SVEUČILIŠTE U RIJECI
ODJEL ZA MATEMATIKU

Sveučilište u Rijeci •Odjel za matematiku
Radmile Matejčić 2 • 51 000 Rijeka • Hrvatska
T: (051) 584-650 • F: (051) 584-699
http://www.math.uniri.hr• e-adresa: math@math.uniri.hr

COURSE SYLLABUS

General information		
Course title	**Statistics**	
Study programme	Graduate course Discrete Mathematics and Its Applications	
Year of study	1st	
Course status	Compulsory	
Course homepage	**https://moodle.srce.hr**	
Language of instruction	English	
Credit values and modes of instruction	***ECTS credits / student workload***	
	Hours (L+E+S)	30+30+0
Lecturer	***Name and surname***	**Ivana Slamić**
	Office	O-321
	Office hours	Tuesday 10-12
	Phone number	051/584-672
	E-mail	islamic@math.uniri.hr
Teaching assistant	***Name and surname***	**Luči Krnić**
	Office	O-332
	Office hours	četvrtak 14:00 - 16:00
	Phone number	
	E-mail	luci.krnic@math.uniri.hr

1. COURSE DESCRIPTION

1.1. Course objectives

The main objective of this course is to get students acquainted with basic ideas and concepts of mathematical statistics. For that purpose, it is necessary within the course to:

- demonstrate basic ways of presentation of statistical data,
- describe the classification of statistical variates,
- define parametres of a sequence of statistical data,
- analyse continuous random variables and vectors that are important in statistics,
- define estimators and describe their properties,
- define confidence intervals,
- define and analyse statistical hypothesis testing,
- describe methods of hypothesis testing,
- enable students to independently use computer software for statistical data analysis

1.2. Course prerequisites

None.

1.3. Learning outcomes

After completing this course, the students are expected to:

- present statistical data in tabular and graphical form (A7, B7, E4, F5),
- explain the classification of statistical variables (A7, B7, E4, F5),
- analyse continuous random variables and vectors that are used in statistics (A7, B7, E4, F5),

• use and understand estimators and their properties within the specific statistical models (A7, B7, E4, F5), • using a computer, construct confidence intervals and conduct a procedure of testing statistical hypotheses (A7, B7, E4, F5), • using a computer, apply methods of statistical data analysis (A7, B7, E4, F5), • mathematically prove validity of all procedures and formulas that are used within the course (A7, B7, E4, F5).
1.4. Course content
Descriptive statistics. Continuous random variables and vectors. Conditional distributions and mathematical expectation. Statistical structure. Estimations of parameters. Confidence intervals. Statistical hypothesis testing. ANOVA. Linear regression models.

1.5. Modes of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☒ e-learning ☐ field work	☒ independent work ☒ multimedia and the internet ☐ laboratory ☐ tutorials ☐ mentoring work ☒ consultative teaching ☐ other
1.6. Comments		

1.7. Student requirements
Students are required to attend classes and actively participate in them. They are required to achieve a certain number of points during the semester and to pass the final exam.

2. GRADING POLICY

2.1. Grading of students' work during the semester and on the final exam

Students' work will be evaluated and graded during the semester and on the final exam. The total number of points a student can achieve during the semester is **70**. Through all forms of evaluation during the semester (midterm exams, seminar), students are required to achieve at least 50% points in order to gain access to the final exam.

MIDTERM EXAMS (**50** points total): During the semester, there will be two written exams which will include assignments related to the material covered both in the exercises and lectures. On each of these exams a student can achieve at most **25** points. At the end of the semester, there will be a possibility for students to write one make-up midterm.

SEMINAR (**20** points total): Each student is required to write a seminar and give a short presentation. Assignments and the date of the presentation will be given at the beginning of the semester. Through this activity, it is possible to achieve at most **20** points.

FINAL EXAM (**30** points total): The final exam is an oral exam. It is possible to achieve at most **30** points.

2.2. Minimal requirements for access to the final exam / passing grade

ACTIVITY	MINIMAL NUMBER OF POINTS REQUIRED
MIDTERM EXAMS	25
SEMINAR	10
TOTAL:	35

SVEUČILIŠTE U RIJECI
ODJEL ZA MATEMATIKU

Sveučilište u Rijeci •Odjel za matematiku
Radmile Matejčić 2 • 51 000 Rijeka • Hrvatska
T: (051) 584-650 • F: (051) 584-699
http://www.math.uniri.hr• e-adresa: math@math.uniri.hr

OTHER REQUIREMENTS:	

2.3. Final grade – grading scale

GRADE	POINTS
Excellent (5) , A	90% - 100%
Very good (4), B	75% - 89,9%
Good (3), C	60% - 74,9%
Sufficient (2), D	50% - 59,9%
Insufficient (1), F	0% - 49,9%

3. LITERATURE

3.1. Required literature

1. Ž. Pauše, *Uvod u matematičku statistiku*, Školska knjiga, Zagreb, 1993.
2. F. Daly, D. J. Hand, M. C. Jones, A. D. Lunn, K. J. McConway, *Elements of Statistics*, Addison Wesley, 1995.

3.2. Recommended literature

1. N. Sarapa, *Vjerojatnost i statistika*, II dio, Školska knjiga, Zagreb, 1996.
2. R. C. Mittelhammer, *Mathematical statistics for economics and business*, Springer Verlag, New York, 1996.
3. J. E. Freund, *Mathematical Statistics*, Prentice Hall, New York, 1992.
4. D. Williams, *Weighing the Odds*, Cambridge University Press, 2001.
5. R. B. Ash, *Lectures on Statistics*, University of Illinois, 2007. (http://www.math.uiuc.edu/~r-ash/Stat.html)

4. ADDITIONAL INFORMATION

4.1. Class attendance

No disturbance of classes will be tolerated, and the usage of calculators, cell phones or electronic devices of any kind is forbidden during class.

4.2. Informing students

All relevant course information will be posted on the course homepage, on https://moodle.srce.hr. It is the student's personal responsibility to be regularly informed, by checking the web page of the course and their official email.

4.3. Other relevant information

Students are expected to have a high degree of independence and responsibility in their work. During the course, an active aproach to learning will be encouraged.

While performing the tasks specified within the course curriculum, students must represent their own work, and they are not allowed to use someone else's text as their own. Submitting work that incorporates someone else's ideas without citation is considered as stealing intellectual property and can be punished according to the university regulations. Students should prepare their work according to the instructions given during classes.

4.4. Assessment of quality and performance for the course

The quality of the lectures is assessed in accordance with the regulations of the Department of Mathematics and the University of Rijeka. At the end of the semester, an anonymous survey will be conducted, in which students will evaluate the quality of the lectures. Additionally, the department will conduct the analysis of the examination results.

4.5. Examination period

Final exam (1st examination period)	June 14, 2021, 8:00
Final exam (2nd examination period)	June 28, 2021, 8:00

SVEUČILIŠTE U RIJECI
ODJEL ZA MATEMATIKU

Sveučilište u Rijeci •Odjel za matematiku
Radmile Matejčić 2 • 51 000 Rijeka • Hrvatska
T: (051) 584-650 • F: (051) 584-699
http://www.math.uniri.hr• e-adresa: math@math.uniri.hr

Final exam (3rd examination period)	September 7, 2021, 9:00

5. COURSE OUTLINE*

DATE	*TIME*	*MODE OF INSTRUCTION*	*TOPIC*	*GROUP*	*LECTURE HALL*
1.3.2021.	***11:15-12:45***	L	*Introduction. Descriptive statistics I*	All	***363***
5.3.2021.	***13:15-14:45***	E	*Introduction to R*	All	***364***
8.3.2021.	***11:15-12:45***	L	*Descriptive statistics II*	All	***363***
12.3.2021.	***13:15-14:45***	E	*Descriptive statistics I*	All	***364***
15.3.2021.	***11:15-12:45***	L	*Conditional distributions and expectation*	All	***363***
19.3.2021.	***13:15-14:45***	E	*Descriptive statistics II*	All	***364***
22.3.2021.	***11:15-12:45***	L	*Conditional distributions and expectation II*	All	***363***
26.3.2021.	***13:15-14:45***	E	*Continuous random variables*	All	***364***
29.3.2021.	***11:15-12:45***	L	*Statistical structure I*	All	***363***
2.4.2021.	***13:15-14:45***	E	*Continuous random vectors*	All	***364***
9.4.2021.	***13:15-14:45***	E	*Conditional distributions and expectation*	All	***364***
12.4.2021.	***11:15-12:45***	L	*Statistical structure II*	All	***363***
16.4.2021.	***13:15-14:45***	E	*Estimation of parameters*	All	***364***
19.4.2021.	***11:15-12:45***	L	*Estimation of parameters I*	All	***363***
23.4.2021.	***13:15-14:45***	E	*Confidence intervals*	All	***364***
26.4.2021.	***11:15-12:45***	L	*Estimation of parameters II*	All	***363***
30.4.2021.	***13:15-14:45***	E	*Testing statistical hypothesis I*	All	***364***
3.5.2020.	***11:15-12:45***	L	*Estimation of parameters III*	All	***363***
7.5.2020.	***13:15-14:45***	E	***1st midterm exam***	All	***364***
10.5.2021.	***11:15-12:45***	E	*Testing statistical hypothesis II*	All	***363***
14.5.2021.	***13:15-14:45***	E	*ANOVA, χ2-test and the Kolmogorov-Smirnov test Testing statistical hypothesis*	All	***364***
17.5.2021.	***11:15-12:45***	E	*Linear regression models*	All	***363***
21.5.2021.	***13:15-14:45***	L	*The Neyman-Pearson lemma*	All	***364***
24.5.2021.	***11:15-12:45***	L	*Tests about the parameters of normal distrubution*	All	***363***
28.5.2021.	***10:15-12:00***	L	*Linear regression models I*	All	***364***

SVEUČILIŠTE U RIJECI
ODJEL ZA MATEMATIKU

Sveučilište u Rijeci •Odjel za matematiku
Radmile Matejčić 2 • 51 000 Rijeka • Hrvatska
T: (051) 584-650 • F: (051) 584-699
http://www.math.uniri.hr• e-adresa: math@math.uniri.hr

31.5.2021.	***11:15-12:45***	L	*Linear regression models II*	All	***363***
4.6.2021.	***10:15-12:00***	E	***2nd midterm exam***	All	***364***
7.6.2021.	***11:15-12:45***	L	***Seminar***	All	***363***
11.6.2021.	***10:15-12:00***	E	***Make up of midterm exam***	All	***364***

**Minor changes are possible.*

L – lectures
E – exercises
S – seminars