



Detailed curriculum for the course:  
**Biology of mental illness**

<b>Academic year:</b>	2020/2021
<b>Programs:</b>	Biotechnology for the Life Sciences (1 <sup>st</sup> year) Biotehnologija i istraživanje lijekova (2 <sup>nd</sup> /3 <sup>rd</sup> year)
<b>Course code:</b>	EBIL168
<b>ECTS points:</b>	3
<b>Language of the course:</b>	English
<b>Teaching hours:</b>	30 hours (19 hours lecture, 7 hours seminar, 4 hours practical) Online: 6 hours seminars (20%)
<b>Pre-requisites for enrolment:</b>	No specific courses required.
<b>Course leader and contact information:</b>	
Title and name:	Doc.dr.sc. Nicholas J. Bradshaw
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E-mail:	nicholas.b@biotech.uniri.hr
<b>Time period:</b>	7 <sup>th</sup> June 2021 – 18 <sup>th</sup> June 2021
<b>Teaching staff:</b>	Doc.dr.sc. Nicholas J. Bradshaw (16 hours lecture, 7 hours seminar) Izv.prof.dr.sc. Luca Malatesti (1 hour lecture) Dr.sc. Ana Filošević Vujnović (2 hours lecture, 4 hours practical × 3 groups)

**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 Croatia. 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 (lecture 1), before focussing in turn on therapeutic options available for treatment (lectures 2 and 3), how we define the conditions (lecture 5), the biological causes of the conditions at a personal and cellular level (lectures 4, 6 and 9) and how these conditions can be studied in clinical and laboratory situations (lectures 7, 8 and 10).

This will be supplemented by practical experience of a model system for mental illness: using the fruit fly *Drosophila* to study drug addiction. Finally, students will explore the sociological and ethical complications surrounding research and treatment of these conditions through a series of organised debates.

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 animal 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 (from theory and practical experience) 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 – 2 hours
- L2. Therapeutic options – 1.5 hours
- L3. Antipsychotics, antidepressants and mood stabilisers – 2.5 hours
- L4. Environmental risk factors – 2 hours
- L5. Psychiatric illness: The philosopher's perspective – 1 hour
- L6. Genetic risk factors – 3 hours
- L7. Rodent models of major mental illness – 1.5 hours
- L8. Investigating mental illness in the clinic – 1.5 hours
- L9. Chronic mental illnesses as protein disorders – 2 hours
- L10. Addiction and using *Drosophila* as a model system – 2 hours



*Seminars:*

S1. Controversies in mental illness – 1 hour

S2.-S4. Debates – 2 hours each (6 total)

The seminars will revolve around discussing the various ethical, philosophical and sociological issues regarding mental illness, including their treatment, education and potential sources of stigma. This will occur primarily through a series of debates. Each student will be required to perform a presentation in one of the debates, while contributing to the discussion in the remaining two.

*Practical:*

P1. Using *Drosophila* as a model of addiction – 4 hours

**Requirements, methods of assessment and evaluation:**

**Examination deadlines:**

The first test deadline will be Friday 18<sup>th</sup> June 2021, 10:00, room O-030.

The second test deadline will be Friday 25<sup>th</sup> June 2021, 12:00, room O-268.

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

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

*Assessment during the course (50%)*

Students will obtain score during the course, in the following areas:

Preliminary exam (15%): – This will consist of short answer questions, based on material covered in lectures 1-5

Seminar work (25%) – Students will be assessed based on their contributions to the debates (S3, S4 and S5). This will include content of their presentations (10%), presentation delivery (5%) and their involvement in both asking (5%) and answering questions (5%) during the discussion phase.

Practical work (10%) – Students will be assessed based on both their results and understanding shown during the practical 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 consist of two sections:

Short answer questions - based on content of lectures 6-10

Multiple choice questions - taken from the entire course

Eligibility to sit the final exam will be based on scores achieved during the course (out of a maximum of 50%):

- Students scoring between 0 and 24.9% will not be allowed to sit the final exam



- Students scoring between 25% and 50% 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	Numerical 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	Group	Time	Location	Activity	Teacher
Mon. 7.6.21	All	9:00-10:30	O-030	L1	Nicholas Bradshaw
	All	10:45-11:30	O-030	S1	Nicholas Bradshaw
Tues. 8.6.21	All	9:00-10:10	O-030	L2	Nicholas Bradshaw
	All	10:30-12:15	O-030	L3	Nicholas Bradshaw
Wens. 9.6.21	All	9:00-10:30	O-030	L4	Nicholas Bradshaw
	All	10:45-11:45	O-030	L5	Luca Malatesti
Thurs. 10.6.21	All	9:00-11:00	O-030	L6	Nicholas Bradshaw
Fri. 11.6.21	All	9:00-10:00	O-030	Mid-course exam	
	All	10:10-11:20	O-030	L7	Nicholas Bradshaw
	All	11:30-12:45	O-030	L8	Nicholas Bradshaw



Date	Group	Time	Location	Activity	Teacher
Mon. 14.6.21	All	9:00-10:30	O-030	L9	Nicholas Bradshaw
	All	10:45-12:15	O-030	L10	Ana Filošević Vujnović
Tues. 15.6.21	All	9:00-10:30	Zoom	S3	Nicholas Bradshaw
	1	12:00-16:00	O-353	P1	Ana Filošević Vujnović
Wens. 16.6.21	All	9:00-10:30	Zoom	S4	Nicholas Bradshaw
	2	14:00-17:00	O-353	P1	Ana Filošević Vujnović
Thurs 17.6.21	All	9:00-10:30	Zoom	S5	Nicholas Bradshaw
	3	14:00-17:00	O-353	P1	Ana Filošević Vujnović
Fri. 18.6.21	All	9:00-11:00	O-030	Final exam (1 <sup>st</sup> sitting)	
<i>Fri. 25.6.21</i>	<i>As needed</i>	<i>12:00-14:00</i>	<i>O-268</i>	<i>Final exam (2<sup>nd</sup> sitting)</i>	

### **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*.