

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

**Course Aims:** To learn the advanced techniques and tools for big data analytics 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)
	<b>Knowledge</b>
1	Describe the principles and techniques of big data analytics
2	Explain the concepts of GPU computing, distributed computing, and cloud computing to support big data analytics
3	Identify the state-of-the-art deep learning models and training methods
	<b>Skill</b>
4	Apply different techniques and tools for big data analytics
5	Design and implement appropriate solutions to big data analytics problems

**Calendar Description:** The course offers a study of the advanced techniques and tools of big data analytics. It also provides case studies on one or more of the advanced topics in computer vision, natural language processing, big graph analytics, 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 via lectures, assignments, and exams.
4-5	Students will gain the practical skills via lab sessions and course projects.

**Assessment:**

No.	Assessment Methods	Weighting	CILOs to be addressed	Remarks
1	Continuous assessment	50%	1-5	Continuous assessments will be used to evaluate how well students have learned the techniques and tools for big data analytics. A project will be used to assess the students' skills in applying the techniques and tools for data analytics problems.
2	Examination	50%	1-5	Examination will be used to evaluate the students' overall understanding and proficiency on the principles, techniques, and tools of big data analytics.

**Assessment Rubrics:**

<b>Excellent (A)</b>	<ul style="list-style-type: none"><li>Achieve all five CILOs, demonstrating a thorough understanding and solid knowledge of big data analytics</li><li>Able to apply a variety of techniques for solving problems in big data analytics</li></ul>
<b>Good (B)</b>	<ul style="list-style-type: none"><li>Achieve most of the five CILOs, demonstrating a good understanding and competent knowledge of big data analytics</li><li>Able to apply an appropriate technique for solving problems in big data analytics</li></ul>
<b>Satisfactory (C)</b>	<ul style="list-style-type: none"><li>Achieve some of the five CILOs, demonstrating a basic level of understanding and knowledge of big data analytics</li><li>Able to provide solutions for familiar problems in big data analytics</li></ul>
<b>Fail (F)</b>	<ul style="list-style-type: none"><li>Achieve few of the five CILOs, with little understanding of big data analytics</li><li>Unable to provide solutions for simple problems in big data analytics</li></ul>

**Course Intended Learning Outcomes and Weighting:**

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

**References:** Venkat Ankam, Big Data Analytics, Packt Publishing, 2016. (ISBN 978-1785884696)  
Sebastian Raschka, Python Machine Learning, Packt Publishing, 2015. (ISBN 978-1783555130)  
Additional reading materials such as research papers and book chapters will be provided.

**Course Content in Outline:****Topic**

- I. Introduction to big data analytics
- II. Advanced technologies and tools for big data analytics
  - 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
  - A. Computer vision
  - B. Natural language processing
  - C. Big graph analytics
  - D. Health informatics