Course descriptor

Title of the course	**Game Theory and Its Applications**
Title of the Academic Programme	Bachelor in "Management" 38.03.02
Type of Course	Main course
Prerequisites	Game Theory
ECTS workload	4

Total indicative study hours	Directed Study	Self-directed study	Total
	78	106	184

Course Overview	Game theory is a framework for hypothetical social situations among competing players. In some respects, game theory is the science of strategy, or at least the optimal decision-making of independent and competing actors in a strategic setting. The key pioneers of game theory were mathematicians John von Neumann and John Nash, as well as economist Oskar Morgenstern. This course is aimed at students, researchers, and practitioners who wish to understand more about strategic interactions. You must be comfortable with mathematical thinking and rigorous arguments. Relatively little specific math is required; but you should be familiar with basic probability theory (for example, you should know what a conditional probability is), and some very light calculus would be helpful. Topics: 1. Basic concepts of game theory. Classification and description of games 2. Static noncooperative games 3. Dynamic games with complete and imperfect information 4. Repeated games 5. Cooperative games and bargaining models 6. Matching, Social rules, Voting rules 7. Bankruptcy problem, Auctions
Intended Learning Outcomes (ILO)	Acquirement of core competencies in the sphere of Game Theory. Acquirement of necessary theoretical base and practical skills in the sphere of Game Theory. Students' preparation for managerial, analytical, research and entrepreneurial roles in companies and organizations.
Indicative Course Content	Directed Study
Teaching and Learning Methods	The course consists of lectures (38 hours) and seminars (40 hours). The seminars involve solving particular examples. At the end of first section students will need to separate in groups and make a presentation on the seminar based on the scientific paper. Best presentations will be required to make presentation during the lecture.
Indicative Assessment Methods and Strategy	Total grade for the course: $Q\_total=0.6*Q\_cumtotal+0.4*Q\_exam2$, here: Q_exam2 is a grade of the final exam of the course in the 2nd module, $Q\_cumtotal$ is a total cumulated grade for the course. Total cumulated grade: $Q\_cumtotal=0.3*Q\_Module1+0.7*Q\_cum2$,

	here: Q_Module1 is a total grade of the 1st Module Q_cum2 is a cumulated grade for the 2nd module. Cumulated grade for the 2nd module: Q_cum2=0.2*Q_Quizzes+0.3*Q_Pres+0.5*Q_CW2, where Q_Quizzes is the average grade of the quizzes, Q_CW2 is the grade for the written class work in the second module Q_Pres is the grade for the presentation
Readings / Indicative Learning Resources	<u>Mandatory</u> Peters, H., Game Theory, Springer-Verlag Berlin Heidelberg, 2015 <u>Optional</u> – Shagin, V. L. Game Theory: tutorial and workshop / L. V. Shagin. — 2nd ed. Rev. and extra — M.: Urait, 2017. — 223 p. — (Series: Author's textbook). — ISBN 978-5-534-03263-5. — Pp. 16-81 – Avinash K. Dixit, Susan Skeath, David H. Reiley Jr. (2014), Games of Strategy (Fourth Edition), W. W. Norton & Company – Ein-Ya Gura, Michael Maschler (2008), Insights into Game Theory An Alternative Mathematical Experience – Mazalov, V., Mathematical Game Theory and Applications, Wiley, 2014 – Osborn M.J., An Introduction to Game Theory, International Edition International, 2018, Oxford University Press – Печерский, С.Л., Беляева, Е.Б., Теория игр для экономистов (вводный курс), Европейский университет в Санкт-Петербурге, 2002 – Печерский, С.Л., Яновская, Е.Б., Кооперативные игры: решения и аксиомы, Европейский университет в Санкт-Петербурге, 2004
Course Instructors	Ovanes Petrosian – lecturer Dmitry Pokrovskiy, Yaroslavna Pankratova, Aleksandra Grinikh