 rakoRepublic of the Philippines

SOUTHERN LEYTE STATE UNIVERSITY

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**COURSE SYLLABUS**

IT 301 – ADVANCED DATABASE SYSTEMS

First Semester, AY 2021-2022

**National Goal :** The attainment of globally competitive Filipinos through quality and excellent education, relevant and responsive to changing environment, accessible and equitable to deserving students, and efficient and effective in optimizing returns and benefits.

**Vision :** A high quality corporate science and technology university

**Mission :** SLSU will: a) Develop Science, Technology and Innovation leaders and professionals; b) Produce high-impact technologies from research and innovations; c) Contribute to sustainable development through responsive community engagement programs; d) Generate revenues to be self-sufficient and financially-viable;

**University Goals** : SLSU shall develop comprehensive curricula to produce S and T leaders and professionals; establish a culture of science and technology-based research; facilitate adoption of technology to communities and service areas; intensify production capability; establish transparent, efficient and effective management system.

**Quality Policy** : We, at Southern Leyte State University, commit enthusiastically to satisfy our stakeholders’ needs and expectation by adhering to good governance, relevance, and innovations of our instruction, research and development, extension and other support services and to continually improve the effectiveness of our Quality Management Systems in compliance to ethical standards and applicable statutory, regulatory, industry and stakeholders’ requirements.

The management commits to establish, maintain and monitor our quality management system and ensure that adequate resources are available.

**Core Values** : **S**ervice Excellence

**L**eadership Competence

**S**tewardship and Accountability

**U**nity in Diversity

**Program Outcomes**

1. ***Common to all programs in all types of schools***

The graduates have the ability to:

1. Articulate and discuss the latest developments in the specific field of practice.
2. Effectively communicate orally and in writing using both English and Filipino
3. Work effectively and independently in multi-disciplinary and multi-cultural teams.
4. Act in recognition of professional, social, and ethical responsibility.
5. Preserve and promote *“Filipino historical and cultural heritage”.*
6. ***Specific to Bachelor of Science in Information Technology***
7. Apply knowledge of computing, science, and mathematics appropriate to the discipline.
8. Understand best practices and standards and their applications.
9. Analyze complex problems, and identify and define the computing requirements appropriate to its solution.
10. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
11. Design, implement and evaluate computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints.
12. Integrate IT-based solutions into the user environment effectively.
13. Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession.
14. Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goal.
15. Assist in the creation of an effective IT project plan.
16. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations and clear instructions
17. Analyze the local and global impact of computing information technology on individuals, organizations, and society.
18. Understand professional, ethical, legal, security, and social issues and responsibilities in the utilization of information technology.
19. Recognize the need for and engage in planning self-learning and improving performance as a foundation for continuing professional development.
20. ***Institutional Outcomes***

w.) Responsible IT professional who can develop and contribute to the advancement in ICT field with global mindset.

***E. SLSU BS Information Technology graduates should be:***

1. Critical Thinking
2. Conceptual Thinking
3. Global Mindset
4. Open-Minded
5. Personal Responsibility
6. Leadership and Management Skills
7. Learning to Learn Skills
8. Problem Solving Skills
9. Research Skills

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| C0URSE NAME | **Advanced Database Systems** |
| COURSE DESCRIPTION | This course provides an understanding and practical application of NoSQL database utilizing the power of MongoDB. It will also cover how we can connect a Python App with a NoSQL database to create very efficient and well architecture applications. |
| NUMBER OF UNITS | 2 units (Lab), 1 unit (Lecture) |
| PREREQUISTE | Fundamentals of Database Management System |

1. **Course Details**

**B. Course Outcomes and Relationship to Program Outcomes**

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| **COURSE OUTCOMES** | **Program Outcomes** | | | | | | | | | | | | | |
| At the end of this course, the students must have: | f | g | h | i | j | k | l | m | n | o | p | q | r |
| ***Knowledge(Think)*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO1. Plan an information management system that utilizes MongoDB NoSQL as its primary database | E |  | D | D |  |  |  |  |  |  |  |  | D |
| ***Skills(Do)*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO2. Build the Information Management System according to the formulated plan | D | E | D |  |  |  | D |  |  |  |  |  |  |
| ***Values (Feel)*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO3. Defend the database architecture of the system and its other functions | D |  |  |  |  |  |  |  |  |  |  |  |  |

**C. Lecture Learning Plan**

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| **Graduate Attribute and CDIO Skills** | **Intended Learning Outcomes** | **Topics** | **Allotted Time in Hours** | **Teaching & Learning Activities** | **Assessment Tasks** | **Instructional Materials** |
| Critical Thinking  Conceptual Thinking | ILO 0 - At the end of the orientation, the students must have:   1. Explained and interpret the national and regional goal, University vision and mission, Campus objectives, program objectives, and relate the overall course outline, grading system and requirements. | **Orientation**   1. National Goal 2. SLSU Vision, Mission, Goals, Objectives and Quality Policy 3. Program Objectives 4. Program Outcomes 5. Course Outcomes 6. Course Outline 7. Course Grading System 8. Course Requirements 9. Gender Awareness and Development (GAD) 10. Student/s with Special Needs 11. Academic Integrity 12. Disaster and Risk Preparedness | 30 mins. | Lecture  Online, Mobile & Blended Learning  Team-based Learning | **Performance-Based Assessment**  The students should understand and inculcate the SLSU VMGO, its policy and core values | Course Syllabus  (IT 316)  Student Handbook |
|  | **ILO1.** Discuss the different functions that MongoDB can do | MongoDB Overview  MongoDB Advantages  MongoDB Environment  MongoDB Functions:  -Create DB  -Drop DB  -Create Collection -Data Types  -Insert Document | 5 hrs. | Flipped Classroom, Modules | Essay  *Grading is based upon***:** Attached rubrics for Essay | Internet source reference # (2)  Book reference # (1) |
| **ILO2.** Discuss the different functions of Python to create an app with MongoDB | **Mongo DB Functions**  -Query Document  -Update Document  -Delete Document  -Projection  Python Installation  Installing PyMongo Package PyMongo overview | 5 hrs. | Flipped Classroom, Modules | Essay  *Grading is based upon***:** Attached rubrics for Essay | Internet source reference # (3) |
| **ILO3.** Implement MongoDB functions to create a very simple system with Python | **Topics:**  PyMongo Create a database  PyMongo Create a collection  PyMongo Insert Data  PyMongo Find Data  PyMongo Query Data | 5.5 hrs. | Flipped Classroom, Modules | Project Based Assessment  *Grading is based upon***:** SL-QF-IN28 : Rubrics for projects/outputs | Internet source reference # (3)  Book reference # (2) |
| **CO1.** Plan an information management system that utilizes MongoDB NoSQL as its primary database | PyMongo Sort Data  PyMongo Limit Data | 20 | Flipped Classroom, Modules | Project Based Assessment  *Grading is based upon***:** SL-QF-IN28 : Rubrics for projects/outputs | Internet source reference # (3) |
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|  |  | **Total** | 36 hrs. |  |  |  |

**D. Laboratory Learning Plan**

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| **Graduate Attribute and CDIO Skills** | **Intended Learning Outcomes** | **Topics** | **Allotted Time in Hours** | **Teaching & Learning Activities** | **Assessment Tasks** | **Instructional Materials** |
| Critical Thinking  Conceptual Thinking | **ILO4.** Reproduce an existing system from a project created from the past that uses MySQL and transform it to MongoDB instead | PyMongo Drop Collection  PyMongo Update Data  PyMongo Delete Data | 12hrs. | Flipped Classroom, Moudle | Performance based assessment  *Grading is based upon***:** SL-QF-IN28 : Rubrics for projects/outputs | Internet sources reference # (2)  Book reference # (1) |
| **ILO5.** Produce a completely new information management system that utilizes MongoDB as its primary database applying best practices | Role of DBMS to Information Systems  MongoDB Best practices  (Most topics to complete this ILO is already covered on previous ILOs) | 12 hrs. | Flipped Classroom, Module | Performance based assessment  *Grading is based upon***:** SL-QF-IN28 : Rubrics for projects/outputs | Journal source reference # (1,2) |
| **CO2.** Build the Information Management System according to the formulated plan | (Topics are covered are from the ILOs) | 10 hrs. | Consultations | Performance based assessment (Partially built)  *Grading is based upon***:** SL-QF-IN28 : Rubrics for projects/outputs |  |
| **ILO6.** Demonstrate awareness to the different functions of MongoDB | (Topics covered by ILO1) | 5 hrs. | Consultations | Essay  *Grading is based upon***:** Attached rubrics for Essay | Internet source reference # (2)  Book reference # (1) |
| **ILO7.** Justify a system architectural decision | (Topics covered by ILO5) | 5 hrs. | Consultations | Essay  *Grading is based upon***:** Attached rubrics for Essay |  |
| **CO3.** Defend the database architecture of the system and its other functions | (Topics are covered are from the ILOs) | 10 hrs. | Consultations | Essay  *Grading is based upon***:** Attached rubrics for Essay | Journal source reference # (1,2) |
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|  |  | **Total** | 54 hrs. |  |  |  |
|  |  | **Overall Total** | 90 hrs. |  |  |  |

* + 1. **References**

**Books**

1. MongoDB: The Definitive Guide, by Kristina Chodorow & Michael Dirolf
2. MongoDB in Action, by Kyle Banker

**Journals**

1. SQL databases v. NoSQL databases. (2018). *SQL Databases v. NoSQL Databases*. Published. https://dl.acm.org/doi/abs/10.1145/1721654.1721659
2. Davoudian, A., Chen, L., & Liu, M. (2018). A Survey on NoSQL Stores. *ACM Computing Surveys*, *51*(2), 1–43. https://doi.org/10.1145/3158661

**Internet sources:**

1. Aloto, E. (2021, February 1). *MongoDB Best Practices: Design, Deployment & More*. Datavail. https://www.datavail.com/blog/mongodb-best-practices/
2. *MongoDB Tutorial*. (2021). Tutorials Point. https://www.tutorialspoint.com/mongodb/index.htm
3. *Python MongoDB*. (2021). PyMongo. https://www.w3schools.com/python/python\_mongodb\_getstarted.asp
4. ZE Media. (2018, June 26). *The Role of Database Management System in Information Systems*. Zema. https://blog.ze.com/the-zema-solution/the-role-of-database-management-system-in-information-systems/#:%7E:text=A%20DBMS%20plays%20a%20crucial,files%20stored%20in%20a%20database.

**F. Grading System**

*A. Lecture & Laboratory*

Learning Tasks 60%

Performance Based Tasks 40%

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Total 100%

**G. Rubrics**

* SL-QF-IN28 : Rubrics for projects/outputs
* Rubrics for essay

**H. Provisions for Flexibility:**

* Students with special needs shall be dealt with appropriately depending on the course activities /requirement

Prepared by: Recommending Approval: Approved:

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Instructor

**CONFIRMATION AND ACKNOWLEDGEMENT**

This is to confirm that the contents of the course syllabus in **IT301 – ADVANCED DATABASE SYSTEMS,** First Semester, 2021-2022 at SLSU, were discussed to us during the first day of class and a copy of which was provided for reproduction and individual reference and guide.

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