Detailed curriculum for the course:

Biology of mental illness

Academic year: 2024/2025

Programs: Biotehnologija i istraživanje lijekova (2nd/3rd year)
Biotechnology for the Life Sciences (1st year)
BioYUFE elective course

Course code: EBIL168

ECTS points: 3

Language of the course: English

Teaching hours: 30 hours (11 hours lecture, 19 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
University of Rijeka, Radmile Matejčić 2
51000 Rijeka, Croatia
E-mail: nicholas.b@biotech.uniri.hr

Time period: 7th March 2025 – 16th May 2025

Teaching staff: Izv. prof. dr. sc. Nicholas J. Bradshaw
Dr. sc. Ana Filošević Vujnović

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 hour
L6. Animal models of major mental illness – 1 hour
L7. Recent lecture – Addiction and *Drosophila* – 1 hour
L8-11. Additional research lectures 1-1.5 hours each

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. Final presentations – 3 hours

Requirements, methods of assessment and evaluation:

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

Assessment during the course (50%)
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 presentation (50%)
The final exam will take the form of a presentation and be completed online after the end of the course. Students have the right to retake this up to two times (up to three additional presentation dates can be scheduled in total for the class, and will be arranged by agreement with the course leader)

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
For Croatian and BioYUFE students, 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	Activity	Teacher
07.03.2025	13:00-16:00	Lecture 1 Introduction to mental illness	Nicholas Bradshaw
		Seminar 1 Working in a psychiatry clinic	Nicholas Bradshaw
14.03.2025	13:00-16:00	Lecture 2 Treatment options	Nicholas Bradshaw
		Seminar 2 Mental illness diagnoses	Nicholas Bradshaw
21.03.2025	13:00-16:00	Lecture 3 Environmental risk factors	Nicholas Bradshaw
		Seminar 3 Treatment options	Nicholas Bradshaw
28.03.2025	13:00-16:00	Lecture 4 Genetic risk factors	Nicholas Bradshaw
		Seminar 4 Environmental risk factors	Nicholas Bradshaw
04.04.2025	13:00-16:00	Lecture 5 Clinical research	Nicholas Bradshaw
		Seminar 5 Genetic risk factors	Nicholas Bradshaw
11.04.2025	13:00-16:00	Lecture 6 Animal research	Nicholas Bradshaw
		Seminar 6 Clinical research	Nicholas Bradshaw
18.04.2025	Break (Easter)		

Date	Time	Activity	Teacher
25.04.2025	13:00-16:00	Lecture 7 Drosophila as a model	Ana Filošević Vujnović
		Seminar 7 Animal research	Nicholas Bradshaw
02.05.2025	13:00-16:00	Lecture 8 Research lecture 1	Nicholas Bradshaw
		Seminar 8 Drosophila as a model	Ana Filošević Vujnović
09.05.2025	13:00-16:00	Lecture 9 Research lecture 2	Nicholas Bradshaw
		Lecture 10 Research lecture 3	Nicholas Bradshaw
16.05.2025	13:00-16:00	Seminar 9 Final presentations	Nicholas Bradshaw

Additional information:
Academic integrity

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