

 **THE OPEN UNIVERSITY OF ISRAEL**

Department of Natural Sciences

SELF-EVALUATION REPORT

Life Sciences

Editor: Dr. Anat Barnea

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The Open University of Israel
LIFE SCIENCES PROGRAM SELF-EVALUATION
Executive Summary

The University: The Open University of Israel (OUI) was established in 1974 as an institution of higher education based on distance learning. Its mission is to open its gates to all individuals capable of higher education, to enable all those capable of academic studies maximum flexibility in time, place and pace of studies and in learning styles through a wide range of programs, unique teaching and learning aids and diverse teaching methods.

The university has no admission requirements for undergraduates; its doors are open to all. Students' academic ability is gauged only by their performance in the courses they take. In the 2006-2007 academic year, 42,782 students were enrolled in undergraduate courses and 3,208 students in graduate programs. In FTE terms, this is comparable to 17,417 undergraduate students and 1,286 graduate students.

The Department of Natural Sciences: The Department of Natural Sciences, which is one of seven academic departments at the OUI, was established in 1997, when the OUI was reorganized on a departmental basis. The first Bachelor's degree (BA in Natural Sciences) was offered by the department in 1984. In 2000, the OUI was authorized to offer an MA in Biological Thought. Since 2003, the department has offered dual-disciplinary and interdisciplinary Bachelor's degrees, among them a BSc in Chemistry and Life Sciences, a BSc in Computer Science and Life Sciences, and a BA in Psychology and Life Sciences. The department offers 17 undergraduate programs (of which eight are evaluated in this report) and 1 graduate program; 144 undergraduate courses in Chemistry, Physics, Earth Sciences and Life Sciences, of which 17 are laboratory courses; and 10 graduate-level courses. In the last 5 years, 289 students have graduated from the department, which represents 3.2% of OUI graduates during that period. Of these, 34.9 % were awarded degrees in Life Sciences. In 2007, the number of enrollments in undergraduate courses offered by the department was 3,381, which represents 2.9% of all undergraduate course enrollments at the OUI.

Senior faculty members in the department engage in research and initiate, develop, maintain and monitor courses. There are currently 11 senior faculty members in the department, five of whom are in Life Sciences. We are currently recruiting a new senior faculty member in Life Sciences.

Teaching and Learning: OUI courses differ markedly from courses in conventional universities, as they are primarily printed scholarly-scientific works specifically suited to independent study. Books are written either by the department's senior faculty or by scholars from other universities. In some courses, up-to-date textbooks either in English or translated into Hebrew are accompanied by study guides, written by OUI faculty. These study guides contain self-study tools characteristic of OUI course books. In advanced courses, materials include original review articles and research papers. Learning materials often include technology-based materials, such as DVDs and multimedia CDs containing courseware, virtual laboratories, simulations, recorded lectures, films and animations.

Each course has a coordinator, usually a member of the academic teaching staff, whose task is to hire and supervise tutors, write assignments and exams, and maintain the course website, under the guidance of a senior faculty member who has academic responsibility for the course. Most course coordinators in the department hold Ph.D. degrees (90%); the rest have master's degrees. At the end of 2007, there were 35 course coordinators in the department, 20

of whom were responsible for undergraduate Life Sciences courses and 3 for graduate courses.

In order to facilitate students' comprehension of the material in the course book, the OUI offers group tutorials in each course, conducted by tutors (who have at least an MSc) in 55 study centers throughout the country. Course coordinators and tutors receive special training before beginning their work, in addition to on-the-job training. Except for lab sessions, attendance at tutorials is not mandatory and many students opt for their home as a private campus supported by the OUI distance teaching method, notably via the internet. Course coordinators also hold regular telephone consultation hours. Laboratory sessions are held in a modern teaching lab on the Raanana campus. In the MA program, mandatory seminar meetings accompany all courses and these too are held in Raanana.

The academic year at the OUI is divided into semesters – fall, spring and summer – with courses offered each semester on the basis of demand. Before the beginning of the semester, all study materials are mailed to students, including course booklets that contain the assignments and the timetable. During the semester, students are required to submit several written assignments by mail or via the internet. At the end of the course, a written examination is held simultaneously at study centers throughout the country, and the student is given a final grade, which is a weighted grade of the assignments and the exam.

As a distance teaching institution, the OUI devotes significant efforts to developing learning technologies. Every course has a website, maintained by the course coordinator, that enables the university to improve services to students, enhance teaching quality, address varied target groups, bridge geographic distances and supply easy communication and continuous availability. The websites include discussion forums that enable interaction between students and the course team, personal notebooks, chat rooms, an online assignment system, additional learning materials such as PowerPoint presentations, demonstrations, simulations, virtual labs, and a tool that enables students to perform collaborative work (Wiki).

Rapid developments in the Life Sciences require constant updating of learning material. OUI books are updated every few years by rewriting certain topics, or replaced with newly published textbooks, in English or translated into Hebrew. In some courses, up-to-date review articles are incorporated into the learning materials or posted on the course websites.

Life Sciences programs, students and graduates: The eight undergraduate study programs in Life Sciences are designed to promote the goals of the department and the University as well as the following specific goals: To qualify Life Sciences graduates who (a) have broad and deep knowledge of the different areas of Life Sciences; (b) are equipped with scientific and intellectual methods essential for critical analysis of biological phenomena, theories and approaches; (c) are capable of independent study, able to read scientific material critically, to express themselves scientifically in writing and to contend with material in English; (d) are equipped with skills necessary for searching for material in libraries and databases (e) have basic experience and knowledge in research and research methods; and (f) have a perspective of biology and the appropriate qualifications that will enable them to pursue advanced studies in Life Sciences, based on an informed decision. Graduates of the department benefit from gaining a high degree of self-discipline that stems from the OUI's unique teaching methods.

All the Life Sciences programs include basic courses in Physics, Chemistry and Mathematics that provide knowledge required in intermediate and advanced courses as well as seminar courses that provide students with an updated perspective of specific research topics. English proficiency, knowledge in basic computer applications and bibliographic training in the library are required for all degrees.

For the purpose of this report, we defined a “Life Sciences student” as a student who passed one course in Life Sciences and was enrolled in at least one other course in Life Sciences or in one of the exact sciences that are mandatory for Life Sciences programs. Life Sciences students are relatively older than in other institutions, just over half are females, almost half live outside of the major cities, and 14.8% did not complete high school. Thus, the Life Sciences programs fulfill the OUI goal of increased access to higher education.

The average grade of graduates over the past five years in the various undergraduate Life Sciences programs is 81.8 (SD=5.9). The OUI’s open admission policy combined with its high academic requirements results in a relatively high dropout rate in the student’s first courses at the OUI. Students who are able to graduate are usually highly motivated and have high intellectual abilities.

Data from a telephone survey performed for the present report indicate that of 70 graduates who responded (who completed their studies after 1998), 59% enrolled in further studies, 88% of these in MSc programs in various universities. Half have completed their master’s degrees and four are pursuing a PhD.

Research: Research in the department is carried out by members of the senior faculty and the academic teaching staff, most notably by those among them who hold a PhD. In the last five years, members of the department won 14 grants from competitive funds including the Israel Science Foundation and the European Council. On nine of these projects, the PIs were faculty members in Life Sciences. During this period, faculty members published numerous papers, cooperated with colleagues in Israel and abroad, presented their work at international conferences, served on editorial boards of journals and took part in the organization of conferences and meetings. The undergraduate textbooks that our faculty members write, which have an excellent reputation for their high academic standards, also have a research aspect, in terms of analysis of up-to-date research and knowledge.

Quality control mechanisms: Due to the nature of distance teaching, the OUI has developed quality control mechanisms for almost every product, process and function. These mechanisms enable the University to continuously examine its strengths and weaknesses and to address problems when necessary.

The department maintains rigorous academic standards with respect to courses and teaching. We maintain an ongoing quality assurance and control system whereby courses undergo extensive refereeing during the development phase, and periodic assessment concerning adequacy, relevance and scientific rigor while the course is being taught. Furthermore, the quality of teaching is routinely monitored by means of student feedback gathered each semester, samples of assignments and examinations, summary statistics regarding students’ achievements, and visits paid to tutorial sessions by the course coordinators and the senior faculty. All faculty members are evaluated every year. The self-evaluation process highlighted our strengths and weaknesses, and motivated thinking about ways to overcome weak areas.

In addition to statistical data, this report reflects the ideas and feelings of all senior faculty members. We believe that the report preparation process contributed to the departmental atmosphere and to the involvement of all faculty members in the activities of the department.

Joel Klemes, PhD

Head, Department of Natural Sciences

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Additional Materials

Enclosed with this report: *Programs of Study – Life Sciences* (in English)

On CD:

Catalog and Registration Guide (in Hebrew)

Rules and procedures (in Hebrew):

- Code of appointments and advancement
- Course development process
- Disciplinary code
- Program approval procedure
- Regulations for preventing sexual harassment
- Tuition fees

Syllabi (in English): Descriptions of all courses in the program

Curriculum vitae (in English): Updated CVs of all staff members

Extras:

- Clusters of courses (list of courses for which Life Sciences faculty members are responsible, in English)
- Bridges to other universities (transfer tracks to other universities, in English)
- Programs of study – Life Sciences (in English, also enclosed with this report)
- Seminar guide (guide to writing a seminar paper, for students, in Hebrew)
- Weights of grades (relative weight of assignments and examinations in each course, in English)
- Labs – fieldtrips (table summarizing laboratory courses, fieldtrips and laboratory sessions, in Hebrew)
- Departmental seminars (list of guest lecturers and symposia topics, in English)
- Course coordinator self-evaluation form (in Hebrew)
- Report on tutor (report of course coordinator on tutor function, in English)

Extras, con'd.

- Teaching survey (ongoing survey administered to students, in English)
- Special exam conditions form (in Hebrew)
- Letter to seminar supervisors (in Hebrew)
- Evaluation of MA seminar paper (sample of feedback, in English)
- Declaration of original work (students' declaration of original work on seminar paper, in Hebrew)
- Survey of graduates (findings of telephone survey of OUI graduates in Life Sciences, in English)
- Role description – course coordinator (components of the course coordinators' role, in English)
- Course Coordinators (report of the committee examining the status of course coordinators, July 2006, in English)

Chapter 1

The Institution – The Open University of Israel

1.1 Brief Summary

The Open University of Israel (OUI) is a distance teaching institution and a research university that offers academic studies to students throughout Israel and abroad. Its study methods allow students to acquire higher education, whenever and wherever convenient, while pursuing other personal and vocational obligations. Established in 1974 by the government of Israel, with the support of the Rothschild Foundation, the University began operating in 1976. The Council for Higher Education (CHE) authorized the University to confer Bachelor's Degrees (BA) in 1980, and in 1996, the University was authorized by the CHE to teach the first program leading to a Master's degree. The OUI does not yet offer studies toward a doctoral degree.

Academic Departments: Seven academic departments function within the OUI. These are: History, Philosophy and Judaic Studies; Literature, Language and the Arts; Management and Economics; Sociology, Political Science and Communication; Education and Psychology; Mathematics and Computer Science; Natural Sciences. An additional unit is responsible for teaching English as a Foreign Language. Each department is autonomous and deals with all professional matters related to the disciplines within it. The members of the departments – senior faculty and academic teaching staff – are involved in research, course development and teaching, as well as academic-administrative tasks.

Degree entitlement: In order to earn a Bachelor's degree from the Open University, students need to accumulate at least 108 credits. Certain programs require up to 128 credits, and a B.Sc. in Engineering requires about 160 credits. Similar differences in required credits are common in other Israeli universities, reflecting differences in the scopes of undergraduate training considered appropriate in the various disciplines. To earn the degree, students must accumulate at least 24 advanced credits, and no more than 36 introductory credits. They are also required to submit seminar papers. In addition, they must demonstrate English language proficiency by passing an exemption test or completing non-credit courses in English. Other requirements are library and bibliographic skills, and, in most study programs, computer application skills.

The OUI deems it important that students pursuing an academic degree expand their horizons, develop their intellectual abilities and justify their status as educated members of society. To this end, the students are required to include in their program of studies at least one course which is not related to their main area of specialization.

Number of Students: Students at the Open University are not required to enroll in a department as is customary at other universities, but rather register for specific courses. A student's program of studies may include a variety of courses offered by more than one department. Consequently, it is not easy to present the numbers of students in each academic department. In the 2006-2007 academic year, 42,782 students were enrolled in undergraduate courses and 3,208 students in graduate programs. In full-time equivalence (FTE) terms, this is comparable to 17,417 undergraduate students and 1,286 graduate students. Due to the open admissions policy, the OUI has a large student body, which is not reflected in the number of its graduates. The relatively low percentage of graduates as compared to other universities may be attributed to the following: some students are simply not suited to academic studies; other students (such as soldiers) begin their studies at the OUI and continue in other universities, and there are also those who take individual courses for personal enrichment only.

Bridges to other universities: With the encouragement of the CHE, the Open University established transfer tracks from the OUI to all other Israeli universities for

second year studies in various departments. After examining the OUI curriculum, these departments undertook to accept to second year studies in their institutions any OUI student with the appropriate record; such students, who achieve a specified minimum grade in the necessary cluster of courses at the OUI, as defined jointly by the two academic institutions, are accepted by the other university irrespective of previous achievements in high school or on the psychometric test.

Study Centers: In addition to the central campus in Raanana, the OUI operates study centers throughout the country. In the 2006-2007 academic year, 5,102 student groups took part in tutorial sessions held in 55 study centers (see map, p. 80). Most of the study centers provide registration, academic counseling and some library services in addition to classroom facilities. Tutorial groups are opened in response to the number of students enrolled in each course in each study center.

Courses: An OUI course is first and foremost a printed scholarly scientific work. Study materials are mailed to the student's home and include textbooks, an assignment booklet, a study guide, a reader of articles, home-laboratory kits, and additional materials such as videotapes, multimedia courseware, etc. are posted on the course website.

1.2 **Mission Statement of the Institution, its Aims and Goals**

The mission of the OUI can be derived from its name: to open the gates of higher education to all individuals capable of high-level studies, by providing a high-quality university education.

The following are the three major goals derived from our mission, and the structural and pedagogical means necessary for their realization:

1. To increase access to higher education

- **Open admissions:** The OUI is open to anyone wishing to undertake studies toward a Bachelor's degree, without preconditions or admission requirements. Students begin by enrolling in particular introductory courses, and may later decide to choose a specific study-program and enroll in further courses leading to a degree. They accumulate credits by passing each individual course. Thus, the first courses represent a kind of individual entrance exam. Only those who are capable of academic studies can continue to higher-level courses (e.g., advanced courses).
- **Distance teaching:** The OUI specializes in distance teaching. Textbooks are the primary component of the OUI methods of instruction. Every course also offers regular tutorial sessions (and in some courses intensive tutorials) held at study centers throughout the country. Students who choose to participate in the tutorials can usually do so on days convenient to them. Regular tutorials meet once every two or three weeks; intensive tutorials usually take place weekly. Students submit assignments during the semester and take a monitored final exam in every course.
- **Special populations:** In addition to those who decide to study at the Open University because the OUI study method suits them, our student body includes a large number of individuals who find it difficult to study in other universities. **Peripheral populations** – Thanks to our many study centers, the OUI is able to reach individuals who reside in peripheral areas. **The working population** – The flexibility offered by the OUI enables these individuals to study at their own pace, toward a degree or for enrichment. **The Arabic-speaking population** – The OUI attempts to address the needs of individuals in this group by establishing study centers in Arabic-speaking areas and by translating introductory courses into Arabic. **The Russian-speaking population** – The OUI offers a complete program of Judaic and Land of Israel

studies in Russian for Russian-speakers in Israel and in the former Soviet Union. **The ultra-orthodox population** – The OUI offers separate tutorials for men and women in centers close to their homes. **Soldiers** – OUI teaching methods are especially suitable for soldiers. **Teachers** – The OUI offers teaching certificates in several subjects and a master's degree in Education. **Israelis abroad** – individuals representing Israel or temporarily living abroad can study in Hebrew. **Prisoners** – The prison authorities allow prisoners to take OUI courses. **The retired** – The flexibility offered by the OUI enables these individuals to study at their own pace. **The physically-disabled** – OUI distance teaching methods are especially suitable for physically-disabled students who are unable to attend classes.

2. To create and disseminate academic knowledge

- **Research:** The Open University offers a unique environment in which a small group of scholars is committed to the creation and transmission of knowledge on the highest level. The Open University aims to build a strong, university-wide culture of excellence in research, by increasing the number and proportion of its faculty who are regarded by their national and international peers as excelling in their disciplines and by providing institutional support to the development of cutting-edge research. In both basic and applied research, the Open University measures achievement against national and international standards. Rigorous assessment and review are central to advancing its research faculty, as are participation and leadership in national and international academic forums.
- **Integrated study materials:** Open University textbooks are written by scholars and specialists in Israel and abroad, for the benefit of students at the OUI and elsewhere. The study materials combine a classic textbook and exercises. Merging the content and didactic aspects in Open University course books contributes to students' active, independent learning.
- **Developing teaching aids:** The OUI also incorporates innovative and advanced technologies into its teaching, including internet, interactive instruction through broadband communication, multimedia, home-lab kits, virtual labs, etc. The teaching aids afford enjoyable and effective learning and enable students with different learning styles and needs to study without time or place restrictions.

3. To offer maximum flexibility in pursuing academic studies

- **Flexibility in time, place and pace of studies:** Within the framework of an academic semester, OUI students can study from any location in Israel and the world, at a time of their choice. The OUI does not require them to complete a structured and uniform program of studies during a specific academic year. Their progress depends on the number of courses in which they enroll each semester. Students determine their own pace of study based on the time at their disposal, taking into consideration family and professional obligations, as well as their determination and diligence. Students can also choose to follow a structured program based on the pace practiced at other universities. The University opens study centers throughout the country wherever there is a large enough group of students to justify this, and holds regular tutorial sessions at these centers.
- **Disciplinary flexibility:** In creating an individual program of study toward a degree, students can select courses from a diverse array of disciplines or a focused disciplinary format. In either case, students are bound by the rules of the chosen program of study, so that their course list has both the internal logic and the scholarly justification commonly accepted by the academic community. The OUI offers a wide range of single- and dual-disciplinary undergraduate programs of study and five

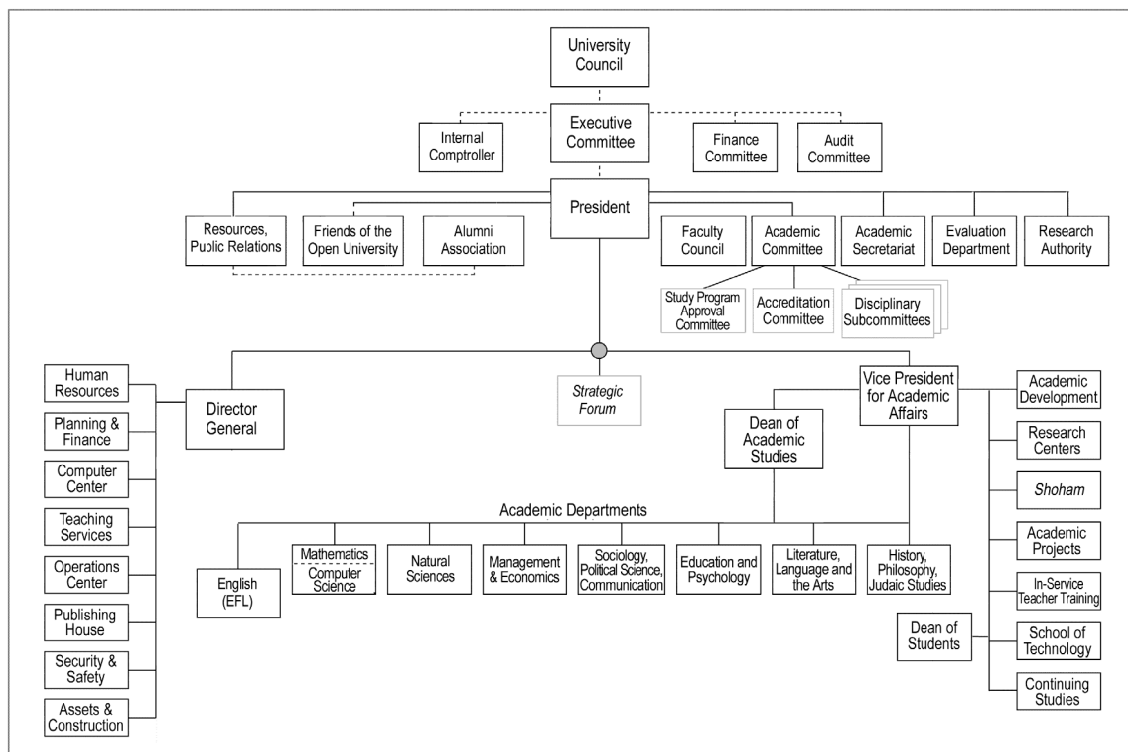
graduate programs: Master of Business Administration (MBA); MA in Democracy Studies; MA in Education – Learning Technologies and Learning Systems; MA in Biological Thought; MSc in Computer Science. An MA program in Cultural Studies will be offered in 2009. In contrast to the open admissions policy regarding undergraduate studies, candidates for the graduate programs are accepted only after fulfilling strict admission requirements, as is customary in all other Israeli universities. The University also offers programs toward high school teaching certificates in several areas as well as certificate studies in Computer Science.

- **Diversity in teaching methods:** Open admissions and the varied student population inevitably results in diversity in learning skills and learning styles. To address the different needs of students with different learning styles, the Open University provides materials in multiple formats, from which students may choose the one most suitable to them. Thus, the OUI caters to those who prefer to read vis à vis those who prefer to listen; those who prefer printed materials vis à vis those who prefer reading on the computer; those who prefer directed, linear learning vis à vis those who prefer modular, independent learning.

1.3 The Organizational Structure of the Open University

According to the OUI organizational structure, the President is the academic and administrative head of the University, with the Vice President for Academic Affairs and the Director General reporting to him.

The organizational structure of the Open University, as of September 2007



The major Open University bodies are:

- The **Council** is the supreme authority of the University. The Council, headed by the Chancellor, determines University policy, supervises the implementation of its decisions and administers the affairs and assets of the University.
- The **Executive Committee** is appointed by the Council and is responsible for ongoing planning, implementation, direction, and supervision.

- The **Academic Committee**, headed by the President of the University, is the academic authority of the University and consists of professors from universities throughout Israel and Open University faculty. It is responsible for designing academic programs and maintaining the University's high standards of academic activity. (The disciplinary subcommittees, the Accreditation Committee and the Study Programs Approval Committee, described below, operate within the framework of the Academic Committee.)
- **The Faculty Council** is composed of all appointed senior faculty as well as representatives of the academic teaching staff. The Faculty Council examines and discusses academic issues and affairs of the University.

1.3.1 University bodies that support the work of the academic departments

The seven academic departments at the Open University work in close coordination with many University bodies, listed below.

The Research Authority: The Research Authority encourages research among faculty members by helping them find external sources of funding and submitting proposals to these funds. The Authority collects and disseminates information on sources of funding, and is responsible for financial and administrative monitoring of research proposals submitted via the Authority that received funding. In addition, the Authority supports faculty research through grants and scholarships from the internal research fund.

The Academic Development Unit: The Academic Development Unit coordinates all activities related to writing, monitoring, and producing academic courses and programs of study, including, among others, receiving the professional opinion of consultants with regard to proposed courses and study materials; drafting contracts with external course writers and translators of books, and managing payment to all involved; coordinating schedules; updating databases on courses; coordinating the activities of the disciplinary subcommittees. In addition, it is responsible for editing the study materials, coordination with the Open University publishing house, and handling copyright issues.

The Disciplinary Subcommittees operate within the framework of the Academic Committee in various disciplines: Humanities; Mathematics and Computer Science; Natural Sciences; Engineering; Social Sciences; Management and Economics; Sociology, Political Science and Communication; Education and Psychology. They approve new programs of study and the development of new courses.

The Office of the Dean of Academic Studies: The Office of the Dean of Academic Studies is responsible for university-wide and inter-departmental issues related to studies and teaching at the Open University, and sets guidelines for the departments in the following areas:

- Formulating ongoing teaching policy which all departments must follow; formulating guidelines, rules and regulations which students must observe; monitoring and regulation of teaching;
- Training teaching staff; coordinating academic counseling and guidance activities;
- Managing the central Open University library and the libraries in study centers;
- Formulating guidelines for collaborating with colleges and institutions in which OUI courses are taught and maintaining ongoing contact with these institutions; supervising all Open University study centers.

The Academic Counseling and Study Guidance Center in the Office of the Dean of Academic Studies supports students throughout their studies by providing general and field-specific counseling, and imparting learning skills through workshops or individual guidance. A special unit in the center focuses on students with learning disabilities by

supplying special technologies, workshops and test accommodations. The academic support system functions on the main OUI campus in Raanana and in study centers.

The Training department in the Office of the Dean of Academic Studies focuses on three areas:

- Developing training programs aimed at providing employees with the resources they need to function effectively in line with OUI goals.
- Guidance and training for managers in the academic sector – ongoing guidance is offered to academic managers (course coordinators and department heads).
- Accompanying organization-wide projects in which the behavioral aspect of employees is vital for success (for example, employee assessment).

The Study Programs Approval Committee reviews each student's record of studies to determine whether degree requirements have been met. The Open University does not confer a Bachelor's degree without the Committee's approval.

The Committee for Accreditation of Prior Studies considers requests for accreditation from students who previously studied at an institution of higher education in Israel or abroad. The Accreditation Committee may grant up to 60 credits for courses studied at an accredited academic institution.

The Disciplinary Committee may impose a sanction of dismissal from a course, revocation of a diploma, suspension, expulsion or fine on students who commit disciplinary offenses. Disciplinary measures are taken in accordance with the Student Code of Conduct. Students are entitled to appeal the Disciplinary Committee decision to the Appeals Board. After receiving the written decision of the Appeals Board, students are entitled to submit a request in writing to the President of the University for a pardon.

The Ethics Committee deals with the following issues: Determining a timetable for distributing questionnaires in classes, by mail or e-mail for both research and administrative purposes; Examining the research plan or format of empirical studies, examining and approving questionnaires or unique experiment processes; Approving in advance all laboratory experiments that reveal students' personal information; Examining all the University's registration questionnaires to ensure that they do not request irrelevant or unnecessary information.

The Evaluation Department: The Evaluation Department is responsible for developing and conducting studies and surveys with the aim of assessing OUI academic activities and providing information to decision-makers. In addition to ongoing surveys of the teaching process, the department also evaluates programs of study, courses and pilot projects. The department investigates and evaluates issues on the level of the university, the department, and specific courses. The initiative to conduct an evaluation may come from OUI management, a specific department, faculty members, or the Evaluation Department.

Shoham (The Center for Technology in Distance Education): *Shoham* deals with the development, evaluation, research and integration of technology-based integrative pedagogical solutions to meet the various needs of academic courses offered by the University, enabling it to provide a higher quality and more effective and enjoyable learning experience to its varied and dispersed student body. To this end, *Shoham* is involved in the following areas:

- The development of an Internet-based learning environment, 'Opus', that serves as the infrastructure for the University's course websites. The websites enable virtual teaching and learning, access to study materials and communication between students and course coordinators or tutors, and among the students themselves

- Locating, examining and testing new technologies and their integration into the teaching and learning system
- The development of alternative distance learning methodologies and models and the assessment of the use of technological and pedagogical alternatives for tutorial sessions
- The development and production of a variety of study materials rich in images, sound and motion to supplement the written study materials
- Training and support of teaching staff who integrate technology in their teaching

Shoham's staff includes pedagogical experts, multimedia and video specialists, and computer and technology professionals involved in the specification and analysis of teaching needs as well as the development, study and evaluation of infrastructures, systems, applications and methodologies aimed at improved teaching.

The Center works in close cooperation with the academic departments on pedagogical issues and with the administrative units in the areas of logistics, administration, communication and computers.

The Chais Research Center for the Integration of Technology in Education: The Chais Center is a research body whose purpose is to examine the integration of technology into teaching processes. It promotes theoretical and practical research among Open University faculty, with the aim of improving the integration of these technologies into their courses. The Chais Center provides a platform for cooperation among faculty from various departments at the Open University, supports the research performed by its members, and awards scholarships to outstanding graduate students. In addition, the Center holds symposia and workshops.

The Dean of Students: The Dean of Students initiates and coordinates areas that relate to students' welfare. The Dean of students also serves as the student ombudsman.

1.4 Senior Academic and Administrative Office holders

Chancellor – The Rt. Hon. the Lord Woolf. The Chancellor is the head of the University and Chairman of the Council.

Deputy Chancellor – The Rt. Hon. the Lord Rothschild. Replaces the Chancellor in his absence.

Vice-Chancellor – Prof. Abraham Ginzburg. Replaces the Chancellor and the Deputy Chancellor in their absence.

Chairman of the Executive Committee – Mr. Zeev Abeles

President of the Open University – Prof. Gershon Ben-Shakhar. The academic and administrative head of the University; Chairman of the Academic Committee, Chairman of the Faculty Council.

Vice President for Academic Affairs – Prof. Ora Limor. Responsible for all the academic aspects of the activities of the University; replaces the President in his absence.

Dean of Academic Studies – Prof. Tamar S. Hermann

Head of the Research Authority – Prof. Miriam Souroujon

Head of the Academic Development Unit – Prof. Aviva Halamish

Director General – Mr. David Klibanski. Responsible for the administrative and financial affairs of the University.

Dean of Students – Dr. Haim Saadoun. Initiates and coordinates activities that relate to students' welfare, including financial aid.

Senior Faculty, Academic Teaching Staff and Administrative Staff – Personnel and Positions (December 2007)

Department	Senior faculty		Visiting faculty / Development consultants		Academic teaching staff		Administrative and professional staff		Total staff	
	Personnel	Positions	Personnel	Positions	Personnel	Positions	Personnel	Positions	Personnel	Positions
Dept. of Mathematics and Computer Science:										
Mathematics Division	2	2			14	10.6	1	0.7	17	13.3
Computer Science Division	9	9	3	1.5	30	18.25	2	2	44	30.75
Dept. of Sociology, Political Science and Communication	6	6	1	0.33	37	26.15	3	2.31	47	34.79
Dept. of History, Philosophy and Judaic Studies	9	9	1	1	28	19.4	2	1.4	40	30.8
Dept. of Literature, Language and the Arts	7	6	1	0.17	25	15.88	2	1.5	35	23.55
Dept. of Education and Psychology	10	10	2	0.83	44	27.5	3	2.62	59	40.95
Dept. of Management and Economics	6	6	8	4.95	66	40.32	5	4.83	85	56.09
Dept. of Natural Sciences	10	10	1	0.5	23	17.12	6 *	5.3	40	32.92
English Unit					15	12.11	4	3.3	19	15.41
In-Service Teacher Training Unit							6	3.8	6	3.8
Center for Information Technology in Distance Education – <i>Shoham</i>	1	1					38	27.6	39	28.6
Chais Research Center			2	1			2	0.6	4	1.6
Supporting Units: Academic Development Unit; Office of the Dean of Academic Studies; Academic Counseling and Study Guidance Center; Research Authority; Library; Dean of Students; President's Office, Evaluation Department, Training Department	4	4					134 **	105.7	138	109.7
Total	64	63	19	10.28	282	187.33	208	161.66	573	422.26

Note: In some cases, the number of positions is smaller than the number of personnel because some of the faculty and staff do not hold full-time positions.

* Including 4 laboratory staff

** Including librarians, academic counselors, statisticians, and other professional staff.

The table does not include tutors who are hired per semester in accordance with enrollment figures, nor does it include all the university's administrative units, such as the Computer Center, Planning and Finance Administration, Human Resources Administration, etc. It also does not include staff in the School of Technology and the Continuing Studies Center.

Chapter 2

The Department of Natural Sciences

2.1 Organizational Framework

The programs of study assessed here are offered by the **Department of Natural Sciences**. The department was established in 1997, when the University adopted its current structure. The University offered the first courses in Natural Sciences (“Introduction to Natural Sciences”) and in Life Sciences (“Life Sciences: Introduction”) in its first year of operation (1976). The number of courses in Natural Sciences has increased significantly over the last three decades, and in 2007 reached 144 courses, 62 of them in Life Sciences.

Institutional and Departmental Milestones

- 1976** – The Open University (OUI) was authorized by the Council for Higher Education to offer academic courses in Natural and Life Sciences
- 1980** – The OUI was authorized to offer a Bachelor’s degree (BA) in Mathematics and Natural Sciences
- 1982** – The Science Instruction Laboratory was established
- 1984** – The OUI offered a Bachelor’s degree (BA) in Natural Sciences
- 1994** – The OUI distinguished between Bachelor’s degrees (BA) in Natural Sciences or in Life Sciences, according to the students’ program of studies
- 1999** – The OUI offered a Bachelor’s degree (BA) in Sciences
- 2000** – The OUI was authorized to offer a Master’s degree (MA) in Biological Thought and studies began the following year
- 2003** – The OUI offered a dual-disciplinary Bachelor’s degree (BA) in Life Sciences and Management
- 2006** – The OUI was authorized by the CHE to offer a dual-disciplinary Bachelor’s degree (BSc) in Chemistry and Life Sciences
- 2007** – The Open University offered a Bachelor’s degree (BA) in Natural Sciences: Emphasis on Biotechnology, and two dual-disciplinary degrees in Psychology and Life Sciences, and in Life Sciences and Economics
- 2008** – The Open University offered a dual-disciplinary degree (BSc) in Computer Science and Life Sciences, and a BA in Life Sciences: Emphasis on Field Studies

The founding group of senior faculty members responsible for the development of the first Natural Sciences courses at the OUI, together with colleagues from other universities, included Prof. Avinoam Adam, Prof. Simona Ginsburg and Dr. Ruth Arav (Life Sciences), Prof. Nava Ben-Zvi (Chemistry), Prof. Yoram Kirsh and Prof. Reuven Aviv (Physics) and Prof. Emanuel Mazor (Earth Sciences). Dr. Joel Klemes joined the Life Sciences group in 1979, Prof. Miriam Souroujon in 1987 and Dr. Anat Barnea in 1994. In 1989, Prof. Itzhak Dotan joined the Chemistry group and Dr. Inbal Tuvi-Arad joined in 2004. In 1992, Dr. Yosef Verbin joined the Physics group and Dr. Yoav Yair joined in 1999. Prof. Shlomo Shoval joined the Earth Sciences group in 1989.

A large number of academic teaching staff members joined the department over the years – some holding PhDs, as well as doctoral candidates, who, together with senior faculty members, are involved in developing and operating the courses offered by the department. At the end of 2007, there were 48 faculty members in the department, of whom 27 were in Life Sciences. Of the 11 senior faculty members in the department, five were in Life Sciences.

The Department of Natural Sciences initiates and is responsible for the development of new courses and programs of study, updating existing courses, study materials and learning aids, and removing courses from the course offering. The department offers 17 undergraduate programs and one graduate program (listed in section 2.5), 144 undergraduate courses in Chemistry, Physics, Earth Sciences and Life Sciences and 10 graduate-level courses. Among

the undergraduate courses, 17 are laboratory courses, based on practical work in the science instruction laboratory (for details, see section 3.6.3). There are 62 undergraduate courses in Life Sciences, which represent 9% of all courses offered by the OUI. The courses were written and developed mainly by the Natural Sciences faculty. Some of the courses were written by leading scholars in their fields, affiliated with other universities, and some are translations into Hebrew of well-known English textbooks. Because of the rapid development of knowledge in the Life Sciences, most of the courses are routinely updated by incorporating reviews and research papers into the study materials. Seminar courses are updated continuously. At the end of 2007, eight courses in Life Sciences (which were not seminar courses) were in the process of complete revision.

In the last 5 years, 297 students have graduated from the department, which represents 3.2% of OUI graduates during that period. Of these, 34.9 % were awarded degrees in Life Sciences.

2.2 The Mission and Goals of the Department

The rationale and goals of the Department of Natural Sciences stem from the goals of the University, as delineated in chapter 1 above, the OUI's continuous striving for excellence, and its focus on high quality scholarly and scientific activities.

The goals of the Department of Natural Sciences are:

- To promote the goals of the programs of study in Natural and Life Sciences (as specified in chapter 3)
- To disseminate knowledge in the field of Natural Sciences on a high level through the development of study materials and teaching tools
- To engage in research in order to create new knowledge in Natural Sciences
- To develop in students the ability to study independently and to follow the rapid advancements in the Natural Sciences
- To provide basic and wide knowledge in Natural Sciences, combined with a deep background in other disciplines, qualifying students to continue their studies toward advanced degrees in any academic institution in Israel or abroad

The absence of equipped research labs on the OUI campus precludes the development of graduate programs based on experimental scientific research. To date, the only graduate program in the department is the MA program in Biological Thought. Congruent with the OUI's desire to develop higher degree programs in all fields, the department intends to develop an MA program in Science Teaching.

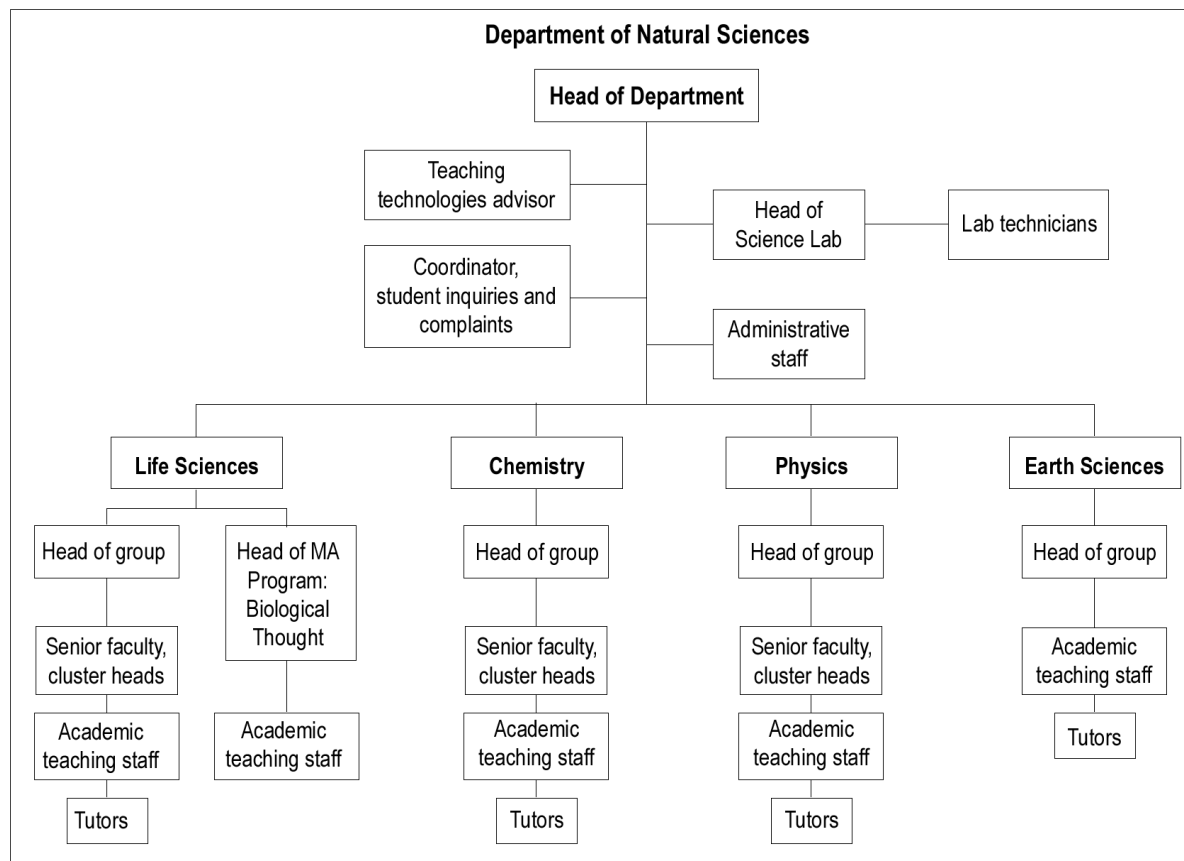
2.3 Internal Organizational Structure

The Department of Natural Sciences is composed of the head of the department (appointed by the President), the heads of groups (Life Sciences, Chemistry, Physics and Earth Sciences) and of the graduate program, senior faculty, cluster heads, academic teaching staff, tutors, science lab head, lab technicians, an individual responsible for technology-based teaching, an individual responsible for students' inquiries and complaints, and the administrative staff.

The Department of Natural Sciences has the authority to seek and select candidates for senior faculty positions whenever such a position is available. The appointment process is detailed in Rules and Procedures, "Appointments" (in Hebrew). Currently the department has 11 senior faculty members, 35 course coordinators, one guest lecturer on sabbatical and one post-doc student.

The senior faculty members are responsible for writing, developing and updating courses, and are active in university academic and administrative activities and committees. They are also

responsible for the appointment of course coordinators and the approval of assignments and final examinations. Each senior faculty member is in charge of the instruction and academic content of a cluster of courses in his/her field of knowledge (“cluster heads,” see Extras, “Clusters of courses” for a list of courses for which Life Sciences faculty members are responsible).



The academic teaching staff includes course coordinators and tutors. Course coordinators are responsible for planning all teaching aspects of an academic course and for implementing and monitoring these aspects (supervised by the senior faculty member responsible for the course). They are also responsible for the administrative aspects of the teaching. The scope of the positions of course coordinators is determined by University regulations based on the number of students enrolled in each course. Tutors are employed under contract and are not faculty members of the department. They are hired each semester based on a contract drawn up according to the number of students registered in the course.

In collaboration with the Dean of Academic Studies, the department recruits teaching staff (course coordinators or tutors) who have the requisite academic degree as determined by the Dean of Academic Studies. The department head, senior faculty members and the cluster heads are responsible for evaluating their performance. With respect to the teaching process, the level and weight of assignments, the number of tutorial sessions, etc., the department is autonomous subject to University regulations as specified by the Dean of Academic Studies.

The coordinator of student inquiries and complaints deals with student requests (for example, requests for an additional exam date), as well as student complaints concerning courses, exams, procedures, etc. The teaching technologies advisor maintains contact with the senior faculty members and the academic teaching staff in all matters concerning technological and pedagogic aspects of the course websites, as well as the educational software implemented in the courses. S/he is responsible for improving the websites, integrating new learning

technologies into course teaching and instructing the members of the department in various aspects of technology.

The head of the laboratory supervises the lab technicians and is in charge of all aspects of lab operation and management, including coordinating the timetable for laboratory sessions during the semester, ordering chemicals and instruments required for the students' experiments, and general maintenance of the lab space and instruments. (For additional details about the laboratory, see section 3.6.3).

The referent of the Evaluation Department is responsible for assisting the department in performing assessment of projects initiated by the department. The referent belongs to the department functionally, not administratively or physically, and is therefore not on the chart.

The department's administrative staff helps the head of the department in various administrative managerial tasks. In addition, they provide administrative services to all members of the department and the students. The administrative staff is also responsible for the technical production of course booklets, handling correspondence with teaching staff and students, and the administration of seminar papers.

The following committees and forums function within the department:

Subcommittee of the Academic Committee for Natural Sciences (Chair: Prof. Shlomo Shoval). The committee is composed of all senior faculty members, as well as four representatives of the academic teaching staff with doctoral degrees. This committee deals with new study programs, updating study programs, proposals for new courses or course updates and academic issues concerning teaching and learning. The committee convenes about once every two months and its decisions are submitted for approval to the Academic Committee.

Steering Committee of the Master's degree program in Biological Thought (Chair: Prof. Simona Ginsburg, head of the program).

MA program admissions committee (Chair: Prof. Simona Ginsburg).

Life Sciences forum (Chair: Dr. Anat Barnea, head of the life sciences group). A forum of all senior faculty members in Life Sciences.

Departmental forum (Chair: Dr. Joel Klemes, head of the department). Members of the department meet every two-three months. Forum meetings are usually divided into two parts: an academic lecture presented by a faculty member or a presentation by one of the University position holders on a general University issue. The second part of the meeting is devoted to a discussion on departmental and University issues.

Life Sciences seminar (Organizer: Dr. Joel Klemes). Held every six weeks. A researcher from another university or an expert on a Life Sciences topic is invited to talk on his/her research or field of expertise. All members of the department are invited to attend.

2.4 Names of Holders of Senior Academic and Administrative Positions

Head of the Department of Natural Sciences: Dr. Joel Klemes

Head of the Life Sciences group: Dr. Anat Barnea

Head of the Chemistry group: Prof. Itzhak Dotan

Head of the Physics group: Dr. Baruch Ziv

Head of the Earth Sciences group: Prof. Shlomo Shoval

Head of the MA program in Biological Thought: Prof. Simona Ginsburg

Head of the Science Laboratory: Dr. Victorya Libin

Administrative Staff

Department secretaries: Rona Alon and Gali Zeidman

2.5 Programs of Study

The following is a list of the programs of study offered by the department:

Undergraduate programs of study: Single- and dual-disciplinary programs

B.A. in Sciences –	בוגר אוניברסיטה במדעים
B.A. in Natural Sciences –	בוגר אוניברסיטה במדעי הטבע
B.A. in Natural Sciences: Emphasis on Biotechnology –	בוגר אוניברסיטה במדעי הטבע בהדגשת ביוטכנולוגיה
B.A. in Natural Sciences: Emphasis on Chemistry –	בוגר אוניברסיטה במדעי הטבע בהדגשת כימיה
B.A. in Life Sciences –	בוגר אוניברסיטה במדעי החיים
B.A. in Life Sciences: Emphasis on Field Studies –	בוגר אוניברסיטה במדעי החיים בהדגשת לימודי שדה
B.Sc. in Chemistry and Life Sciences –	בוגר אוניברסיטה בכימיה ובמדעי החיים
B.Sc. in Computer Science and Chemistry –	בוגר אוניברסיטה במדעי המחשב ובכימיה
B.Sc. in Computer Science and Life Sciences –	בוגר אוניברסיטה במדעי המחשב ובמדעי החיים
B.Sc. in Mathematics and Chemistry –	בוגר אוניברסיטה במתמטיקה ובכימיה

Interdisciplinary degrees

B.A. in Chemistry and Education (Curriculum & Instruction Studies) –	בוגר אוניברסיטה בכימיה ובחינוך (במגמת תכניות לימודים ושיטות הוראה)
B.A. in Chemistry and Economics –	בוגר אוניברסיטה בכימיה ובכלכלה
B.A. in Chemistry and Management –	בוגר אוניברסיטה בכימיה ובניהול
B.A. in Life Sciences and Economics –	בוגר אוניברסיטה במדעי החיים ובכלכלה
B.A. in Life Sciences and Management –	בוגר אוניברסיטה במדעי החיים ובניהול
B.A. in Psychology and Life Sciences –	בוגר אוניברסיטה בפסיכולוגיה ובמדעי החיים

Focused Programs

B.A. in Science - Focus on Physics –	בוגר אוניברסיטה במדעים
B.A. in Natural Sciences - Focus on Physics –	בוגר אוניברסיטה במדעי הטבע

Graduate degree

M.A. in Biological Thought –	מוסמך אוניברסיטה במחשבה הביולוגית
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Transfer options between the Department of Natural Sciences and other universities are currently available (for details, see Extras, “Bridges to other universities”):

- To four faculties at the Technion, Haifa
- To the faculty of Agriculture at the Hebrew University, Rehovot
- To the faculty of Life Sciences at Tel Aviv University

Transfer options to the faculties of Chemistry and Biology at Ben-Gurion University are currently being established. Even before the OUI formalized this option, students applied on their own initiative and were accepted to second-year studies at other universities.

Number of Students

As noted in chapter 1, students at the Open University are not required to enroll in a department, but register for specific courses. Therefore, it is difficult to determine the exact number of students in the department or in Life Sciences programs. In addition, a student is usually enrolled in more than one course each semester. Therefore, the numbers in the table below are estimates. As is evident from the table, the number of students in undergraduate programs in the Department of Natural Sciences has grown over the years.

Number of students in Natural Sciences

2003	2004	2005	2006	2007
848	933	1081	1113	1211

Enrollment in the MA program in Biological Thought is different from enrollment in undergraduate programs. The program, unique in Israel, is a combination of theoretical biology, philosophy of biology and bioethics, and its students mainly come from two disciplines: biology and philosophy. Acceptance to the program requires that students take qualifying courses in the discipline with which they are not familiar and undergo an interview by an admittance committee (for a description of the MA program, see the booklet, *Programs of Study – Life Sciences*, enclosed with this report). The MA program was first offered in 2000 and is open for enrollment every two years. Two groups entered the program between 2003 and 2007: in 2004, there were 14 students, and in 2006, 16 students. The next group will open in September 2008 and 31 applicants are now in the process of completing their requirements.

2.6 Graduates

The table below relates to all students granted degrees in programs offered by the department over the past five years.

Graduates in Natural Sciences

Year	Undergraduate programs	Graduate program
2003	53	First group studying
2004	42	3
2005	58	3
2006	65	0
2007	71	4

2.7 Deciding upon the Rationale, the Mission and the Goals

The rationale, goals and objectives of the programs of study are determined by the senior faculty of each field in the department (Chemistry, Physics, Life Science and Earth Sciences) and are reviewed and approved by the Natural Sciences subcommittee, by the Faculty Council, and the by the Academic Committee (in that order). Each new course or new program proposal is reviewed by internal and external reviewers, and then undergoes an approval process by the Natural Sciences subcommittee and the Academic Committee. The goals and objectives are discussed at regular meetings conducted by these bodies, at department meetings, at ad-hoc meetings convened for a specific purpose and in informal conversations.

The major changes that have been implemented in the last five years are listed below:

- **Design of new programs of study:** New undergraduate programs include Natural Sciences with an emphasis on biotechnology and Life Sciences with an emphasis on field studies; a dual-disciplinary degree (BSc) program in Chemistry and Life Sciences; interdisciplinary programs in Chemistry with Education, Economics and Management; and in Life Sciences with Management, Psychology and Economics. These programs enable us to reach a broader range of students, who want to focus on a specific area within the sciences, or combine two disciplines.
- **Development of new courses:** New undergraduate courses include “Bioinformatics: Analysis of Sequences and Genomes,” “Field Laboratory: The Social Life of the Arabian

Babbler,” “Nutrition,” “Research Project in Life Sciences,” “Laboratory: Biotechnology,” “General Chemistry,” “Organic Chemistry,” “Chemical Kinetics,” “Laboratory: Organic Chemistry,” “Quantum Theory II: The Chemical Bond,” “Molecular Dynamics of Chemical Processes,” “Secrets of the Earth,” “Introduction to Geophysics,” “Laboratory in Meteorology,” “The World of Electricity and Electronics,” “Microelectronic Technologies” and “Nuclear Physics.” Also on offer are several interuniversity courses approved for study by advanced students who are toward the end of their undergraduate studies. These courses can be included among the required Life Sciences credits in the various Life Sciences programs (for details, see 3.1.1). New graduate courses are “Reduction and Teleology in Biology” and “Sociobiology and Its Offshoots: Science in Controversy.”

- **Revision and updating of courses:** Courses that have been revised and updated include “Cell Structure and Function,” “The World of Bacteria,” “Immunology,” “Biochemistry I: Proteins – Structure and Function,” “Biochemistry II: Carbohydrates, Lipids, Nucleic Acids,” “From Mendelism to Genetic Engineering,” “Insects,” “Introduction to Earth Sciences,” “Oceanography,” “Statistical Physics,” “Electronics I,” “Electronics II,” “Laboratory: Fundamentals of Physics,” “Laboratory: Physics II” and the “The Physics of Elementary Particles.”
- **Development and adaptation of new learning aids,** including virtual laboratories.

The goals, objectives and changes are communicated via the President’s Report, the Academic Information Guide, in protocols of meetings, on the department website, and are announced by email and at meetings.

Chapter 3

The Evaluated Study Program

3.1 The Goals and Structure of the Study Program

3.1.1 The name of the study program and a brief summary describing its development since its establishment

Undergraduate Programs

Life Sciences studies at the OUI began as part of a trend that characterized the University in its first years: to offer a broad academic education in different disciplines. Thus at the outset, efforts were invested in developing a variety of courses in many disciplines, with each discipline represented by a small number of courses. The first course in Life Sciences, “Life Sciences: Introduction” was first offered in 1976. A BA degree in Mathematics and Natural Sciences was accredited by the Council for Higher Education (CHE) and first offered in 1980. Over the years, additional courses were developed and consequently, in 1984, this degree was replaced by a BA in Natural Sciences. In 1994, the OUI enabled students to study toward a degree in Natural Sciences or in Life Sciences, depending on the courses they chose. In 1999, the OUI also offered a more general BA in Sciences. The Natural Sciences and the Sciences programs suit students who seek considerable freedom of choice in their studies. These two programs are not among the evaluated study programs, but are mentioned here because many students, who originally aim for a degree in the Life Sciences and find it too difficult, eventually get their degree in Sciences or Natural Sciences.

The range of courses in the Life Sciences program corresponds to accredited Life Sciences programs offered by other universities. Therefore, OUI graduates who meet the admission criteria to graduate programs in Life Sciences at other universities are usually not required to take qualifying courses.

In addition to the BA in Life Sciences, students who prefer to focus on a specific area, or to combine the Life Sciences with another discipline, can choose from a variety of programs listed in section 3.2.2 below.

Sixty-two courses in Life Sciences are currently offered. Five additional, more general courses can be included in the Life Sciences credits required for the various Life Sciences programs. In addition, each program requires a number of basic courses in Physics, Chemistry and Mathematics.

Courses in undergraduate Life Sciences programs	Level	First offered
Life Sciences: Introduction (no longer offered)	introductory	1976
Biochemistry I; The Vertebrates; Plants and Vegetation From Mendelism to Genetic Engineering	intermediate inter./adv.	1978
Cell Structure and Function Biological Clocks; Cancer and Heredity; Human Physiology	intermediate advanced	1980
Insects Symmetry: Biology	intermediate advanced	1981
Laboratory: Cell Biology A Community in Israel: Historical and Genetic Aspects; Immunology	intermediate advanced	1982
Mammalian Reproduction; Plant Physiology	advanced	1984
The World of Bacteria; Laboratory: Animal Physiology Intracellular Protein Transport	intermediate advanced	1985
Vegetation of Israel The Cytoskeleton of Eukaryotic Cells; Chemical Communication in Animals; Oxygen: Chemical and Biological Aspects	intermediate advanced	1986
Oceanography Seeds: Dormancy and Germination; Aging	intermediate advanced	1987
Nerve Cells: Introduction to Neurobiology Laboratory: Molecular Biology	advanced inter./adv.	1988 1990
Faunistics of Vertebrates in Israel Biochemistry II	intermediate intermediate	1991 1992
Differentiation of Blood Cells	advanced	

Courses in undergraduate Life Sciences programs	Level	First offered
Evolution; Bacteria in Industry; Toxins and Toxicology	advanced	1993
Laboratory: Biochemistry of Proteins; Virology	intermediate	1994
Ion Channels	advanced	
Receptors and Signal Transduction	advanced	1995
Developmental Biology	intermediate	1997
Laboratory: Immunology	intermediate	1998
Plant Genetic Engineering; Biotechnology	advanced	
Selected Topics in Animal Behavior	intermediate	2000
Adaptation of Plants to Environmental Stress	advanced	
General Biology I	introductory	2001
Ecology	intermediate	
Selected Topics in Immunology	advanced	
Introduction to Life Sciences (also for students of other disciplines)	introductory	2002
General Biology II	intermediate	
Symbiosis	advanced	
Symbiosis (Field Trip)	intermediate	2003
Field Laboratory: The Social Life of the Arabian Babbler	inter./adv.	
* Marine Animal Behavior; * Molecular and Cellular Neurophysiology; * Fishes of the Red Sea; * Ecology and Physiology of Marine Algae	intermediate	2004
Research Project in Life Sciences	advanced	
Nutrition (also for students of other disciplines)	introductory	2005
* Biogeochemistry of Coral Reefs; * Echolocation and Bat-Insect Interactions	intermediate	2006
Seminar: Special Topic in Life Sciences	advanced	
Laboratory: Biotechnology	intermediate	2007
Bioinformatics: Analysis of Sequences and Genomes	advanced	

* - Interuniversity courses not developed at the OUI. At other universities, these courses are offered only to 3rd-year undergraduate students or to graduate students. At the OUI, these courses are offered to advanced students who are close to the end of their undergraduate studies. They can be included among the Life Sciences credits required in the various programs of study.

In recent years, the main thrust of OUI efforts has been devoted to updating and revising existing courses.

The first two senior faculty members in Life Sciences were recruited in 1974-5, and four additional faculty members joined in 1978, 1979, 1987 and 1994. The academic teaching staff has grown over the years in accordance with the number of new courses developed. Some are doctoral candidates and others hold PhDs. Together with senior faculty members, they are involved in developing and operating the courses offered in Life Sciences. Senior faculty members in Life Sciences from all universities in Israel accompany program development and contribute as consultants to course development, study material preparation and quality control.

MA in Biological Thought

In March 2000, an MA program in Biological Thought was approved by the CHE. The program, unique in Israel, is a combination of theoretical biology, philosophy of biology and bioethics, and its students mainly come from two disciplines: biology and philosophy. The program is offered to a new group of students once every two years; so far, 4 groups have enrolled (in Feb. 2001, Sept. 2002, Sept. 2004 and Sept. 2006 and the next group will open in Sept. 2008). The program was developed by Simona Ginsburg in consultation with several scholars, notably Rafael Falk and Eva Jablonka.

Acceptance to the program requires that students take qualifying courses in the discipline with which they are not familiar (for a description of the MA program, see the booklet, *Programs of Study – Life Sciences*, enclosed with this report).

3.1.2 Mission statement of the study program, its aims and goals

Undergraduate programs of study: The various undergraduate programs of study in Life Sciences aim to promote the mission and goals of the OUI, specified in chapter 1, and those of the department, specified in chapter 2. Specifically, the study programs aim to qualify graduates in Life Sciences who have broad and deep knowledge in different aspects of Life Sciences, view Life Sciences as a scientific discipline, and are capable of studying toward advanced degrees.

The evaluated study programs aim to equip students with scientific and intellectual methods essential for critical analysis of biological phenomena, theories and approaches. The programs also aim to train graduates who are capable of independent study, are able to read scientific material critically both in Hebrew and in English. We also aim to equip them with skills necessary for searching for material in libraries and databases and to enable them to acquire the ability to express themselves scientifically in writing. Another goal is to teach our students to translate general research questions into research procedures and, if they choose, to provide them with a taste of research. Taken together, we hope that our students will have a perspective of biology and the appropriate qualifications that will enable them to pursue advanced studies in Life Sciences, based on an informed decision. We also hope that these qualifications will enable our graduates to find employment in the field of Life Sciences or in related fields. Finally, we hope that the study materials developed for our programs at the OUI will continue to be highly regarded by faculty of all Israeli universities and colleges, as indicated by their widespread use.

MA in Biological Thought: Undergraduate Biology students acquire comprehensive, detailed knowledge of the various branches of the Life Sciences. Interactions between these sciences and philosophical or social issues, however, are not perceived in Israeli universities as part of the curriculum. Hence, it is hardly surprising that Biology graduates in Israel are quite naive in their thinking about the implications of the Life Sciences for society and about the influence of other fields of knowledge on Biology itself. Thus, it is doubtful whether a typical Biology graduate can properly define the mind-body problem, express a reasoned view concerning creationism, present arguments for or against animal experimentation, hold ground in a debate on sociobiology and evolutionary psychology, or even clearly state the basic ethical questions that arise in stem cell research, cloning and the human genome project. Learning to think about meta-biological questions is intellectually stimulating and valuable in broadening the biological perspective of any life-scientist, and in enabling him or her to explain issues related to Biology to the layperson. Our primary mission is *to reach Biology graduates and practitioners in related fields* (e.g. physicians, nurses, biotechnology workers, Biology teachers) and *offer them the opportunity to examine the Life Sciences from a wide range of viewpoints*; our secondary mission is *to train outstanding students to do research in philosophy, history and sociology of Biology*.

Two major goals of the program are *developing the abilities to reflect on Biology from the outside* and *understanding the intrinsic theoretical aspects of biology*. Biology has many implications for the world, human action, moral judgments and other disciplines (medicine and psychology, to name just two). *Exposing and coming to grips with these implications* is the third major goal of the program. The state of the art in Biology changes so rapidly that the corpus of knowledge attained by a student is but a fragment of the biological information a biologist can transmit to his or her own students. Hence, the fourth major goal of the program is *to unravel the contexts in which biological thought develops*.

The program seeks to qualify MA graduates who are endowed with skills and knowledge that enable them to implement the following more specific aims:

1. Describe and define the structure and nature of biological thought, and compare and contrast these with the characteristics of other fields of knowledge.
2. Identify and explain the social, political and historical climate in which biological thought emerges, and in which life science practitioners act.
3. Understand and articulate theory-laden key concepts in the life sciences (pertaining to developmental biology, genetics, evolution, ecology, systems-biology, etc.)
4. Understand and articulate the ethical and social implications of biological research.
5. Logically and conceptually analyze problems arising in philosophical debates, and derive valid conclusions; in particular, take a stand on every issue discussed in the program (and on others relating to these), justify it, and assess its strengths and shortcomings.
6. Play the devil's advocate and present arguments for alternative opinions.
7. Point at the sources of one's own value judgments.
8. Clearly define and suggest new problems, and identify their ontological, epistemological and methodological dimensions.
9. Independently search for and find professional articles, books and other sources in order to compile clear and critical expositions of specific issues in bioethics, theoretical biology, philosophy of biology, history of biology and sociology of biology.
10. Integrate different types of information and knowledge; in particular, combine analyses, modes of thinking, ideas and methodologies that stem from a variety of disciplines: natural sciences, social sciences, history and philosophy.
11. Present ideas orally to an audience, in a pre-planned and worked-out manner (i.e. deliver a short or a full-scale lecture and prepare a response to a lecture given by someone else).
12. Write a scholarly publishable article, or at the very least compose a good seminar paper.

3.1.3 Description of the academic and administrative organizational structure of the study program (including relevant committees)

In keeping with the OUI organizational structure, there are 3 types of key academic positions in the program: Senior faculty, academic teaching staff (course coordinators) and tutors. In addition, senior faculty in Life Sciences departments at other universities are involved as program and course consultants, course developers and seminar paper supervisors.

Administrative positions:

Head of the department

Head of the Life Sciences group

Head of the MA program in Biological Thought

Head of the Science laboratory

The department administrative staff

Subcommittee of the Academic Committee for Natural Sciences (see section 2.3)

3.1.4 Names of holders of senior academic and administrative positions

Head of the department: Dr. Joel Klemes

Head of the Life Science group: Dr. Anat Barnea

Head of the MA program: Prof. Simona Ginsburg

Head of the science laboratory: Dr. Victorya Libin

Coordinator of learning technology: Dr. Dror Bar-Nir

Senior faculty: Prof. Simona Ginsburg, Prof. Miriam Souroujon, Dr. Ruth Arav,
Dr. Anat Barnea, Dr. Joel Klemes

Administrative staff:

Department secretaries: Rona Alon and Gali Zeidman

Coordinator of student inquiries and complaints: Dr. Dror Bar-Nir

3.2 The Study Program: Contents, Structure and Scope

3.2.1 The name of the study program, specializations/tracks within the program

The **undergraduate programs** in Life Sciences:

Name of program	Date first offered
BA in Natural Sciences	1984
BA in Life Sciences	1994
BA in Sciences	1999
BA in Natural Sciences: Emphasis on Biotechnology	2007
BA in Life Sciences: Emphasis on Field Studies	2008
Dual-disciplinary programs	
BSc in Chemistry and Life Sciences	2006
BSc in Computer Science and Life Sciences	2008
Interdisciplinary programs	
BA in Life Sciences and Management	2003
BA in Life Sciences and Economics	2007
BA in Psychology and Life Sciences	2007

The **graduate program** in Life Sciences:

The name of the program is “Biological Thought.” The program is a combination of theoretical biology, philosophy of biology and bioethics. The MA Program in Biological Thought is offered in two tracks: A non-thesis track and a research-oriented track with a thesis. The program is offered (only) on the Raanana campus.

3.2.2 Description of the programs in Life Sciences

Undergraduate programs of study: In planning and designing the undergraduate programs in Life Sciences, a comprehensive comparison with other programs offered by universities in Israel was conducted. Because some of OUI Life Sciences courses are 6-credit courses, the equivalent of two or more corresponding courses at other universities, the number of courses required for the degree is smaller.

A large selection of courses in Life Sciences is offered, with the aim of giving the students a broad and in-depth background in the field. The requirements for the BA in Life Sciences were changed in 2001. Two required basic courses (“General Biology I” and “General Biology II”) were developed, providing all students with a broad basis in Biology. This change enabled us to decrease the overall number of required courses in most programs and increase the level of freedom in selection of electives. The current and previous requirements are detailed in the booklet, *Programs of Study – Life Sciences*, enclosed with this report. All undergraduate Science students at the OUI are required to take a non-credit Computer Applications course, to show evidence of English proficiency and to take bibliographic instruction in the library.

The programs offered are similar in content to those offered by other academic institutions in Israel. This ensures acceptance to advanced degrees for capable graduates, and smooth transfer to other universities after beginning their studies at the OUI, for students who wish to do so. The programs are described below, and detailed in the booklet, *Programs of Study – Life Sciences*.

BA in Life Sciences: The Life Sciences program requirements include the following groups of courses:

- Basic studies that impart a broad foundation in Mathematics, Statistics, Chemistry and Physics – 21 credits
- Required courses (introductory and intermediate) that provide broad basic knowledge in different areas of Life Sciences: “General Biology I,” “General Biology II,” “Biochemistry I,” “Cell Structure and Function” – 21 credits
- Electives in Life Sciences (intermediate and advanced) including three laboratory courses (at least 6 credits) that include at least 39 theoretical (not laboratory) credits in Life Sciences, among them at least 18 advanced credits
- Two seminar courses in Life Sciences – at least 6 credits

To accumulate the number of credits required for the degree, students may select courses in the Sciences or in other disciplines. In addition, since 2007, the OUI requires students in most programs to take at least one course in a discipline other than the discipline they are studying (see chapter 1).

BA in Natural Sciences: The BA in Natural Sciences is less structured than the BA in Life Sciences. Students are required to accumulate at least 84 credits in the Sciences, among them at least 54 credits in Life and Natural Sciences, one course in Mathematics, one theoretical course in Physics and one in Chemistry. They are required to take one laboratory course and one seminar course in Sciences. However, students who study toward a BA in Natural Sciences can choose all or most of their elective courses in Life Sciences. Therefore, if they decide to change their program to a BA in Life Sciences, they will have to take only a few additional courses. Similarly, if they are accepted to a graduate program in Life Sciences at another university, they will probably need to take only few qualifying courses.

BA in Sciences: The BA in Sciences is even less structured than the BA in Natural Sciences. Students are required to take 84 credits in the Sciences, including at least one course in Mathematics, one theoretical course in Physics and one seminar course in the Sciences. This allows them to choose a variety of courses in Computer Science, Mathematics, Physics, Chemistry, Geology and Life Sciences, or they can choose to focus on one area in the Sciences, i.e. Life Sciences. If they do so and then decide to switch to a BA in Life Sciences, they will have to take a few additional required and elective Life Sciences courses.

BA in Life Sciences: Emphasis on Field Studies: This program includes courses in zoology and faunistics, botany, ecology and animal behavior. The requirements are as follows:

- Basic studies, as in the Life Sciences program, with the addition of one geology course – 28-31 credits
- Required introductory and intermediate courses with an emphasis on field subjects, among them: ecology, botany, vertebrates and animal behavior – 40 credits
- Elective intermediate and advanced courses, including courses in geology, oceanography, entomology and animal behavior, and one required course on plant-animal interaction – 30-35 credits
- Two seminar courses, including “Interactive Project” – 6 credits
- Three laboratory courses, among them “Field Laboratory in Biology” – 6-9 credits

BA in Natural Sciences: Emphasis on Biotechnology: This program, requiring 108-115 credits, is a very rigid program: Most of the courses are required, including “Statistics,” “Differential and Integral Calculus,” “Management of Technology-Rich Projects,” “Genetics,” “Microbiology,” “Virology,” “Biotechnology,” a laboratory course in Biotechnology, “Immunology,” “Natural Materials and Antibiotics,” “Bioinformatics,”

“Selected Topics in Molecular Biology,” and two required seminar courses: “Bacteria in Industry” and “Biological Aspects of Industrial Microorganisms.”

Dual-Disciplinary Programs: The OUI offers two programs that combine Life Sciences with other disciplines in Sciences: a BSc in Chemistry and Life Sciences and a BSc in Computer Science and Life Sciences. In both programs, students are required to accumulate more credits than in a single-disciplinary program: 128 and 118 credits, respectively. The rigid structure of these programs enables graduates to enroll in MSc programs in both disciplines with minimal qualifying courses. The BSc in Computer Science and Life Sciences also fulfills the requirements for candidacy for an MSc in Bioinformatics, with only very few qualifying courses depending on the graduates’ areas of specialization.

Interdisciplinary Programs: The three interdisciplinary programs in Life Sciences with a discipline in Social Sciences: Economics, Management and Psychology (126, 118, and 124-128 credits, respectively), include all the basic courses and required and elective courses in both disciplines, among them at least one seminar or seminar course in each discipline and at least one laboratory course in Life Sciences.

MA in Biological Thought: Students accepted to the MA program take 10 courses (30 credits), write two seminar papers (10 credits), and submit either a final paper (10 credits) or a thesis. For a complete description of the program, see the enclosed booklet, *Programs of Study – Life Sciences*.

At present, the program includes the following 10 courses:

1. Definition of Life
2. Reduction and Teleology in Biology
3. Vitalism, Mechanism and Organicism
4. The Mind-Body Problem
5. Evolution and Creationism
6. The Human Genome Projects: Genetics and Genethics
7. Bioethical Issues: Animal Experimentation
8. Ecological Balance and Environmental Conservation
9. A Critique of Alternative Medicine
10. Sociobiology and Its Offshoots: Science in Controversy

3.2.2.1 Duration of studies

Undergraduate studies: The OUI does not require students to complete a uniform and defined study program in a given academic year. Students set their own pace of studies and their progress is measured according to the credits they accumulate rather than in units of time, but most undergraduate programs also have a recommended “accelerated” track, that enables students to complete their degree in three years. The only timeframe that students must take into consideration is the semester. Most courses span one semester and students are required to fulfill all course requirements within the semester in which they take the course. The Registrar’s Office monitors the timeframe of each student. For the 102 graduates of Life Sciences programs between 2003 and 2007, the average time taken to complete their degrees was 7.1 years.

MA in Biological Thought: The structured part of studies spans 4 semesters and includes 10 courses. During these two years, students also write the first of two required seminar papers. At the end of this period, students are allocated to the non-thesis track or to the thesis-track. Students in the former track participate in a third-year graduate seminar, submit a second seminar paper and begin working on a final paper (of limited scope); research-oriented students submit a second seminar paper and begin working on a thesis.

3.2.2.2 Courses for students of other disciplines

Two courses in the Life Sciences program also serve students in other disciplines who are interested in broadening their knowledge and understanding the basics of Biology: “Introduction to Life Sciences” (6 credits), based on a Hebrew translation of selected chapters from *Biology: The Unity and Diversity of Life*, by Starr and Taggart, and “Nutrition” (3 credits), which provides students with basic knowledge on nutrition and its influence on human physiology and health.

3.2.3 To what extent do the structure, scope and contents properly reflect the main goals of the study programs?

Undergraduate studies: Generally, the main goals of the university are reflected in the programs themselves: our programs *increase access to higher education* by open admissions, distance learning and addressing the needs of special population groups. We provide an alternative for some special groups in the population. Flexibility in time, place, pace and teaching methods enables students from these groups to cope, each in his or her own way, with academic studies. For example, students who are unable to attend traditional universities due to work or family commitments can study at their own pace. The study programs in Life Sciences are based on distance learning and therefore students are not required to come to a central campus, with the exception of laboratory courses and field trips. Study groups in each course are opened each semester in various study centers throughout the country, based on the number of students enrolled in a given geographical area.

The goal of *developing study materials* is realized in the integrative learning materials that are developed for Life Sciences courses (for details, see section 3.3). These materials also serve other higher education institutions in Israel. Research conducted by faculty members in various Life Sciences fields (see chapter 4) is incorporated into up-to-date materials in the courses for which they are responsible. Taken together, the various learning and teaching methods materials, study aids, laboratory experiments, virtual experiments, home experiment kits and field trips, that are included in the Life Sciences programs, combined with the flexibility in time, place and pace, enable students with a potential for academic studies to realize their potential in Life Sciences studies.

The more specific mission of the Life Sciences program, *to train qualified graduates*, is achieved in several ways: The variety of courses that students are required to take in our undergraduate programs exposes them to the major areas in Life Sciences and enables them to acquire broad and deep knowledge in this discipline. The training they receive enables our students to view Life Sciences as a scientific discipline and to analyze biological phenomena, theories and approaches critically.

In required courses, students are exposed to key theories and multiple approaches, and in advanced courses, they also read original scientific research articles and examine complex research issues. In some of these courses, students analyze studies that contrast and challenge different theories and approaches. At laboratory sessions, students gain experience in the different stages of the research process. Moreover, in two courses, students actually take part in active research. The first – “Field Laboratory in Biology: The Social Life of the Arabian Babbler” – enables students to perform a short field study in the framework of a long-term research project. The other course – “Research Project in Life Sciences” – enables students to participate in ongoing research in laboratories in one of the universities or research institutes in Israel. This course is offered to outstanding students toward the end of their studies. The seminar papers that students are required to submit also add to their in-depth understanding of research, teach them how to critically read scientific literature and provide them with the opportunity to express themselves in writing and present their work orally.

The unique OUI study method increases students' independent study ability by requiring that they cope with scientific material, work on assignments independently and participate in discussion groups on course websites. In addition, students are required to show evidence of a high level of English proficiency prior to enrolling in advanced courses so that by the end of their studies, they are able to read scholarly texts and contend with material in English.

We believe that our programs provide graduates with knowledge and training in different areas of Life Sciences that enable them to make an informed decision as to the area in which they prefer to continue their Life Sciences studies or to find employment.

MA in Biological Thought: We think that the contents and scope of the program are well suited to achieve the four main goals described above. Thus, the *ability to reflect on biology* is addressed and developed in many of the courses, notably “Definition of Life,” “Reduction and Teleology,” “The Mind-Body Problem.” The *theoretical frameworks of biology* are the focus of the course “Evolution and Creationism” and one of the foci of five other courses: “Definition of Life,” “The Human Genome Projects,” “Ecological Balance,” “A Critique of Alternative Medicine,” and “Sociobiology and Its Offshoots.” The *ethical and social implications of biological ideas and research* – as well as the *context in which biological thought emerges and the life sciences are practiced* – are examined and studied in 6 courses: “Vitalism,” “Mechanism and Organicism,” “Evolution and Creationism,” “The Human Genome Projects,” “Bioethical Issues,” “A Critique of Alternative Medicine,” and “Sociobiology and Its Offshoots.”

3.2.4 Planning and managing the study programs

Design of study programs: New programs of study at the OUI are initiated by senior faculty members in the department and usually developed by OUI faculty members together with the teaching staff, in consultation with scholars from other universities and reviewers. In most cases, one of the initiators also heads the program and is responsible for its operation. Every program undergoes the following stages before it is approved (for the detailed procedure, see Rules and Procedures, “Program approval,” in Hebrew):

1. The program is submitted to experts in other universities for evaluation.
2. The development team revises the program, in accordance with the reviewers' comments.
3. The Natural Sciences subcommittee discusses the program.
4. If approved by the subcommittee, the Faculty Council discusses the program.
5. If approved by the Faculty Council, the Academic Committee discusses the program.
6. If approved by all the committees of the OUI, the program is submitted to the Council for Higher Education for approval.

The Academic Committee is the highest academic authority with respect to study programs (see chapter 1). If one Committee member opposes a decision or maintains that it was not sufficiently substantiated (for example, if individuals recognized as leading experts in the relevant field in Israel were not involved in the decision), the recommendation is returned to the relevant academic department.

Members of the department in the field of Life Sciences design the programs and update them. Programs are continuously evaluated and updated as needed, and compared to corresponding programs at other universities. Major changes in the programs go through the first five of the six stages specified above.

Developing new courses: In general, every course undergoes stages similar to those of the program: the course proposal is submitted to advisors, and then to the Natural Sciences subcommittee and the Academic Committee. As part of the course development process, all

written material is submitted to external consultants and undergoes quality control, editing and production processes (see Rules and Procedures, “Course development” in Hebrew).

Updating courses: Teaching of outdated courses is discontinued and new or updated courses are developed on the initiative of the department (e.g., an old course, “Life Sciences: Introduction,” was discontinued and replaced by two new, comprehensive up-to-date courses: “General Biology I” and “General Biology II”). In other courses, some units are replaced by new ones and updating is performed continuously (e.g., in “Biochemistry I,” old units were replaced by new updated ones and revised chapters were added to other units in the course; the course “Cell Structure and Function” was completely rewritten). Advanced courses are usually updated by adding up-to-date research papers to the course materials.

Changes in study programs over the past five years

Undergraduate programs: Since 2003, the OUI has added three interdisciplinary programs: Life Sciences and Management, Life Sciences and Economics, and Psychology and Life Sciences; two dual-disciplinary programs: Chemistry and Life Sciences and Computer Science and Life Sciences; and two single-disciplinary programs with emphasis: Natural Sciences: Emphasis on Biotechnology and Life Sciences: Emphasis on Field Studies.

Courses: In the past five years, five courses taught by the Interuniversity Institute for Marine Sciences in Eilat, and one course on Echolocation and Bat-Insect Interactions, taught by Ben Gurion University, were added to the course offering.

Five new courses were developed: “Field Laboratory: The Social Life of the Arabian Babbler,” “Bioinformatics: Analysis of Sequences and Genomes,” “Nutrition,” “Laboratory: Biotechnology,” “Research Project in Life Sciences.”

Nine courses were rewritten: “Plant Physiology,” “Cell Structure and Function,” “The World of Bacteria,” “Biochemistry II,” “Chemical Communication,” “Entomology,” “Laboratory: Immunology,” “Laboratory: Animal Physiology,” “Laboratory: Molecular Biology.”

Continuous updating of courses: It is difficult to update OUI printed textbooks as often as we would like to. In most of our intermediate courses, we try to overcome this difficulty by regularly posting up-to-date materials on course websites. In advanced courses and seminars, this difficulty is overcome by updating readers every 1-2 years.

Changes in the MA Program in Biological Thought

- Following approval by the OUI Academic Committee, the number of seminar papers required was reduced from three to two. The decision was reached because the requirement of three seminar papers unnecessarily prolonged the period of studies and did not significantly contribute to the quality of the program. This change is also consistent with the academic requirements of MA programs in philosophy and history of science offered by other Israeli universities.
- The 10 courses taught in the program have been continuously updated; new readers were introduced in 2005 and 2006.
- Two of the older courses – “Reduction in Biology” and “Teleology in Biology” – were combined into a new course: “Reduction and Teleology in Biology.”
- A new course was introduced in 2006: “Sociobiology and Its Offshoots: Science in Controversy.”

3.2.5 Coordinating and examining the contents taught

Monitoring programs and courses in terms of development and teaching: OUI courses are approved in accordance with the procedure specified above. Senior faculty members routinely evaluate course contents and courses are rewritten or updated as necessary. Examinations and assignments for each course are written each semester by the course

coordinator, and evaluated and approved by the senior faculty member who is responsible for the academic aspects of the course.

The OUI Evaluation Department conducts teaching surveys on every course at the end of each semester, in which students answer questions pertaining to the courses they took. Measures are taken to implement improvements based on the survey findings. The department also initiates feedback surveys asking students to express their opinions about their studies, including course-specific issues.

Monitoring students' programs of study: Studies at the OUI in general, and in some of our study programs in particular, are characterized by a high degree of flexibility. All students are entitled to complete their study program at a rate that suits them. Flexibility is also reflected in the fact that students may change their program at any time. For example, a student may begin a very focused program, such as the program in Natural Sciences with an Emphasis on Biotechnology, and later decide to study toward a degree in Life Sciences. Students are given individual academic counseling to assist them in structuring their program and monitoring is performed by the Study Program Approval Committee, which approves all study programs.

Academic counseling: The OUI provides both general and field-specific counseling by faculty members and teaching staff. Upon commencing their studies, students are invited for academic counseling in order to design a study program suited to their needs and goals. At any time during their studies, students can seek counseling either from the general counselors or from department faculty members and teaching staff. Counseling is offered by phone, face-to-face or online.

Approval of programs of study: After accumulating 48 credits, students can propose a program for completing their studies, in accordance with the degree requirements. The Study Program Approval Committee examines the program and returns it with comments and guidelines, or approves it as a program of study leading to a degree. A degree cannot be conferred without the Committee's approval. The Committee reviews each student's record of studies to determine whether degree requirements have been met. Approval of a study program is valid for a period of five years from the approval date. Students continuing their studies for a period exceeding five years after the program is approved are required to reapply to the Committee for re-approval of their study program, due to possible changes in the program requirements. The Study Program Approval Committee is authorized to enforce additional limitations on programs of students who have been granted more than 36 credits on the basis of prior studies, as well as on inter-disciplinary programs, which include combinations of courses different from the distribution described in the degree requirements. These programs may deviate from the minimum number of credits required for a degree.

3.2.6 Summary of the strengths and weaknesses of the study program

Undergraduate programs – Strengths

- The main strengths of the programs are their high level together with considerable flexibility in pace and learning methods.
- The programs provide exposure to theoretical knowledge in the various areas of Life Sciences and to methodologies applied in research areas in the Life Sciences as well as in Medicine and Agriculture.
- The independent nature of studies in the program develops self-discipline and the ability for self-criticism in its graduates and prepares them for the type of learning required in advanced studies.
- Open admissions and the distance learning nature of studies offer an opportunity to various population groups, unable to study in traditional institutions, to take advantage of high-level academic studies.

- The high quality learning materials, developed by scholars from the OUI and other academic institutions serve OUI students as well as students in other institutions.
- The high academic level of the programs and of the individual courses is recognized by Life Sciences departments in other Israeli universities, and enables capable students to continue toward advanced degrees or to transfer credits to other universities.

Weaknesses

- Despite substantial efforts, it is difficult to continually update courses, mainly due to the small number of senior faculty members in the Life Sciences and the large number of courses that require evaluation. In addition, when courses are developed or updated by scholars from other universities, OUI faculty members often need to revise the materials so that they are suitable for self-study. In most years, at least one faculty member (of the five in Life Sciences) is on sabbatical, and others fulfill various administrative tasks at the OUI. For example, two faculty members are currently on sabbatical, another serves as head of the department, and still another heads the Research Authority. Nevertheless, much has been achieved in recent years, and the course websites facilitate this endeavor. Since the Life Sciences are very heterogeneous in nature, we are especially understaffed. In the next two years, two of our five senior faculty members will retire. The university is currently recruiting a new senior faculty member.
- There are courses that we would very much like to add to our Life Sciences offering (e. g., Invertebrates); however, because it is extremely difficult to find a scholar both willing and able to develop them, we have been unable to do so.
- Most courses in the Life Sciences are semester-long courses. Some of these 6-credit courses cover large amounts of material, which in other universities is usually spread over multiple courses. Therefore, students are expected to study and internalize large quantities of material in a short period. Students can naturally enroll in fewer courses in order to devote more time to such heavy-load courses, and some such courses are also offered in a year-long format, but this prolongs the duration of studies.
- Because fewer than 5% of OUI students choose to study toward a degree in Natural or Life Sciences, only a small number of students enroll in some Life Sciences courses each semester. Therefore, there are some courses that we cannot offer every semester or open study groups for in the periphery. This also contributes to prolonging the study duration.
- Most introductory and intermediate courses are based on books written in Hebrew expressly for OUI students. In advanced courses, on the other hand, students must contend with materials written in English. The transition from material specifically prepared for the students in Hebrew to material that, for the most part, is not processed for self-study and is in English, is often very abrupt, and the skills required to make this transition are not acquired as gradually as necessary. In order to surmount this problem, we are attempting to add material in English to intermediate courses.
- Although students receive a special guide to writing seminar paper in Life Sciences (see Extras, “Seminar guide,” in Hebrew), and although their supervisors provide extensive support (multiple meetings, phone and e-mail), many students still have great difficulty writing high-level seminar papers. This may also be related to the nature of distance learning and the wide geographical distribution of students who enroll in specific seminar courses, making meeting with seminar supervisors more difficult.
- Most of our Life Sciences programs grant a BA degree and not a BSc. The reason is mainly historical: in the early years, the CHE authorized BA degrees. However, in recent years this has changed. Since the number and variety of Life Sciences courses has significantly increased over the years, we feel that the time has come to ask for a change in this respect, to enable the OUI to grant a BSc in Life Sciences.

MA in Biological Thought

Strengths: We believe that we have succeeded in our primary mission of broadening the perspective of Biology graduates and life-science practitioners who enrolled in the program. To the best of our knowledge, the program in Biological Thought is unique in Israel and elsewhere.

We have been able to train a small number students (in the thesis track) to do research in biological thought. With respect to the 4 major goals, by and large, the MA program seems be successful: All goals are reached by more than 80% of the students, as judged from their achievements in course assignments, active participation in course seminars and oral presentations. The students' critical and integrative faculties grow, and they are able to present good expositions of major topics and problematics in bioethics, theoretical biology and philosophy of biology.

Weaknesses: The program does not fully succeed in training the students to combine ideas and methodologies from the Social Sciences, Philosophy and History with those of the Natural Sciences; there is no doubt, however, that on leaving the program, all students do realize that other fields of knowledge are essential in order to deal with biological problems and implications.

3.2.7 Additional non-academic bodies' involvement in the activities of the department and the program

No additional non-academic bodies are involved beyond those described in chapter 1.

Department involvement in the activities of other bodies: Department faculty members give lectures that are open to the public in the framework of extra-academic studies offered by the OUI on various topics.

3.2.8 Directions for further development

Recruitment of senior faculty: Two senior faculty members in Life Sciences will soon retire. A search committee is now in the process of recruiting a new faculty member whose areas of expertise are cell biology / molecular biology.

An **MA program in Science Teaching** is in the early planning stages in collaboration with the Dept. of Mathematics and Computer Science.

Undergraduate studies

Updating and development of existing programs: Maintaining the high academic level of the undergraduate programs requires ongoing monitoring of courses. This will result in updating and rewriting parts of some courses, and others in their entirety.

New programs: A dual-disciplinary program in Life Sciences and Philosophy is in the initial stages of approval by internal OUI bodies.

The MA in Biological Thought – Several new courses are planned:

- “The Origin of Life”: This course will replace the current course, “Definition of Life”; some of the topics of the old course will be subsumed under the new one. The decision to revise this course arose because the definition and origin of life are intertwined, and recent research on the origin of life justifies a change in the focus of this course.
- “Bioethical Issues”: Animal Experimentation / Reproductive Choices / Matters of Life and Death: We plan to re-shape the current bioethics course, which deals with animal experimentation, and integrate it into a cluster of courses in bioethics.
- “New Developments in Evolutionary Theory”: Recent changes and novelties in evolutionary theory crystallized our decision to develop this course.

3.3 Teaching and Learning

3.3.1 Teaching and learning methods

Undergraduate programs: The distance teaching and self-study method developed by the Open University enables individuals with work, family and military service constraints to organize their studies according to their personal needs. The method is not time or place dependent; it is not based on a central campus with teachers and students or on a fixed and uniform class schedule. The OUI's teaching and study conception combines distance teaching and active independent study with components of face-to-face study (blended learning), and enables students to choose the tutorial framework most suited to their needs.

MA in Biological Thought: The teaching and learning methods combine self-study and mandatory face-to-face seminar meetings. Each meeting is headed by one of the teaching team, but all four team members are present at the meetings and participate in discussions. The 10 courses are covered during the first 2 years of study. Each course is divided into two sections. Section A of courses 1 to 5 is studied in the first semester and Section A of courses 6 to 10 in the second semester. Section B of courses 1 to 5 is studied in the third semester, and Section B of courses 6 to 10 in the fourth semester. The spiral nature of the courses, with each course studied twice, has two outcomes: first, in the first year, students are exposed to a wide range of topics in a gradual manner; second, in the second year, on the basis of knowledge acquired, students can deepen their understanding of various issues already touched upon.

In the third year, students participate in a graduate seminar that includes six 3-hour seminar sessions, at which guest lecturers deliver presentations of their work. In addition, students either report on their progress in their papers, or present a lecture relating to a paper submitted. Individual supervision is provided when students work on the two required seminar papers and the final paper or thesis.

3.3.1.1 Learning materials

Undergraduate courses: Most courses are based on **books** written in Hebrew or on Hebrew translations of existing texts. In the latter case, the books are accompanied by a study guide (see below). The written courses are specifically suited for self-study: they are usually divided into study units, each unit dealing with a defined topic and designed to be covered within a set period; the material is clearly explained and combined with guiding questions, answers to questions, and, in many cases, self-assessment questions.

Some courses include **readers** of articles on course topics to expand students' knowledge. In advanced courses (and in a few intermediate courses), students are required to search for materials in the library or in electronic databases. The articles in readers in advanced courses are in English. All courses based on readers in English or Hebrew or on translated books are accompanied by a **study guide** (in digital or print format) providing detailed instructions on how to approach and integrate the various materials. The guide usually includes a short overview of the material, a list of objectives, definitions of key topics, a focus on the principal topics in the readers, references to reading assignments, clarifications of complex issues, reflection questions on specific topics (some accompanied by detailed answers or guidelines), key terms, experimental observations that can clarify theoretical issues, updates on scientific advances in topics in the reader, and more. Course materials frequently include **technology-based materials** developed by senior faculty members, by the academic teaching staff, and in some cases with the help of external experts in the field. These include:

- **CDs:** Multimedia CDs were developed for several courses. For example, "Selected Topics in Animal Behavior" includes software on animal development and learning and a video clip on social mammals used to drill observation methods.
- **Laboratory simulations:** The course "Laboratory: Animal Physiology" is mainly based on virtual labs demonstrating nerve simulation through the classic experiment on the

sciatic nerve of a frog (SimNerve), the patch clamp technique (SimPatch), physiology of striated muscle (SimMuscle) and activity of an isolated mammalian heart (Langendorff heart; Simheart).

- **Recorded lectures:** The material in several courses includes lectures recorded by experts, such as a lecture by Prof. Yoram Reiter of the Technion on “Man-made antibodies” in “Immunology.”
- **Films and animations:** The websites of many courses have films and animations. For example, in “Fundamentals of Physics,” students view a simulation on colliding objects.

Printed course materials and CDs are mailed to students’ homes, accompanied by a booklet that describes the course format and process. The booklet includes the course topics, assignment questions and timetable (dates of tutorial sessions and topics of discussion, as well as deadlines for submitting assignments). The booklet also includes an example of final exams from previous semesters.

Updating study materials: In the Life Sciences, we face the constant need to update materials to meet the rapid developments in the field. OUI books, which serve as the primary learning materials, are updated every few years but can by no means serve as the only source of knowledge in rapidly advancing areas such as molecular biology, immunology and neurobiology. This challenge is overcome at the OUI by providing the students with digital materials that can be updated more easily than printed materials. Advanced courses, as well as some intermediate courses, are routinely updated by incorporating review and research papers into the learning materials and posting recent papers on course websites.

Graduate courses: Each graduate course includes a detailed study guide, an introductory overview essay, an opening lecture delivered by an outstanding scholar in the field (on DVD) as well as 2-3 books and a course reader containing articles (mostly in English).

3.3.1.2 Tutorial sessions

All courses include tutorial sessions, conducted by a tutor who holds a PhD (71%) or at least a master’s degree. In most cases, tutorial sessions are not mandatory. The aim of these sessions is to discuss issues in the course material, clarify complex topics, enrich and update the study material, and practice problem unpacking and solving. Tutors select topics together with the course coordinator and use varied methods: activities in small groups, role-play, case studies, etc. Multimedia presentations used by the tutor during the tutorial session are posted on the course website for students who did not attend the session. Students are offered several tutorial formats and choose the most suitable for them from among the following:

- **Regular face-to-face tutorials (at OUI study centers):** A 2-3-hour session once every 2-3 weeks, 5-8 tutorial sessions over a semester.
- **Intensive face-to-face tutorials (at OUI study centers):** Usually between 7 and 14 tutorials (2-3 hours long) per semester conducted weekly or biweekly.
- **Online tutorials:** The Life Sciences faculty uses a variety of tools and methods for virtual tutorials conducted through course websites (see section 3.3.1.3).

Telephone tutorials: All course coordinators and tutors have weekly telephone tutorial hours during which students can call them to discuss academic and administrative issues.

Tutoring via e-mail: In addition to telephone tutoring that is usually limited to specific hours during the week, students can e-mail the teaching staff and receive a speedy response.

3.3.1.3 Online teaching

The department makes extensive use of the following technology-based distance teaching methods. Synchronous and asynchronous learning is conducted through different media with the aim of bridging geographic distances and varying teaching methods.

Course websites: All courses (except for seminar courses) have a website that serves as a major learning and teaching component (see section 3.3.3.1).

InterWise: A system that enables real time interaction among students and between students and lecturers or tutors. Classroom activity is based on the transmission of a live lesson to students' home computers. All the students can hear the lecturer or tutor, and the other students.

Ofek satellite system: Live broadcast of a tutorial session, usually conducted by an experienced course coordinator or by a guest lecturer who is an expert in the field, enabling a dialog between the students and the lecturer. *Ofek* lessons are broadcast to 20 classrooms throughout the country and to students' home computers. For example, in "Biochemistry I," students can enroll in a study group that has no face-to-face meetings; all study sessions are transmitted via *Ofek* to the student's home computer and saved on the course website.

Studio recording of lectures: Recorded lectures do not include interaction with students. The lecture is edited, sent to students on CD and posted on the course website.

Animations: Principles of biological processes and biological and chemical structures are presented to students in several courses through animations, such as animations of propagation of neuronal impulses in "Neurobiology."

3.3.1.4 Assignments, examinations and seminar papers

In all **undergraduate courses**, students submit a specified number of assignments during the semester based on a predefined timetable. Assignments serve several goals. A typical assignment in most courses provides students with the opportunity to review basic questions in the course material, introduces students to key concepts and their applications and allows for integration and/or in-depth processing of certain parts of the study material.

Several courses have special assignments of larger scope. For example, assignments based on reading several research articles or on material not included in the printed course materials or the integrative application of concepts and principles across many study units (different types of special assignments are detailed in section 3.3.7.1). In laboratory exercises and laboratory courses, assignments include detailed lab reports.

Assignments are submitted by students individually via regular mail or through the online assignment system (see section 3.3.3.1). Assignment grades are weighted as part of the course grade, and in most cases comprise 15-30% of the final grade (for details, see Extras, "Weights of grades").

Students receive **feedback** on assignments from their tutors. In most courses, the course coordinator formulates guidelines for checking the assignments in order to ensure uniformity of the checking process among all the tutors checking the assignments. In some courses, the course coordinator posts general feedback on the course website in order to clarify major issues that emerged after checking many assignments.

All courses, except for laboratory and seminar courses, have a **final examination**. Examinations are held at OUI study centers throughout the country (students abroad take the exams at Israeli embassies or consulates) and students may take the exam at a center of their choice. For details on examinations, see section 3.3.6.1.

Students in undergraduate Life Sciences programs are required to take two advanced seminar courses. In these courses, students read review articles and empirical scientific papers, submit an integrative paper that describes the state of the art of the topic they have chosen to focus on, and distinguish between proven scientific facts and unresolved observations. Students submit the written paper and present their work orally.

In each **graduate course**, students submit two written assignments that deal with the required readings in the course. In some courses, the assignments are prepared collaboratively, using Wiki.

3.3.1.5 Practical research experience

The requirements for the various undergraduate programs in Life Sciences include participation in laboratory or field laboratory courses, in addition to participation in laboratory sessions that are part of theoretical courses. See Extras, “Labs – fieldtrips” in Hebrew, for a table summarizing laboratory courses, fieldtrips and laboratory sessions. Students have various opportunities to gain practical experience in research methods through these as well as the “Research Project in Life Sciences,” and courses offered by the Interuniversity Institute in Eilat and by Ben-Gurion University.

Many of the Life Sciences courses include 3-4 mandatory laboratory sessions in which students are acquainted with the principal methodology of the field. Most of the lab sessions in science courses are conducted in the lab on the Raanana campus; some are held at the large study centers in Haifa and Beer Sheba or in laboratories of other universities in the country. In two courses – “General Biology I” and “The World of Bacteria” – students perform home experiments using kits provided by the University. Students are required to participate in 1-3 laboratory courses, depending on their program of study. The theoretical part of these courses is usually based on a reader that includes chapters from textbooks and original papers and the practical part is conducted either at individual laboratory sessions spread over the semester or as an intensive 3-5 day workshop.

The department offers 17 laboratory courses of which 7 are in the Life Sciences, a field laboratory on the social life of the Arabian Babbler and a field trip on symbiosis. Some of the laboratory sessions are based on virtual experiments designed to enable students to practice collection and analysis of experimental data. OUI students are also encouraged to enroll in interuniversity courses offered by the Interuniversity Institute in Eilat and by Ben-Gurion University, which last one to two weeks. These courses include field and laboratory work, lectures and seminars. The field laboratory courses, field trips, and interuniversity courses combine individual and group work and enable students to gain skills in research methods, to plan, perform and report research, and to increase their theoretical knowledge on the basis of fieldwork.

The “Research Project in Life Sciences” enables students to practice research work in one of Israel’s universities or research institutes. Usually, the student’s individual project is combined with the broader research of the laboratory. As part of the work on the project, the student participates in defining the research question, investigating the scientific background related to the topic, determining (together with the project supervisor) objectives, studying research methods and preparing an outline detailing the stages of the research, methodology and timetable. The project can be carried out over one or two semesters. At the end of the project, the student analyzes the data and presents the project in a written report and as a PowerPoint presentation. The presentations are posted on the course website. This course may afford opportunities for graduate studies: in some cases, the connections established between the research laboratory and the students were so successful that the students continued their studies toward an MSc in that laboratory.

3.3.1.6 Symposia

The Natural Sciences department holds symposia that afford students the opportunity to enrich their knowledge in different areas in Life Sciences and to meet leading experts in the field. Attendance is not mandatory.

Graduate symposia: Every two years, a short conference, open to the public, is held on a specific topic (the last one was on Eugenics). Four or five guest lecturers deliver talks,

culminating in a round-table discussion. The lectures are videotaped, and sometimes used in future assignments and course meetings, with the aim of exposing students to a wide range of outlooks. A list of guest lecturers and symposia topics is appended in Extras, “Departmental seminars.”

3.3.2. Evaluating and improving teaching

The distance learning teaching methods enable maximum flexibility. They enhance students’ learning skills and personal responsibility for the process, but demand a significant investment of resources. The methods provide students with a concentrated and active learning experience that helps them process and internalize the study material, and contributes to their preparation for advanced degree studies.

Originally, the key weaknesses of studies in the OUI format pertained to limited campus life as a learning community. Discussion groups in course websites and the option to participate in tutorial sessions as well as meetings with seminar paper supervisors provide a (partial) solution to this difficulty. Another limitation is lack of direct contact with researchers and leading academics in the field. To reduce this limitation, efforts are now made to include recorded expert lectures in a growing number of courses.

3.3.2.1 Training the academic teaching staff

The teaching staff of each course consists of a senior faculty member, a course coordinator and tutors. The senior faculty member who is academically responsible for the course is usually from the OUI, or in some cases a senior faculty member from another university who was involved in course development. Since the field of Life Sciences is very diverse, each of the five senior faculty members is responsible for courses that are within his/her area of expertise. Actual teaching is primarily conducted by the course coordinator and tutors. Due to the small number of students enrolled in some of the Life Sciences courses, course coordinators sometimes also serve as tutors.

The OUI’s unique study method requires training for all personnel involved in teaching, despite the fact that in most cases, tutors and coordinators have prior teaching experience from other academic frameworks. The Training Department in the Office of the Dean of Academic Studies provides training activities for course coordinators and tutors.

Course coordinator training

New course coordinators begin their employment two months before the beginning of the semester. They visit various OUI units and are briefed by key individuals. The department head appoints a veteran course coordinator to **mentor** the new coordinator. When a new course coordinator replaces a current coordinator, there is an **overlap** period, during which the new coordinator works side-by-side with the veteran coordinator.

In the second stage, the course coordinator participates in workshops conducted by the Training Department that include:

- **Orientation for new course coordinators** (5 hours): participants learn about the OUI – its nature and key values; study and discuss the essence of their position, its challenges, position partners and interfaces. Participants meet with a panel of position holders who answer questions and address dilemmas.
- **Writing assignments and exams** (a two-day workshop – 14 hours): the workshop provides theoretical knowledge as well as skills in writing assignments and exams.
- **Using Oracle software** (3.5 hours): Oracle is the OUI database software that serves as the main tool used by course coordinators. The information that can be produced from the system is necessary for ongoing academic and administrative course management.
- **Training in managing course websites** from *Shoham* staff members.

Experienced course coordinators can participate in a management development program (9 sessions), offered once a year.

Tutor training

The OUI Training Department is involved in initial training of tutors. Course coordinators are responsible for further, course-specific training of tutors.

Tutor training in the general university system: New tutors at the OUI are required to participate in a three-day training program, offered twice a year, that deals with the nature of the position, the first tutorial session, checking assignments and examinations, and tutoring skills. Correcting assignments is one of the main components of the tutor's job. Therefore, the training process emphasizes the development of skills for formulating grading criteria, as well as improving reliability and providing effective feedback to students.

The training program for new tutors

Session 1 (about 5 hours): Acquaintance with the OUI and preparing for the first tutorial session. Tutors are acquainted with the OUI, its values and work style.

Session 2 (about 5.5 hours): Assignments as a means of two-way communication – checking assignments and providing feedback. In this session, tutors practice checking assignments and providing effective feedback, discuss grading dilemmas and the preparation of students for writing assignments.

Session 3 (about 5 hours): Tutoring skills. In this small group workshop, tutors learn and practice the use of a wide range of tutoring skills through simulations and constructive feedback from colleagues and experienced tutors.

Training and activities for experienced tutors

1. **Workshop – The online assignment system** (3.5 hours): This workshop aims to acquaint tutors with the tool for submitting assignments and giving feedback through the Internet.

2. **Workshop – Tutors as leaders of study groups** (8 hours): To help tutors develop tutorial skills that increase student involvement and commitment.

3. **Workshop – Feedback and criticism** (8 hours): The aim of the workshop is to enhance tutors' skills in giving and receiving feedback.

4. **Workshop – Pygmalion tutoring** (7 hours): The workshop aims to teach tutors how to improve students' achievements by raising their expectations about themselves.

5. **Workshop –Tutors together** (4 sessions, 1 hour each): Tutors from different disciplines contend with similar dilemmas and professional and organizational issues.

6. **University-wide activities**, including symposia, lectures, guided concerts, exhibitions, tours and workshops on a variety of topics. Demand is high for most of the activities offered.

Tutor training in the framework of individual courses: Course coordinators are responsible for training new course tutors. A variety of means are used for tutor training:

1. **Tutor team orientation:** At least one meeting between all new tutors and the course coordinator is held for every course. Goals are:

- To present the course teaching goals and study aids
- To survey the study topics and various emphases (for example, to help in detecting difficulties encountered by students) and the teaching schedule
- To explain the importance of assignments in general and in the course in particular
- To provide teaching aids that can facilitate tutoring (lesson plans, exercises developed in the course, presentations, film clips for illustrating different topics, etc.)

2. **Continuous tutoring throughout the semester:** The course coordinator is responsible for maintaining continuous contact with new tutors throughout the semester, accompanying them and monitoring their integration into the tutoring framework.

3. **Observing tutorials:** The course coordinator and senior faculty members visit and observe tutorials from time to time, and discuss the quality of tutoring with the tutor.

4. **Observing a veteran tutor:** New tutors in several courses are asked to observe tutorial sessions conducted by veteran tutors as part of their training process.

5. **Accompaniment by a veteran tutor:** In several courses, the course coordinator appoints a veteran tutor to be responsible for the new tutor's integration.

6. **Tutor discussion groups:** Many courses have a tutor discussion group on the course website to facilitate ongoing course management and discuss problems.

7. **Workshops or symposia:** In some courses, the course coordinator or a number of course coordinators organizes workshops or symposia for the tutors.

8. **Tutor meetings:** Meetings of tutors are often held when a course has more than two tutors. In most courses, these meetings are held every semester, usually before the beginning of the semester or after the semester ends. The main issues discussed are:

- Summary of the preceding semester as well as notifications (usually administrative), guidelines and updates concerning preparations for the upcoming semester
- A discussion of various topics concerning course contents
- Sharing information about study and drilling methods for different topics
- Enrichment and in-depth examination of various topics related to course contents and to study and tutoring issues.

The meetings also have an important social function in consolidating the group, heightening involvement and reinforcing tutors' feelings that they are not working on their own.

3.3.2.2 **Evaluation of the teaching staff**

The OUI has guidelines for course coordinator and tutor evaluations. However, these processes are conducted with varying rigor in the different academic departments. During the self-evaluation process, we identified this issue as one that deserves more serious consideration and significant improvement in our department. We found that in the last few years, evaluation of course coordinators has not been performed regularly. A new system including guidelines for course coordinator evaluation (see Extras, "Course coordinator self-evaluation form," appended in Hebrew), which is currently being implemented in all OUI academic departments, will certainly help us to improve this process in the department in general and in Life Sciences in particular.

Course coordinator evaluation: The evaluation of the course coordinators involves the senior faculty members who have academic responsibility for the courses. Every senior faculty member receives data (assignments and exams, results of the teaching survey described below, course grades) on the courses for which s/he is responsible, evaluates these and course website activities, and reviews any additional information available. The course coordinators report on their work as course coordinators as well as on additional activities, the tasks they agreed to undertake within the department or as part of general OUI endeavors, as well as on their research activities and, when relevant, on doctoral studies.

Tutor evaluation: Observing tutorial sessions – Course coordinators continuously monitor the quality of the tutors' work by conducting visits to study centers, observing tutorial sessions and talking with students (see Extras, "Report on tutor"). Senior faculty also visit study centers and observe tutorial sessions. **Assignment and exam sampling** – Course coordinators are responsible for examining the quality of assignment checking. To this end, assignments are sampled during the semester, usually through the online assignment system.

The course coordinator summarizes his/her comments and sends feedback to the tutor. Course coordinators can decide in advance for every tutor how many assignments will be sampled. They usually sample more from new tutors than from veteran tutors. Similarly, the course coordinator can sample exams in order to examine the quality and uniformity of the grading process among all those grading the exam (when tutors are involved).

Teaching survey: One of the important tools for evaluating and examining teaching quality is the teaching survey, which gathers feedback from students and is conducted in every course each semester. The survey helps course coordinators to monitor tutors' performance and the efficacy of the variety of teaching tools and methods used in the course. The survey is conducted by the Evaluation Department via the internet through the course website, using a standard questionnaire (see Extras, "Teaching survey").

Statistical data about student performance on the assignments and the exam are provided to the head of the department and the course coordinator who sends it to tutors along with comments and insights. A recently launched "Grade Site" is available to the teaching staff online and serves as the major tool for retrieving information regarding students' grades immediately after feeding the data into the system. The site includes grade distributions, averages and standard deviations of test scores, assignment grades, correlation between assignments and test grades, and more. All measures are presented on the course level, tutor level, group and study center level and allow comparisons by semester. The information on the site enables the teaching staff to analyze data adapted to their specific needs regarding the quality of the tests, tutors and the teaching process.

MA in Biological Thought: Data about student performance on the assignments and exam are provided to the course coordinator, who is also the tutor. Due to the small number of graduate students, a statistical analysis of teaching surveys is not relevant in graduate courses.

3.3.3 The use of information technology in teaching and learning

The information technology used includes several components:

3.3.3.1 Course websites

Life Science courses (except most seminar courses) have websites that enable the department to improve service to students, enhance teaching quality, update learning materials, address varied target groups, bridge geographic distances and supply easy communication and continuous availability. The websites provide two types of communication channels – an administrative channel and an academic channel.

Administrative channel

All administrative details pertaining to the course are found on the website, for example: course description, course schedule, information about the teaching team and list of students in the course by study group.

Academic channel

Discussion forum: Each website has a discussion forum that is one of the key components of an online course. Forums provide a unique collaborative learning environment through asynchronous discussion among members of the group (students and teaching staff) who are geographically distant from each other. Students can ask questions about the study material, request clarifications, discuss assignment questions and receive help from their fellow students and from the teaching staff. For students who do not attend tutorials, the course website enables them to maintain contact with the staff and their fellow students, to more easily keep up with the appropriate study rate, and to feel a part of a large study group.

Message board: Every website has a message board with notices posted by the course coordinator throughout the semester about the study material and about administrative issues.

Personal notebook: This tool enables students to gather and organize selected information from course websites and to add their personal comments. This personal tool accompanies students throughout their studies.

Chat room: Every website has a chat room that the students and tutors are authorized to enter with a personal password. The chat enables synchronous group communication using text messages. The chat serves as a social and learning meeting place for students, a site on which to converse with students abroad or with tutors, to answer questions while preparing for an exam, etc.

Online assignment system: The system enables students to submit assignments and receive feedback from their tutor, online. The procedure is efficient and enables tutors to grade assignments on their computers; enables students, tutors and the course coordinator to monitor assignments; and helps overcome technical obstacles (delays in regular mail services). The system serves all students and is especially helpful to students who prefer to study at home or who live abroad.

Enrichment: Various types of learning materials are integrated into course websites: supplementary information on study units, exercises and exams for self-evaluation, sample exams, weekly briefings, feedback on assignments, videotapes and recorded lectures, demonstrations, presentations, students' papers, references to current topics, links to databases and websites, etc.

The screenshot shows a course website for 'The World of Bacteria - 20237'. The page features a navigation menu on the left with categories like Forums, Presentations, Clips, Eduware, Links, Glossary, Database, Experiments, Papers (in Hebrew), Books, TV programs, Test yourself, and Ask about bacteria. The main content area includes a 'Messages' section with a list of articles such as 'The Non-Immunized', 'The Importance of Washing Hands', and 'The Village of the Survivors'. Below the messages is a section titled 'On bacteria in...' with sub-links for 'The news', 'Updates', 'Photos', and 'Riddles and jokes'. A large photograph of a salt flat in Bolivia is displayed, with a caption identifying it as 'Salar de Uyuni - Salt flat in Bolivia' and mentioning the student Eyal Sagie. The footer contains the Telem logo and copyright information for The Open University of Israel.

Example of a course website homepage (translated)

Virtual tutorial meetings: Tutors post all PowerPoint presentations on the course website, enabling students who could not attend tutorial meetings to follow the learning material presented by the tutor during these meetings.

Wiki: A tool that enables students to perform collaborative work used for pedagogic purposes. For example, Wiki may be used for creating a lexicon of course terms or for group preparation of assignments in graduate courses.

3.3.3.2 General department websites

The **Department website** is intended for Natural Sciences students and for those interested in studies in Natural Sciences. It includes descriptions of programs and courses offered, a list of faculty members and their research interests, a list of the course coordinators and academic counselors and the contact information for all department staff. The website has links to the OUI library, to the Academic Counseling Center and to various student services.

The **Life Sciences Online** website is intended for Life Sciences students and staff. It presents important information for students, including rules and guidelines on seminar papers in and information about the Master's program. The website includes a forum for the discussion of general biological issues, and a link to lectures on the Philosophy of Science. Students can request online academic counseling through the site and pose academic as well as administrative questions and receive a response directly via the website. In addition, the Life Sciences website contains a forum for Life Sciences senior faculty and course coordinators, a special forum for academic counselors in the Life Sciences, announcements on new or updated courses, details on lectures at the OUI and at other universities that would be of interest to Life Sciences students and staff, minutes of the Natural Sciences subcommittee, glossaries in different courses and PowerPoint presentations of seminar papers and research projects prepared by outstanding students. The Life Sciences website includes links to other websites of interest, including picture albums of biological species, glossaries, animations and simulations of molecular processes, databases and full text journals, professional societies, and biological issues in the news.

3.3.3.3 The Biological Thought website

The program website serves as a gateway with links to various virtual administrative and academic facilities. The policy in this program is to open the websites to the general public (excluding items involving copyright material and student privacy).

All **graduate course websites** contain assignments, digital readers, additional study materials (e.g. an introductory lecture, previous seminar presentations, exercises, new articles) and links to recommended sites and to the discussion forum.

Forums: The program forum serves to extend seminar meetings, allowing students and staff to continue discussing matters that were brought up face to face. The forum is also used for other structured discussions initiated by the staff or by the students themselves. A special sub-forum is available for the students for “chatting” on topics that are not directly related to course materials. The forum also serves as a message board, where notices can be posted throughout the semester by the course coordinators regarding study materials (e.g., clarifications, emphases, guidance) and administrative issues.

Wiki: Unlike most Wikis, the University Wiki demands a password, and is not open to the general public. Thus, it enables knowledge sharing among students while maintaining their privacy and protecting copyrights. Since 2002 (when Wiki was still in its infancy), we have been using Wiki as part of the student assignments for presenting short summaries of articles, and for working in small groups on articulating questions relating to the articles and responding to them. In one course, Wiki is also used by groups to write a shared paper, which is later posted on the web and followed by a group discussion.

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BIOLOGICAL THOUGHT – M. A.
Master's degree program in the Philosophy and History of Biology

- Definition of Life
- The Mind-Body Problem
- A Critique of Alternative Medicine
- Vitalism, Mechanism and Organicism
- Evolution and Creationism
- Reduction and Teleology in Biology
- Sociobiology and Its Offshoots
- The Human Genome Projects
- Bioethical Issues: Animal Experimentation
- Ecological Balance - Environmental Conservation

Messages
30/10/2007
To students interested in enrolling in Biological Thought
The program will next open in 2008-2009. Registration is open for qualifying courses that can be taken before the program begins.
Prospective students may contact [the program team](#) by telephone and e-mail for counselling.

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כל הזכויות שמורות לאוניברסיטת הפתוחה

Gateway to the MA program in Biological Thought

3.3.3.4 *Sheilta* – Interactive services to students

Sheilta is a computerized system developed by the OUI to offer students on-line administrative services via the Internet and other advanced electronic channels of communication (e-mail, SMS). *Sheilta* enables students to receive services and up-to-date information on three levels: general information, information on courses in which they are enrolled, including tutorial session dates, grades and more; and personal information. The range of information and services offered by the system is continuously being expanded.

3.3.3.5 Electronic databases

The OUI library subscribes to electronic databases and to a database of journals of all higher learning institutions (that provides a full digital text of the articles), providing direct and convenient access to updated academic publications to faculty members and students (see section 3.6.4.1 for information about databases in Life Sciences and their frequency of use).

3.3.3.6 DVDs and CDs used for teaching

In all graduate courses and some undergraduate courses, students receive DVDs or CDs containing expert lectures, laboratory simulations, three-dimensional models, animations of molecular and cellular processes, some of which were developed in-house.

3.3.3.7 Online tutorial sessions

In some courses, tutorial sessions are conducted through advanced technologies: the *Ofek* system and *InterWise* (see section 3.3.1.3).

Evaluation: The use of information technologies in the learning process has many advantages. It enables continuous contact between students and the teaching staff, as well as communication among the students themselves. This contact enriches and facilitates the learning process. From the course coordinator's perspective, study materials can be updated and enriched, beyond the written course material and tutorials. Integrating technology allows for learning through different channels (integrating picture, three-dimensional diagrams, simulations and interactive activities) and can suit various learning styles.

Nonetheless, there are limitations to the integration of technology in learning and it is not a simple endeavor. Operating the technologies demands an intensive investment of time on the part of the course coordinators, and despite its obvious importance, detracts from the time allocated to their academic work. Another problem that needs to be addressed is the tendency of a handful of students to use the websites rather than think through issues on their own. The availability of the teaching staff may encourage them to ask questions without first taking the time to work out a problem alone. Finally, reliance on technology exposes the learning process to technological problems. However, all these are minor compared to the advantages gained from the use of technologies.

3.3.4 Policy regarding student attendance

The OUI study method (distance learning and self-study) does not require students to attend tutorial sessions except in special cases such as laboratory sessions and fieldtrips. In addition, students enrolled in advanced seminar courses need to meet their tutors in order to discuss their papers. The tutorials are intended for enrichment, to clarify and discuss points with which the students have difficulty during independent study, to drill and practice problem solving.

In the graduate program, seminar meetings are mandatory. Attendance is checked, and students who miss a meeting must submit an extra assignment. Students are expected to participate actively in the meeting and to contribute to the ongoing discussions.

3.3.5 Methods for measuring student achievements

The OUI has open admissions in undergraduate courses and does not have information about students' prior scholastic achievements. Nevertheless, the principle of open admissions does not contradict upholding standards of excellence with respect to the academic level of OUI courses or the methods used to evaluate students' academic achievements. The level of the courses is fixed and does not change from one semester to the next nor does it change according to the level of the students in one study group or another. This "golden standard" is achieved by the fixed study material and by the fact that course coordinators prepare the course assignments and exams before the beginning of the semester.

Student achievements at the OUI courses are evaluated mostly through assignments and exams. During the semester, students are required to submit several written assignments that are checked, graded, corrected and returned to students. Assignment grades are weighted into the final grade of the course (on assignments, see section 3.3.7.1).

In all courses, except seminar and laboratory courses, there is a final exam at the end of the semester. The exam is written by the course coordinator and is approved by a senior faculty member who is academically responsible for the course (on exams, see section 3.3.6.1).

Calculating final grades in undergraduate courses: The final grade in the course is calculated as a weighted average of the assignments submitted and of the exam. In some laboratory courses, the weighted grade also includes a grade for the student's performance. A student who fails the final exam (less than 60) cannot pass the course even if the weighted grade is above 60.

Grading seminar papers: See section 3.3.7.2.

Calculating the final degree grade (undergraduate): In the Sciences, the weight of each introductory and intermediate course is equivalent to the number of credits granted for that course. The weight of advanced courses (including seminar courses) is one-half more (150%) than the credits granted in the course. A final degree grade between 85 and 94 entitles the student to a degree "with honors" and a final grade between 95 and 100 entitles the student to

a degree “with highest honors,” provided that the student accumulated at least 60 credits in OUI courses in the discipline in which the degree was conferred.

In **graduate courses**, achievements are evaluated through written assignments, active participation at meetings and on the website, seminar papers, and the final paper or thesis. The grade for each course is based on two written assignments (40% each) and active participation in meetings and on the web (20%).

The **final degree grade** in the non-thesis track is a weighted average of the courses grades (3 credits each), the two seminar paper grades (5 credits each) and the graduate seminar and final paper (10 credits). In the thesis track, the weighted average of the 10 courses (3 credits each) and the two seminar papers (5 credits each) contribute 50% toward the final degree grade, and the thesis grade contributes the other 50%.

3.3.6 Examinations

3.3.6.1 Method of examinations, their character and organization

Written final examinations are conducted at the end of all courses offered by the department except for laboratory courses, fieldtrip courses and advanced seminar courses. Examinations take place simultaneously in examination centers throughout the country (students abroad take the exams at Israeli embassies or consulates) and students may take the exam at a center of their choice. Students are entitled to take each exam twice (the last grade is the one that counts). Students who fail an exam twice or want to improve their exam grade have to re-enroll in the course and fulfill all course requirements (including assignments). The OUI usually holds three exam dates each semester for every course: two regular exam dates (sitting 1) and one repeat exam date (sitting 2). Exam questionnaires are different on every exam date. The exam is three hours long. Students may not take an oral exam, a take-home exam or write a paper in lieu of a written exam.

Special exam conditions are granted in some cases, primarily to students with learning disabilities or physical problems (for the list of possible accommodations, see Extras, “Special exam conditions form,” in Hebrew).

During the exam, the course coordinators (who wrote the exams) are available at the telephone center on the OUI campus to answer students’ questions referred to them by the exam proctor. Tutors are not present at the examination centers during the examination and do not see the exam before it is administered.

Exams in Life Sciences usually combine open and multiple-choice questions. In most of the courses, there is some choice. To ensure that all students have an equal chance to succeed, the examination questions reflect only the written study materials, irrespective of what topics arise in tutorial sessions.

The relative weight of an examination in the student’s final grade varies in accordance with the number of assignments submitted during the semester. In most courses, the examination accounts for 70%-85% of the final grade, with the remainder determined by assignment grades. A detailed breakdown of weights can be found in Extras, “Weights of grades.”

The examination process at the OUI is a complex logistical one, and organized as follows:

1. **Dates** of the final exams: Exams are held at the end of each semester. Students are entitled to take the exams at the end of the semester when they studied, or in the following semester.
2. **Geographical distribution**: Exams are held simultaneously at dozens of centers throughout the country to enable all students to take the exams as close to their place of residence as possible.

3. **Exam questionnaires:** All questionnaires are prepared by the course coordinator and approved by a senior faculty member, undergo professional editing and proof reading, and are duplicated about one month before the date of the exam.
4. **Organization:** The “Proctor Coordinator” is responsible for the management of the examination center and works with a local team. Examinations for different courses are held in the same classroom. Seating arrangements are computerized, and no student sits next to a student taking the same course. Students’ questions are transmitted to the course coordinators (by phone) via the proctors. At the end of the examination, the examination booklets are transferred to the campus in Raanana where the course coordinators pick them up for checking. Examination booklets are not sent by mail. Examination booklets are anonymous – the grader sees only the number of the booklet, and not the student’s name or ID number.

3.3.6.2 Grading

Grades in all courses are on a scale of 0-100. The passing grade is 60. To receive a “pass” in a course, students must meet all course assignment requirements and receive at least 60 on the final examination. Grades are not influenced by statistical considerations, in other words, grades are not factored in order to achieve a desired grade distribution. The distribution of exam grades is available for all courses each semester, enabling the coordinator and responsible senior faculty member to compare the current grade distribution to prior semesters (see also section 3.3.2.2 on the “grade site”). Experience shows that the grade distribution is usually very stable, most likely because of processes applied to writing exams and extensive monitoring.

Course coordinators have a bank of exam questions that, in many cases, include statistics on them. “Good” questions may be reused, though coordinators are required to include new questions on every exam. Poor items are removed from the question bank. All OUI students receive information about their grades via *Sheilta* and can view a table of the grade distribution showing frequencies and percentages. The category of the student’s grade is marked, enabling students to see their grade relative to other students. Exams should be graded within 10 days.

Over the past five years, of 6,833 enrollments in Life Sciences courses (not including seminar courses), a final course grade was given in 4,455 course enrollments (65.2%). The percentage of students who completed the courses rose from 54.6% in introductory courses (which are the self-test that show students whether they are capable of academic studies in the field), to 82.2% in advanced courses. The table below shows that the average grade of students who completed courses on all three levels was around 80%, but the percentage of students completing the courses consistently rose (from only 55% in introductory courses to 82% in advanced courses), indicating that only students capable of higher-level courses actually continue their studies.

Distribution of grades (2003-2007) – Undergraduate courses

Course level (# of courses)	# of students enrolled	Received a final grade (%)	Distribution of grades of all students enrolled in the course (in percentages)					Mean final grade of those who completed the course	
			0-59 *	60-69	70-79	80-89	90-100	X	SD
Introductory (2)	2378	1,298 (54.6)	46.8	8.3	14.2	17.9	12.8	80.2	11.9
Intermediate (25)	3748	2,576 (68.7)	33.7	10.4	19.1	22.5	14.3	79.4	11.6
Advanced (14)	707	581 (82.2)	18.8	12.3	23.3	28.7	16.8	80.3	10.0

* The 0-59 category includes both those who failed and students who did not take the final exam (dropped out).

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The table below presents the grade distribution in the MA courses. No factorial measures are employed in grading.

Distribution of grades (Fall 2002-Fall 2006) – Biological Thought

Course	Average grade	SD	Low grade	High grade	N
Definition of Life (22000)	81.2	7.0	61	92	48
Reduction in Biology (22001)	78.1	15.5	0	95	35
The Role of Teleology in Biology (22002)	79.0	7.0	65	93	35
Reduction and Teleology in Biology (22010)	81.1	5.8	73	92	11
Vitalism, Mechanism, Organicism (22003)	83.1	8.0	62	98	46
The Mind-Body Problem (22004)	79.9	14.2	0	95	47
Evolution and Creationism (22005)	80.0	7.5	64	96	35
The Human Genome Projects (22006)	84.3	6.5	64	95	35
Bioethical Issues: Animal Experimentation (22007)	76.5	24.2	0	100	36
Ecological Balance and Environmental Conservation (22008)	85.6	5.9	75	95	35
A Critique of Alternative Medicine (22009)	89.4	6.1	74	98	35
All courses	81.6	11.9	0	100	398

3.3.6.3 Average grades of graduates

The average overall degree grade of 102 graduates over the past five years in the various undergraduate Life Sciences programs is 81.8 (SD=5.9) (see table below). The relatively higher average grades of graduates in the Life Sciences and Management program can be attributed to higher grades they earned in Management courses. It should be noted that the OUI's open admission policy combined with its high academic requirements results in a relatively high dropout rate in the student's first courses at the OUI. Students who are able to graduate are usually highly motivated and have above-average intellectual abilities.

Graduates of Undergraduate Life Sciences Programs – 2003-2007

Degree	N	Average degree grade	SD	Low grade	High grade
BA in Life Sciences	53	82.6	5.8	72	93
BA in Life Sciences & Management	3	86.7	9.5	76	94
BA in Natural Sciences	35	80.9	5.3	71	92
BA in Natural & Life Sciences	2	77.0	1.4	76	78
BA in Sciences	9	80.3	6.6	73	89

MA in Biological Thought: The average overall degree grade of the nine graduates in the non-thesis track is 85 (low 77, high 89). The grade of one graduate in the thesis track was 82.

3.3.7 Written papers

3.3.7.1 Types of written assignments, their contents and scope

Undergraduate course assignments: Written assignments are an important component of teaching and learning that aim to help students assimilate the material, underscore important course contents, provide feedback to students and, through the students' answers, provide feedback to the teaching staff on how well students understood the study material or what difficulties they encountered.

Assignments are submitted during the semester on pre-determined dates by mail or through the Internet and sometimes serve as the only means of communication between students and tutors. In many courses, students may submit more assignments than required. Only the assignments with the highest grade and weight are used in the final course grade calculation. In this way, the OUI encourages students to invest time in assignments and to study throughout the semester and not only before the final exam.

Undergraduate seminar papers: The requirements for the degrees in Life Sciences, Natural Sciences: Emphasis on Biotechnology, and Life Sciences: Emphasis on Field Studies, include at least two seminar courses in Life Sciences. Degrees in Natural Sciences, in Sciences, in Life Sciences and Economics, Life Sciences and Management, Psychology and Life Sciences require one seminar among the advanced seminar courses offered by the department, and, in the dual-disciplinary programs, one seminar in the second discipline.

Seminar courses usually have two parts: in the first part, students submit a written assignment composed of open questions based on material studied in a reader that includes selected chapters from textbooks and review articles from scientific journals. This enables students to demonstrate their writing, analysis and synthesis skills with respect to the topics studied. After successfully completing the first part of the course, the student chooses a topic for an independent seminar paper and the course coordinator refers the student to a supervisor based on the chosen topic. Seminar paper supervisors are experts in the topic and they are among the senior faculty members either at the OUI or at other Israeli universities. The student then submits a proposal containing an outline of the paper and a list of primary references that is approved by the supervisor. Most seminar papers are theoretical and include a detailed state of the art and an analysis of current research and references. Writing the seminar paper represents the student's first encounter with raw – and sometimes contradictory – scientific data. This advanced stage in the student's education requires integration of information and distinguishing between established data and open scientific questions. Students are also required to add their personal perspective of the topic and suggest how they would continue its research. Students receive a detailed guide for writing a seminar paper in the Life Sciences (see Extras, "Seminar guide," in Hebrew).

Laboratory and Field Reports: Before each laboratory session, students read background material in English and, in some of the lab courses, are required to submit written assignments. After the laboratory session, students are required to submit a final report analyzing the results obtained in the session. In the field laboratory course "The Social Life of the Arabian Babbler," students submit a summary and analysis of the collected data, a field diary and a lab report in the form of a scientific paper.

Research Project in Life Sciences: This course enables students to experience research work, and usually to combine an individual project with the work of a research group in the laboratory of one of Israel's universities and research institutes (see section 3.3.1.5). The grade includes the student's preparatory work, the work on the project itself, the final report and the presentation.

Graduate courses

In each graduate course, there are two written assignments. An assignment is usually based on reading two books and 7-12 articles from the course reader. The submitted assignment includes answers to questions, exercises, and short essays, and its scope is 12-15 typed pages.

Graduate seminar papers: During the first two semesters, following Section A of the courses, students select a topic for their first seminar paper, and by the end of the second year they select a topic for a second paper. Students also prepare a lecture to be delivered to their peers in the third-year graduate seminar or at a special workshop held at Beit Daniel.

The scope of a seminar paper is 25-30 pages (7,500-9,000 words), and is based on 2-5 review papers (or one or two books) and 5-10 additional articles.

Thesis or Final paper: Outstanding students (with an average of 90 or more) are entitled to write a thesis. The student selects the thesis topic and is assigned a supervisor. The thesis is research-oriented, must demonstrate originality in synthesis and integration, and is expected to include a bona fide innovation. Two professionals (internal and external) read the thesis and judge its merit. Other students write a shorter final paper. In writing the final paper, students are guided by one of the team members. The paper includes a summary of materials covered in the relevant courses and seminars and an extended presentation of a topic or problem. The scope of the paper is about 50 pages (15,000 words).

3.3.7.2 **Methods for evaluating students' achievements**

Grading of written assignments in undergraduate courses: As indicated above, students are required to submit written assignments throughout the semester in every course. The course coordinators prepare elaborated criteria for grading each item on the assignment that enable the tutors to give students specific, uniform and informative feedback on their performance.

Grading of undergraduate seminar papers: All seminar papers supervisors receive a letter from the Dean of Academic Studies describing the requirements pertaining to seminar papers at the OUI and the supervisors' responsibilities (see Extras, "Letter to seminar supervisors," in Hebrew). The supervisor meets with the student prior to writing the paper and interacts with him/her via e-mail or telephone to provide advice and feedback. They also meet after the student has submitted the written seminar to enable the student to present the paper and answer questions orally. In general, the course coordinator is present at this evaluation meeting. After the evaluation, the supervisor sends a copy of the paper, with his/her comments, as well as a detailed evaluation form and the final grade to the course coordinator.

Grading of written assignments in graduate courses: Course assignments are evaluated by the course coordinator (who is one of the four members of the Biological Thought team) against full model-answers composed by the team. Very detailed written feedback is supplied to the student. After receiving the graded assignment, students may schedule individual meetings with the staff to go over their work and the written feedback.

Graduate seminar papers are composed in several stages (articulating the main issue, searching for sources, writing preliminary notes, preparing a detailed outline, submitting a sample chapter, submitting a whole draft). Students are individually supervised by a team member who meets with them several times to assess, encourage and direct the work throughout the various stages of composing a paper. Feedback is given at each stage in writing (see sample in Extras "Evaluation of MA seminar paper"), face-to-face, and (optionally) using Wiki. In addition, the third-year graduate seminar serves as a platform for discussing progress and for "brain-storming" in the presence of all team members.

Final paper or thesis: Regular meetings are conducted with individual students during the various stages of writing the final paper or the thesis. Written feedback is given during the early stages.

3.3.7.3 **Average grades of papers, theses and projects**

Undergraduate seminars: Between 2003 and 2007, the average grade for the 162 undergraduate seminar papers submitted in 19 advanced seminar courses was 88.5 (SD = 8.0). The high average in these courses can be explained by the fact that only successful students are capable of reaching this level and we would expect their grades to be high.

Distribution of grades (2003-2007) – Advanced undergraduate seminars

# enrolled	Received a final grade (%)	Distribution of grades (in percentages)					Mean final grade	
		0-59	60-69	70-79	80-89	90-100	X	SD
315	162 (51.4) *	0.0	4.3	8.6	32.7	54.3	88.5	8.0

* The rest are students who registered for the course, but have not yet submitted seminar papers or may have decided not to finish the course.

Graduate seminars: The average grade on 62 MA seminar papers was 80.0 (SD 13.4). The spread of grades ranged from a high grade of 97 to a low grade of 0. Ten graduates have received an MA degree in Biological Thought. The average final paper grade of nine graduates was 82 (high 90, low 75); the thesis grade of the one graduate was 76.

3.3.8. Other methods applied to measure achievements of the students used by the institution

No other methods are applied in the Life Sciences programs.

3.3.9 Strengths and weaknesses of teaching and learning in the program

The quality of evaluation of achievements can be viewed from two perspectives:

- Quality of evaluation tools (are they reliable and valid?)
- Quality of the evaluation process in terms of its effect on the student

The validity and reliability of evaluation processes are related to the design of evaluation tools (in this context, exams and assignments) as well as the application of these tools (for example, assessing students' answers). To ensure the validity and reliability of the student evaluation processes, the Evaluation and Training Departments use several methods:

- The academic teaching staff is trained in writing exams and assignments, checking assignments and grading exams (see section 3.3.2.1).
- Statistical reports are generated in order to analyze and learn from the results of the tools: item analyses for all assignments and exams are consolidated in a general OUI database from which reports are generated and used by course coordinators to track students' achievements:
 - Students' achievements – for every student in the course, the report shows the students' assignment grades, final exam grade and final course grade.
 - Consolidated results of multiple-choice questions – the difficulty level, item discrimination, the proportion of students who chose each of the options, the correlation between each of the options and the overall exam grade.
 - Consolidation of grades of open questions – the average grade and SD for every item, and the percentage of examinees that chose to answer the question. The report also shows the distribution of the exam grades.
 - Statistical data (means and SDs) on assignment grades, final exam grades, the correlation between the assignment grades and the exam grade, and reliability coefficients.

These reports can be generated very easily after the items are entered into the OUI database. They enable course coordinators to identify 'bad' items that could have affected students' success on the exam, to remove them from the grade calculation, and to improve future exams. In exceptional cases (when the student's grade is very close to a pass grade), the exam notebook is rechecked. This also contributes to the reliability of the checking process.

The statistical data enable course coordinators to oversee several aspects pertaining to teaching the course and evaluating students' achievements:

- Comparing the assignment and exam grades in the various study groups can show the level of students in the group and the quality the tutor's grading of assignments.
- Comparing assignment grades to the final exam grade and checking the correlation between the two can, in combination with additional information, show the degree to which the assignments prepare students for the final exam.

The reliability and validity of the assignment, exam and seminar paper checking process is enhanced through monitoring of course coordinators by senior faculty members and the department head, course coordinators' monitoring of tutors' work, and the criteria prepared by the course coordinators for grading assignments and exams. The OUI's special exam system also creates uniform exam conditions for all examinees, preventing pressure on the course team to provide answers to students' questions during the exam. The questions are transmitted by telephone, not personally, by the exam proctor. The system also prevents copying since every student taking an exam sits with students taking exams in other courses.

The evaluation process makes an important contribution to students: because assignments are mandatory, students are required to study throughout the semester and not only before the exam; every course includes a variety of assignments that expose students to varied skills; assignments include a range of tasks on different levels of knowledge, comprehension, application, integration, etc.

A possible weakness of the assignment system is the increased potential for plagiarism at the OUI compared to other institutions due to the fact that a number of study groups are conducted in each course. Tutors can uncover copied assignments in their study group, but not between students in different study groups. For this reason, accumulated assignment grades do not exceed 30% of the course grade, and, irrespective of their weighted grade, students must receive at least 60 on the exam in order to pass the course.

We do not face a serious problem of copying seminar papers (from students at other universities or from the Internet). We do however take the following measures to minimize this possibility:

- Together with the seminar paper, every student submits a written statement declaring that s/he wrote the paper (appended in Hebrew in Extras, "Declaration of original work"). We hope that this deters some of those who considered plagiarizing.
- Severe punishment by the Discipline Committee for plagiarism, if discovered.
- Supervisors closely monitor work processes and stages and meet personally with students.

Alongside the strengths of the evaluation methods and processes at the OUI, there is an inherent weakness stemming from the nature of the University. Evaluation cannot be based on "softer" evaluation tools such as class participation (except in laboratory tutorials and field trips, which are mandatory). However, efforts are made to evaluate the students' contributions to website discussions.

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Strengths: The small size of each group of students (15-20) enables close contact between students and teaching staff; individual instruction is offered whenever sought or thought necessary, according to the needs of each student. The regular seminar (and other) meetings provide students with the opportunity to develop their discussion skills in the presence of colleagues, teachers and guest-experts; meetings also expose students to many scholars and to different outlooks. Many of the study materials are articles, which are easily and regularly updated and changed by the staff, thus contributing to the dynamic nature of the program.

Weaknesses: Student skills in integrating materials and ideas from different disciplines and modes of thought improve, but do not always reach a high standard. The research opportunities of the teaching staff are limited. Since good teaching requires, among other things, keeping up serious research activities, this shortcoming should be further addressed.

3.4 Students

3.4.1 Selection and admission procedures

Undergraduate students: One of the unique aspects of the OUI is open admissions to its undergraduate programs. The University provides an opportunity for higher education to all, and has no selection or admissions process. Hence, corrective discrimination in admission neither exists nor is it needed. Unlike other academic institutions, OUI students do not enroll in an academic year within a specific academic department, but register for individual courses. Thus, there are no criteria for advancement from year to year, nor do students need to decide on a program of studies in the early stages of their studies. Instead, registration is conditional upon meeting all prerequisites specified for each course. In addition, before enrolling in an advanced course, students must fulfill all English language requirements, take a computer applications course, and take bibliographic training in the library (see 3.6.4.1).

Degree entitlement: In general, in order to earn a Bachelor's degree (BA or BSc) from the OUI, students need to accumulate at least 108 credits. However, the credit requirements are not identical for all programs of study. Some programs require 108 credits; others require more, sometimes because of the scope of the specific program, and sometimes because of the courses that each individual student chooses to take. Usually, no more than 120 credits are required. Among the undergraduate Life Sciences programs, only three require more than 120 credits: the BSc in Computer Science and Life Sciences (128 credits), the BA in Psychology and Life Sciences (124-128 credits) and the BA in Life Sciences and Economics (126 credits). All students at the OUI must accumulate at least 24 advanced credits. The amount of choice among advanced courses, and the seminar requirements, differ from program to program.

Students who previously studied in another university or in an institution for higher education, in Israel or abroad, can request accreditation for these studies before commencing their studies at the OUI. The Committee for the Accreditation of Prior Studies is an interdisciplinary committee composed of representatives from various fields of study, including members of the Department of Natural Sciences.

The OUI has no criteria for accepting students with special needs. The policy is to accept all students. Students who for medical, physical or other reasons require special study conditions contact the Dean of Students for assistance (see below, section 3.4.5.1)

Graduate students: To be admitted to the Biological Thought program, applicants are required to hold a BSc or BA in biology or related sciences, or a BA in philosophy. In line with the reaching-out spirit of the OUI, no minimal degree average is required. However, since the program relies on modes of thought from different disciplines, we do employ the following “alternative” selection criteria: For biology graduates, the criterion is the ability to pass at least two qualifying undergraduate courses in philosophy (“Philosophy of Science” and “Problems in Moral Philosophy”); For philosophy graduates, the criterion is the ability to pass at least two undergraduate courses in biology (“General Biology” I and II).

The majority of our applicants have a biological background, and the qualifying courses in philosophy serve as more than a mere selection tool, providing additional multiple purposes: gaining basic knowledge in philosophy of science and in ethics; developing basic skills in philosophical reflection; and finally, offering the applicants themselves a chance to assess whether they are, in fact, interested in philosophical studies. All applicants must be able to read English texts without any difficulty.

Suitability of admission and selection criteria: The admission and selection criteria suit the program, since in dealing with issues of biological thought, some grounding is necessary in both biology and philosophy. The admission process is described in the enclosed booklet *Programs of Study – Life Sciences*.

Degree entitlement: To be eligible for the degree, students in the non-thesis track must accumulate 50 credits: 30 for 10 courses (3 credits each), 10 for 2 seminar papers (5 credits each), and 10 credits for the third-year graduate seminar and final paper. The final paper grade accounts for 20% of the final degree grade. The students in the thesis track must accumulate 40 credits: 30 for the courses and 10 for 2 seminar papers. The thesis grade accounts for 50% of the final degree grade. The minimal grade required to gain credits for courses and papers is 60.

Advancement from year to year: Students enroll in the MA program for two consecutive years during which they are expected to complete ten required courses. Before embarking on writing the final paper or thesis, students must submit two seminar papers. Most students complete the first seminar paper during the first two years while studying the courses; the second seminar and the final paper or thesis are usually completed during the following 1-3 years.

Number of undergraduate students: Between 2003 and 2007, 2,896 students took courses in Life Sciences. Due to the special structure of studies at the OUI, students are required to submit their study program for approval at a relatively advanced stage of their studies. Thus, the definition of a “Life Sciences student” is not trivial. For the purpose of this report, we used the following definition: A “Life Sciences student” is a student who has taken and passed at least one course in Life Sciences, and has enrolled in either one additional course in Life Sciences, or in a basic Science course required for the Life Sciences study programs. According to this definition, the total number of undergraduate Life Sciences students between 2003 and 2007 was 1,463. The table below shows the number of registered Life Sciences students in each of the last five years.

	2003	2004	2005	2006	2007
# of students *	462	539	617	645	671

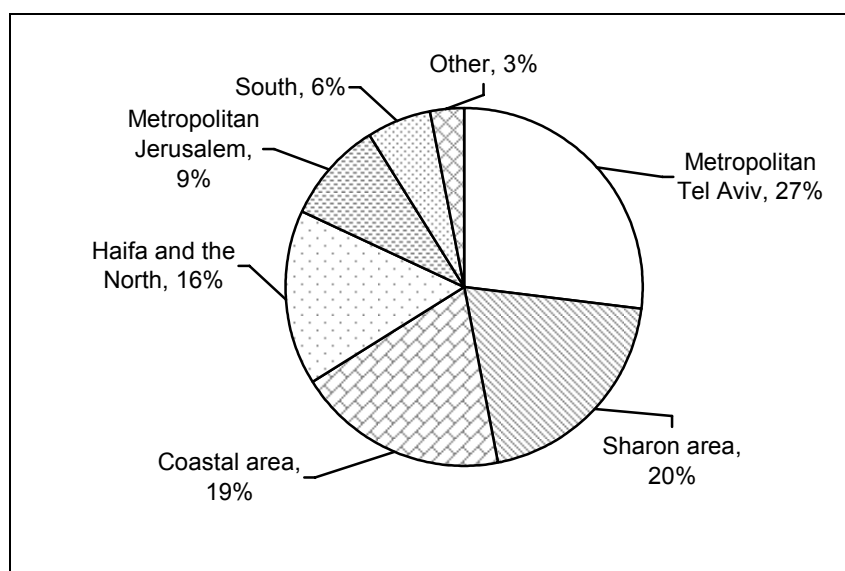
* The number of students represents the number of students registered each year, and thus includes continuing students.

The tables and figure below summarize the distribution of undergraduate Life Sciences students (based on the above definition) between the years 2003-2007 by age, area of residence, gender and prior education. In spite of the fact that many students were enrolled in courses over several years, in the tables below, each student is counted only once.

Age: The age distribution of Life Sciences students is presented in the table below: between the years 2003-2007, more than half of the students were above 26 years of age, and a quarter of them were above 31. In 2007, their ages ranged from 15 to 76. The mean age of the students was 27.8, which is relatively older than in other institutions of higher education. From the age perspective, the OUI meets its goal: the university is open to students of all ages.

Age	Up to 18	19-20	21-25	26-30	31-35	36-45	Over 46	Total
N	99	63	543	391	167	130	70	1,463
%	6.8	4.3	37.1	26.7	11.4	8.9	4.8	100.0

Area of Residence: The distribution of Life Sciences students by residential area (see figure below) has undergone only minor changes in the past five years. In general, nearly half of the students live in the central areas of the country, about a third in the coastal plain, Haifa and the north, and smaller numbers in Jerusalem and its surroundings, the South and abroad. This distribution reflects one of the missions of the OUI – to increase access to higher education by offering flexibility in place of study.



Gender: The table below shows that more than half of the students are females. This proportion has remained stable over the past five years.

Female		Male	
N	%	N	%
791	54	672	46

Prior Education: The table below shows that between 2003 and 2007, the majority of Life Sciences students (81.1%) enrolled in undergraduate studies at the OUI had a matriculation certificate. It should be noted that the data pertain only to entitlement to a matriculation certificate, irrespective of matriculation grades. But an impressive 14.8% – individuals who did not complete high school – are today Life Sciences students and are pursuing academic studies. This situation reflects the main mission of the OUI: increased access to higher education through open admission.

	N	%
Have matriculation certificate	1,187	81.14
Have no matriculation certificate	217	14.83
Unknown	59	4.03
Total	1,463	100.00

Young Students and Soldiers: A small number of high school students and soldiers in compulsory military service study at the OUI. High school students, who wish to enroll in Life Sciences courses, are interviewed by a special academic counselor, must receive various approvals, and provide various documents (e.g. recent school grades, recommendation from school). After completing their high school studies or their military service, these students either continue their studies and receive their undergraduate degrees from the OUI, or transfer to other institutions which accredit their prior studies. The difficulty of science studies may affect soldiers, and few choose to focus on life sciences, as is clear from the table below.

Soldiers in compulsory military service

	2003	2004	2005	2006	2007
N	18	8	8	12	16

3.4.2 Publishing information about courses

The OUI Course Catalog and the Academic Information Guide, provided free of charge to all interested individuals and students, contain very detailed information about all teaching components, including detailed course descriptions. The information can also be found in Hebrew and English on the OUI website. A primary source of detailed information and updates are the department and course websites (see section 3.3.3). OUI academic counselors are available at all OUI study centers to provide updated information. Students also have access to the *Sheilta* system (interactive services to students, see section 3.3.3.4) and can contact the OUI Information Center to receive answers to their inquiries.

A course booklet is produced for every course each semester containing details of course prerequisites, the calculation of the final course grade, course assignments, the course timetable and sample exams. The booklet is mailed to students along with the study material.

In addition to ongoing contact between students and the teaching staff through the course websites, telephone and email, as well as in group tutorials and individual meetings, contact is maintained through visits to tutorial sessions, by the course coordinator and the senior faculty member who is in charge of the course. As part of these visits, students can provide feedback on the course and its administration, and the course coordinator can explain course requirements. These meetings help match expectations and facilitate adaptation required on both sides.

To enable graduate students to plan their studies, assignments and the timetable for meetings are published on the program website at least a month before each semester opens.

3.4.3 The dropout rate

Undergraduate students: The term “dropout” at the OUI differs from that at other universities. Students register for individual courses, not for an academic year. Students can discontinue their studies for a certain period and resume them after one or two years, or even more, so that discontinuation of studies for one year does not necessarily indicate what is usually considered “dropping out.” Some “dropouts” declare that the break is only temporary, and do resume their studies and eventually graduate from the OUI. Students who discontinue their studies are entitled to return to the University to complete their studies at any time. However, in 2007, the Faculty Council decided to enforce a statute of limitations on credits students have accumulated. Today, the academic subcommittees determine a statute of limitations for each discipline.

The University’s open admissions policy enables students to enroll in OUI courses even if they have no matriculation certificate, psychometric test score, or prior academic experience. The first course or courses they take therefore serve as a self-test. The OUI recommends certain courses as “first courses” to provide a “soft landing” for new students. However, some students are unable to continue their studies at the OUI due to lack of suitability.

Furthermore, we encourage students to enroll in one or several courses, not necessarily with the aim of pursuing a degree, but to enrich their knowledge, to provide an additional challenge beyond their ongoing activities or to keep abreast of their profession while continuing their work. Some students are referred to the OUI by other universities in order to complete course requirements prior to their acceptance to graduate studies at these institutions. After completing several courses, these students discontinue their studies at the OUI. They are considered dropouts although they completed exactly what they set out to accomplish. We almost ‘encourage’ students to drop out (while maintaining our goal of expanding access to higher education), as we invite students to take courses at the OUI that are the equivalent of one academic year and then, if they wish, to transfer to another

university (see Extras, “Bridges to other universities”). Students choosing to do so are also counted as OUI dropouts.

While clearly, for the reasons mentioned above, OUI students harbor a dropout potential, the challenge of increasing student retention while maintaining high academic standards has accompanied the OUI since its establishment. Over the years, varied measures were taken to investigate the issue and contend with its implications. Based on these studies, it was decided to define a “dropout” as a student who discontinued his/her studies and did not renew them after three semesters. The Evaluation Department conducts a survey every two years (on average) among all such students. A questionnaire is mailed prior to the registration period for the following semester, along with registration forms and students are asked if they would like to receive academic counseling in preparation for their possible return to studies.

To gain a picture of the perseverance and dropout rates of our students, we used the population of Life Sciences students in 2003 (based on the definition above) as a reference point. We found that of the 1,463 students who fit the definition between the years 2003-2007, 102 (8.2%) completed a degree, 668 (45.7%) were still studying at the OUI in 2007 and the remainder (693, or 47.4%) have not enrolled at the OUI for three successive semesters or more and can be considered dropouts.

The University is currently attempting to contend with the dropout issue and to increase student retention through a broad system-wide approach creating collaboration among all relevant entities in the system, involving as many staff members as possible in the process. In January 2006, OUI President Prof. Gershon Ben-Shakhar established a Steering Committee to address all aspects of the issue. The website of the Dean of Students includes a link to the recommendations of the Steering Committee and the results of pilot projects that were carried out in various areas, in an attempt to increase student perseverance and reduce dropout.

Graduate students: The term “dropout” is not easy to define in the graduate program, since our students usually continue working on seminar papers and their final paper (or thesis) long after completing the 10 courses. The table below may demonstrate this situation.

Previous and current enrollment in the MA Program in Biological Thought

Group	Enrollment date	# of applicants ^a	# enrolled	Completed courses	Active ^b	Dropouts	Graduates
1	Feb. 2001	32	19	12	4 (1 thesis)	10	5 (1 thesis)
2	Sept. 2002	26	21	21	11 (2 theses)	7	3
3	Sept. 2004	27	14	14	9 (1 thesis)	3	2
	Total	85	54	47 (87%)	24 (44.5%)	20 (37%)	10 (18.5%)
4 ^c	Sept. 2006	28	16	13	13	3 ^d	–

^a All had to take qualifying courses

^b Writing seminar/final papers or theses

^c Currently enrolled

^d Two students postponed their studies

We are not dissatisfied with the dropout rate of students who fail to achieve the minimal requirements of the program (about 13%). We are not happy, however, with the dropout rate of students who do well and nevertheless quit. Just over one-third of the students drop out for personal reasons; typically, the reason stated is lack of time due to job demands, family obligations, or giving birth. In an attempt to decrease the dropout rate in this group, we invite potential dropouts to meet the team in order to assess together what may be done to prevent their quitting. If little can be done, we refer students to the possibility of resuming studies in the following enrollment.

It should be noted that some of the students, probably from the outset, are interested only in taking the courses and not in attaining a degree. We know, for example, of several students already holding MA or even PhD or MD degrees, who did not wish to invest the required effort into writing seminar and final papers, although their achievements in the courses were very good. There is no doubt that submitting written seminar papers is the main obstacle to completing the degree in this program. Since we regard writing seminar papers as academically crucial, we constantly seek and try out new ways and methods to train our students in such writing.

3.4.4 Student participation in research conducted by faculty

There are no research labs in the OUI campus in Raanana, and faculty members conduct their research in other academic institutions. However, students who enroll in the course “Research Project in Life Sciences” can conduct their project in laboratories at any university, as long as their project has been approved by the course coordinator. The research project is conducted under the supervision of the laboratory head and a senior faculty member from the OUI.

The students in the Biological Thought program are not involved in staff research.

3.4.5 Counseling systems

3.4.5.1 Counseling students before and during their studies

Academic counseling – Undergraduate students

The OUI Academic Counseling and Study Guidance Center supplements the teaching system and accompanies students throughout their studies. **Academic counseling** is provided by OUI faculty and departmental counselors (field-specific counseling), and by general counselors (general counseling) at the OUI campus in Raanana and at the OUI’s study centers throughout the country. Field-specific counseling in Life Sciences is provided by senior faculty members and the academic teaching staff, both during their weekly counseling hours and continuously online. It includes guidance in choosing the first course, the study track, specific courses, transferring from one study track to another, designing a study program to be submitted to the Study Program Approval Committee (described in 3.2.5) and referral to the committee for the Accreditation of Prior Studies.

Study skills guidance: The Study Guidance Unit offers individual and group training in improving learning skills that contributes to the ability to get organized for learning, effective reading of academic material, summarizing and processing information verbally or with the help of charts and tables, analyzing questions and formulating answers, and preparing for exams. Regarding Life Sciences, the Unit offers a workshop in learning skills for new students who enroll in their first introductory course in Life Sciences - **General Biology I**. The Unit also offers guidance in writing seminar papers. In addition, information get-togethers are offered to prospective students.

Counseling and assistance to students with special physical needs: Services are provided to students with special physical or emotional needs by the Dean of Students and by the Academic Counseling and Study Guidance Center.

Physical access: In coordination with the Study Facilities Coordinator and the Center for the Organization of Exams, study and exam centers are adapted for students with motor disabilities. Those confined to their home receive special tutoring and take the exam at home.

Access to services: The Coordinator for Special Needs Students personally accompanies students with special needs and coordinates contact with entities within and outside the University.

Access to study material: Study materials are mailed to students. With advance notification, students with a legal blindness certificate or with a visual disability can receive the study

material recorded on audio cassettes (coordinated with the *Aleh* Association and libraries for the visually impaired).

Special exam conditions: In accordance with their difficulty, students receive special conditions in taking exams, including extended time, writing the exam using a word processor, assistance from a proctor (reads, writes, copies the exam), various aids (an enlarged or recorded exam questionnaire, using enlarging paper, Braille pages, closed circuit TV, an enlarging lens, etc.).

Counseling and assistance to students with learning disabilities: Extensive efforts are invested in students with learning disabilities. Meetings with a tutor specializing in learning strategies are conducted on an individual basis at study centers throughout the country. The individual training sessions focus on managing time, question analysis strategies, organizing answers, effective ways to summarize theoretical material, preparing for an exam and functioning during the exam.

Students interested in enhancing learning processes by using computers and technology are referred to a counseling meeting at the Center for Assisting Technology to find the suitable technology, view a demonstration, train and practice using software and technological aids in their studies. The Center provides learning aids such as personal computers, a scanner, Quicktionary II, a Palm and more. The Center conducts individual training, primarily for students with difficulty processing and understanding texts in English, and in the future plans to offer workshops in small groups in study centers. New technologies are currently being studied in the aim of expanding services to students with additional needs.

The University offers anxiety-reducing assistance to students suffering from exam anxiety. Assistance to students with learning disabilities is also offered through the *Perach* Project. Like all other students with disabilities, students with learning disabilities receive special exam conditions.

Accreditation of prior studies: Students who previously studied at an institution of higher education in Israel or abroad are entitled to request accreditation of these studies at the Open University. The Committee for the Accreditation of Prior Studies is inter-disciplinary and includes several members of the Department of Natural Sciences. The Committee considers the merits of each request.

Counseling in the MA program

Teaching staff are available for counseling anyone interested in joining the program. The staff can be reached either directly (through information supplied on the website), or indirectly, through the OUI Information Center and general counselors.

Students participating in the program are regularly encouraged to approach any member of the staff, in person, for academic counseling. They are also encouraged to make use of the program website's discussion groups, which are regularly visited by staff members in order to provide guidance. Students make wide use of these possibilities.

3.4.5.2 Counseling and guidance in choosing future career paths

The Guidance and Placement Unit in the office of the Dean of Students, also known as *Opjob* (<http://www.openu.ac.il/opjob/>), serves as a coordinating body between OUI students and organizations providing academic and career counseling services as well as employment placement services. The Unit coordinates these services and ensures their operation on the OUI campus and at the study centers. The Career Guidance and Placement Unit offer the following services:

Guidance – provides counseling and guidance services to students who are undecided as to their choice of career path and/or academic field, through:

- Workshops and individual counseling to help students select a career path and an academic field of study
- Individual counseling to students who wish to continue to graduate studies at other universities, provided by senior faculty
- Software packages for planning a personal career path

Placement – assistance to students in finding employment through:

- Relations with external employment agencies
- Job search workshops addressing topics such as writing a resume, contacting potential employers and preparing for a job interview
- Employment fairs that are held on the OUI campus with the participation of employers and placement agencies offering employment opportunities in various fields
- Employment offers at the OU and from employers are posted on the *Opjob* website
- *OpJob* now also conducts a virtual job fair, *Opportunity*, in which employers contact students online through a dedicated website

Information published by the Guidance and Placement Unit can be found on the Dean of Students website, on bulletin boards at the study centers and in special leaflets accompanying study materials.

3.4.6 Student inquiries and complaints

The Department of Natural Sciences, like all OUI academic departments, appointed an individual from each discipline in the department responsible for handling student inquiries and complaints. Most inquiries pertain to the following matters: Requests to take an exam after the entitlement date, to take an exam for the third time, to submit a course assignment after the specified date, to enroll in a course for the third time, or complaints regarding tutorial meetings. Students who wish to appeal the decisions of the student inquiry representative can approach the Dean of Students who functions as the student ombudsman. The Dean handles complaints of students who maintain that their inquiry was handled inappropriately by the department, and his decision may take into consideration financial and personal aspects.

3.4.7 Identifying and rewarding outstanding students / Financial assistance

Outstanding students: Outstanding students who meet predetermined criteria receive a certificate of academic excellence. The list of outstanding students is published once a year by the Dean of Students (students do not submit their candidacy). Certificates on two levels are awarded: President's list (*magna cum laude*) – weighted grade average of 95 and above and Dean's list (*cum laude*) – weighted grade average of 90-94. President's list students receive a scholarship for tuition for one course which can be used for studies at the OUI.

Financial assistance: The OUI grants scholarships to students with financial difficulties. Students can apply for a scholarship, provided they have successfully completed at least one course and are registered for the semester in which their application is considered. Scholarships take the form of vouchers for course registration. A scholarship covers the basic tuition for a course at the OUI. In 2006-2007, the OUI awarded 3,112 financial assistance scholarships and an additional 450 scholarships to outstanding students.

3.4.8 Maintaining contact with graduates and employers

Maintaining contact with OUI graduates: The OUI has more than 20,000 graduates. The OUI Alumni Association publishes a newsletter twice a year and conducts monthly activities including trips, lectures, plays, musical evening, performances, etc, published on the alumni

website (<http://www.openu.ac.il/bogrim/>). In addition, the Alumni Association contributes scholarships to students every year. The OUI is interested in maintaining contact with its graduates also in order to learn from their experience about the contribution of the degree to their personal, professional and academic lives. For this purpose, the Evaluation Department administers questionnaires to OUI graduates that deal with the contribution of the degree to these domains and the general assessment of aspects of teaching.

Maintaining contact with employers and the employment market: The OUI invests extensive efforts and funds to maintain ongoing contact with employers. *Opjob*, the OUI Guidance and Placement Unit, links the University with the professional job market, publishes employment openings in the OUI website and at study centers and liaises between students and graduates on one hand and employers offering jobs on the other (see section 3.4.5.2). Dozens of employers maintain contact with *Opjob* and offer employment opportunities to students and graduates. Students are informed of particularly attractive employment opportunities by e-mail. Because most OUI students combine their studies with employment, after gaining practical experience, they enter the job market with professional experience, or can advance in their current jobs.

For the purpose of this report, in 2008 the OUI conducted a telephone survey among 208 students who graduated between 1998 and 2007. Of the 70 OUI graduates who responded (35%), 41 (59%) enrolled in advanced studies: 36 (88%) of these to pursue an MSc degree. About half were required to take qualifying courses, most in microbiology. The majority (94%) of graduates who applied for MSc programs were accepted, two are still waiting for a reply. About half have already completed their master's degrees, a third are still pursuing their studies, and the rest will begin their studies next year. Four OUI graduates enrolled in PhD studies in Life Sciences in various Israeli universities (two are already studying; the other two will begin next year).

In terms of employment, 56% of the OUI graduates who responded are currently working in the field of life sciences (teaching, lab technology, industry and research), compared to 36% who worked in the field before their studies. The majority (83%) of the respondents felt that their undergraduate studies at the OUI enhanced their personal potential and opened new professional opportunities for them. The full survey findings are attached in Extras, "Survey of graduates." The attitude of our graduates toward their studies in the OUI is demonstrated in letters that we occasionally receive from them. Excerpts from one letter are appended here:

Dear Joel,

I chose the OUI after a process of deliberation, which led me to the conclusion that financially and academically, and also in terms of my personal development, it would be the best option for me. ... The Dept. of Natural Sciences was my academic home during my five years of my studies toward a BA in Life Sciences....

I completed my Master's degree at the Weizmann Institute and am currently pursuing a direct doctoral track there. The fact that I had a BA from the OUI worked in my favor – the admission committee was impressed by my grade transcript, but also with the fact that studies at the OUI improve skills important for a scientific career and life in general. ... I attribute much of my academic success to individuals in the Dept. of Natural Sciences at the OUI who were always willing to help.... The course teams provided help when needed through lessons and course websites, as well as telephone tutoring – even when I did not call during office hours. The students also gladly helped each other and I am still in contact with many of them.

I would like to thank the faculty of the Dept. of Natural Sciences for their warm and caring support in the course of my studies. If I decide to pursue another academic degree or have the time to study for fun and self-enrichment, I hope to return to study at the OUI.

Sincerely yours,

Rena

3.4.9 Summary – Strengths and weaknesses

Undergraduate studies: To ensure that its goal of expanding access to higher education does not remain only on paper, the OUI places the student at the center of its endeavor. Therefore, the distance education method is supported extensively by counseling and guidance for self-study as well as innovative and friendly learning technologies aimed at compensating for the distance from tutors and the other students, financial assistance through scholarships, encouraging and rewarding outstanding students, support and intensive individual assistance to individuals with disabilities and by helping graduates proceed towards advanced studies at other universities and to find employment after completing their studies.

The OUI contends with the “weakness” of open admissions by strictly maintaining a high academic level of studies. The study material and assignments are prepared in advance and based only on academic considerations. Examinations are not written by the tutors who meet with the students, but by course coordinators and approved by senior faculty to ensure that they take into account the knowledge students must demonstrate and not only what the students have covered at tutorial sessions.

The result of open admissions at the OUI is high student heterogeneity (from varied backgrounds, from the center and the periphery, of differing ages and with differing abilities), some of whom do not meet the scholastic demands of the OUI science programs. This diversity necessarily results in quite a high dropout rate in the first courses and considerable differences in student achievements.

Although studies at the OUI can be accomplished from any place, we still feel uncomfortable that many of the students in the Dept. of Natural Sciences, including Life Sciences students, come mainly from the central area of the country and less from the periphery. We try to offer tutorial sessions, primarily in introductory courses, in study centers located in the periphery. Unfortunately, this is not always viable because of the relatively small number of students taking Life Sciences courses. As a result, students living in the periphery have to attend meetings in the central area, mainly in Tel Aviv, and this undoubtedly affects their motivation to study at the OUI. We do hope that by intensifying our efforts to include *Ofek* broadcasts, InterWise and video conferencing that afford virtual tutorials (see section 3.3.1.3), we will increase the number of students living in the periphery among the OUI Life Sciences student population. The steady increase in the number of graduates in recent years obliges us to find better ways to remain in contact with our graduates, and mainly with the outstanding students and those who continue studies toward higher degrees. We feel that continued contact with the OUI teaching staff may help these students in the academic track they choose.

Graduate studies: We believe that our admission and selection criteria are a strength, in that they keep the door open, with relatively few requirements, to a wide range of applicants of appropriate backgrounds. In addition, the heterogeneous nature of each enrollment, with students of different disciplinary backgrounds and a wide range of life and job experiences, is an asset: it contributes to the quality of discussions, offering a rich array of outlooks.

Among the weaknesses, we view the following: The admission and selection criteria enable applicants to register even when their previous academic record may be relatively low. Although, in practice, only a minority of our students are academically weak, their presence occasionally disrupts group discussions, forcing the staff to spend too much time on trivial issues. Similarly, the diverse composition of each enrollment has its disadvantages. Thus, for example, the range in ages (25 to 70) sometimes demands too much effort in seeking common ground. Moreover, the close contact between staff and students, which is the outcome of regular seminar meetings over a period of three years, leads some students (notably the younger ones) to expect the staff to act as counselors on personal matters, a service they obviously cannot, and should not, provide.

3.5 Human Resources

3.5.1 Teaching staff

3.5.1.1 Profile of the teaching staff

There are three main categories of teaching staff in the Life Sciences programs: senior faculty members, academic teaching staff and tutors.

Five **senior faculty** members: One full professor, one associate professor and three senior lecturers. Senior faculty members are employed under personal contracts (identical to corresponding employment terms at other universities, except for tenure) that are renewed after a period of 3-10 years. The senior faculty members are responsible for initiating programs and course development, writing and updating. They are also responsible for the appointment of the course coordinators and approval of the final examinations and assignments. Senior faculty members also take a major part in all the academic and administrative activities of the University and its committees.

Data concerning senior faculty are presented in Table 2A, appended at the end of this section. The table includes only members of the Life Sciences group. Other senior faculty members of the department are Prof. Itzhak Dotan, Prof. Yoram Kirsh, Prof. Shlomo Shoval, Dr. Inbal Tuvi-Arad, Dr. Yosef Verbin, and Dr. Yoav Yair, whose CVs are appended to this report. The legend and explanations regarding the table are as follows:

1. The original table included the columns “Part of full time job in Institution” and “Part of full time job in Program.” At the OUI the distinction between the two is irrelevant. The “Part of full time job” column in Table 2A indicates the percentage of the position in the department (part-time position in terms of hrs/week is irrelevant at the OUI).
2. The column “Planned Courses” in the original table is irrelevant for senior OUI faculty members, as they engage in course development and not in ongoing teaching.
3. The part of full time job under “Additional Employment” is shown as a percentage of a full-time position or as weekly hours for each individual case.
4. As to “Additional Tasks in Institution,” all senior faculty members are members of the Faculty Council and the Academic subcommittee for Natural Sciences.
5. The “No. of Students Receiving Guidance” column is relevant only to the MA program team.

The **academic teaching staff** for the Life Sciences programs in 2007 included 26 **course coordinators**. Course coordinators are responsible for planning, implementing and monitoring all teaching aspects of the course, as well as for the administrative aspects of the teaching. Most of them also tutor at least one group in their course. Some of the course coordinators also serve as academic counselors to students in the study programs. Of the 26 course coordinators, 19 (73%) hold PhDs and all the others have MSc degrees. Twelve (46%) were employed full-time (or almost full-time), with the remainder holding part-time positions ranging between 60% and 10% of a full-time position (see details in Table 2B). Course coordinators are employed under contracts that may change from semester to semester based on the number of students enrolled in the courses they coordinate. Most course coordinators have been employed for many years.

Data concerning the **academic teaching staff** are presented in Table 2B, appended below. The table includes only coordinators of Life Sciences courses. Coordinators of other courses in the study programs are Dr. Dorota Czarkie and Dr. Chava Gal (Chemistry), Dr. Baruch Ziv (Physics), Dr. Nurit Goldman (Geology) and Anat Gazit and Hezi Neiman (Mathematics and Statistics). Their CVs are appended to this report. The legend and explanations regarding the table are as follows:

1. “Part of full time job in Institution” and “Part of full time job in Program”: The “Part of full time job in Life Sciences” indicates the percentage of the position in the department (part-time position in terms of hrs/week is irrelevant at the OUI).
2. The part of full time job under “Additional Employment” is shown as a percentage of a full-time position or as weekly hours for each individual case.
3. At the OUI, the employment status of all course coordinators is non-tenured junior faculty.

There were 28 **tutors** (excluding course coordinators who tutor at least one group in their course) in Life Sciences courses in 2007. The majority of tutors (71%) hold a PhD degree and most of the others have a Master’s degree. Tutors represent the external teaching staff of the OUI. They are employed under personal contracts for the semester in which they are required. 174 different tutors, with seniority of between 1 and 30 semesters, taught 1,043 groups taking courses in Life Sciences and basic required courses over the last five years. Data on the number of tutors and study groups between 2003 and 2007 are in Table 2C, appended below.

Teaching Team in the Graduate Program: The areas of specialization of the staff members encompass the areas taught in the program. The staff profile enables a great deal of flexibility and dynamism within the program, since there is a certain degree of overlap in education and research interests: All team members have been trained in one of the natural sciences, and their specializations in biological thought complement one another. Responsibility for teaching and updating specific courses is shared by staff members; all members have been active in most program courses at one point or another (see also section 3.5.1.2 below).

Two guest-scholars, who have participated in teaching, added their expertise and enriched the team: Dr. Iris Fry of the Technion and the Cohn Institute of Tel-Aviv University (who specializes in the origin of life and science vs. religion) was a guest lecturer in 2002-2003 and 2004-2005. Dr. Etienne Lepicard, who specializes in the history and sociology of medicine, was a guest scholar in the program in 2006-2007.

3.5.1.2 Specializations and skills

Because of the small number of senior faculty members, the range of specializations is limited and concentrated in specific fields of the Life Sciences. This limited range rarely affects course development as to this end we recruit the assistance of faculty members, experts in their field, from other universities. Senior faculty members have many and varied responsibilities:

Research: Senior faculty members are expected to conduct scientific research on an internationally recognized level, demonstrated by publications in respected academic journals. Maintaining such a research level is essential for quality supervision of the academic teaching and guidance of seminar papers in advanced courses. Faculty members’ research fields for the most part do not affect introductory and intermediate courses since most undergraduate courses at the OUI, like in any institution of higher learning, are basic and general. However, many advanced courses reflect the fields of specialization of the faculty members who developed them and who are responsible for updating them.

Course development: Senior faculty members are expected to have excellent pedagogical writing skills, as required for OUI textbooks aimed at independent study. Development includes initiating proposals for new courses and study programs, writing new courses, and updating and revising courses. It also involves academic responsibility for translations, for material written by external experts, and for material prepared for course websites.

Of all the Life Sciences courses that were developed over the years, 13 advanced courses and 18 intermediate courses were written completely or partially by senior OUI faculty members. However, even when courses are developed by faculty members from other universities, there is always a senior OUI member on the team to ensure that the courses are suitable for independent study.

Teaching and overseeing teaching: Every senior faculty member is responsible for overseeing and monitoring the work of several course coordinators whose courses touch upon their field of specialization (see Extras, “Clusters of courses”) The senior faculty member approves the exams written by the course coordinator, reviews assignment feedback to students, occasionally observes tutorial sessions and monitors the course coordinator’s overall performance. Senior faculty members serve as supervisors to students writing seminar papers and rotate in providing academic counseling to students during weekly counseling hours. Some senior faculty members are themselves course coordinators.

Managerial roles: OUI faculty members are involved in university-wide management roles. Due to the small number of senior faculty members at the University, each carries a heavy managerial load. The myriad functions filled by faculty members require varied capabilities: senior faculty members must have research abilities, academic writing skills, teaching abilities, the ability to build good relations with others and high-level administrative abilities. They must also be initiators.

MA program: Staff members teaching the Biological Thought program must specialize in one or more of the program areas, i.e. philosophy of biology, history of science, sociology of science, theoretical biology and bioethics. They should also conduct research in their areas of specialization. In addition, staff members need good didactic skills, including a flare for providing detailed constructive criticism; they should excel at composing well-designed assignments, delivering lectures, conducting guided group discussions (both face-to-face and on the web) and supervising students individually in writing papers.

The **course coordinators (academic teaching staff)** carry the primary load of distance teaching. As such, they must demonstrate the following skills:

- Expertise in the topic of the course: Course coordinators write the assignments and the examinations, help tutors prepare lesson plans and help students who have difficulties with the material and come to them for guidance. They also have to cooperate closely with the senior faculty member who is academically responsible for the course.
- Good interpersonal skills: Coordinators work with both students and tutors and must occasionally handle student complaints about tutors or vice versa.
- Computer skills: Course coordinators are responsible for maintaining the course website.
- Management skills: This is needed in relatively large courses with several study groups and tutors and/or in various places in the country. Coordinators handle logistical issues concerning classrooms, equipment, study materials, etc.

In addition to the above, some course coordinators also take a part in course development. Over the years, course coordinators were involved in the development of 17 advanced courses and 19 intermediate courses.

Role description of the **course coordinator:** The position of course coordinator at the OUI is a professional position. It is unique to the OUI and is difficult to compare to positions at other universities. It has two main components, academic and administrative. Course coordinators acquire their academic education prior to their appointment. Managerial skills, if needed, are acquired during their training and on the job. The components of the course coordinators’ role are detailed in Extras, “Role description - course coordinator.”

Alongside the advantage of recruiting course coordinators specializing in the field of a specific course (doctoral students or those holding a PhD and conducting research in the field), the disadvantage pertains to inflexibility – these course coordinators prefer to continue to coordinate courses in their field of expertise rather than take on additional courses.

Tutors: Due to the relative small number of students enrolled in the Life Sciences courses, the number of tutors per course is also small, and in many courses, tutorials are given by the

course coordinator. However, in courses in which there is more than one study group, tutors are involved in teaching and meet with students at tutorial sessions. Tutors must be proficient in the relevant knowledge area and must demonstrate appropriate teaching abilities. In addition to their teaching skills, tutors are also selected on the basis of geographic constraints. In general, the OUI employs tutors who live in the area in which they tutor. At tutorial sessions, tutors clarify complex topics, answer students' questions, and manage discussions. They are responsible for presenting the material in an experiential manner and for helping students to meet the academic requirements of the course. Tutors also check assignments based on criteria set by the course coordinator and provide feedback. They also respond to students' inquiries during counseling hours by telephone, face-to-face or through the course website.

3.5.1.3 Steps to ensure that staff members are updated

Senior faculty members are expected to be updated in their area of expertise by virtue of on-going scientific research, which involves reading relevant new literature, participation in, and sometimes organization of, seminars and conferences in Israel and abroad, collaboration with colleagues from other universities, publishing in refereed journals, etc.

Some of the **course coordinators**, most notably those who are studying towards a PhD or already have a PhD, are active in research, and are similarly updated professionally. Moreover, each course coordinator is subject to the professional supervision of one of the senior faculty members, who is responsible for periodically updating the course contents, with recent articles to be added to the reading list, new resources to be put on the course website, etc. Some course coordinators work closely with course writers and are involved in course development, revision and updating. Through this process, the course coordinator is updated on relevant material.

In order to encourage course coordinators to keep abreast of their field of expertise, the Research Authority offers them research grants and funding for travel to professional conferences, for which they can apply. The OUI also funds advanced studies both monetarily and by enabling a day off once in two weeks for studies. In addition, the Research Authority offers course coordinators who are able and wish to be involved in research, a 6-month exemption from teaching and course development in order to enable them to devote time to research.

3.5.1.4 Rules, criteria, and procedures for appointments

Department head: The President appoints department heads. The appointment is usually for three years. Criteria are ability, seniority and rank.

Head of the group: The senior faculty members in Life Sciences choose the head of the group from among themselves, usually for three years.

Senior faculty: For details on the appointment procedure of senior faculty members and their advancement in rank, see Rules and Procedures, "Appointments" (in Hebrew). The advancement procedure for senior faculty is similar to that at other universities. The research element is crucial in the promotion of senior faculty members.

Academic teaching staff (course coordinators): After consultation with the head of the field and the senior faculty member responsible for the course, the department head appoints the course coordinator, subject to the approval of the Dean of Academic Studies and the Vice President for Academic Affairs. See recruitment, section 3.5.1.8.

Tutors: Tutors are employed based on a short-term (semester) contract, though many of them work as tutors for many years.

3.5.1.5 Credentials required of the head of the study program

Undergraduate programs: The senior faculty members in Life Sciences choose the head of the Life Sciences group, who is responsible for the study programs. S/he works in close collaboration with colleagues, and decisions are made with the involvement of all 5 senior faculty members in Life Sciences.

Graduate program: The head of the program is a senior faculty member, educated in both biology and philosophy of biology, experienced, and engaged in research in these fields. The head of the program should exhibit leadership and initiative, participate in teaching and instruction and be skillful in running and maintaining both the quality of the program and the teamwork.

3.5.1.6 Definition of employment

The pedagogical component of **senior faculty members'** role typically involves the writing and development of new courses, advising students on seminar papers and overseeing all teaching components, and not face-to-face teaching. Hence, "number of teaching hours" is not relevant at the OUI. Senior faculty members at the OUI do not have tenure.

Until recently, the employment conditions of the **course coordinators** were determined within the framework of overall University limitations and changed every semester based on the number of students enrolled in their courses. Recently, a committee headed by the president was established to examine the status and rank of the course coordinators. The new system has four ranks, with promotion from one rank to the next depending on education, research and contribution to course development. For the Committee's recommendations, see Extras, "Course coordinators."

Tutors are employed at the Open University on a per-semester basis, and their remuneration depends on the number of tutoring hours and further specific responsibilities.

3.5.1.7 Thesis and dissertation advisors

Senior faculty members serve as undergraduate seminar paper advisors, according to their area of expertise. They also serve as co-supervisors to graduate students (master's as well as doctoral students) in other universities (see also chapter 4).

Graduate program in Biological Thought: All team members supervise graduate students on seminar papers. For supervising final papers and theses, where a senior faculty member is required, other team members may join a senior faculty member in joint supervision.

3.5.1.8 Recruiting and absorbing teaching staff

Senior faculty: Planned future recruitment and absorption of senior faculty members is discussed in the President's five-year plan. A tender for a senior faculty member in the field of cell biology is currently under way. The selection of the new faculty member is based on his/her research activity as reflected in the publication record, on reference letters and on a sample of didactic course materials that the candidate writes and submits. In the next two years, two senior faculty members will retire.

The OUI plans to recruit an additional senior faculty member for the **MA program** by 2009. Another senior faculty member is essential for sharing responsibility, adding novel input and, in particular, for supervising students in the research-oriented thesis track.

Academic teaching staff: The academic teaching staff is recruited according to teaching needs in the various courses. When there is a need to recruit a new course coordinator (because one is leaving or a new course is offered), a search is conducted to find suitable candidates, usually through colleagues at other universities. Candidates must hold at least a master's degree, with a preference for doctoral students or individuals holding a PhD. Requirements include acquaintance with the relevant field, teaching experience, management

skills, good interpersonal skills and reasonable computer and Internet skills. Candidates submit a CV and the program head, together with the other senior faculty members, and especially with the member who is academically responsible for the course, select the suitable candidate. The scope of the position is based on the number of courses s/he coordinates and the number of students in each course.

Tutors are recruited by the course coordinator. The search is similar to recruitment of course coordinators. The coordinators receive recommendations and CVs and interview candidates.

3.5.2 **Technical and administrative staff**

Two administrative coordinators in the department office fulfill a dual role: administrative coordination of courses and secretarial services.

Administrative coordination of courses includes organizing and coordinating departmental teaching services; preparations for the beginning of the semester in terms of study material and various University offices; coordinating the department's activities with other OUI departments; tracking performance of tasks, decisions and timetables; assisting new course coordinators; maintaining contact with institutions; handling reports and payments. Administrative coordinators also respond to student inquiries on administrative issues. Academic inquiries are referred to the individual responsible for student inquiries or to the course coordinator of the relevant course.

General secretarial services include secretarial services to the department head and faculty members; organizing meetings and preparing protocols; handling departmental human resource issues; filing; handling payments; ordering supplies and equipment.

3.5.3 **Summary – Strengths and weaknesses of the human resources**

The most prominent **strength** pertains to the motivation and dedication of those involved in programs in Life Sciences. All feel involved, have a strong sense of belonging and are highly dedicated to their work. Senior faculty and academic teaching staff members take part in various projects that are not part of their formal job descriptions.

Another strength is the serious attitude of members of the department toward the recruitment and training process. In a decentralized system such as the OUI, in which course developers do not teach the courses (it is the tutors who meet with the students), and with another central position holder between them (the course coordinator), the recruitment, training, overseeing, monitoring and feedback processes are critical for all involved. The University pays serious attention to these issues and as a result, the high academic level is maintained, the tutoring level is high, there is ongoing contact with students and an overall high satisfaction level from their studies.

As to the **weaknesses**, five **senior faculty members** are not enough to meet the needs of the study programs and the diverse nature of the Life Sciences. There are several reasons for this: First, all faculty members hold key administrative roles in the university and in the department in addition to monitoring teaching, conducting research as well as membership on various committees. (Thus, in 2007, one faculty member was on sabbatical leave and each of the other four had at least one other role: as head of the department, head of the Research Authority, head of the graduate program in Biological Thought, and head of the Life Sciences group.) Second, faculty members oversee a remarkably high leveraged operation, as they are responsible for all Life Sciences programs, courses, course coordinators, and hundreds of students. Finally, since the field changes rapidly, there is constant need for rewriting and updating courses.

With the retirement of two current members and the recruitment of one, the number of senior faculty will be reduced to four. Recruiting additional senior faculty is crucial to ensure the

continuous updating of courses, to enable reasonable sharing of the many responsibilities and to allow senior faculty members to devote more of their time to research.

Academic teaching staff members are devoted to their task, and skillfully carry out their professional and managerial duties. At the same time, they suffer from lack of stability in the scope of their employment. The new system of remuneration, with 4 ranks, offers a horizon for promotion and more stability in employment terms. Nevertheless, even this new system does not completely alleviate the problems. A complete solution is apparently not feasible at the moment, since almost 80% of the university budget comes from tuition payments, and is thus highly sensitive to fluctuation – even if temporary and random – in enrollment rates. Another problem concerns the double message transmitted to course coordinators: while the University encourages them to pursue doctoral studies and raises their salary and status upon completing these studies, this is not reflected in a significant change in their role or responsibilities. Two groups of individuals holding a PhD work alongside each other – one group is part of the academic teaching staff while the other belongs to the senior faculty – and the ramifications are not easy for the teaching staff to accept.

Tutors are hired on a per semester basis, though some in fact work as tutors for many years. They are selected, trained and then reveal high academic standards in tutoring. Though not an inherent organ of the university – due to the temporary nature of their employment – they are the ones who maintain direct contact with the students. This tension, which is not likely to be resolved in the foreseeable future, causes dissatisfaction among some tutors. The OUI's low commitment to tutors necessarily engenders low tutor commitment to the OUI. In an effort to increase their sense of belonging and involvement, the department makes efforts to strengthen the relationship between tutors and the department by inviting them to symposia and other events, sending them the department bulletin, etc.

Graduate program

Strengths: The four faculty members (1 senior faculty member and 3 members of the academic teaching staff with PhDs) specialize in different fields, which together, cover several aspects of philosophy of biology, history and social studies of science or biology, bioethics, and theoretical biology. There is excellent team work: responsibility for teaching, academic administration, course updates and supervision of students in writing papers is shared in a structured manner; before each semester, a plan is worked out to ensure that team members switch roles as much as possible so that they gain versatility in running and operating the program, and in deepening and broadening their individual fields of specialization. The faculty to student ratio in the program is very high, especially by OUI standards.

Weaknesses: There is only one permanent senior faculty member (we have tried to minimize this shortcoming by encouraging guest scholars to join the team for periods of 1-2 years.)

At the OUI, the academic teaching staff has only recently been granted the option of a (competitive) semester-long sabbatical leave to provide proper time-stretches for conducting research. There is a pressing need for such an arrangement in the Biological Thought program to ensure personal development and to maintain the quality of the program.

Table 2A: Senior Faculty

Name of Faculty Member			Employment Status	Part of Full Time Job at OUI	Additional Employment	Area of Specialization	Courses coordinated	Additional Tasks in Institution	No. of students currently supervised
First	Family	Degree		Per Cent					
Ruth	Arav	PhD	Senior Lecturer	100%		<ul style="list-style-type: none"> ▪ Interactions of nucleotides with polyamino acids, proteins, enzymes and membranes ▪ Effects of oxidation on heme proteins 	<ul style="list-style-type: none"> ▪ On sabbatical 		
Anat	Barnea	PhD	Senior Lecturer	100%		<ul style="list-style-type: none"> ▪ Behavioral neurobiology ▪ Zoology ▪ Behavior ecology and ecophysiology 	<ul style="list-style-type: none"> ▪ Research Project in Life Sciences 	<ul style="list-style-type: none"> ▪ Member, Accreditation committee ▪ Member, Ethics committee ▪ Head, Life Sciences group ▪ Academic advisor 	2 MA students (Tel-Aviv, Haifa Univ.) 2 doctoral students (Tel-Aviv Univ.)
Simona	Ginsburg	PhD	Associate Professor	100% (50% - MA program)		<ul style="list-style-type: none"> ▪ Neurobiology ▪ Physiology ▪ Evolution ▪ Philosophy of biology 	<ul style="list-style-type: none"> ▪ The Mind-Body Problem ▪ Critique of Alternative Medicine 	<ul style="list-style-type: none"> ▪ Head, Biological Thought program 	Theses: 4 Final and seminar papers: 19
Joel	Klemes	PhD	Senior Lecturer	100%		<ul style="list-style-type: none"> ▪ Microbiology ▪ Cell biology ▪ Learning technologies 	<ul style="list-style-type: none"> ▪ Bacteria in Industry ▪ Differentiation of Red Blood Cells 	<ul style="list-style-type: none"> ▪ Chair, Dept. of Natural Sciences 	

Name of Faculty Member			Employment Status	Part of Full Time Job at OUI	Additional Employment	Area of Specialization	Courses coordinated	Additional Tasks in Institution	No. of students currently supervised
First	Family	Degree		Per Cent					
Miriam	Souroujon	PhD	Full Professor	100%	Visiting Scientist (at no wage), Dept. of Immunology, Weizmann Institute	<ul style="list-style-type: none"> ▪ Immunology 	<ul style="list-style-type: none"> ▪ Cancer and Heredity ▪ Receptors and Signal Transduction 	<ul style="list-style-type: none"> ▪ Head, Research Authority ▪ Member, OUI Council ▪ Member, Appointments and Promotion Committee for Lecturers and Senior Lecturers ▪ Member, Academic Committee ▪ Head, Ad hoc committee for Intellectual Property regulations at the OUI ▪ Member, several ad hoc committees 	1 doctoral student (Tel Aviv Univ.)

Table 2B: Academic Teaching Staff

Name of Coordinator			Part of Full Time Job in Institution	Part of Full Time Job in Program	Additional Employment		Areas of Specialization	Courses coordinated (tutored)
					Name of Employer	Part of Full Time Job (%)		
First	Family	Degree	Per Cent	Per Cent				
Idith	Barlas	MSc	100	100			<ul style="list-style-type: none"> ▪ Genetics ▪ Biochemistry 	<ul style="list-style-type: none"> ▪ From Mendelism to Genetic Engineering ▪ Biochemistry I ▪ (Introduction to Life Sciences)
Dror	Bar-Nir	PhD	100	100			<ul style="list-style-type: none"> ▪ Microbiology ▪ Cell biology 	<ul style="list-style-type: none"> ▪ The World of Bacteria ▪ Cell Structure and Function ▪ The Cytoskeleton of Eukaryotic Cells ▪ (Symbiosis)
Orna	Dahan	PhD	25	25	Weizmann Institute	100	<ul style="list-style-type: none"> ▪ Molecular Biology 	<ul style="list-style-type: none"> ▪ Laboratory: Molecular Biology
Sara	Dovrat	PhD	19	19	Bar-Ilan Univ.	50	<ul style="list-style-type: none"> ▪ Virology ▪ Molecular Biology 	<ul style="list-style-type: none"> ▪ Virology
Tamar	Katzav-Gozansky	PhD	15	15	Tel Aviv Univ.	100	<ul style="list-style-type: none"> ▪ Chemical Ecology, Social Insects, Entomology 	<ul style="list-style-type: none"> ▪ Entomology
Lea	Koren	MSc	39	39			<ul style="list-style-type: none"> ▪ Botany 	<ul style="list-style-type: none"> ▪ Vegetation of Israel
Revital	Lavy	DSc	90	90			<ul style="list-style-type: none"> ▪ Biophysics ▪ Neurobiology ▪ Physiology 	<ul style="list-style-type: none"> ▪ Nerve Cells- Introduction to Neurobiology ▪ General Biology II ▪ Aging ▪ Symmetry ▪ Ion Channels
Noam	Leader	PhD	34	34			<ul style="list-style-type: none"> ▪ Behavioral ecology 	<ul style="list-style-type: none"> ▪ Selected Topics in Animal Behavior ▪ Faunistics of Vertebrates in Israel

Name of Coordinator			Part of Full Time Job in Institution	Part of Full Time Job in Program	Additional Employment		Areas of Specialization	Courses coordinated (tutored)
					Name of Employer	Part of Full Time Job (%)		
First	Family	Degree	Per Cent	Per Cent				
Ruth	Lomnitzer	PhD	100	100			<ul style="list-style-type: none"> ▪ Immunology 	<ul style="list-style-type: none"> ▪ Immunology ▪ Laboratory: Immunology ▪ Selected Topics in Immunology ▪ Laboratory: Cell Biology
Ada	Neer	DSc	100	100			<ul style="list-style-type: none"> ▪ Biochemistry ▪ Bioinformatics 	<ul style="list-style-type: none"> ▪ General Biology I ▪ Biochemistry II ▪ Laboratory: Biochemistry of Proteins ▪ Bioinformatics: Analysis of Sequences and Genomes
Roni	Ostreicher	PhD	15	15			<ul style="list-style-type: none"> ▪ Behavioral ecology 	<ul style="list-style-type: none"> ▪ Field Laboratory: The Social Life of the Arabian Babbler
Vanda	Reich	PhD	14	14	Hebrew University	50	<ul style="list-style-type: none"> ▪ Symbiosis ▪ Zoology 	<ul style="list-style-type: none"> ▪ Symbiosis ▪ Symbiosis Field Trip ▪ (General Biology I)
Stefan	Rokem	PhD	10	10	Hebrew Univ.	100	<ul style="list-style-type: none"> ▪ Biotechnology 	<ul style="list-style-type: none"> ▪ Bacteria in Industry ▪ Laboratory in Biotechnology
Alon	Rothschild	MSc	19	19	Society for Protection of Nature in Israel	100	<ul style="list-style-type: none"> ▪ Nature conservation and planning 	<ul style="list-style-type: none"> ▪ Evolution
Ayelet	Schuster	PhD	19	19	Seminar HaKibbutzim	35	<ul style="list-style-type: none"> ▪ Ecology 	<ul style="list-style-type: none"> ▪ Ecology
Marta	Schwartz	PhD	21	21			<ul style="list-style-type: none"> ▪ Plant sciences 	<ul style="list-style-type: none"> ▪ Plant Physiology ▪ Seeds: Dormancy and Germination ▪ Adaptation of Plants to Environmental Stress ▪ Plant Genetic Engineering ▪ (General Biology I)

Name of Coordinator			Part of Full Time Job in Institution	Part of Full Time Job in Program	Additional Employment		Areas of Specialization	Courses coordinated (tutored)
					Name of Employer	Part of Full Time Job (%)		
First	Family	Degree	Per Cent	Per Cent				
Meir	Shlissel	PhD	15	15	Tel Hai College	100	<ul style="list-style-type: none"> ▪ Cellular biology ▪ Biotechnology 	<ul style="list-style-type: none"> ▪ Biotechnology
Sarah	Weissenberg	PhD	100	100			<ul style="list-style-type: none"> ▪ Physiology 	<ul style="list-style-type: none"> ▪ Human Physiology ▪ Mammalian Reproduction ▪ Chemical Communication in Animals ▪ Laboratory: Animal Physiology
Nurit	Wengier	MSc	60	60			<ul style="list-style-type: none"> ▪ Embryology ▪ Tratology 	<ul style="list-style-type: none"> ▪ Vertebrates ▪ Developmental Biology ▪ Introduction to Life Sciences
Ilana	Zilber-Rosenberg	PhD	19	19			<ul style="list-style-type: none"> ▪ Nutrition 	<ul style="list-style-type: none"> ▪ Nutrition

Name of Coordinator			Part of Full Time Job in Institution Per Cent	Part of Full Time Job in Program Per Cent	Additional Employment		Areas of Specialization	Courses coordinated (tutored)	No. of Students Receiving Guidance
First	Family	Degree			Name of Employer	Part of Full Time Job (%)			
Susie	Fisher	PhD	100	100 (MA program)			<ul style="list-style-type: none"> ▪ History of Natural Sciences 	<ul style="list-style-type: none"> ▪ Vitalism, Mechanism and Organicism ▪ Ecological Balance and Environmental Conservation ▪ Biological Thought Website coordinator 	Thesis: 1 Final papers and seminar papers: 7
Sara	Schwartz	PhD	100	100 (MA program)			<ul style="list-style-type: none"> ▪ Genetics ▪ Philosophy of biology 	<ul style="list-style-type: none"> ▪ Definition of Life ▪ Reduction and Teleology in Biology ▪ The Human Genome Projects 	Thesis: 2 Final papers and seminar papers: 9
Batya	Zalinger	PhD	75	75 (MA program)			<ul style="list-style-type: none"> ▪ Social studies of science 	<ul style="list-style-type: none"> ▪ Evolution and Creationism ▪ Bioethical Issues: Animal Experimentation ▪ Sociobiology and Its Offshoots: Science in Controversy 	Final papers and seminar papers: 10

Table 2C – Tutors and number of study groups between 2003 and 2007

Note: “Employment Status” and “Yearly Teaching Units” in this case are reflected in the number of groups tutored.

With the exception of tutors who are also course coordinators (academic teaching staff), who appear in Table 2B, the tutors have no additional tasks in the institution. The OUI does not have data about the tutors’ additional workplaces, if any, as they are external employees.

Tutor seniority (number of semesters)	Number of tutors	Total groups tutored	Mean number of groups per tutor per semester
1	33	38	1.15
2	18	35	0.97
3	21	60	0.95
4	12	41	0.85
5	10	40	0.80
6	11	59	0.89
7	4	22	0.79
8	6	47	0.98
9	6	60	1.11
10	8	79	0.99
11	10	112	1.02
12	5	45	0.75
13	4	51	0.98
14	3	30	0.71
15	2	36	1.20
16	4	57	0.89
17	1	22	1.29
18	4	67	0.93
19	2	20	0.53
20	2	25	0.63
21	1	1	0.05
22	1	2	0.09
23	2	35	0.76
25	1	1	0.04
26	1	19	0.73
28	1	27	0.96
30	1	12	0.40
Total	174	1,043	0.79

3.6 Infrastructure

3.6.1 Administration

3.6.1.1 Location of the Department

The Department of Natural Sciences is located in 26 offices on the second floor of the Academic Building on the Raanana Campus (see map below). The staff of the MA program has two rooms on the Raanana campus and half a room in the Jerusalem study center. Faculty members who live in Jerusalem and its vicinity were allocated several rooms at the OUI's center in Jerusalem and additional rooms were allocated in the Haifa center.

3.6.1.2 The Department office

The department office is located on the 2nd floor of the Academic Building, room 258. The office of the head of the department is in room 255, close to the department office and the offices of other faculty members.

3.6.1.3 Academic staff offices

Offices are allocated as follows: senior faculty members have their own offices; academic staff members share offices (one office for two staff members). Standard furniture in every office includes a desk, wall cabinets, bookshelves and a computer for each person. On every floor, there is a technical services room with a network printer, photocopier and an outgoing mailbox; and a kitchenette that also serves as a shelter, with a coffee machine and sink.



The Open University Campus, Raanana

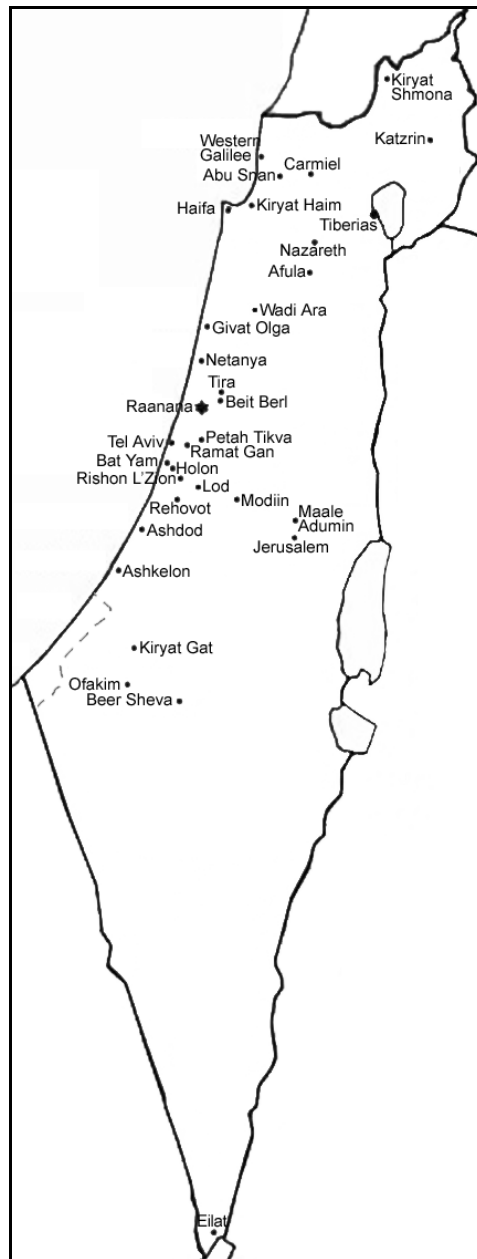
3.6.2 Classes

3.6.2.1 Classrooms, seats and equipment

Face-to-face study activities (tutorial sessions) in Natural Sciences courses are held in study centers throughout the country. A limited number of study activities take place in ten classrooms on the Raanana campus. In most cases, classrooms are furnished with desks for two and sometimes with chair-desks, most without access to electric outlets or to the Internet. All study centers have a cafeteria and restrooms. All classrooms are used for all OUI courses, allocated according to the nation-wide dispersion of students at the OUI.

Study centers: The Open University functions in 55 study centers throughout the country (see map below). Not all study centers are opened every semester; tutorial groups are opened

each semester in response to the number of students enrolled in each course in each area. Between 2003 and 2007, 2,896 students in 510 study groups took undergraduate courses in Life Sciences (7,223 course enrollments in 62 different courses) at 14 study centers and abroad.



Distribution of study centers

3.6.2.2 Computer layout

Open University students use personal computers. The OUI provides software to students according to the requirements of the various courses. The software programs are licensed and usually downloaded from the Internet. The academic teaching staff provides support on content issues. The OUI Computer Center provides general computer support. Computer classrooms located in the large study centers are available for students' use.

The institutional computer system

Communication: A three-layer Local-Area-Network (LAN) (backbone bandwidth of 2-4 gigabits/second) spread over the buildings on the campus: edge switches (operating at layer

II) on the users' floors, aggregation switches (operating at layer III) at the building level and core switches (also operating at layer III) at the campus level. Fast Ethernet links (100 megabits/second) or (where needed) Gigabit Ethernet links (1000 gigabits/second) connect end-users' workstations to the LAN. A Wide-Area-Network (WAN) (1/4-4 megabits/second) connects the OUI regional campuses. The OUI is connected to the Israel Academic Network (ILAN) and through this network to the Internet via a 150 Mbps line, with a 34 Mbps backup line. The OUI provides secure remote access communication (VPN – virtual private network) to all employees that need such communication. Wireless networks (WLANs) are installed in Raanana and in the regional campuses that provide users access to specific computer services through a personal computer with a wireless adapter. The wireless network covers all public and students areas such as the library, classrooms, laboratories and lecture halls.

Security: The network is secured using several layers of firewalls and related security solutions.

Computer services: Intra-organizational e-mail, online schedule management and shared activities, based on the MS-Exchange system; Internet e-mail; access to Internet websites and other services; file servers for central and backed-up storage of personal and departmental documents; printing services for the variety of printers on campus; a secure system for remote access (VPN) to organizational computer services and to the OUI information system services.

3.6.2.3 Additional facilities

The OUI campus has two lecture halls (70-150 seats), one large auditorium (350 seats) and 26 conference rooms (seating 12-20) allocated to the department as needed. The conference rooms (for the use of committees, seminars, demonstrations, etc.) have an infrastructure for audio-visual equipment and for a connection to the Internet, as well as a coffee corner. Rooms must be reserved in advance and equipment for each activity must be specified ahead of time. There are also facilities for different types of meetings at the large OUI study centers in Haifa, Jerusalem, Beer Sheba, and Givat Haviva.

3.6.3 Laboratories

The laboratory unit of the Life Sciences department is located on the Raanana campus (rooms 211-216, 2nd floor, Plaza building). The complex includes two experimental labs, an observation room, a preparation room, three equipment rooms, a reagent room and a cleaning room. Each lab is equipped for up to 22 students. The lab is multidisciplinary and equipment is used for experiments in Physics, Biology, Chemistry and Geology. The laboratory staff consists of Dr. Victorya Libin (Head) and three technicians holding BSc and MA degrees in various areas of the sciences. The annual budget of the lab is approximately \$55,000.

The labs are equipped with the following:

General equipment: Central gas, vacuum and condensed air systems; ice maker, vortex, evaporator, drying samples oven, cooled centrifuge – 20,000 rpm, cooled mini centrifuge, analytical scales, pH meters, refrigerators, deep freezer (-72°C), incubator, CO₂ incubator, vacuum pumps, binoculars, autoclave, dishwasher, magnetic heating plates, shaker water baths.

Special equipment for physics experiments: Power suppliers, classic dynamic systems, spring and mass sets, “Passport” computerized graphic system for science education, resistance apparatus, RLC circuit, resistors and capacitors, multimeters, basic optic systems, lasers, spectrometer, microwave optic system, E/m apparatus, earth's magnetic field apparatus, oscilloscopes, polarimeter, digital manometer.

Special equipment for biology and chemistry experiments: Scintillation counter, ELISA reader, fluorescent microscopes; visible and UV spectrophotometers, calorimeters, VIS9 gas chromatograph, a chamber for growing plants, DNA gel electrophoresis apparatus, protein gel electrophoresis apparatus, gel electrophoresis power suppliers, lyophilizer, flow-meter, chemical and biological hoods, PCR – polymerase chain reactor, inverted microscope, oxygen meter, argonometric bicycle.

Special equipment for Earth Sciences experiments: FTIR – Fourier transform spectroscopy, polarizing microscopes, UV lamp, conductivity electrode, oxygen electrode.

In each of the last five years, about 275 science lab tutorials were held, 35-40% of them in Life Sciences. To make it easier for students to free time for lab work, many of the tutorials take place during the summer semester.

3.6.4 The Library

3.6.4.1 Description

The Open University's central library offers reference, loan and information services to students and to academic faculty and administrative staff. The library holds all OUI publications (study units, video and audio cassettes); collections of books, journals and CDs; a digital collection of bibliographic databases, electronic journals, digital books, an exam database, a course reader database, a database of sample chapters from OUI course books, etc.

Location: The library is located in a four-storey building on the OUI campus in Raanana, spanning with a total area of 2,000 sq. meters. The library has reading halls (54 seats and 17 computer stations), a training classroom (15 computer stations), a multimedia room, multimedia storerooms and staff offices.

Library hours: Three days a week from 09:00-16:30, twice a week from 09:00-19:30 and on Fridays from 09:00-13:00.

Library staff: 17 librarians with academic degrees in library and information studies; most also hold graduate degrees.

Training: In light of the special character of the studies at the Open University, in the early stages of their studies students do not need bibliographic training because the study material and textbooks are sent to them. However before the students take advanced courses they are required to participate in bibliographic training. This training focuses on the general use of the library and on searches for material when writing seminar papers. The training includes use of all library components and emphasizes searching in catalogs and electronic databases. It is offered in two formats – face-to-face training (at the Raanana campus and large study centers throughout the country) and training at home through courseware developed by the library. The courseware includes tests on the material and calculates the student's grade and updates the student's record for purposes of tracking and recording student participation.

Assistance: Librarians offer advisory services and assistance in searching for information using electronic resources to students and faculty during all library hours. Distance services (online and telephone) that support students and faculty in searching for information are provided 45 hours a week.

Acquisitions policy: Acquisitions can be initiated by a faculty member or the library staff, subject to the approval of the relevant department head or the Dean of Academic Studies. The OUI policy for developing the library collection states that the library will purchase books, periodicals and databases that are relevant to OUI development and teaching fields.

Updated information about information databases is received from publishers and suppliers through MALMAD – Israel Center for Digital Information Services (the Israeli University Libraries' Consortium). New databases are usually received for a trial period during which the

librarians and faculty members examine their quality and suitability to the unique needs of the OUI. They are acquired only if the librarians and faculty members recommend them.

The library and faculty members are updated on new books and periodicals through bibliographic publications and tools for critiquing and selecting books, as well as through publishers and suppliers.

The Library Committee, composed of the Director of the Library and senior faculty members representing the fields studied at the OUI, provides assistance in all issues pertaining to acquisition policy, updating the library and development of the library collection.

The collection available to students and faculty in the Life Sciences:

- 902 print books (maximum number of copies per title – 3)
- 49 multi-volume Open University course books in the field of Life Sciences (maximum copies per title – 6)
- Access to 424 electronic journals in the field of Life Sciences
- 7 Biology databases and 9 multi-disciplinary databases that include material in the field of Life Sciences

Life Sciences faculty and student use of the library facilities over the past year (searches and loans):

- E-journals: 1,154 searches in different journals
- Print books: 115 books and 146 Open University course books in Life Sciences were loaned

3.6.4.2 Access

Regional libraries: There are regional libraries at the large study centers with OUI course books and additional material – books and multimedia resources, corresponding to the courses studied in the study centers in the region.

Information databases are accessible to students and faculty who have a password, from any computer connected to the Internet.

3.6.5 Strengths and weaknesses of the physical infrastructure

The Open University's central control over study centers and computer services provides operational flexibility and the ability to offer tutorial sessions (throughout the country) and computer services, based on need – with significant financial savings. For the most part, rooms on campus are large and have new furniture and modern equipment; however, the meeting rooms on each floor are often too small for gatherings of a large number of participants. OUI computer services meet the needs.

With respect to the library, the option of connecting to a wide range of leading journals and to receive the full text of articles electronically is extremely important for a University that serves students throughout the country. The inter-library loan service facilitates access to articles in journals that the OUI does not receive digitally. Agreements with most other University libraries provide students with access to these libraries for reference and loan services.

Strengths with respect to the laboratory are that it serves only the Dept. of Natural Sciences, it is spacious and thus allows running two different laboratory sessions simultaneously and is equipped to accommodate sessions in Physics, Chemistry, Earth Sciences and Life Sciences. This situation is significantly improved in comparison with the facility we had until just a few years ago, when the OUI campus was located in Ramat-Aviv. Some of the equipment purchased when the OUI moved to the new campus in Raanana released us from the previous need to rely on Tel-Aviv University for some of the lab sessions. The laboratory staff is well

trained and highly motivated. The numerous laboratory tutorials are well prepared, so that the academic teaching staff is able to focus on teaching.

However, several weaknesses should be pointed out: three technicians are too few to run the operation of the many lab sessions held throughout the year. We are still dependent on other universities in some aspects, such as supply of drosophila flies for genetics experiments or mice and rats for zoological experiments. Furthermore, there are no facilities to keep these animals in the laboratory, even overnight. Some pieces of equipment are old and need to be replaced. Finally, a serious weakness is that the laboratory serves only for teaching purposes: Life Sciences faculty and academic teaching staff cannot use the facility for research.

Chapter 4

Research

4.1 Research in the Department of Natural Sciences

Research in the department is carried out by the members of the senior faculty and by members of the academic teaching staff, most notably by those among them who hold a PhD. This is a small group of researchers, which nevertheless gives rise to cooperation and synergies, and produces superior output in terms of publications, grants, and of organization and participation in international and national conferences as well as departmental symposia.

Faculty members in the Department of Natural Sciences specialize in various areas: Life Sciences, Chemistry, Physics and Electronics, Earth Sciences, Atmospheric Sciences, Philosophy of Science and Science Education. A number of faculty members also conduct research on learning technologies and distance learning. Since the laboratories on the OUI campus serve only for teaching, most of the experimental work is carried out, in collaboration with researchers from other institutions, at their labs.

Researchers: In the last five years, full time senior faculty members in the Life Sciences included Dr. Ruth Arav, Dr. Anat Barnea, Prof. Simona Ginsburg, Dr. Joel Klemes and Prof. Miriam Souroujon. Senior faculty members in disciplines other than the Life Sciences included Prof. Itzhak Dotan (Chemistry), Prof. Yoram Kirsh (Physics), Prof. Shlomo Shoval (Earth Sciences), Dr. Inbal Tuvi-Arad (Chemistry), Dr. Yosef Verbin (Physics) and Dr. Yoav Yair (Atmospheric and Space Physics). Some of the academic teaching staff members in the Life Sciences are also engaged in research in other fields. The research interests of the members of the departments are linked to their contribution to course development and teaching activities and especially in the repertoire of advanced courses offered by the department.

Publications: In the last four years, senior faculty members and academic teaching staff members of the department published 104 papers in refereed journals and chapters in refereed books. Beyond international publications, the OUI undergraduate textbooks that our faculty members write also have a research aspect, in terms of analysis of up-to-date research and knowledge. These textbooks have an excellent reputation for high academic standards.

Research cooperation in Israel and abroad: Because of the very small faculty and the lack of research laboratories, collaboration with colleagues from Israel and abroad is essential for both the experimentalists and the theoreticians in the Natural Sciences department. Faculty members in the department collaborate with their colleagues in Israel from the Weizmann Institute, the Hebrew University of Jerusalem, Tel Aviv University, Haifa University and Bar-Ilan University. In addition, there is collaboration with colleagues from the US (The Rockefeller Institute, Yale University, and the US Air Force Research Laboratory), France (INSERM, Université Claude Bernard), Italy (Istituto di Scienze dell'Atmosfera e del Clima), Germany (Institute for Physical Chemistry), Switzerland (Bern University), Denmark (Dept. of Solar System Physics, National Space Center), Greece (The National Observatory of Athens), Japan (Tohoku University), and Brazil (Inst. Nacional de Pesquisas Espaciais).

Participation in international conventions: Senior faculty members routinely present their scientific data in national and international meetings. Their participation in conferences is financed through the government granted funds (such as the International Science Linkages program). The Research Authority supports the academic teaching staff through grants for travel to international conferences to present papers.

Service to the professional community: Senior faculty members in Life Sciences serve as referees of papers in peer-reviewed journals and of proposals for competitive grants.

They also act as readers of graduate theses and dissertations by Life Sciences students at other universities.

Supervision of graduate students: In the last five years, faculty members of the department supervised, jointly with faculty members of other universities, the work of 17 MSc students and 10 PhD students. In addition to acting as formal supervisors, faculty members work with graduate students from other universities on cooperative research projects.

Departmental and area-specific colloquia: Research of general interest to faculty members is routinely presented at the department forum. The department is too small to offer forums for the presentation and discussion of research in more specific research areas; faculty members participate in such forums at other universities. In addition, guest lecturers appear before graduate students in the MA program. For a list of recent department seminars and lectures in the framework of the Biological Thought program, see Extras, “Departmental seminars.”

4.2 Research at the OUI

Research activity is at the heart of the academic endeavor at the OUI and plays a pivotal role in maintaining high levels of course development and teaching. Faculty members’ continual involvement in their fields of research ensures that the courses and study programs they develop – whether for undergraduate or higher degrees – provide an accurate and updated view of the area of study. The university strives to recruit and support faculty members with the strongest possible research capacities.

Detailed information on research at the OUI can be found on the OUI website at <http://www-e.openu.ac.il/research/>

The Open University Research Authority (see also Chapter 1): The Research Authority (RA) encourages research among faculty members by accumulating and disseminating information on external sources of funding and by submitting applications to these funds. The RA is also responsible for financial and administrative monitoring of research proposals submitted via the RA that received funding. In addition, the RA encourages research by providing direct support through grants and scholarships for research purposes (see below). The overall budget of the RA’s internal fund in the last 3 years was NIS 0.98m, 1.128m and 1.58m, respectively.

Special issues addressed by the RA in recent years include:

1. **Formulating policy for managing intellectual property:** An ad-hoc committee headed by the head of the RA formulated procedures for ensuring the University’s intellectual property rights and discussed ways to realize the commercial potential embodied in the fruits of University activities for the general good, for the benefit of the University and for appropriately rewarding the developers. A technology transfer company was established recently as a result of this committee’s recommendations.
2. **Agreement between the Open University and Tel Aviv University:** An agreement between the OUI and Tel Aviv University signed recently establishes collaboration between the two institutions and enables faculty members in experimental fields to expand their research activities and conduct independent research using Tel Aviv University infrastructures. This agreement ensures stability and continuity over time.
3. **Approval to perform experiments on animals:** The Ministry of Health Council for Experiments on Animals decided to recognize the OUI as an institution authorized to conduct experiments on animals.

4. Contacts with national and international research management bodies: The director of the OUI RA is a member of the Forum of Research Authority Directors in Universities in Israel, the European Association of Research Authority Directors, and a committee of the Israel Academy of Sciences established to design a national database on research in Israel.

5. Annual Research Day: The OUI holds an annual research day, at which research activities of senior faculty and academic teaching staff are presented.

Research Grants

Grants from competitive external sources: The number of research grant applications submitted by OUI researchers has risen significantly during the last years (from 4-5 applications in 2003-2005 to 47 applications in 2007). The small number of grant applications is explained by the small number of faculty members at the OUI (37 in the beginning of 2003 and 64 at the end of 2007). The average success rate of OUI researchers in competitive funds in the last two years was 29%. (Average success rates in previous years (2003-2005) were higher but the absolute number of grant applications was significantly smaller.)

The total income from external grants to the OUI in the last 5 years was NIS 10.3m and the total sum of external grants to members of the Natural Sciences department was NIS 6.2m, of which NIS 4.2m were awarded to Life Sciences faculty members acting as sole Principal Investigators (PIs) or as co-PIs with colleagues from other universities.

In the last five years, researchers in the Dept. of Natural Sciences received 32% of all OUI external grants (representing 60% of the total sum of grants awarded the OUI). On nine of these projects, the PIs were faculty members in Life Sciences (see Extras, “External grants”).

Grants from the Open University Research Authority fund: Faculty members also routinely submit proposals and receive research grants and fellowships from the OUI Research Authority. In 2006-2007, 101 requests for funding were submitted to the internal fund and 73 were approved by the Steering Committee (see Extras, “Internal grants”).

4.3 Challenges to Life Sciences Research at the OUI

Conducting research in the Life Sciences at the OUI poses some unique challenges. The experimentalists face the most serious challenge due to the lack of research labs at the OUI and to the lack of graduate students who can assist in performing the research studies. However, due to the small number of faculty members at the OUI in general and in the Life Sciences in particular, experimentalists as well as theoreticians also face the problem of limited interaction with colleagues in their field of research within the university. Thus, researchers in the Life Sciences cannot conduct research unless they collaborate with colleagues at other research institutions. This dependence creates an inherent a-symmetry in the relationships of OUI faculty with the peers with whom they collaborate and poses serious problems of lack of free choice of research topics and publication authorship issues. In addition, the lack of “visible” research labs poses a serious problem to the OUI’s positioning as a research institute. Faculty members in the department indeed supervise graduate students in collaboration with colleagues from other universities but need to recruit sustenance fellowships either from external grants or compete on the small number of fellowships offered by the OUI Research Authority. This is in contrast to the situation in parallel departments at other universities in Israel,

in which senior faculty members get a number of departmental student fellowships on a non-competitive basis, which frees them from absolute dependence on grants.

The situation of members the academic teaching staff who act as course coordinators is also not free of challenges. In the past, research was not explicitly defined as part of the duties of course coordinators, and there were no incentives for carrying out research. This situation has since changed; however, academic teaching staff members in the Life Sciences still face serious problems in establishing long-lasting scientific collaboration with peers in other universities, especially due to difficulties in allocating the time need for biological research.

In the last 5 years, the OUI has been trying to find creative solutions to some of these problems. For example, the OUI invested NIS 50,000 in the purchase of equipment for Prof. Shlomo Shoval and NIS 100,000 toward establishing a laboratory for Dr. Anat Barnea at the Zoological Garden of Tel-Aviv University, where she and students co-supervised by her and faculty members from Tel-Aviv University conduct their research. Dr. Barnea's lab is equipped with a computerized brain mapping system attached to a light and fluorescence microscope. In addition, she has access to a confocal microscope at Tel-Aviv University.

More recently, a framework agreement was signed between the OUI and Tel Aviv University that establishes collaboration between the two institutions. This agreement will allow OUI researchers in the experimental sciences to conduct independent research using laboratories and equipment at Tel Aviv University, ensuring stability and continuity over time of their research activities. This could be a model for similar agreements with other universities.

The OUI Research Authority offers a limited number of different research grants and fellowships including two partial MSc sustenance fellowships for students supervised by senior faculty members in the experimental sciences and two partial PhD sustenance fellowships for students of all OUI senior faculty members.

4.4 Summary and Evaluation

Faculty members at the OUI view research as an important part of their role. Their small number severely limits the overall impact of their research and the lack of research laboratories affects the “visibility” of the OUI as a research university. Senior faculty members and academic teaching staff seek to achieve individually high research standards and some of them find creative ways to overcome the unique challenges that faculty members at the OUI face in conducting research. However, these obstacles seriously affect the overall research output in the Life Sciences, which are essentially experimental in nature.

In spite of the problems inherent in conducting research in the experimental sciences at the OUI, there has been a significant improvement in the way the OUI addresses issues concerning the research activities of its senior faculty and academic teaching staff, and the scope of the support by the internal fund of the Research Authority. This change of attitude is also reflected in the number of grant applications submitted to external and internal funds, in the overall number of scientific publications and in the recruitment of excellent new faculty members. The special challenges and the unique mission of the OUI have made it possible to attract to its faculty excellent researchers who are willing to cope with the difficulties and be part of the OUI.

Chapter 5

The Self-Evaluation Process Summary and Conclusions

5.1 Routine Self-Evaluation at the Open University

Due to the nature of distance teaching, involving three groups of teaching staff (course developers, course coordinators and tutors), the OUI has already developed quality control mechanisms for almost every product, process and function. These mechanisms enable the University to continuously examine its strengths and weaknesses and to address problems when necessary. Evaluation at the OUI is routinely conducted by two main entities: (a) **the students** and (b) **the institution** that evaluates programs of study and courses, teaching materials (assignments and exams), teaching processes and those involved in these processes, as well as special projects.

5.1.1 Evaluation of student satisfaction

As described in section 3.3.2.2, the Open University Evaluation Department conducts an ongoing teaching survey among students at the end of every semester. The survey, attached in Extras, “Teaching survey,” is conducted at tutorial sessions or via course websites. It includes questions about all components of the course (study material, assignments, the tutor, tutoring, the website and all other course activities). Students can also add comments as they see fit. The Evaluation Department submits the results of the teaching survey to the course coordinators and the department head. Senior faculty members receive the survey results relevant to the courses for which they are academically responsible. Survey data analyses provide information on each course as well as a comparison of department and University mean scores on each aspect surveyed.

The course coordinators’ evaluation of tutors focuses mainly on each study group’s teaching survey, and on observations of tutorial sessions. The department head receives a consolidated report per course and a copy of the report is given to the senior faculty member responsible for the course. The survey results can help to indicate changes that need to be made in the structure of assignments, can serve as the basis for feedback discussions with tutors, and sometimes can even lead to discontinuing the employment of tutors who received unsatisfactory evaluations. In the Dept. of Natural Sciences in general, and in the Life Sciences area in particular, we routinely make use of the results of these surveys and reports: the head of the Department or the senior faculty member who is academically responsible for the specific course meets with course coordinators whose courses received low scores on one or more areas of the survey. Nevertheless, the present self-evaluation process made us aware that we could use the results of these surveys and reports more efficiently and systematically. We definitely intend to change this in the future.

Along with the surveys among active students, the University also conducts feedback surveys among new graduates, among veteran graduates (described in section 3.4.8) and among dropouts (described in section 3.4.3). Here too, as a result of the self-evaluation process, we realized that we do not make sufficient use of these tools. For the purpose of this report, we asked the Evaluation Department to conduct a survey among our graduates (described in section 3.4.8) and our intention is to implement this process on a routine basis in the future.

5.1.2 Self-evaluation by the institution

5.1.2.1 Evaluation of the quality of programs of study and courses

Every new study program, new course proposal, course update or revision (irrespective of whether it is part of a new or existing study program) is initially sent to senior academics (within and outside of the OUI) in relevant fields for external review. After

receiving their comments and the response of the initiator of the program or course, the issue is discussed by the appropriate disciplinary subcommittee. Following approval of the subcommittee, discussions concerning new programs are held in two additional OUI forums (the Faculty Council and the Academic Committee). After approval by the Academic Committee, new study programs are submitted to the Council for Higher Education. Course proposals are discussed by the Academic Committee and, if approved, are submitted to the OUI President who authorizes the development of the course. Every new unit written is sent to senior faculty members at the OUI and at other universities or research institutes for evaluation.

The study program approval procedure is attached in Rules and Procedures, “Program approval” (in Hebrew); course development is described in Rules and Procedures, “Course development” (in Hebrew). This exacting process ensures the high level of programs of study and written course materials. Accordingly, quality control at the OUI with respect to course contents and materials is stricter than quality control customary at other universities.

5.1.2.2 **Evaluation of the quality of teaching materials**

Towards the beginning of every semester, the course coordinators write the assignments that students submit during the course. They also write at least three versions of the course final exams (two for the first exam sitting and one for the second exam sitting, and in some cases a special version for students abroad), and update the course website. A senior faculty member, or a member of the academic teaching staff holding a PhD, examines and approves exam questionnaires every semester. Thus, every OUI exam is examined by an expert in the field who did not write the exam. The assignments and other course contents are also examined once a year by the senior faculty member who is responsible for the course.

The quality of assignments and exams is also monitored on the basis of responses to the teaching survey and item analyses. The average grades of assignments and exams, from the item level to the study group level are analyzed each semester (see section 3.3.2.2). The main parameters examined in this analysis are unusually high or low grades on specific items, low correlations between the mean exam grades and the mean assignment grades, and unexplained variation in grades among study groups. The course coordinator, the head of the Life Sciences group, and the department head receive results of the analysis.

The course website contents are updated continuously by the course coordinators, and are routinely evaluated as part of the teaching survey. Student comments in the discussion forums are another source of changes and additions to the site that contribute to students’ learning.

Technology-based materials also undergo quality control that begins at the planning stage. Multimedia material is often developed by a team of experts from the OUI and other institutions. For recorded lectures, the OUI engages preeminent experts in a specific content field. For example, for lectures in the courses “General Biology I” and “Evolution,” we recruited the assistance of senior faculty members from other universities who are experts in the field. *Shoham* – The Center for the Integration of Technologies in Distance Education – is responsible for the technological quality control of these materials.

5.1.2.3 **Evaluation of teaching processes and those involved in them**

Senior faculty evaluation: The senior faculty is evaluated annually. At the end of every year, all senior faculty members submit a detailed report to the OUI President, the Vice

President for Academic Affairs and the Dean of Academic Studies about their activities during the year on research, course development, teaching and administrative activities. This allows for greater transparency regarding senior faculty activities and for extra pay (a percentage of the salary), based on standard criteria. In order to make informed decisions about extending employment contracts (senior faculty at the OUI do not have tenure) and academic promotions, senior faculty members are asked to submit a detailed curriculum vitae, a list of publications, and a description of their contribution to the OUI. Committees composed of members of OUI senior faculty as well as senior faculty from other universities decide on their continued employment and/or promotion (on procedures for promoting senior faculty, see Rules and Procedures, “Appointments,” in Hebrew).

Evaluation of academic teaching staff (course coordinators): The department head is responsible for the annual evaluation of all course coordinators in the department. Evaluation is performed by the department head, the head of the Life Sciences group and the senior faculty member responsible for the courses taught by the course coordinator. The evaluation is intended to relate to several parameters: the quality of assignments written by the course coordinator in the past year, the course website, student satisfaction as reflected in the teaching survey, and the distribution of grades on assignments and exams over the past year. The evaluation should also touch on the course coordinator’s contributions to revisions and updating of course material, administrative functioning and contribution to the department. Unfortunately, during the self-evaluation process, we found that evaluation of course coordinators in the department as a whole, and specifically in Life Sciences, is not performed rigorously enough, and merits significant improvement.

We intend to correct this, and a new system and guidelines based on reflective self-evaluation by course coordinators, which is currently being implemented in all academic departments of the OUI, will certainly help us. (The questionnaire, in Hebrew, is appended in Extras, "Course coordinator self-evaluation form"). In addition to self-evaluation, the questionnaire also includes feedback on departmental administrative services and other relevant department activities as well as goals for the coming year. Following the submission of the course coordinator’s responses to the questionnaire, we plan to schedule a meeting between each course coordinator, the department head and the senior faculty member academically responsible for the course to discuss the coordinator’s self-evaluation, as well as gaps between what was planned and what was executed. The meeting will be documented in the course coordinator's personal file and a reminder will be sent in the middle of the following academic year.

Tutor evaluation: The course coordinators evaluate two main components of the tutors’ work: their teaching and how they check assignments. The evaluation is followed by detailed feedback (described in section 3.3.2.2).

Evaluation of administrative staff: Once a year, the Human Resources Department conducts an evaluation of all OUI administrative employees, using feedback questionnaires. The department’s administrative staff are evaluated through this process.

5.2. The Staff Member in Charge of Quality Evaluation in the Institution

With the announcement by the CHE of its intent to implement a process of quality self-evaluation in institutions of higher education, the President of the OUI, on the recommendation of the Vice President for Academic Affairs, appointed Dr. Sonia Roccas as the individual responsible for dealing with quality evaluation at the OUI. Dr.

Roccas is a senior faculty member in the Department of Education and Psychology. Her role includes:

- Collecting information pertaining to the self-evaluation process (participating in CHE symposia) and transmitting the information to relevant OUI entities (Vice President for Academic Affairs and the head of the department under evaluation).
- Activating the evaluation process and, when needed, participating in the work meetings of the evaluation team.
- Sharing information with the Vice President for Academic Affairs about the evaluation process and on all matters pertaining to information about processes that relate to OUI policy to be included in the quality self-evaluation report.
- Formulating ways (in collaboration with the Vice President for Academic Affairs) for the various academic departments to prepare for the quality self-evaluation process they will undergo in the future in order to facilitate, when the time comes, information collection and writing the report. Furthermore, institutionalization of the preparation process with respect to teamwork of the evaluation team will serve as a catalyst for strategic thinking and critical evaluation of the routine activities of OUI academic departments.

In our opinion, the fact that on the institutional level, a senior faculty member is responsible for quality self-evaluation in the University is important to ensure that the information and experience gathered during the work of the self-evaluation teams is accumulated and consolidated in a way that will enable OUI management to implement and internalize the conclusions of the evaluation teams. Furthermore, the knowledge accumulated will serve all the academic departments that will undergo the quality self-evaluation process in the future.

5.3 Methods Used in the Self-Evaluation Process and Conclusions Regarding the Way it was Performed

Upon receipt of the guidelines from the CHE for performing the self-evaluation, the President, Prof. Gershon Ben-Shakhar, appointed a senior faculty member, Dr. Anat Barnea (head of the Life Sciences group), to lead the evaluation process in Life Sciences. At a meeting of the entire staff of the Natural Sciences Department, the head of the department (Dr. Joel Klemes) and Dr. Barnea presented the quality evaluation issue. Following this meeting, Dr. Barnea set up a Steering Committee whose members, together with her, would be responsible for the entire process. The committee included three senior faculty members (Prof. Miriam Souroujon, Dr. Ruth Arav and Dr. Joel Klemes) and three veteran course coordinators (Dr. Sara Schwartz who represented the MA program, and Dr. Revital Lavy and Dr. Dror Bar-Nir who are course coordinators of undergraduate courses).

The innovation in the current process of quality evaluation stems from the fact that it was conducted on the disciplinary level: for every development, teaching, and research component in Life Sciences. Some members of the department felt that due to the intensive and multi-stage process of evaluation that already exists in the OUI, the present self-evaluation process did not add insights that were previously unknown. According to this view, work on the report only disrupted the daily academic work of the department. In contrast, other members of the department felt that the process enabled the department to examine all its components holistically and from this unique perspective to derive the necessary lessons. Moreover, unlike institutionalized monitoring processes conducted by different entities and passed on to various interested parties, the disciplinary process allowed for collaboration among all bodies with respect

to all evaluation processes. We view the collaborative work of the entire senior faculty of the discipline as a prerequisite for realizing the potential of the quality self-evaluation process. The process offered an opportunity to hear the opinions of all faculty members. Aside from the statistical data, the report includes the ideas and viewpoints of all senior faculty members and of some of the academic teaching staff. Hence, we believe that the process contributed to the validity of the report.

Moreover, we believe that the involvement of all senior faculty members in the process was very fruitful. The weekly meetings, as well as additional numerous interactions related to the self-evaluation, which took place between the faculty members, led to important discussions and highlighted issues that need improvement. On the other hand, the rather limited involvement of the academic teaching staff, despite the open invitation to join the process, deserves future attention. Only three of them volunteered to participate and take an active part in the process. This situation probably stems from the frustration of the academic teaching staff, due to their complicated situation and status at the OUI, as described in section 3.5.3.

5.3.1 Summary of strengths and weaknesses

While we were already aware of many of the strengths and weaknesses of the Life Sciences programs and of the department, the holistic perspective focused our attention on several issues we had not identified before, or not identified in a sufficiently detailed way. The following is a summary of these issues:

Strengths: In the *undergraduate programs* in Life Sciences, the OUI provides a response to the demand for Life Sciences studies, due to their central place in the general framework of the Sciences. The varied programs of study impart knowledge, skills and qualifications in the main areas of Life Sciences and combine Life Sciences studies with other fields in the Sciences and in other disciplines. These programs enable graduates to find employment or continue to advanced studies in each of the disciplines studied. The department is satisfied with the results of its academic endeavor, which meets the goal of enabling graduates to find their place in both the labor market and the academic world. The programs offered by the department also answer the needs of its students, primarily employed individuals who require flexibility in their studies in order to integrate their studies with additional demands on their time.

Study materials, developed in accordance with exacting procedures, combined with rigorous academic quality control, from the proposal stage to the final product, enable the department to produce outstanding and balanced materials, widely used by other universities. The fact that experts from academic institutions in Israel and abroad contribute to course development is an advantage, since the development of courses and study programs is not biased towards the fields that interest a specific faculty member, but rather are based on the needs dictated by new programs of study and the goals of the department. As a result, the OUI offers students a wide and varied range of elective courses that are not dependent on the availability of senior faculty members.

The University and the department conduct *on-going evaluation* of teaching components to examine contents of courses and programs continuously, and members of the teaching staff are updated in many ways, in both subject matter and pedagogic aspects.

The OUI's unique *pedagogic model*, based largely on independent study, helps to promote intellectual ambition and develop perseverance, responsibility and self-discipline. These qualities and abilities equip graduates with a relative advantage in the employment market and as candidates for advanced studies. The OUI *teaching method* combines distance teaching with face-to-face components. Every course has a course

book; a study guide (in courses based on existing textbooks or readers); optional tutorial sessions (which provide guidance and support); a course booklet that includes assignments or projects which have to be submitted during the semester; a laboratory guide (in courses that include laboratory sessions), exams (conducted at OUI study centers throughout the country), and are integrated with distance learning technologies through the course website.

The strengths and weaknesses of teaching and learning in the Department are similar to those of the OUI method in general. For most students, independent study is more difficult than group study through lectures. We invest efforts in integrating technologies aimed at facilitating distance learning. Surveys indicate that students are satisfied with the online systems, feel that they significantly contribute to courses and help them understand the course material and prepare assignments, and they actively participate in asynchronous discussions. However, they are divided with respect to whether the online systems are a suitable alternative to classroom learning, and are usually unwilling to forego face-to-face tutorial sessions. The University devotes the utmost attention to students and accompanies them from their initial interest in studies at the OUI, up to receipt of their degree. In their feedback, students for the most part praise the OUI's personal and warm attitude towards students, as well as the level of teaching, study materials and learning technologies.

In summary, the teaching approach is congruent with the goals of the OUI and of the department. It enables the University to expand access to higher education to all interested individuals, and offers an opportunity to pursue academic studies to those working for their livelihood, raising a family or involved in other pursuits that prevent them from studying at other academic institutions despite their intellectual abilities. The academic teaching staff believes in the OUI as a unique institution with a social mission, and this belief serves as the main motivating factor for their work, despite difficulties and problems. Coordinators and tutors at the OUI are experienced teachers who view their teaching work as a mission rather than as a constraint. Senior faculty members also have high management abilities reflected in the administrative roles and positions they hold in the University and in the department.

Weaknesses: Five *senior faculty* members are too few to meet the needs of the evaluated study programs, despite the relatively small number of Life Sciences students, for several reasons: 1) Faculty members hold key administrative roles in the university and the department and are involved in various committees, in addition to their teaching and research duties. 2) As the field changes rapidly, the few faculty members need to closely monitor all courses, and supervise updating, revising, and rewriting them when necessary. 3) The field is very diverse; therefore, a faculty member whose expertise is, for example, molecular biology, cannot be responsible for botany courses.

Despite this situation, in recent years the number of faculty members in the Life Sciences has actually decreased, with the retirement of one member who was not replaced. In the next few years, two other members will retire. Recruiting additional faculty is crucial to ensure the continuous updating of courses, enable reasonable sharing of the many responsibilities and allow faculty members to devote more of their time to research. Currently a new faculty member is being recruited.

In addition, due to the lack of *research laboratories* at the OUI and other obstacles that senior faculty face when trying to conduct research (as explained in Chapter 4), the OUI needs to allocate more resources and find creative ways to help the faculty overcome the unique challenges they face in this respect.

Relating to teaching issues, the small number of senior faculty and the lack of research laboratories causes our students not to have enough exposure to scientific research. The advanced course, **Research Project in Life Sciences**, provides our students with some rather limited research opportunities. Another issue is the fact that, as a distance learning institution, our students do not get enough lab experience. We are trying to respond to this challenge by offering additional lab courses in our study programs, in addition to virtual labs that are included in some courses. However, we have found that graduates who continue their studies toward higher degrees do not face any difficulties in lab work.

Another issue is the difficulty in opening *study groups in the periphery*, due to the relatively small number of students enrolled in life sciences courses. In lab courses, this is an even greater problem, because of the lack of suitable and well-equipped laboratories in those areas. As a result, most labs are held on the Raanana campus.

Another weakness that we identified during the preparation of this report, which deserves more consideration and significant improvement, is the *evaluation of course coordinators*, a process that in recent years, has not been performed regularly and seriously enough in our department (see 3.3.2.2, 3.5.3 and summary of Chapter 4). The new system and guidelines for course coordinator evaluation, which is currently being implemented in all academic departments of the OUI, will certainly help us to improve this process. We intend to give this issue priority and monitor it more closely.

As to *tutor evaluation*, although course coordinators are usually in close contact with the tutors of their course/s and regularly observe tutorial sessions, the reporting system should be improved. The Dean of Academic Studies recently set up guidelines for a new tutor evaluation process, which will be implemented, university-wide, next year, and will make the system more effective. In addition, during the self-evaluation process, we discovered that some of the tutors who teach more than one group per semester are not veteran tutors (see 3.5), a situation that should be avoided with new tutors.

Last is the issue of the *degrees* that the OUI grants: for historical reasons, most of our degrees are BA and not BSc degrees because the CHE initially authorized the OUI to grant BA degrees. In our experience, this in itself does not pose a problem, since our graduates are accepted to advanced studies in other universities, in Israel and abroad. However, since the question is often raised, mostly by students but sometimes also by other institutions, we feel that the time has come to ask for a change, especially considering the fact that the CHE recently authorized dual-disciplinary BSc degrees in Chemistry and Life Sciences, and in Computer Science and Life Sciences. We believe that the continuous change in the content of our programs over the years, which is reflected in an increase in the number and variety of Life Sciences courses in general and laboratory courses in particular, justifies such a change.

Apart from the MA in Biological Thought, we will probably not be able to offer other *graduate programs* in Life Sciences due mainly to the lack of research laboratories.

To sum up, performing this comprehensive self-evaluation, which examined various aspects of the activity of the Department of Natural Sciences, and particularly that of the Life Sciences staff, illuminated more strongly some issues that deserve further attention, improvement and changes. With these deeper insights in mind, we intend to deal with these issues regularly, and on a case-by-case basis.

5.4 Consolidation Process of the Self-Evaluation Report

At the first meeting held regarding the self-evaluation report, with the participation of OUI management, Dr. Roccas, members of the Life Sciences faculty and Ms. Gila

Haimovic (the English-language editor responsible for the self-evaluation reports), a suggested timetable for work on the report was distributed.

At the first meeting of the departmental self-evaluation Steering Committee, tasks were allocated so that the responsibility for preparing parts of the report were divided among the members, and a detailed timetable for completing each part was set. It was decided that the Steering Committee would meet on a weekly basis to track progress and to discuss various issues concerning the report. In the first stage, team members were asked to submit to the Evaluation Department requests for data needed to compile the report. All course coordinators were asked to submit CVs and detailed syllabi of the courses they teach.

During the entire process, all material relevant to preparing the report was posted in an internal department folder, which was especially created on the OUI server and was accessible to all. The folder also included the CHE guidelines and previous reports submitted by the University (in Management and in Psychology). The entire department faculty and staff were periodically notified regarding progress and updates. Each team member submitted a draft version of the part of the report that s/he had to prepare. The version was read and commented on by the rest of the team. Dr. Barnea corrected and updated the draft version according to the team's comments. An updated version was posted in the report folder, and, if necessary, this updated version went through additional review and reading. Dr. Barnea compiled the full version of the report and submitted it for language editing. The report was then read and commented on by Prof. Simona Ginsburg, the fifth senior faculty member in Life Sciences who was on sabbatical and therefore did not take an active part in the ongoing process and the weekly meetings. The full and final report was submitted to Dr. Roccas, to Prof. Limor, and to OUI President, Prof. Gershon Ben-Shakhar, for their comments.

5.5 Mechanism for Continued Monitoring of the Handling of Problematic Issues

Overall, we intend to review in details the problematic issues that were highlighted by the self-evaluation activity and define appropriate strategies to improve our performance in those areas in which we are weak. More specifically, in order to deal with the issues that arose in this report, we plan to take the following steps:

- A team from the department should prepare a document describing the short and long-term approaches to handling problematic issues highlighted in this report. The department head, in collaboration with the Vice President for Academic Affairs, should ensure that the proposed approaches for handling problems be integrated into annual work plans so that the required resources are allocated.
- The department will monitor handling of the problems on an ongoing basis in accordance with the measures taken. Monitoring will be documented in a report that is submitted at time intervals commensurate with problem type (semester, annual or five-year basis).

5.6 Are the Evaluation Findings Available and Accessible to the Staff and Students?

A copy of the report is posted on the quality evaluation folder that was created for the project on the OUI server. This is open to all members of the department. A copy will also be posted on the University intranet site, and will be accessible to all OUI staff. Printed copies of the report will be available in the Library and in the Department office for review by faculty, administrative staff and students.