

Spotlight: Cognitive Science



How do we initially acquire language and what do we learn from speakers of the language that we hear all around us? What processes lead the information that first reaches our retina towards a three-dimensional representation in our brain of some familiar object in our environment? What is the mental mechanism that enables us to acquire knowledge of another person's emotional status? Why do we continue to fall prey to optical illusions? Is the physical structure of the brain essential to thought, or is a silicone "brain" also capable of a thought process similar to ours? Can a computer think? Can a robot have consciousness or awareness?

These questions represent only a small portion of the research undertaken in the study of cognitive science, which attempts to understand processes such as sensory perception, language acquisition, the perception of art, decision-making; in effect, all cognitive processes. A basic premise of cognitive science is that a full understanding of these processes requires inter-disciplinary cooperation.

The principal academic disciplines that play a role in any

cognitive science project are psychology, linguistics, philosophy, computer science, and brain science. The primary goal of cognitive scientists is to reveal how human beings and other living creatures receive and process information, including the processes that encode it, convert it from one format to another, retain and retrieve it from memory, and create a synthesis between different items of information received from different channels. Another important concept that is fundamental to cognitive science is seeing the mind as a computer. One of the major roles of the discipline is to penetrate that computer's "software" – that is, the algorithms that make up the different processes.

The Open University boasts a significant number of cognitive science researchers, which has enabled us to open a full bachelor's degree program in the field. This is only the second full cognitive science bachelor's degree program to be established in the Israeli academic world. It has been offered since 2009-2010, and in May 2012 the Council for Higher Education authorized us to award the degree. The OUI degree is dual-disciplinary, and includes studies in one of the following disciplines: philosophy, psychology, computer science, mathematics, administration, and education. The most popular combination is cognitive science and psychology. In its first two years, 100 students listed cognitive science as one of their areas of study. The first group of students is expected to complete degree studies at the end of 2013.

One special feature of the Open University Cognitive Science Program is that, in addition to basic studies in the different disciplines, it also includes a number of courses focused on the interdisciplinary cooperation that is characteristic of the field. One such course is "The Basics of Cognitive Science." This is a unique course with a variety of lectures delivered by researchers from different areas of cognitive science from both the OUI and other universities. Each lecturer presents a different area of research in the subject, including examples from his or her own specialist field. Other interdisciplinary courses include "Brain and Cognition," which covers brain and behavioral research and combines a variety of research methodologies such as brain imaging, electrical brain recording and behavioral-cognitive research methods; and "Language and Cognition," which examines the links between linguistic research and psychology, and neurophysiology and computer science.

The degree program requires that students demonstrate a diverse range of study skills, such as an aptitude for abstract philosophical thought processes, empirical psychological methodologies, and mathematical models. All these requirements clearly make this a highly demanding and challenging program, and by definition one that is appropriate for outstanding students. Naturally, the OUI's open acceptance policy in no way contradicts an adherence to the highest levels of academic

standards, and those undertaking this course provide a fine example of the possibility for such a policy to be consistent with standards of excellence.

The challenging nature of the program led to the opening of the Outstanding Students Track. Students achieving high grades in the initial stages of the program and completing four courses (Statistics, Philosophy, Computer Science, and Psychology) with a grade of 90 and above are accepted into this special track. In addition to receiving tuition grants, these students are personally mentored by a senior faculty member. They are also offered opportunities to participate in faculty research projects and in seminars for outstanding students. So far, seven students, including four women, have been accepted into the Outstanding Students Track.

One of these students is 26-year-old Yam Tzur, a resident of Moshav Beit Halevi. Yam has always been fascinated by the mysteries of the mind and tries to watch every possible documentary film on anything connected with the brain. As soon as she heard of the Open University's cognitive science program, she knew that it was tailor-made for her. In addition to working as an assistant kindergarten attendant, and writing, composing and performing songs (one of which has been broadcast on several radio stations), Yam has also excelled in psychology and cognitive science courses. Her exceptionally high grades made her eligible for acceptance to the Outstanding Students Track. Her combination of cognitive science and psychology courses will enable Yam to choose which path to pursue in the future; whether it be cognitive research or clinical psychology.

Beyond qualifying our students, the Open University hopes that the program will also produce collaborative research ventures between faculty members from different cognitive science disciplines. The program brings together researchers from the fields of psychology, biology, education, computer science, linguistics, and philosophy.

One interdisciplinary seminar has already taken place, which, in addition to Open University faculty members, was also attended by Prof. Katrin Amunts of Aachen University in Germany. Another seminar and further research collaborations are planned for the near future.