

**PANGASINAN STATE UNIVERSITY**

**Alaminos City, Pangasinan**

**BS IN INFORMATION TECHNOLOGY**

**SIA 101 - Software Integration & Architechture**

1st Semester, S.Y 2021 – 2022

**COURSE SYLLABUS**

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| **COURSE INFORMATION** | | | | | | | | | | | |
| **COURSE CODE** | | SIA 101 | | | | | | | | | |
| **COURSE TITLE** | | System Integration and Architecture | | | | | | | | | |
| **COURSE CREDIT** | | 3 (2 lecture; 1 lab) | | | | | | | | | |
| **CLASS HOURS** | | 90 hours | | | | | | | | | |
| **COURSE PREREQUISITE/**  **CO-REQUISITE** | | IPT 101 | | | | | | | | | |
| **COURSE SCHEDULE** | | |  |  | | --- | --- | |  |  | |  |  | | | | | | | | | | |
| **UNIVERSITY VISION, MISSION, QUALITY POLICY, INSTITUTIONAL OUTCOMES AND PROGRAM OUTCOMES** | | | | | | | | | | | |
| **UNIVERSITY VISION** | | To become an ASEAN Premier State University by 2020. | | | | | | | | | |
| **UNIVERSITY MISSION** | | The Pangasinan State University, through instruction, research, extension and production, commits to develop highly principled, morally upright, innovative and globally competent individuals capable of meeting the needs of industry, public service and civil society. | | | | | | | | | |
| **QUALITY POLICY** | | The Pangasinan State University shall be recognized as an ASEAN premier state university that provides quality education and satisfactory service delivery through instruction, research, extension and production.  We commit our expertise and resources to produce professionals who meet the expectations of the industry and other interested parties in the national and international community.  We shall continuously improve our operations in response to changing environment and in support of the institution’s strategic direction. | | | | | | | | | |
| **INSTITUTIONAL OUTCOMES** | | The Pangasinan State University Institutional Learning Outcomes (PSU ILO) are the qualities that PSUnians must possess. These outcomes are anchored on the following core values: **A**ccountability and Transparency, **C**redibility and Integrity, **C**ompetence and Commitment to Achieve, **E**xcellence in Service Delivery, **S**ocial and Environmental Responsiveness, and **S**pirituality – (ACCESS).  Anchored on these core values, the PSU graduates are able to:   1. Demonstrate through institutional mechanisms, systems, policies, and processes which are reflective of transparency, equity, participatory decision making, and accountability; 2. Engage in relevant, comprehensive and sustainable development initiatives through multiple perspectives in decisions and actions that build personal and professional credibility and integrity. 3. Set challenging goals and tasks with determination and sense of urgency which provide continuous improvement and producing quality outputs leading to inclusive growth; 4. Exhibit life-long learning and global competency proficiency in communication skills, inter/interpersonal skills, entrepreneurial skills, innovative mindset, research and production initiatives and capability in meeting the industry requirements of local, ASEAN and international human capital market through relevant and comprehensive programs; 5. Display, socially and environmentally responsive organizational culture, which ensures higher productivity among the university constituents and elevate the welfare of the multi-sectoral communities and; 6. Practice spiritual values and morally upright behavior which promote and inspire greater harmony to project a credible public image   . | | | | | | | | | |
| **PROGRAM OUTCOMES** | | |  |  |  | | --- | --- | --- | | **GRADUATE ATTRIBUTES** | **PROGRAM OUTCOMES** | **PERFORMANCE INDICATORS** | | Knowledge for solving computing problems | 1. Apply knowledge of computing, science, and mathematics appropriate to the discipline | 1. Identify or determine the techniques, tools, methodologies to be used given a particular scenario that involves computing, science, and mathematics 2. Compare different tools, techniques, methodologies as to their pros and cons that will help in decision making | |  | 1. Distinguish best practices and standards and their applications | 1. Identify the characteristics that conforms to standards and their best practices 2. Compare and contrast tools and methodologies in terms of best practices, standard and their application | | Problem analysis | 1. Analyze complex problems, and identify and define the computing requirements appropriate to its solution | 1. Analyze complex problems 2. Identify and define the complexity requirements appropriate to its solution | |  | 1. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems | 1. Analyze the user’s needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. 2. Identify the user’s requirements and take them into account in the selection, creation, evaluation and administration of computer-based systems. | | Design, development of  solutions | 1. Design, implement, and evaluate   computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints | 1. Translate specification into a design 2. Design software to meet desired needs under various constraint 3. Design a database to meet desired needs for storing data under various constraints 4. Design networks to meet desired needs for sharing information under various constraints 5. Design a hardware infrastructure to meet desired processing needs under various constraints 6. Implement a network to meet desired needs for sharing information under various constraint 7. Implement database to meet desired needs for storing data under various constraint 8. Implement a software to meet desired needs for task under various constraints 9. Evaluate software on its functionality and level of satisfying user requirements for task under various constraint 10. Evaluate an existing network for its level of satisfying user requirements for under various constraint | |  | 1. Integrate IT-based solutions into the user environment effectively | 1. Implement a network to meet desired needs for sharing information under various constraint 2. Implement database to meet desired needs for storing data under various constraint 3. Implement a software to meet desired needs for task under various constraints 4. Evaluate software on its functionality and level of satisfying user requirements for task under various constraint 5. Evaluate an existing network for its level of satisfying user requirements for under various constraint | | Modern Tool Usage | 1. Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession | 1. Evaluate techniques, methodologies, standards/frameworks and tools for its appropriateness to the IT Infrastructure to be designed and managed considering its advantages and limitations. 2. Select, use and adapt appropriate techniques, methodologies, standards/frameworks and tools the IT Infrastructure to be designed and managed. | | Individual and Team  Work | 1. Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a   common goal | **Team member:**   1. Independently source necessary knowledge, assistance, skills and resources to complete tasks. 2. Performs tasks effectively to accomplish a common goal   **Leader of a team:**   1. Set proper goals and timeline of activities to complete team objectives 2. Allocate task according to team member capabilities 3. Monitor task completion and performance of team member 4. Provide expertise, assistance and support to team members to achieve of team goals 5. Resolve and reduce conflicts within the team | |  | 1. Assist in the creation of an effective IT project plan | 1. Perform task in the creation of an effective IT project plan 2. Create an effective IT project plan | | Communication | 1. Communicate effectively with the computing community and with   society at large about complex computing activities through logical writing, presentations, and clear instructions | 1. Interview clients to gather background information, situation, existing concerns and issues necessary to frame and achieve common understanding of problems to be addressed by computing solutions 2. Write effective reports and documentations about the results of performing specific computing and professional tasks 3. Write documentations (including design documentations) completely and comprehensively, with appropriate tone, correct grammar and construction, adapting to documentation standards, to communicate ideas, choices, assumptions, and consequences of decisions 4. Develop effective presentation material that will enhance understanding of ideas being communicated 5. Deliver presentations effectively and efficiently to various audience (computing community, society at large, and users) using English and Filipino as needed, with appropriate tone, correct grammar and construction 6. Choose appropriate language suitable to the audience and respectful to the audience background and culture 7. Provide clear instructions to team members | | Computing  Professionalism and  Social Responsibility | 1. Analyze the local and global impact of computing and information   technology on individuals, organizations, and society | 1. Analyze the local impact of computing and information technology on individuals, organizations, and society 2. Analyze the global impact of computing and information technology on individuals, organizations, and society 3. Make design and implementation decision considering the impact of IT on individuals, organizations, and society 4. Provide /conceptualize solutions to domain where IT is needed 5. Evaluate the impact of this solutions to individuals, organizations, and society | |  | 1. Understand professional, ethical, legal, security and social issues   and responsibilities in the utilization of information technology | 1. Make decisions considering professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology 2. Assess professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology | | Life-Long Learning | 1. Recognize the need for and engage in planning self-learning and   improving performance as a foundation for continuing professional development | 1. Reflect on own abilities and skills to determine necessary development needs to reach level of expectations and aspirations as a computing professional 2. Prepare a personal development plan for continuing professional 3. development 4. Engage independently in developmental activities (like participating in professional organizations, attendance to seminars and training) as a result of recognizing the need to further and continuously develop one’s competencies as a computing professional 5. Evaluate achievements and deficiencies against own’s personal development plan | | | | | | | | | | |
| **COURSE DESCRIPTION** | | | | | | | | | | | |
| The course is focus concepts in enterprise architecture and application integration. It describes data, application and technology needed to create business solution to organizations. Principles and major frameworks in EA (Enterprise Architecture) will be introduced as well as the techniques and strategies in designing and planning and managing an enterprise architecture. | | | | | | | | | | | |
| **COURSE OUTCOMES** | | | | | | | | | | | |
| |  |  | | --- | --- | | **COURSE OUTCOMES (CO)** | **PROGRAM OUTCOMES CODE (PO)** | | 1. Explore the different components and domains in Enterprise Architecture and underlying principles and concepts. | Distinguish best practices and standards and their applications | | 1. Develop skills in the creation and management of an Enterprise Architecture using various frameworks and methodologies. | Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession | | 1. Integrate support tools and web service technologies to existing applications to design appropriate business solutions to organizations. | Design, implement, and evaluate  computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints | |  | | | | | | | | | | | | | |
| **COURSE LEARNING PLAN** | | | | | | | | | | | |
| **Course Outcome/s** | **Learning Outcomes** | | | **Topics** | | **Hours**  **Lec/Lab** | **Learning Activities**  **Face-to-Face and Remote Teaching** | | | **Learning Materials and Platform** | **Assessment** |
|  | Recall the topics to be covered and relate those topics to the coverage of Operating System Concepts.  Recall the policies and guidelines.  Express the expected requirements to be delivered. | | | Course Orientation | | 1 | * Presentation and explanation of the VGMO * Discussion on course policies and requirements | | | Modules/study guide  Web link |  |
| CO1 | Understand the underlying concepts, value and risk of an Enterprise Architecture. | | | THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  THE CONCEPT OF ENTERPRISE ARCHITECTURE  1. Enterprise Architecture overview  2. Enterprise structure  3. Enterprise Architecture – value & risks  The Concept of Enterprise Architecture (EA)   * Overview of Enterprise Architecture * Enterprise Structure and Types * Architecture Value,   Myths and Risks | | 5 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **References**  4, 8, 10 | * Learning activity |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1 | Understand different EA frameworks, methodologies and domains. | | | Enterprise Architecture Components   * Frameworks and Methodology * Layers, Domains and Artifacts   Components & Artifacts | | 10 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **References**  4, 8, 10 | * Learning activity * Quiz |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1, CO2 | Understand terminologies used in EA models and create management plan while applying existing framework and methodologies. | | | Developing an Enterprise Architecture   * Architectural Views and View Points * EA Management Plan and Structure | | 10 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **References**  4, 9, 11, 12 | * Learning activity |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1, CO2 | Understand the role of an EA management plan and the importance of project management.  Identify security policies and repository management methods in an Enterprise Architecture.  Identify support tools in project management and planning. | | | Using an Enterprise Architecture   * Planning and Project Management * Security * Repository Management * Support Tools * Tools Standardization | | 10 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **References**  1, 4 | * Learning activity * Quiz |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1 | Understand essential concepts in SOA and its role in business. | | | Service Oriented Architecture (SOA)   * Overview of SOA * Myths and Facts * SOA Model * SOA Evolution | | 5 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **References**  2, 4, 5 | * Learning activity * Quiz |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO3 | Understand different web service technologies.  Integrate between technologies and existing applications.  Evaluate different integrating technologies. | | | Integrating Technology   * XML Technology and Integration * Introduction to Web Service Technologies * XML and databases | | 15 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **Reference**  3 | * Learning activity * Midterm Exam |
| Remote Learning   * Online class * Demonstration * Online/homework assignment | | |
| CO3 | Understand application integration and its levels.  Identify best practices in application integration.  Evaluate the strategies in application integration. | | | Integrating Applications   * Application Integration Concepts * Levels of Application Integration * Legacy Integration * Web Services Integration and Strategies | | 5 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **Reference**  4, 10 | * Learning Activity * Quiz |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO3 | Identify and analyze XML integration best practices | | | Integrating the Enterprise   * XML Integration Best Practices * Best Practices and Strategies * Enterprise Integration | | 10 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **Reference**  4, 10 | * Learning Activity |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1, CO2 | Understand the concepts of MDA.  Understand the different languages and supporting tools in MDA. | | | Model Driven Architecture (MDA) Fundamentals   * Terms & Concepts * MDA Approach and Tools * Components of MDA * MDA Models * Mapping, Metamodels and Language | | 10 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **Reference**  4, 6 | * Learning Activity * Quiz |
| Remote Learning   * Online class * Demonstration * Online/homework assignment | | |
| CO1, CO2, CO3 | Understand the MDA process and framework. | | | MDA Process   * Building Blocks of MDA Framework * Building and Executing the MDA Process | | 5 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link  **Reference**  4, 6 | * Learning Activity * Quiz |
| Remote Learning   * Online class * Online/homework assignment | | |
| CO1 | Understand futures trends in EA. | | | Future Trends and Review on Previous Topics | | 5 | Face-to-Face   * Lecture/discussion | | | Modules/study guide  Web link | * Learning Activity * Final Exam |
| Remote Learning   * Online class * Online/homework assignment | | |
| **COURSE REFERENCES AND SUPPLEMENTAL READINGS** | | | | | | | | | | | |
| 1. **Books and E-books** 2. Collier, M. and Shahan, R. (2016). Microsoft Azure Essentials, 2nd Edition. Retrieved from https://www.onlineprogrammingbooks.com/microsoft-azure-essentials-fundamentals-azure-second-edition/ 3. Richards, M. (2016). Microservices vs Service-Oriented Architecture. Retrieved from https://cloud.redhat.com/hubfs/pdfs/Microservices\_vs\_SOA\_OpenShift.pdf?hsLang=en 4. Jacobs, S. (2006). Beginning XML with DOM and Ajax. Retrieved from https://freepdf-books.com/download/?file=7072 5. Sparx System and Maguire, S. (2020). Enterprise Architecture. Retrieved from https://www.sparxsystems.com/resources/user-guides/15.1/guidebooks/enterprise-architecture.pdf 6. The Open Group (2007). Service Oriented Architecture (SOA) in the Real World. Retrieved from http://s3.beckshome.com/20070727-SOA-In-The-Real-World.pdf 7. The Fast Guide to Model Driven Architecture (omg.org). https://www.omg.org/mda/mda\_files/Cephas\_MDA\_Fast\_Guide.pdf | | | | | | | | 1. **Electronic Sources** 2. Baca, M. (2006). Introduction to Metadata. Retrieved from http://www.getty.edu/publications/intrometadata/ 3. What is Enterprise Architecture? (visual-paradigm.com). https://www.visual-paradigm.com/guide/enterprise-architecture/what-is-enterprise-architecture/ 4. Developing a Standard Enterprise Architecture Practice (Intel). Retrieved from https://www.intel.com/content/dam/doc/white-paper/intel-it-it-leadership-developing-a-standard-enterprise-architecture-practice-paper.pdf 5. Introduction to Enterprise Architecture, part 3 (oracle.com). Retrieved from https://www.oracle.com/technical-resources/articles/enterprise-architecture/introduction-part3.html 6. Developing Architecture Views (opengroup.org). Retrieved from https://pubs.opengroup.org/architecture/togaf8-doc/arch/chap31.html 7. ArchiMate 2.1 Specification - Chapter 8 (opengroup.org). Retrieved from https://pubs.opengroup.org/architecture/archimate2-doc/m/chap08.html#:~:text=Viewpoints%20define%20abstractions%20on%20the%20set%20of%20models,isolation%2C%20and%20to%20relate%20two%20or%20more%20aspects. | | | |
| **ASSESSMENT AND GRADING** | | | | | | | | | | | |
| **Final Grade = ½ Midterm Grade + ½ Final Grade**   |  |  | | --- | --- | | **Midterm Grade= 60% lecture + 40% laboratory** | | | Lecture Grade 60%)  Midterm exam – 40%  Attendance/ Recitation/ Quizzes – 30%  Home Based Requirements – 30% | Laboratory (40%)  Laboratory reports – 80%  Participation – 20% | | **Final Term Grade= 60% lecture + 40% laboratory** | | | Lecture Grade 60%)  Final exam – 40%  Attendance/ Recitation/ Quizzes – 30%  Home Based Requirements – 30% | Laboratory (40%)  Laboratory reports – 80%  Participation – 20% | |  |  | | | | | | | | | | | | |
| **COURSE POLICIES AND EXPECTATIONS** | | | | | | | | | | | |
| **Lecture Class Policies (Residential Class)**   1. Please wear your face masks at all times. Bring your alcohol, soap, ballpen, paper, and other materials. Strictly no borrowing of things. 2. Please stay home if you are unwell. 3. Attendance in the class signifies readiness to participate in class discussions and activities. 4. A student is responsible for his/her absence. 5. A student will be automatically marked DRP (Dropped) after eight (8) consecutive absences. 6. Requirements must be submitted within the designated date of submission. 7. NO CELL PHONES OR ELECTRONIC DEVICES AT ANY TIME. All school rules will be followed as stated in the student handbook 8. Late work: Deductions will be given however, leniency will be observed. 9. Others (agreed upon by the class)   **Lecture Class Policies (Online Class)**   1. Wear a decent casual dress during the web conference. 2. No foul words during online discussions. 3. Observe punctuality and courtesy (the group of 5 individuals per batch; usually group leaders) 4. Private conversations during web conferencing are not allowed. 5. Respect shall be observed for the teacher and students 6. Cheating and plagiarism not tolerated 7. On-time submission of requirements as agreed during class orientation   **Laboratory Class Policies**   1. No laboratory gown; no attendance; no performance of the activity 2. No playing of music 3. No food or drinks allowed in the lab 4. Late work: Deductions will be given however, leniency will be observed. 5. Attendance in the laboratory implies a prior reading of procedures indicated in the manual 6. Cheating on a test or assignment will result in a grade of zero for all involved. 7. Data for lab reports must be taken during the lab. Copying of lab data after the lab is not allowed. Each student is responsible for individual lab reports unless specifically stated by the instructor.   **Additional Information:**   1. A Messenger Group Chat will be created for the subject specifically which will be used for immediately answering queries. 2. A closed Facebook group will be created for the posting of announcements, syllabus, assignments, rubrics, directions, laboratory manuals, videos, or links of instructional materials. 3. All assignments shall be submitted to the teacher’s email: ruissan.ramos@gmail.com or unless otherwise indicated by the instructor. 4. All documents and/or photos shall be renamed bearing your name and the activity (e.g. FundofProg \_SalvioKB\_LabActivity\_1) for purposes of monitoring of submission and on-time passing. | | | | | | | | | | | |
| **FACULTY CONTACT INFORMATION** | | | | | | | | | | | |
| **NAME** | | Name of Faculty Member | | | | | | | | | |
| **DESIGNATION** | | Designation | | | | | | | | | |
| **MOBILE PHONE NUMBER** | | Mobile Number | | | | | | | | | |
| **E-MAIL ADDRESS** | | Email | | | | | | | | | |
| **CONSULTATION SCHEDULE** | | |  |  | | --- | --- | | Day | Time | | Day | Time | | | | | | | | | | |
| **OFFICE LOCATION** | | Ground Floor, CMT Office, Purita Braganza Building | | | | | | | | | |
| **Prepared by:**   |  | | --- | | Name of Faculty | | Faculty | |  | | | |  | | **Recommended by:**   |  | | --- | | Name of College Dean | | College Dean | | | | | **Approved:**   |  | | --- | | Name of Campus Executive Director | | Campus Executive Director | | | |