



# UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES

Alubijid | Balubal | **Cagayan de Oro** | Claveria | Jasaan | Oroquieta | Panaon | Villanueva

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<p><b>Program Educational Objectives:</b></p> <p>Three to five (3-5) years, graduates of BS Data Science are:</p> <p>1. proficient in the Data Science field and able to engage constantly in big data analysis and professional advancement by pursuing a higher academic level and/or practicing quality improvement in their career or entrepreneurial endeavor;</p> <p>2. highly competent in generating new ideas and innovations in Data Science emphasizing on capturing, storing, retrieving and visualizing massive data; and</p> <p>3. leading data scientists who can effectively work on data sets to extract knowledge and identify patterns in order to predict trends; and contribute significantly to human development, socio-economic transformation and national initiatives.</p> <p><b>Program Outcomes:</b></p> <p>a. Apply knowledge of computing science, and mathematics, and business management in solving complex data-driven problems;</p> <p>b. Use current standards and best practices within data-science and specific areas of mathematics (e.g. statistical analysis, optimization, machine learning, network analysis, experiment design, and algorithms, among others.) in solving complex</p>	<b>III. Course Outline:</b>								
	<b>Allotted Time</b>	<b>Course Outcomes (CO)</b>	<b>Intended Learning Outcomes (ILO)</b>	<b>Topic/s</b>	<b>Suggested Readings</b>	<b>Teaching-Learning Activities</b>	<b>Assessment Tasks/Tools</b>	<b>Grading Criteria</b>	<b>Remark</b>
	<b>2 hours</b> <b>Week 1</b>			<b>Course Orientation</b>  - University’s Vision and Mission  - CITC Goals and Objectives  - Class Policies and Agreement  - Grading System  - Course Requirements  - Course Syllabus, Course Outline Presentation	   <				

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<p>data-driven problems and requirements;</p> <p>c. Analyze complex data-driven problems by applying analytical and quantitative reasoning; and identify the statistical and computing requirements appropriate to its solution;</p> <p>d. Extract, process and analyze data sets, including Big Datasets too large for traditional data processing techniques;</p> <p>e. Design, implement and evaluate different predictive models, techniques, processes, components, or programs to meet desired needs and requirements under various constraints;</p> <p>f. Integrate effectively the big data analytics solutions into government sectors such as transportation, public health and safety, environmental issues as well as issues in the corporate and non-profit organizations;</p> <p>g. Create, select, adapt and apply appropriate techniques, resources, mathematical or statistical models, machine/deep learning and other modern tools to complex data science activities;</p> <p>h. Utilize data science and its technologies as strategies in marketing/branding of potential entrepreneurial ventures;</p> <p>i. Function effectively as individual or work collaboratively and respectfully as a member or leader in diverse development teams and in</p>	<p><b>10 hours</b> <b>Week 4-5</b></p>	CO1	<ul style="list-style-type: none"> <li>- Describe how to use stored procedure in Relational Database Management Systems.</li> <li>- Illustrate how stored functions can be used in Relational Database Management Systems.</li> <li>- Describe the properties of constraints and triggers in SQL.</li> <li>- Explain the difference between Definer versus Invoker Rights.;</li> </ul>	Stored Procedures and Triggers	<p>IV. 2 (a)</p> <p>*Modern Database Systems</p> <p>*Database Management Systems</p>	Flipped classroom	<p>Quiz</p> <p>Laboratory Activity</p>	See Grading System		
	<p><b>10 hours</b> <b>Week 6-7</b></p>	CO1	<ul style="list-style-type: none"> <li>- Describe the stages of Query Processing.</li> <li>- Explain the various types of Query Processing algorithms available in Database Management.</li> <li>- Understand the fundamentals of Query-Based Optimization techniques.</li> </ul>	Query Optimization	<p>IV. 2 (a)</p> <p>*Modern Database Systems</p> <p>*Database Management Systems</p>	Jigsaw	<p>Gamified Quiz</p> <p>Think-Pair-Share</p>	See Grading System		
	<p><b>5 hours</b> <b>Week 8</b></p>	CO2	<ul style="list-style-type: none"> <li>- Describe the stages and properties of transactions.</li> <li>- Explain the concepts involved with serializability and the serializability theorem.</li> </ul>	Concurrency and Recovery	<p>IV. 2 (a)</p> <p>*Modern Database Systems</p> <p>*Database Management Systems</p>	<p>Jigsaw</p> <p>Concept Discussion</p>	<p>Quiz</p> <p>Creative Presentation</p>	See Grading System		



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multi-cultural and multi-disciplinary settings; j. Communicate effectively in both oral and in written form by being able to deliver and comprehend instructions clearly; and present persuasively to diverse audience the data science-related ideas and perspectives; k. Assess the model used to solve data science tasks and identify its local and global impact on individuals, organizations, and society; l. Recognize the need to engage in independent learning and be at pace with the latest development in a specialized Data Science field, with emphasis on Massive Data Analytics and Business Intelligence for continual development as a computing professional; m. Participate in generation of new knowledge, or in research and development projects with the end view of contributing to local and national economy; and n. Preserve and promote “Filipino historical and cultural heritage”.			- Demonstrate an understanding of the actions involved in concurrency control.		*Database Management Systems					
	MIDTERM EXAMINATION									
	10 hours Week 10-11	CO3	- Identify and describe the components and characteristics of Data Warehouses.  - Demonstrate the appropriate syntax for SQL OLAP Extensions.  - Understand how to use the algebraic operator for OLAP queries.	Data Warehousing	IV. 2 (a)  *Modern Database  *Database Systems  *Database Management Systems  *The Manga Guide to Databases	Flipped Classroom  Interactive Demonstration	Problem Set  Laboratory Activity	See Grading System		
	15 hours Week 12-14	CO3	- Identify and describe the components and characteristics of the object-oriented data model.  - Describe the role that query processing has on object-oriented databases.  - Identify and describe the components and characteristics of the object-relational database systems.  - Explain the object-relational data model.	Object-Oriented and Object-Relational Databases	IV. 2 (a)  *Modern Database  *Database Systems  *Database Management Systems	Problem Set  Creative Presentation		See Grading System		
	15 hours Week 15-17	CO4	- Explain the basics of the XML language.	XML and Databases	IV. 2 (a)  *Modern Database  *Database Systems  *Database Management Systems	Laboratory Activity  Quiz		See Grading System		
FINAL EXAMINATION										

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## IV. Course Requirements:

### 1. Class standing (attendance, participation, etc.) policy:

(a) Expected classroom behavior (may want to develop this with the students, e.g., What guidelines m are appropriate for behavior and participation in a large class

- Students must come to class on time.
- Strict observance of deadlines.
- Class participation is encouraged.
- Observe proper courtesy.

(b) Ground Rules for participation in discussions or

- Only one student may talk at a time.
- Must follow instructions for every activity given.
- For group activity, each member must participate accordingly.

### 2. Course Readings/Materials:

(a) Titles, authors, and editions of textbooks and other materials, required and recommended

1. **Silberschatz–Korth–Sudarshan (2001):Database System Concepts, Fourth Edition**
2. Person Education Limited (2004): Database Concepts
3. R. Ramakrishnan and J. Gehrke (2003): Database Management Systems, 3ed
4. Fundamentals of Database Systems, 6th ed., Elmasri & Navathe, Addison-Wesley, 2011, ISBN: 978-013-608620-8
5. Modern Database Management, 11th ed., Hoffer, J.A., Ramesh, V. and Toppi, H, 2013
6. The Manga Guide to Database, Mana Takahashi
7. Database Systems 8th Edition (2009);Peter Rob and Carlos Coronel

(b) Supplies needed (calculators, software, workbooks, disks, CDs, lab supplies, art supplies, etc.)

- xampp
- IM
- Talend

(b) URLs for online resources

- DBMS Tutorial: Learn Database Management System
- <https://www.guru99.com/dbms-tutorial.html>
- Database Tutorials
- [https://www.tutorialspoint.com/database\\_tutorials.htm](https://www.tutorialspoint.com/database_tutorials.htm)

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- SQL Tutotial
- <https://www.w3schools.com/sql/>
- Database Tutorial
- <https://www.quackit.com/database/tutorial/>
- Relational Database
- <https://www.udacity.com>

### 3. Assignments, Assessment, and Evaluation

- Policy concerning homework (grading, posting, late policy, etc.)  
Students may share ideas as they work on their assignments but the submitted assignments must be their own work.
- Policy concerning make-up exams  
No special examination is given unless a student has valid reasons stipulated in the Student Handbook Article 3: Excused Absences.
- Policy concerning late assignments/requirements
  - Assignments: no assignment for a particular date, will have a grade of zero (0).
  - Projects: late submission of projects will have a corresponding consequence. There will be a deduction of points for every day that the project submission will be late.
- Preliminary information on term papers or projects, with due dates
  - Projects for midterm and finals are given ahead of time along with its corresponding due dates, rubrics, and other requirements for the completion of the projects.
  - Non-submission of projects does not mean you
- List of assignments that will impact the final grade and % weight given each
  - Portfolio: grade will be part of the PIT.
- Description in detail of grading processes and criteria (how many quizzes, tests, papers; weighting of each; amount of homework, etc.) or the GRADING POLICY

Grading System

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	<b>Lecture Grade (67%)</b>	
	Performance Item/Criteria	%
	Class Performance Item	10%
	Quizzes (All quizzes, prelim and pre-final exams)	40%
	Major Exams (i.e, Midterm and Final Exams)	30%
	Performance Innovative Task / Project	20%
	TOTAL	100%
	<b>Laboratory Grade (33%)</b>	
	Performance Item/Criteria	%
	Laboratory Exercises/Reports	30%
	Laboratory Major Exam	40%
	Hands on Exercises	30%
	TOTAL	100%
	Term/Periodic Grade = 67% Lecture Grade + 33% Laboratory Grade	
	Options:	
	FINAL GRADE (FG) = 1/3 Midterm Grade (MTG)+ 2/3 Final Term Grade (FTG)	
	FINAL GRADE (FG) = 1/2 Midterm Grade (MTG)+ 1/2 Final Term Grade (FTG)	
	(Passing Percentage is 70%)	
	Ex. In a 10-item quiz, obtaining 7 points would be equivalent to a passing score.	
	<b>Attendance and Participation in Co-Curricular Activities</b> Students are expected to attend and actively participate in relevant webinars, trainings, and competitions as part of their academic engagement. Participation in such activities will be awarded corresponding points, which shall be determined and arranged by the	
	<i>Disclaimer:</i> Every attempt is made to provide a complete syllabus that provides an accurate overview of the subject. However, circumstances and events make it necessary for the instructor to modify the syllabus during the semester. This may depend, in part, on the progress, needs, and experiences of the student.	

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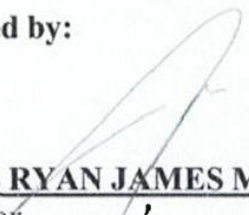
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**Prepared by:**

  
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