



THE OPEN UNIVERSITY OF ISRAEL

**Department of Mathematics
and
Computer Science**

SELF-EVALUATION REPORT

Mathematics

Editor: Dr. Daniela Leibowitz

Raanana 2009

The Open University of Israel
MATHEMATICS SELF-EVALUATION REPORT
Executive Summary

The Open University of Israel (OUI) is unique on the Israeli academic scene. Although it resembles other universities in its pursuit of excellence in teaching and research, it differs from them in its educational mission – to widen access to quality higher education, and in its method of instruction – distance teaching. The OUI is dedicated to the creation of university-level materials that are suitable for independent learning, and to the development and implementation of versatile means of support for individual study.

To date, the OUI has prepared close to 700 university-level courses. It offers a variety of study programs toward Bachelor's and Master's degrees in a wide range of disciplines in Sciences, Humanities, Social Sciences and Engineering. The academic development and teaching activities are carried out by seven academic departments, backed by a sophisticated, centralized administrative system.

In keeping with its mission, the Open University has created a singular framework for university studies that enables uncompromising adherence to pre-set, high standards, without imposing admission requirements on undergraduates, without dictating specific yearly loads and without demanding regular class attendance. Student screening at the OUI is solely through performance.

The elaborate teaching method developed by the OUI allows students to study throughout Israel and abroad, whenever and wherever, alongside other personal and vocational obligations.

The gates of the OUI are open to all; however, only individuals who are intellectually inclined to acquire up to date advanced knowledge, capable of doing so and willing to work hard, can meet the strictly maintained level of academic excellence.

OUI learning materials are prepared by field specific experts. They undergo thorough (internal and external) peer-review to ensure their scholarly value. Extensive additional measures and quality control procedures are employed to ascertain their didactic merit as well. As a result, OUI texts are highly regarded and widely used in all Israeli universities.

Students: In academic year 2007/08, close to 44,500 students took OUI undergraduate courses and about 3,250 took graduate courses (in FTE terms, this represents about 18,550 undergraduates and 1,300 graduate students); 2,259 students completed various undergraduate programs and 331 received Master's degrees.

Learning at the OUI: Unlike traditional universities, at the OUI, students enroll in courses each semester. Study materials (books, study guides, readers, etc.) are mailed to them before the beginning of the semester with learning instructions and homework assignments for the entire semester. They study mainly on their own, and

submit assignments according to a predetermined schedule. The individual learning process is supported by detailed personal feedback on assignments and by various learning aids, printed and electronic, mailed or delivered via the course websites (home laboratory kits, videotaped enrichment lectures, problem solving sessions, online demonstrations, multiple choice drills, etc.). Tutorials held at study centers throughout the country help to clarify and practice applications of the subject matter and encourage socialization with peers. At the end of the semester, students take monitored written final exams. Since the assignments and exams are prepared in advance, the same pre-set high standard is preserved throughout the country, regardless of study center or tutor.

Academic staff: The academic staff of each department consists of senior faculty and academic teaching staff – course coordinators and tutors. The senior faculty (about 75 members in all) is the academic leadership; its members initiate study programs, and are in charge of the development of all course materials. Senior faculty members are also responsible for quality control. In particular, they supervise all ongoing instructional activities, by guiding and monitoring the performance of course coordinators (about 300), who, in turn, are responsible for the smooth, effective running of the teaching system. Each course offered by the OUI has a course coordinator, usually a member of the academic teaching staff, whose task is to hire and supervise tutors, prepare new assignments and exams for each semester, maintain the course website and enrich it with appropriate materials. Tutors (about 1000 in all), whose number in each course depends on the number and geographical dispersion of students enrolled, conduct group tutorial sessions, grade homework assignments and provide personal support when necessary.

Technologies: Extensive administrative and instructional services are provided to students and academic staff via internet. The OUI naturally invests considerable efforts in learning technologies: *Shoham*, the Center for Technology in Distance Education, investigates/adapts/creates platforms and technologies for use on the course websites. Faculty and teaching staff take part in the endeavor to use educational technologies wisely, creatively, innovatively and effectively. The versatile outcomes provide a multitude of means to remain academically updated, to liven up the lonely process of individual learning and to bridge physical distances.

Research: As in all universities in Israel, senior faculty members at the OUI conduct research as a major part of their role. Although their small number limits the overall impact of their research, individually they achieve high research standards, as measured by the numbers of papers in leading, refereed professional journals, review articles in refereed books, grants, memberships on journal editorial boards and contributions at international conferences. The OUI Research Authority encourages research by helping OUI faculty to locate external funding sources and submit proposals, and by competitively allocating grants from its internal research fund. The internal fund is also used to encourage and support research among members of the teaching staff. The *Chais Research Center* at the OUI encourages research on theoretical and practical issues related to educational technologies.

Quality control: Parallel to the development of the various components of its teaching method, the OUI has developed intricate peer-review-based quality control mechanisms of ever-increasing sophistication for almost every product, process and function. These enable the University to constantly examine its teaching performance and to address problems when necessary.

The Department of Mathematics and Computer Science: The department comprises two disciplinary groups – the **Math Division** and the **CS Division**. Each is responsible for developing and teaching all the courses in its discipline. The chair of each division is one of its senior faculty members. There are 14 senior faculty members in the department; 2 full professors, 3 associate professors (including 1 adjunct associate professor serving as a part time CS development consultant), 6 senior lecturers and 3 lecturers. In addition, there are 43 academic teaching staff members (28.8 full time positions). About 150 tutors were employed by the department in the 2007/08 academic year. The department offers Bachelor's degrees in Mathematics, Computer Science and Software Engineering, and a Master's degree (with/without thesis) in Computer Science. On the undergraduate level, it currently offers 62 courses, over 25 seminar courses and workshops, and two non-credit pre-academic workshops. In addition, there are 17 graduate Computer Science courses and 10 graduate CS seminars. In 2007/08, about 9,250 students took undergraduate Mathematics and Computer Science courses (about 15,000 course enrollments in all). 233 students took graduate CS courses (418 enrollments). 188 students graduated and 9 received Master's degrees.

The Mathematics division offers study programs toward Bachelor's degrees in Mathematics, in Sciences with an emphasis on Mathematics, in Mathematics & Computer Science, and double track programs in Mathematics plus an extra-departmental discipline. The number of Mathematics graduates is very low (11 in 2007/08, 46 in 2004-2008; ~240 since 1986), but this does not imply that all those who studied Math and did not complete an OUI degree are dropouts. OUI Math courses serve more than its own graduates. They constitute part of the curriculum of many students who began their studies at the OUI when other options were not available (e.g. while in high school or during military service), who later transferred to other universities and graduated. OUI Math students who choose to transfer before they complete a degree program are admitted and accredited in other Math/CS/Physics/Engineering departments and many of the division's graduates excel in advanced studies at all Israeli universities and abroad. The Mathematics division strictly maintains standards that ensure that credits granted for its courses are rightfully earned and transferable to any other academic institution that teaches parallel subject matter.

Daniela Leibowitz, PhD
Chair, Mathematics Division
Department of Mathematics and Computer Science