Title (Units): **COMP 7120 Advanced Topics in Big Data Analytics and Management (3,2,1)**

Course Aims: To learn the advanced techniques and tools for big data analytics and management, and apply them in selected case studies

Prerequisite: Research Postgraduate Student Standing

Course Intended Learning Outcomes (CILOs):
Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Describe the principles and techniques of big data analytics and management
2	Explain the concepts of GPU computing, distributed computing, and cloud computing to support big data analytics and management
3	Identify the state-of-the-art deep learning models and training methods
	Skill
4	Apply different techniques and tools for big data analytics and management
5	Design and implement appropriate solutions to big data analytics and management problems

Calendar Description: The course offers a study of the advanced techniques and tools of big data analytics and management. It also provides case studies on one or more of the advanced topics in computer vision, natural language processing, big graph analytics and management, and health informatics.

Teaching and Learning Activities (TLAs):

CILOs	TLAs will include the following:
1-3	Students will learn the concepts and techniques of big data analytics and management via lectures, assignments, and exams.
4-5	Students will gain practical skills via lab sessions and course projects.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Remarks
1	Written Assignments	30%	1-4	Continuous assessments in the form of written assignments will be used to evaluate how well students have learned the concepts, principles, techniques and tools for big data analytics and management
2	Project Assignments	30%	1-4	Continuous assignments in the form of a project will be used to evaluate how well students can apply the techniques and tools for big data analytics and management problems.
3	Examination	40%	1-3	The examination will be used to evaluate the students' overall understanding and proficiency in the principles, techniques, and tools of big data analytics and management.

Assessment Rubrics:

Excellent (A)	• Achieve all five CILOs, demonstrating a thorough understanding and solid knowledge of big data analytics and management • Able to apply a variety of techniques for solving problems in big data analytics and

	management
Good (B)	• Achieve most of the five CILOs, demonstrating a good understanding and competent knowledge of big data analytics and management • Able to apply an appropriate technique for solving problems in big data analytics
Satisfactory (C)	• Achieve some of the five CILOs, demonstrating a basic level of understanding and knowledge of big data analytics and management • Able to provide solutions for familiar problems in big data analytics and management
Fail (F)	• Achieve a few of the five CILOs, with little understanding of big data analytics and management • Unable to provide solutions for simple problems in big data analytics and management

Course Content and CILOs Mapping:

Content	**CILO No.**
I. Introduction to big data analytics and management	1
II. Advanced technologies and tools for big data analytics and management	2-5
III. One or more advanced topics in big data analytics and management A. Computer vision B. Natural language processing C. Big graph analytics and management D. Health informatics	4-5

References: Venkat Ankam, Big Data Analytics, Packt Publishing, 2016. (ISBN 978-1785884696)
Simone Gressel, David Pauleen, Nazim Taskin, Management Decision-Making, Big Data and Analytics, SAGE Publications Ltd, 2020. (ISBN 978-1526492005)
Balamurugan Balusamy, Nandhini Abirami R, Seifedine Kadry, Amir H. Gandomi, Big Data: Concepts, Technology, and Architecture, Wiley, 2021. (ISBN 978-1-119-70182-8)
Additional reading materials such as research papers and book chapters will be provided.

Course Content in Outline:

Topic

I. Introduction to big data analytics and management

II. Advanced technologies and tools for big data analytics and management
- A. GPU computing
- B. Distributed computing and cloud computing
- C. Deep learning algorithms and platforms
- D. Big data visualization

III. One or more advanced topics in big data analytics and management
- A. Computer vision
- B. Natural language processing
- C. Big graph analytics and management
- D. Health informatics