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| --- | --- | --- |
| VISION | : | A research university with culture of excellence in developing globally competitive and values-oriented leaders and professionals |
| MISSION | : | Provide advanced higher professional, technical and special instructions, as well as undertake innovative researches and collaborative extension and income generating programs, for the sustainable development of Sorsogon. |
| CORE VALUES | : | **S**ocial  **Co**mmitment  **Re**siliency |
| GOAL OF THE PROGRAM | : | The BS in Information Technology graduates are expected to become globally competent, innovative, and socially and ethically responsible computing professionals engaged in life-long learning endeavours. They are capable of contributing to the country’s national development goals. |
| PROGRAM DESCRIPTION | : | The BS in Information Technology program includes the study of the utilization of both hardware and software technologies involving planning, installing, customizing, operating, managing and administering, and maintaining information technology infrastructure that provides computing solutions to address the needs of an organization. |
| PROGRAM EDUCATIONAL OBJECTIVES | : | *A graduate of the Information Technology Program should:*   1. Contribute to economic development of the society through the application and management of Information Technology for business, government, service, and research. 2. Advance in their careers by applying Information Technology skills and by understanding evolving business and technological issues. 3. Continuing professional development through advanced studies and research. 4. Exhibit leadership qualities in their chosen career path. 5. Integrate Gender and Development basic concepts such as Gender mainstreaming, rights-based approach, and women’s empowerment in the awareness of the future teachers. |

**PROGRAM OUTCOMES IN RELATION TO PROGRAM EDUCATIONAL OBJECTIVES**

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| --- | --- | --- | --- | --- | --- | --- |
| **Program Outcomes** | | **Program Educational**  **Objectives** | | | | |
| 1 | 2 | 3 | 4 | 5 |
| 1 | Articulate and discuss the latest developments in the specific field of practice. | x |  |  |  | x |
| 2 | Effectively communicate orally and in writing using both English and Filipino. | x |  |  |  |  |
| 3 | Work Effectively and independently in multi-disciplinary and multi-cultural teams. | x | x |  |  |  |
| 4 | Apply knowledge of computing, science, and mathematics appropriate to the discipline. |  | x |  |  |  |
| 5 | Preserve and promote Filipino historical and cultural heritage. | x |  |  |  |  |
| 6 | Analyze complex problems, and identify and define the computing requirements needed to design and appropriate solution. |  | x | x |  |  |
| 7 | Apply computing and other knowledge domains to address real-world problems. |  |  |  |  |  |
| 8 | Design and Develop computing solutions using a system-level perspective. |  | x |  |  |  |
| 9 | Utilize modern computing tools. |  |  | x |  |  |
| 10 | Apply knowledge of computing, science, and mathematics appropriate to the discipline. |  |  |  |  |  |
| 11 | Understand best practices and standards and applications of networking. |  | x |  |  |  |
| 12 | Analyze complex problems, and identify and define the computing requirements appropriate to its solution. |  |  |  |  |  |
| 13 | Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of network technologies. | x | x | x |  |  |
| 14 | Design, implement, and evaluate computer-based systems, processes, components, or program to meet desired needs and requirements under various constraints. |  | x |  |  |  |
| 15 | Integrate IT-based solutions into the user environment effectively. |  |  |  |  |  |
| 16 | Apply knowledge in computer network through the use of current techniques, skills, tools and practices necessary for the IT profession. |  | x | x | x |  |
| 17 | Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goals. |  |  |  |  |  |
| 18 | Assist in the creation of an effective ICT network platform. |  | x |  |  |  |
| 19 | Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions. |  |  |  |  |  |
| 20 | Analyze the local and global impact of computing information technology on individuals, organizations, and society. |  |  | x | x |  |
| 21 | Understand professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology. |  |  | x | x |  |
| 22 | Recognize the need for and engage in planning self-learning and improving performance as a foundation for continuing professional development. |  |  |  |  |  |
| 23 | Graduates of the College participate in the generation of new knowledge and/or research and development of new knowledge. |  |  | x | x | x |

**COURSE SYLLABUS**

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| --- | --- |
| **COURSE CODE:** | IT 312 |
| **COURSE TITLE:** | Systems Integration and Architecture 1 |
| **PRE-REQUISITE:** | NONE |
| **CREDITS UNITS:** | 3 UNITS; 5hrs/week (Lecture: 2hrs; Lab: 3hrs) |
| **TERM:** | 1ST SEMESTER |
| **COURSE: DESCRIPTION:** | One of the roles of the IT professional is to design and build systems and integrate them into an organization. This knowledge area, student will develops the skills to gather requirements, then source, evaluate and integrate components into a single system, and finally validate the system.  The course topics covered include, but are not limited to documenting, integration requirements using business process models, designing integration solutions, and implementing integration solutions using service oriented architecture. Also, this course covers the fundamentals of project management and the interplay between IT applications and organizational processes. Students will extend course topics via homework assignments and other assigned activities. |

**CONTENT OUTLINE AND TIME FRAME**

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| --- | --- |
| **TIME FRAME** | **COURSE CONTENT / SUBJECT MATTER** |
| Week 1 | **VMGO**  **Gender and Development**   * Overview of Systems Integration: challenges and drivers * Type of Systems Integration |
| Week 2-3 | SIA Requirements |
| Week 4-5 | SIA Acquisition and Sourcing |
| Week 6 | Laboratory Session |
| Week 7-8 | SIA Integration and Deployment |
| Week 9 | **Midterm Examination** |
| Week 10-11 | SIA Project Management |
| Week 12-13 | SIA Testing and Quality Assurance |
| Week 14 | Laboratory Session |
| Week 15 | SIA Organizational Context |
| Week 15-16 | SIA Architecture |
| Week 17 | Presentation of Final Project |
| Week 18 | **Final Examination** |

**COURSE OUTCOME IN RELATION TO COURSE OBJECTIVES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Outcomes** | | **Course Objectives** | | | |
| 1 | 2 | 3 |  |
| 1 | Explain key challenges, concepts, drivers, and strategies related to systems integration projects | x |  |  |  |
| 2 | Explain and apply organizational and managerial issues related to systems integration projects | x | x |  |  |
| 3 | Explain and apply key systems integration architecture, methodologies, and technologies |  | x |  |  |
| 4 | Identify and assess current and emerging systems integration tools. | x |  | x |  |
| 5 | Define and analyze systems integration requirements using business process models. | x |  | x |  |
| 6 | Design feasible solutions for an integration problem that utilizes proven design solutions described in integration patterns. |  | x | x |  |
| 7 | Apply advanced integration technologies to implement system integration solutions. |  |  |  |  |
| 8 | Explain how standardized, components, implementation issues, certification, and case studies are used in an organization. |  |  | x |  |
| 9 | Assess how well a project follows its project plan. | x |  | x |  |
| 10 | Select the appropriate tools and techniques to create a testing environment. |  | x | x |  |
| 11 | Explain how the current IT infrastructure influences system architecture and system integration. |  |  | x |  |
| 12 | Assess how some specific system architecture supports enterprise architecture. | x |  | x |  |
| 13 | Explain key challenges, concepts, drivers, and strategies related to systems integration projects | x | x | x |  |
| 14 | Explain and apply organizational and managerial issues related to systems integration projects |  |  | x |  |
| 15 | Explain and apply key systems integration architecture, methodologies, and technologies |  | x | x |  |

**LEARNING PLAN:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Desired Learning Outcomes (DLO)** | **Course Content Subject Matter** | **Teaching and Learning Activities (TLA’s)** | **Assessment Task (AT)** | **Resource Materials** | **Time Table** | **Values Infused/ Competencies** |
| Explain key challenges, concepts, drivers, and strategies related to systems integration projects | Orientation   * Overview of Systems Integration: challenges and drivers * Type of Systems Integration | * Lecture and discussion | * Assignment * Recitation | * eBooks * Modules (pdf) * Online sources | Week 1 | Effective communication between technical and non-technical. |
| Explain and apply organizational and managerial issues related to systems integration projects | **SIA Requirements**   * Requirement, documentation, & maintenance * Use case model * Modeling tools and methodologies * Testing * Project lifecycle phases | * Lecture and discussion * Group Activity | * Quizzes * Assignment * Recitation | * eBooks * Modules (pdf) * Online sources | Week 2-3 | Collaborate with team member and stakeholders and have strong communication and technical skills. |
| Define and analyze systems integration requirements using business process models. | **SIA Acquisition and Sourcing**   * Build and buy * In-sourcing and outsourcing * System architecture: hardware, software and virtual Testing, evaluation and benchmarking * Contracts and Request for Proposal (RFPs) | * Lecture and discussion * Homework | * Quizzes * Seat Work * Recitation | * eBooks * Modules (pdf) * Online sources | Week 4-5 | Ensure the solution it choose is reliable, secure, and scalable with a low risk of failure and downtime. |
| Explain and apply key systems integration architecture, methodologies, and technologies | Laboratory Session | * Group Activity |  | * Computer/laptop | Week 6 | System integrator skills and do simple tasks, occupational health and safety |
| Design feasible solutions for an integration problem that utilizes proven design solutions described in integration patterns. | **SIA Integration and Deployment**   * Components, interfaces and integration * Infrastructure, middleware and platforms * Techniques – data warehouses, extending frameworks, wrappers, glue, facades * Testing/evaluation/benchmarking * System release: pilot and acceptance testing and defect repair * System support strategies and user support plans * Enterprise integration approaches, standards, and best practices | * Lecture and discussion * Homework * Group Activity | * Quizzes * Oral Recitation | * eBooks * Modules (pdf) | Week 7-8 | Ensure the integration process run smoothly and the integration solution continues to meet business needs over long terms. |
|  | **Midterm Examination** |  | Written Examination |  | Week 9 |  |
| Apply advanced integration technologies to implement system integration solutions. | **SIA Project Management**   * Cost benefit analysis * Roles, responsibilities, accountability Finance, estimation, budgeting Planning * Risk management * Scheduling * Tracking | * Lecture and discussion * Homework | * Quizzes * Oral Recitation | * Books * Modules (pdf) * Online sources | Week 10-11 | Practice accountability, ensure that the project is completed on time, within budget, and to a high standard of quality. |
| Select the appropriate tools and techniques to create a testing environment. | **SIA Testing and Quality Assurance**   * Standards * Techniques * Usability * Acceptance / contract conformance * Stress testing * Performance | * Lecture and discussion * Group Activity | * Quizzes * Oral Recitation | * Books * Modules (pdf) | Week 12-13 | Practice high quality standard for software development and e-commerce website. |
| Assess how well a project follows its project plan. | Laboratory Session | * Group Activity |  | * Computer/laptop | Week 14 | System integrator skills and do simple tasks, occupational health and safety |
| Apply advanced integration technologies to implement system integration solutions. | **SIA Organizational Context**   * Business processes * IT environment Organizational culture | * Lecture and discussion * Group Activity | * Quizzes * Oral Recitation | * Books * Modules (pdf) | Week 15 | Create a workplace culture that is respectful, equitable and supportive. |
| Explain how the current IT infrastructure influences system architecture and system integration. | **SIA Architecture**   * Representation/modeling * Information Architecture * Enterprise Architecture * System Architecture * Enterprise Integration * Applications (CRM, ERP) | * Lecture and discussion | * Quizzes * Oral Recitation | * Books * Modules (pdf) | Week 16 | Embrace scalability, efficiency, and cost-effectiveness. Adapt new opportunities and challenges. |
|  | **Presentation of Final Project** | * Group activity | * Rubric | * PPT/Slides presentation | Week 17 |  |
|  | **Final Examination** |  | Written Examination |  | Week 18 |  |

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| **REFERENCES**   1. Books  * Ravi Sethi (2023). Software Engineering: Basic Principles and Best Practices. Cambridge University Press. New York, USA. ISBN: 978-1-316-51194-7. * Ted Klastorin and Gary Mitchell (2021). Project Management: A Risk Management Approach. Sage Publication Inc. ISBN: 978-154-4-333972. * Ralph M. Stair and George Reynolds (2020). Principles of Information Systems. 13th Edition. Cengage Learning Asia Lte Ltd. ISBN: 978-981-48-9647-4. * Scott Telley (2020). System Analysis and Design. 12 Edition. Cengage Learning Asia. Lte, Ltd. ISBN: 978-981-48-7830-2. * Kenneth C. Laudon & Jane P. Laudon (2019). Management Information Systems: Managing the Digital Firm, 15th Edition. Pearson Education. ISBN 13: 978-1-292-21175-6. * Carlos Coronel & Steven Morris (2019). Database Systems: Design, Implementation, & Management. 13th Edition. Cengage Learning, INC. ISBN: 978-1-337-62790-0. * Ellen Monk & Bret Wagner (2019). Concepts in Enterprise Resource Planning (4th Edition). Course Technology -Cengage learning, USA. ISBN-13: 978-1-111-82039-8. |

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| **COURSE REQUIREMENTS**   * Quizzes (Short and Long Quizzes) * Major Examination * Class Participation (F2F) * HOMEWORK activity * Final Output (Case Study by group) | **PERFORMANCE STANDARD (ASSESSMENT CRITERIA)**   |  |  | | --- | --- | | **Theory** (35%) | **Laboratory** (65%) | | Examination - 30%  Recitation - 20%  Project (Case Study) - 20% Quizzes - 20%  Attendance - 10%  ----------  100% | Project - 35%  Performance - 35%  Attitude - 20%  Attendance - 10%  ----------  100% |     Computation of Semester Grade:   |  | | --- | | Semester Grade = (Midterm + Final) /2 | |
| **COURSE POLICIES** | For face-to-face classes, the following policies shall be observed:   1. Students are expected to attend face-to-face classes regularly. 2. Students are expected to actively participate in class discussions and activities. 3. Surprised short quiz will be administered, on or before the start of classes. 4. Students are expected to be in the network laboratory room 10 minutes before the start of lab activity, students who are late 10 minutes after the start will not be accommodated. |
| **CONSULTATION PERIOD** | Every Thursday, 10:30-11:30AM, at CCB Room 7, Computer Center Building |
| **FACULTY IN-CHARGE** | Name : **RUEL G. GRAFIA**  Academic Rank : ASSO. PROFESSOR I  Mobile # : 09202226042  Email address: : ruel.grafia@sorsu.edu.ph |

**FLEXIBILITY**

The course expects that the students will develops the skills to gather requirements, then source, evaluate and integrate components into a single system, and finally validate the system. This course also includes, but are not limited to documenting, integration requirements using business process models, designing integration solutions, and implementing integration solutions using service oriented architecture. The reference materials for this course are not limited to those listed above. The students may use other learning resources that they deemed appropriate and relevant. Reliable and accurate internet materials can also be used. The topics covered in this syllabus may also be altered depending on the needs of the students. The order and the phasing of the topics may also vary subsequently to the intensity of deliberations or discussions that may take place. Other unavoidable circumstances may also affect the phasing and completion of the course. In such cases, necessary adjustments and proper arrangements with the students shall be made to hold makeup classes to meet the target of the course.

Prepared by: Recommending Approval: Approved:

**ENGR. RUEL G. GRAFIA, MSIT** **ENGR. RUEL G. GRAFIA, MSIT ENGR. REY C. RODRIGUEZA, MIT MA.ELENA C. DEMDAM, RGC**

Faculty Name/Signature Program Chair/Signature Dean/Signature Campus Director/Signature