

## Incoming student mobility

UNIOS University Unit: SCHOOL OF APPLIED MATHEMATICS AND INFORMATICS

### COURSES OFFERED IN FOREIGN LANGUAGE FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	School of Applied Mathematics and Informatics
Study program	Graduate university study programme in mathematics (Master level) Branches: <ul style="list-style-type: none"> <li>• Financial Mathematics and Statistics</li> <li>• Mathematics and Computer Science</li> </ul>
Study level	Graduate (master)
Course title	Stochastic Processes I
Course code (if any)	M119
Language of instruction	English
Brief course description	<p>Syllabus.</p> <ol style="list-style-type: none"> <li>1. Definition of a stochastic process. Types of stochastic processes. Examples of stochastic processes in discrete time.</li> <li>2. Discrete-time Markov chains. Definition and basic properties (initial distribution, transition probability function and matrix of transition probabilities). Important examples. Higher order transition probabilities. Chapman – Kolmogorov equations. State space decomposition to classes of communication. Absorption probabilities. Strong Markov property. Recurrence and transience. Canonical decomposition (on return classes and transient states). Periodicity. Stationary distribution and invariant measure. Limiting distribution. Ergodic theorem.</li> <li>3. Discrete-time martingales and their properties. Previsible (predictable) processes. Martingale transformation. Stopping time. Important examples and applications.</li> </ol>
Form of teaching	
Form of assessment	Lectures and exercises are obligatory. The final exam is oral, taken after the completed lectures and exercises and achieved minimum number of credits at the midterm exams. Students can influence the

## ERASMUS+

EU programme for education, training, youth and sport

	grade by writing homework during the semester.
Number of ECTS	6
Class hours per week	2+2+0
Minimum number of students	
Period of realization	Winter semester
Lecturer	Ivan Papić