



Detailed curriculum for the course:
Biology of mental illness

Academic year:	2023/2024
Programs:	Biotehnologija i istraživanje lijekova (2 nd /3 rd year) Biotechnology for the Life Sciences (1 st year) BioYUFE elective course
Course code:	EBIL168
ECTS points:	3
Language of the course:	English
Teaching hours:	30 hours (9 hours lecture, 21 hours seminar)

Pre-requisites for enrolment: No specific courses required.

Course leader and contact information:

Title and name: Izv.prof.dr.sc. Nicholas J. Bradshaw
Address: Faculty of Biotechnology & Drug Development, O-226
E-mail: nicholas.b@biotech.uniri.hr

Time period: 8th March 2024 – 17th May 2024

Teaching staff: Izv. prof. dr. sc. Nicholas J. Bradshaw (8 hours lectures, 17 hours seminars)
Dr. sc. Ana Filošević Vujnović (1 hour lectures, 2 hours seminars)
Dr. sc. Aristeja Pavešić Radonja, dr. med. (1 hour seminar)
Dr. med. Ilijana Stanivuk (1 hour seminar)

Required literature:

None, although students will be required to undertake independent reading in preparation for the seminars.

Course description:

Major mental illnesses are devastating conditions that represent one of the most significant causes of disability both globally and within Europe. Despite the enormous personal and economic effects of these illnesses, progress in revealing their underlying biology has been slow, and is only now truly beginning to be understood.



In this course, students will be taught about biological aspects of major mental illnesses, with a particular focus on schizophrenia, bipolar disorder and major depressive disorder. Lectures will provide an overview of the aetiology and symptoms of these conditions, before focussing in turn on therapeutic options available for treatment, how we define the conditions, the biological causes of the conditions at a personal and cellular level and how these conditions can be studied in clinical and laboratory situations. Students will explore the sociological and ethical complications surrounding research and treatment of these conditions through a series of organised debates.

Assessment will occur through a individual written tasks and group seminar-based activities, including the debates. For the group tasks, students will be required to work together with students from other YUFE Universities.

Through this course, it is intended that students will develop an understanding of the devastating and widespread conditions, but also gain a broader understanding of the experimental methods by which researchers can investigate and eventually understand complicated biological conditions.

Learning outcomes:

After completion of the course, students should be able to:

- 1) Describe the symptoms and methods of diagnosis for a range of mental illnesses
- 2) List a range of treatment options for these conditions and discuss (where known) their means of action
- 3) Understand and describe environmental factors contributing to their onset
- 4) Understand the role of heritability in major mental illness, and genetic methods by which candidate genes for the conditions can be identified
- 5) As an example, describe several prominent examples of genes studied in relation to schizophrenia
- 6) Understand the potential uses and limitations of different animals models in mental illness research
- 7) Discuss the means by which genetic-environmental interactions can be studied, both in the clinic and using animal models
- 8) As an example, describe the use of *Drosophila* in addiction research
- 9) Discuss modern approaches to major mental illness, including protein-based methods
- 10) Debate and discuss ethical and sociological issues regarding mental illness

Detailed course content:

Lectures:

- L1. Introduction to mental illness – 1 hour
- L2. Treatment options – 1 hour
- L3. Environmental risk factor – 1 hour
- L4. Genetic risk factors – 1 hours
- L5. Investigating mental illness in the clinic – 1 hours
- L6. Rodent models of major mental illness – 1 hours
- L7. Recent approaches – addiction and *Drosophila* – 1 hour
- L8. Recent approaches – protein disorders – 1 hour
- L9. Recent approaches – peptides – 1 hour



Seminars:

- S1. Working in a clinic – 2 hours
- S2. Mental illness diagnoses – 2 hours
- S3. Treatment options – 2 hours
- S4. Environmental risk factor – 2 hours
- S5. Genetic risk factors – 2 hours
- S6. Investigating mental illness in the clinic – 2 hours
- S7. Animal models of major mental illness – 2 hours
- S8. Addiction and *Drosophila* – 2 hours
- S9. Research approaches – 2 hours
- S10. Final presentations – 3 hours

Requirements, methods of assessment and evaluation:

Examination deadlines:

The first test deadline will be Friday 24th May 2024, 13:00 and conducted online

The second test deadline will be Friday 14th June 2024 11:00, and conducted online

Additional test deadlines (maximum two, between July and September) will be by arrangement with the students.

Students are allowed to sit the exam a maximum of three times

Qualification and grades (according to *Pravilniku o studijima Sveučilišta u Rijeci*):

Assessment during the course (70%)

70% of the course will be assessed on seminar work performed during the course, which will consist of presentations, debates and written tasks. Note, that ability in the English language will not be specifically assessed at any stage of the course, however the course will require students to be able to make themselves understood in both spoken and written English.

Final exam (50%)

The final exam will be completed online after the end of the course.

Eligibility to sit the final exam will be based on scores achieved during the course (out of a maximum of 30%):

- Students scoring between 0 and 14.9% will not be allowed to sit the final exam
- Students scoring between 15% and 30% will be allowed to sit the final exam



Final grades

The following grades will be awarded based on the final score:

Percentage score	ECTS grade	Croatian grade
90% to 100%	A	Excellent (5)
75% to 89.9%	B	Very good (4)
60% to 74.9%	C	Good (3)
50% to 59.9%	D	Satisfactory (2)
0% to 49.9%	F	Unsatisfactory (1)

The final grade is based on the sum of percentage points accumulated during the course and on the final exam. Passing grades are excellent (5), very good (4), good (3) and satisfactory (2).

Schedule of classes:

Date	Time	Location	Activity	Teacher
08.03.2024	13:00-14:00 CET (UTC+1)	Online	Lecture 1 Introduction to mental illness	Nicholas Bradshaw
	14:00-16:00 CET (UTC+1)	Online	Seminar 1 Working in a psychiatry clinic	Aristea Pavešić Radonja Ilijana Stanivuk
15.03.2024	13:00-14:00 CET (UTC+1)	Online	Lecture 2 Treatment options	Nicholas Bradshaw
	14:00-16:00 CET (UTC+1)	Online	Seminar 2 Mental illness diagnoses	Nicholas Bradshaw
22.03.2024	13:00-14:00 CET (UTC+1)	Online	Lecture 3 Environmental risk factors	Nicholas Bradshaw
	14:00-16:00 CET (UTC+1)	Online	Seminar 3 Treatment options	Nicholas Bradshaw
29.03.2024	No classes			
05.04.2024	13:00-14:00 CET (UTC+2)	Online	Lecture 4 Genetic risk factors	Nicholas Bradshaw
	14:00-16:00 CET (UTC+2)	Online	Seminar 4 Environmental risk factors	Nicholas Bradshaw



Date	Time	Location	Activity	Teacher
12.04.2024	13:00-16:00 CEST (UTC+2)	Online	Lecture 5 Clinical research	Nicholas Bradshaw
	13:00-14:00 CET (UTC+2)	Online	Seminar 5 Genetic risk factors	Nicholas Bradshaw
19.04.2024	13:00-14:00 CET (UTC+2)	Online	Lecture 6 Rodent research	Nicholas Bradshaw
	14:00-16:00 CET (UTC+2)	Online	Seminar 6 Clinical research	Nicholas Bradshaw
26.04.2024	13:00-14:00 CET (UTC+2)	Online	Lecture 7 Drosophila as a model	Ana Filošević Vujnović
	14:00-16:00 CET (UTC+2)	Online	Seminar 7 Animal research	Nicholas Bradshaw
03.05.2024	13:00-14:00 CET (UTC+2)	Online	Lecture 8 Proteins in mental illness	Nicholas Bradshaw
	14:00-16:00 CET (UTC+2)	Online	Seminar 8 Drosophila as a model	Ana Filošević Vujnović
10.05.2024	13:00-14:00 CET (UTC+2)	Online	Lecture 9 Peptides in mental illness	Nicholas Bradshaw
	14:00-16:00 CET (UTC+2)	Online	Seminar 9 Research approaches	Nicholas Bradshaw
17.05.2024	13:00-16:00 CET (UTC+2)	Online	Seminar 10 Final presentations	Nicholas Bradshaw

Additional information:

Academic integrity

Students are required to respect the principles of academic integrity, and refer to the documents: *Etički kodeks Sveučilišta u Rijeci* and *Etički kodeks za studente*.