programme Administration

28. Programme Management

The BSc biotechnological Sciences degree is a named programme, within the University framework, and is governed by the same administrative structures and regulations as other programmes within the University. There are three tiers of management, administration and quality assurance:

- Departmental
- Programme
- Course

The quality and content of the curriculum is the responsibility of the programme leader. The programme leader reports to the Faculty Dean. Individual courses within the programme have a designated course co-ordinator responsible for the day-to-day delivery.

Programme Committees

The programme is a forum in which student and programme issues for management consideration are highlighted.

The committee comprises:

- Faculty Dean
- Programme Leader
- Course Co-ordinator
- Faculty Teaching Staff
- Teaching Assistants
- Student Representatives
- Library Representative
- IT Representative

Faculty Dean

Each Faculty has a Dean who is appointed by the Board of Trustees every four years. The responsibilities of the Dean are running the educational and administrative affairs of the Faculty and representing it on the University Board. The Dean is responsible for the implementation of University Board decisions at Faculty level, the supervision of curriculum development, and the development of the Faculty. The Dean collects and evaluates instructors and students' feedback and through the Faculty Board agrees any actions

necessary to address issues arising from feedback. The Dean is responsible for ensuring that students receive appropriate support and guidance to ensure that they are able to meet the learning outcomes of their programmes.

Programme Leader

The programme leader plays a key role in maintaining the quality and standard of the educational process. The programme leader has been nominated on March 1st, 2005 with the following responsibilities: -

- To ensure that the programme is delivered in accordance with the approved learning and teaching strategies.
- To ensure an effective academic advising system.
- To prepare a programme handbook.
- To ensure that the schedules cover the students requirements.
- To ensure that the resources needed for supporting the programme are available in sufficient quantity and quality.
- To ensure that the assessment takes place in accordance with the approved assessment strategy and that the external examiners receive assessment information.
- To lead the process of reaccreditation whenever required and monitor the requirements of any external reference points.
- To lead the process of programme review and update and to report to the dean on the operation of the programme.
- To attend University and Faculty assessment boards.

Course Co-ordinator

The course co-ordinator is responsible to the programme leader for the organization and management of the programme.

Responsibilities

- The quality of the student experience.
- Current course contents, in collaboration with the teaching team.
- External examiners liaison.
- Advising the programme leader on programme resource issues.
- Library resource issues.
- The initial induction of teaching staff on the programme.
- Attend Faculty assessment panels and Board of Examiners.
- Discuss the organization and content of the course with the teaching team.
- Provide students with a teaching programme and details of assessment.

- Co-ordinate the supply of printed materials, as appropriate.
- Engage in the moderation and evaluation of the course.

Faculty Teaching Staff

The actual delivery and assessment of courses are important factors in determining the quality of the student experience and the standards of the University's degrees. Teaching staff have a key role in this aspect of the assurance of quality and standards for courses delivered.

Responsibilities

- To contribute to the preparation of Programme Handbooks that make reference to the course.
- To deliver and teach the course according to the course outline included in the Handbook.
- To insure that the lectures and tutorials published in the schedule are delivered in the specified time all over the semester.
- To provide extra help to students whenever needed.
- To closely follow-up the performance of all students and to provide support and advice whenever needed.
- To co-ordinate the delivery of the course to include innovative learning methods.
- To review the adequacy of the learning resources to support the course including teaching accommodation, laboratories and workshops, books, journals, software and equipment, and to advise the Programme Leaders as appropriate.
- To inform the Programme Leaders immediately of any issues that could have an impact on the student's learning experience.
- To take responsibility, at course level, for the implementation of the University policy on Student Participation.
- To co-ordinate the preparation, monitoring, scheduling and distribution to students of coursework assignments with accompanying assessment criteria, submission dates and return.
- To ensure the prompt return of coursework to students.
- To co-ordinate the preparation of examination papers for submission to the Control Unit by the published deadline date, and their checking prior to being sent to the External Examiner.
- To attend the first 15 minutes of any examination component and indicate clearly where they may be contacted for the duration of the examination.

- To attend the meeting of the Programme Assessment Board and the Board of Study (if a representative) and to confirm the accuracy and completeness of the student performance data presented to the Board.

Teaching Assistants

Teaching assistants have a key role in the teaching and learning process through their working with students in close relationship. They have the responsibility to: -

- Deliver and teach the practical course according to its outline stated in the programme handbook.
- Ensure that the practical sessions supply the students with the intended knowledge and skills.
- Inform the programme leader of any issue that may have impact on the students' learning experience.
- Provide an additional support to the students whenever needed.
- Closely follow up the performance of the students.
- Ensure that the practical sessions are delivered in their specified time all over the semester.
- Help in future planning for updating the practical courses.
- Offer advice and guidance during the registration of courses.
- Offer academic, social and personal advice to the students through families.

29. Staff Development policy

MSA University is committed to developing the standards and quality of its education. Thus, its staff development is considered an essential long-term investment, aiming to enhance good teaching practice by implementing new instructional strategies to enable the staff to respond positively to the changing needs of students. Therefore, the University is allocating a certain percentage of its budget toward staff development to provide the opportunities for staff by:

- 1) Offering workshops and training courses for all academic staff members (including full-time and part-time staff) guided by international external lecturers and based on academic standards.
- 2) Enhancing their English language skill in addition to their academic progress by giving them chances to perform the practical experiments of their researches in the University's advanced research labs.

Also, to make certain that resources invested in this development achieve their intended results, distinct incentive system is redirected to reward demonstrations of knowledge and skills.