Title of the Program: Master Program in Medical Molecular Biology
The master's program is implemented in the framework of cooperation between Ivane Javakhishvili Tbilisi State University and University of Westminster

Academic Degree Offered: MSc in Medical Molecular Biology
(Collaborative degree with University of Westminster)

Head of the Master's program: Dr Nino Porakishvili, Dr Nina Kulikova, Dr Martin Parry, Head of the Department of Biomedical Sciences the School of Life Sciences, UoW;
Mode of Study: Full-time and Part-time

Qualification of the program:
Aims of the course: This course aims to furnish students with up-to-date information in molecular biology as it relates with human disease. The molecular biology technologies are covered in the core modules of the course and the option modules allow students to focus their interests to one of three main areas of application: immunology, bioinformatics or governance and ethics. A mixture of flexible teaching and learning methods, with a particular emphasis on multimedia and *e*-learning methods, will encourage students to critically evaluate published material, understand the underpinning science, analyse contradictory arguments, design their own project, carry out a piece of research and present the results. The students will also learn a variety of presentation skills, with a particular emphasis on *e*-based skills, to ensure they are effective communicators of science.
The course also aims to produce graduates who work in an ethical, legal, safe and sustainable manner and take an effort to minimize the risk of harm on humans, society, animals and the environment.

Learning Outcomes:
Knowledge and Understanding:
By the end of their course of study, a successful student will be able to:
• critically discuss and review the fundamental principles, concepts and terminology of the subject areas of Molecular Biology, Recombinant DNA technology, Immunology and Genetics;
• critically discuss the use and the potential of Molecular tools in the diagnosis and therapy of disease;
• critically discuss the principles, practice, importance and uses of molecular technologies;
• critically discuss the importance of immunology in disease pathogenesis, diagnosis and therapy;
• present an analysis of the ethical problems associated with the use of molecular and stem cell technologies;
• critically review the principles and the use of software tools for the identification of genes;
• be able to access, retrieve, analyze and interpret data from a variety of databases;
• critically discuss the potential of nucleic acid and protein analysis in improving medical diagnostics and treatment;
• discuss the principles, and critically evaluate the advantages and disadvantages of screening technologies;

- utilize and review the principles underlying the therapeutic uses of gene manipulation.
- critically review the legislation that controls the use of molecular diagnostic and therapeutic tools;
- critically discuss current ethical, legal, safety and environmental issues relevant to medical molecular biology.

Specific skills:
By the end of the course of study, a successful student will be able to:
- reflect critically on the relationships between theory and practice;
- use a range of technologies in molecular biology;
- critically review the processes of legislation and clinical trials of materials destined for therapeutic use;
- select and evaluate diagnostic and therapeutic tool(s), appropriate for a particular given purpose;
- understand methodology, use relevant software packages and Internet tools to evaluate experimental data;
- master selected relevant methods of multimedia and *e*-learning and assessment to achieve the learning outcomes;
- utilize hands-on experience to use and critically evaluate a range of resources and applications related to molecular biology;
- devise, organise and conduct an independent research project within a chosen area of molecular biology.

Key Transferable skills:
By the end of the course of study, a successful student will be able to:
- work effectively with a group as a leader or a member to produce team seminars
- use a full range of learning resources in making literature searches via the library, Infolinks, BIDS, PubMed, CD-ROMs, World Wide Web, University intranet, and in using on-line teaching material, word processors, spreadsheets, and databases;
- demonstrate skills in using relevant multimedia and *e*-learning and assessment methods for individual and group work;
- show self evaluation skills, reflecting on their own and others functioning via coursework feedback, project reports, critical reviews of scientific articles and peer evaluation, with a particular emphasis on *e*-based reports and feedbacks;
- manage information effectively by undertaking research tasks and compiling reviews and discussion essays;
- show autonomy by acting as an independent and self-critical learner, managing requirements and undertaking research tasks with minimum guidance;
- communicate effectively by means of oral, written and poster presentations, using print and electronic resources, reporting information, ideas and actions clearly, autonomously and competently;
- demonstrate problem solving skills by interpreting data, designing and carrying out projects and experimental work, and making professional use of others where appropriate.

Teaching, Learning and Assessment Methods: The course views a student as being at the centre of the learning process and students are expected to take responsibility for their own learning, to further develop skills acquired by their previous study and to further pursue knowledge by using the learning resources provided.

The Course itself utilizes a variety of teaching methods and approaches, including a mixture of traditional lectures, practical sessions, tutorials (student-centred learning activities), poster presentations and oral presentations. Throughout the course a range of multimedia and *e*-based learning methods will be employed including online seminars, tutorials, chat rooms, wikis and virtual practicals to encourage and support independent learning.

These combined teaching approaches aim to improve both students' knowledge of Medical Molecular Biology, as well as help to develop their faculties through an experiential approach. In addition, the key communication skills are developed throughout the course.

Teaching methods are flexible and will make use of a variety of media. Traditional overhead projectors and whiteboards are available alongside digital projectors. There are 14 computer classes at the Faculty of Exact and Life Sciences at TSU, and they have access to Moodle web site for storage and management of *e*-learning teaching materials and information.

Students registered for this course at TSU will have access to the UoW Blackboard which allows the staff and the students to participate in discussions using *e*-technology. Teaching and administrative materials are available on a designated Webpage. Finally, the joint UoW/TSU course team will also use Blackboard to post information on modules, lectures, tutorial notes and other teaching materials, improving the flexibility of student access and learning.

Each module in the programme has its own aims and teaching, learning and assessment methods that have been set up to facilitate its learning outcomes. Module assessment is carried out on the basis of examination (50%) and course work (50%). Assessment methods are varied and include essays, practical work, group work, individual presentations and reports

Structure of the Master Program:

This section shows the core modules available as part of the course and their credit value. These will be offered for the students at the beginning of the collaborative project. Full-time Postgraduate students study 120 ECT credits in two academic years.

Table I, Foundation Semester (Organized by TSU)

Name	Status	ECTS	Semester
Molecular Immunology	core	5	I
Scientific Data Analysis	core	5	I
Biochemistry and Molecular Biology of the Cell	core	10	I
Seminars in Scientific Reading and Writing	core	10	I

Table II, core modules

Name	Status	ECTS	Semester
Genetics and Developmental Genetics	core	10	II
Molecular Diagnostics	core	10	II
Molecular Therapeutics	core	10	II
Recombinant DNA technology	core	10	III
Immunotherapy	core	10	III
Immunopathology	core	10	III
Project A: Critical Review and Design Study	core	10	IV
Project B: Project and Report	core	20	IV

QAA Subject Benchmark (where available): None available

Preconditions for Admissions to the Master's program: The University will at all times seek to ensure equality of opportunities for all applicants as described in its Admissions policy.
Applicants should normally possess at least one of the following:
- BSc Honours degree in a relevant subject eg Biomedical Science/Biology/Chemistry or Bioinformatics discipline
- a Medical or Veterinary degree,
- Postgraduate Certificate in Biomedical Science or Graduate Diploma in Biomedical Science
- IBMS Fellowship or Primary Examination of the IBMS
- Experience or qualifications deemed suitable by the joint UoW/TSU course team
In addition:
Applicants who did not have their secondary or tertiary education in English should have aqcuired the equivalent of an IELTS score of at least 6.5 in all components; TOEFL (paper) score of at least 600 plus TOEFL written test at Grade 4.5 or above; TOEFL (computer based test) of at least 250; or Cambridge Proficiency, Grade B.

Applicants will normally be interviewed and assessed for their suitability to join the course by the TSU team.
Applicants for the part-time mode of study will normally be working in a relevant area and should have written support from their employer both for day release and to indicate that facilities will be available in their workplace for the research project.

Support for the students: This will be carried out by the program partner Ivane Javakhishvili Tbilisi State University. Generally, on arrival, the students will be introduced to the TSU staff responsible for the course, the Library and IT facilities and to the administration of the Faculty of Exact and Life Sciences. The TSU staff will introduce the students to the UoW course team,

administration and the learning resources using the means of electronic communication modern technologies.

Learning support at TSU includes the specialists of Life Sciences Library, a General Library as well as the Library established and supported by the British Council in Georgia. The libraries have designated librarians who can provide in-depth training in the use of library resources, including RefWorks. In addition to the printed book collections, the libraries are providing an increasing number of electronic books. The library catalogue is also available enabling students to request and renew books. There are photocopiers, open access PCs (see above) and wireless networking for laptop users. Loan and reference copies will be available for some textbooks (e.g. Instant Notes in Immunology, Case Studies in Infectious Diseases, Molecular Therapeutics) and other titles will be available as *e*-books.

TSU uses a free Virtual Learning Environment Moodle where students can access course materials and will communicate with the TSU team- administrators and lecturers.

Students will have a full access to the UoW Intranet student portal and library facilities where the majority of journal titles are available online. Electronic resources, including databases, are accessed through an *e*-library known as infoLinX and is available off-campus too.

UoW uses a Virtual Learning Environment called Blackboard where students can access course materials and communicate with staff and other students via message boards.

TSU Services for Students provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues and careers. The International Education Office provides particular support for international students.

In addition, students will receive the following student support:
- Each new student receives a project copy of 'Essential Information', published by UoW, to cover various aspects of academic life including Course Frameworks, Regulations and Policies;
- Course and module handbooks;
- Students will take part in Postgraduate Academic Tutorial Scheme (PATS) that aims to furnish students with the key skills required to successfully produce work at the current level. This will be carried out by the TSU team using topics, materials and documents used at UoW;
- In common with all courses within the UoW School of Life Sciences, the TSU Course team and UoW course leader will meet each semester with Student Representatives;
- UoW Web-based teaching timetable which can be searched by day, slot, lecturer, course or module as well as Web-based examination timetable;
- TSU Library Resources will provide training opportunities for software packages and electronic database information retrieval throughout the programme of study;

- TSU Student Services can offer advice on accommodation, financial and legal matters, personal counselling, health and disability and international issues; careers guidance and chaplaincy support;

Reference Points for the course:
Internal:
- University of Westminster Mission Statement
- University teaching and learning policies.
- University quality assurance handbook and Modular Frameworks.
- Handbook of academic regulations.
- School of Life Sciences teaching, learning and assessment strategies.
- The research and practice of the School's staff have influenced not only the breadth of the curriculum on offer, but also teaching and learning.

External:
The South East England Consortium (SEEC) of 37 HE institutions have set out descriptors for knowledge skills and attributes at each academic level (2003) that have been adopted by the University as good practice.
Professional Body guidance: Institute of Biomedical Science.
The Health Professions Council.
Department of Biomedical Sciences Advisory Group.

Employment and Further Study Opportunities: The part-time students are already employed and many take the course as part of their career. Some use the qualification to move out of routine laboratories into more research orientated jobs as well as university teaching positions. About 20% of the full time students apply directly for PhD positions in Georgia, other Southern Caucasian countries, their home countries of origin, in the UK or in other EU countries, bound by Bologna agreement. The remainder gets employment in Georgia (about 20%), in their home countries (about 40%) or in EU member countries (15%) and in US (5%). Many of the overseas students see the value of one or two years research experience before either seeking a PhD abroad or at home. They are employed as research technicians, medical laboratory assistants, scientific or medical technical officers or research assistants. They also seek jobs in industry, research or healthcare or apply for further training (biomedical or clinical scientist routes). Medical doctors have used the degree to enter clinical fellow's positions and to advance their careers in healthcare, research and teaching.

Quality Management and Enhancement:
Course Management:
The management structure supporting the courses is as follows:
- Dr Nino Porakishvili, UoW Course leader, responsible for and overall management of the course and development of the curriculum;
- Dr Nina Kulikova, TSU deputy Course leader responsible for day to day running of the course;

- Dr Martin Parry, Head of the Department of Biomedical Sciences holds overall responsibility for the course within the School of Life Sciences, UoW;

The management structure is further supported by the Course Teams from two partner universities, UoW and TSU, with the former possessing the powers of course development and general administration, and the latter implementing teaching activities and local administration at TSU. Its membership is as follows:

- Course Leader (UoW);
- Deputy Course Leader (TSU);
- Liaison Tutor (UoW);
- UoW Module leaders who provide teaching material, set up assessments and ensure overall general management of the course;
- TSU full-time staff teaching the course, including "shadow" Module Leaders;
- Visiting lecturers and outside advisors, where appropriate.

Course Teams consider those aspects of the course not covered by the Course Committee such as timetabling, rooming and preparation and monitoring of examinations and assessments.

Administration of the course delivery: Students will be fully registered both at UoW and TSU with the induction provided by the TSU team, but containing information on studying/learning in both partner universities.

Students will have full access to the on site learning facilities of TSU and on line learning facilities of UoW (Blackboard, e-library etc).

The teaching material in blended format (power point presentations with text/voice over recorded on CD/DVD, modules presented in independent/DL format etc) will be provided to the TSU teaching team (deputy course leader and "shadow" module leaders) by the correspondent UoW module leaders and Course leader.

UoW and TSU teaching teams will maintain day-to-day communication via e-mail, Blackboard and Moodle. TSU deputy course leader will have an access to UoW Intranet.

The course delivery and all the assessments at TSU will be fully synchronised with those at UoW. The assessments set up for the on site course will be communicated to the TSU team by safe *e*-mail. The assessments will be carried out by the TSU team and samples (20%) swill be ent to the TSU module leaders for double marking (scanned original hard copies sent by e-mail).

Examinations will be synchronised with those at UoW. Exam papers and original UoW examination books will be sent to TSU deputy course leader via courier mail. Exam board will be held at TSU with an external examiner from the UK nominated by UoW and UoW course leader attending the board.

Diploma will be awarded by the UoW nominee at TSU.

Course approval, monitoring and review: The non-collaborative version of the course was initially approved by a University Validation Panel in 2004, followed by a successful re-validation in 2009. The Panel included internal peers from the University and external subject specialists from academia and industry to ensure the comparability of the course to those offered in other Universities and the relevance to employers.

Periodic Course Review helps to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers.

The collaborative version of the course upon a successful validation at UoW, will be validated at TSU. The core modules were selected for the collaborative degree in accordance with the local market research (see below). The course will be advertised in Georgia, in the Southern Caucasus, neighbouring and other countries (see below) by TSU staff and administration.

The course will be monitored each year by the School of Life Sciences, UoW, and Faculty of Exact and Life Sciences, TSU, to ensure that it is running effectively and that issues that might affect the student experience have been appropriately addressed.

Staff will consider the outcomes from each Course Committee, evidence of student progression and achievement and the reports from External Examiners to evaluate the effectiveness of the course. The outcomes are reported to the Academic Council of the University, which has overall responsibility for the maintenance of quality and standards in the University.

Student involvement in Quality Assurance and Enhancement: Student feedback is important to the University and student comment is taken seriously. The most formal mechanism for feedback on the course is the course committee. Student representatives will be elected to interact with the TSU course team and to represent the views of their peer group in the discussions. These will be communicated to the Course committee by the TSU representative deputy course leader.

Students will be asked to complete an end-of module questionnaire at the end of each module. The feedback from this will inform the Module Leader(s) on the effectiveness of the module and highlight areas that could be enhanced. Students will be able to directly electronically communicate with UoW Review Panels when the periodic review of the course is conducted to provide oral feedback on their experience on the course.

Course marketing and advertising: Upon validation TSU will carry out an intensive advertising and recruitment campaign to promote the course. There is a significant interest from the local and regional markets, as well as from other countries.

The regional Georgian universities have only thus far been licensed for BSc degrees. Therefore, MSc degrees developed in partnership with TSU would be likely to attract BSc degree holding students from the State Universities in Eastern, Central and Western Georgia. The UoW degree will attract students from the Southern Caucasian region (SCR) (Armenia, Azerbaijan), Turkey and from the Middle Asia and Far East (India, China).

Since this project is now supported by the EU Tempus program recruitment of the students will be facilitated by a very well structured and academically advanced consortium of SCR universities established as the result of previous Tempus programs.