



## Big Data: Theory and Application

<b>Version</b>	2020/1
<b>Effective from (date of when the course was developed)</b>	06/11/2020

<b>Course Credits given</b>	4 ECTS
<b>Level/Year</b>	Bachelor, Master and PhD students
<b>Teaching (contact) hours</b>	54
<b>Total learner managed hours (incl. self-work)</b>	90
<b>Total hours of student learning</b>	144

<b>Pre-requisites</b>	Knowledge of general technical disciplines is desirable: - Linear algebra: vectors, matrices, and their products, derivative; - Probability theory: random events, mathematical expectation, variance; - Basic programming knowledge: Python/R, SOLID, SQL, git, docker.
<b>Co-requisites</b>	None
<b>Alignment to graduate profiles</b>	This programme contributes to achievement of the graduate outcomes of the following qualifications: <ul style="list-style-type: none"> <li>• Bachelor of Information Technology</li> <li>• Graduate Diploma in Information Technology</li> <li>• Diploma in Information Technology</li> </ul>
<b>Course aim</b>	The program includes fundamental and applied aspects of research in the field of big data processing; development of innovative technologies and software solutions for solving problems of analysis, pre-processing, forecasting and other applied tasks. Students interact with specialized software, create new solutions and mathematical models in the field of intelligent big data processing. Teams of students study and demonstrate general and highly specialized methods of data analysis, demonstrate skills in developing complex models. They use the latest innovations in machine learning.
<b>Indicative Course content</b>	Content may include but is not limited to: <ul style="list-style-type: none"> <li>• Introduction to Big Data</li> <li>• Working with Big Data</li> <li>• Systems for collecting, processing and storing big data</li> <li>• Machine Learning</li> </ul>

### LEARNING OUTCOMES

<b>On successful completion of this course students will be able to:</b>	
1	To understand modern software development tools; software that allows you to solve practical problems of processing large amounts of data
2	To know modern information technologies used in science and industry; hardware and software complexes and systems used in high-load big data processing systems; current trends in the development of information technologies
3	To choose, to create complexes and to operate software and hardware in the created computing and information systems and network structures; to set and solve software problems related to the choice of architectural elements in the design of high-load systems

### ASSESSMENTS

<b>Basis of assessment</b>	Achievement based assessment
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Methods of assessment	Learning Outcomes	Pass criteria (Minimum)	% Weightings
Summative review	1, 2	50%	40%
Summative of project work	3	50%	60%

#### REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Mark of 50% or more in every summative assessment</li> <li>• Gain a course result of 50% or higher</li> </ul>
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#### RESULTS

<b>Assessment results</b>	Results for assessments are given in percentage marks
<b>Course results</b>	<ul style="list-style-type: none"> <li>• Individual assessments may cover one or more of the learning outcomes</li> <li>• Each summative assessment is assigned a percentage weighting</li> <li>• The overall percentage mark for the course is calculated by adding the weighted results for all summative assessments</li> </ul>

#### LEARNING AND TEACHING

<b>Learning and teaching approaches</b>	Lectures, group discussions, tutorials, learner managed activities, laboratories, presentations, research, projects and case studies.
<b>Learning and teaching resources</b>	Textbooks, journals and manuals; use of Internet; laboratory and specialist software: <ul style="list-style-type: none"> <li>• Jupyter Notebook</li> <li>• JetBrains Pycharm Community Edition</li> <li>• Apache Hadoop</li> <li>• SQL and NoSQL server</li> </ul>
<b>Learner managed activities</b>	<ul style="list-style-type: none"> <li>• Completion of course work, set assignments/projects</li> <li>• Reading of course materials</li> <li>• Study group work</li> <li>• Preparation for classes</li> <li>• Homework</li> <li>• Research</li> <li>• Discussions with colleagues/subject matter experts</li> <li>• Review application of information to project work</li> <li>• Practising relevant practical and technical skills/methods/techniques</li> <li>• Presentation and self-evaluation of project work</li> <li>• Gathering relevant contextual information/ issues/ideas to build knowledge of the subject</li> </ul>