BACHELOR OF SCIENCE
in Computer Science
Specialization in Game Design and Development(GameDev)

Program Description

BS Computer Science with Specialization in Game Design and Development – equips graduates with the skills to design, develop, and optimize interactive applications using game technology. This specialization focuses on game mechanics, graphics programming, AI for games, and immersive storytelling, utilizing advanced technologies to create innovative and engaging digital solutions.

Program Educational Objectives

Within three to five years after obtaining a bachelor's degree in Computer Science at University of St. La Salle, a graduate is expected to have:

1. Possessed a significant role in development team confidence to produce high-quality software solutions and in research and development in various application domains which includes the use of game technologies and data science.
2. Exhibited high standards of professionalism while maintaining social and ethical responsibilities both in local and international organizational environment
3. Capable of communicating and engaging in life-long learning activities relevant to their profession, including earning advanced degrees, attaining professional certification and engaging in research activities to further nation building and national development.

Program Outcomes

By the time of graduation, the students of the program shall have the ability to:

1. Apply knowledge of computing fundamentals, mathematics, science, and domain knowledge appropriate for computer science specialization to the abstraction and conceptualization of models from defined problems and requirements.
2. Apply knowledge in algorithms that can be used in solving complex programming problem.
3. Apply software engineering practice over the entire system life-cycle activities and management of risks involved in software and embedded systems which meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4. Adapt appropriate techniques, resources and modern computing tools to complex activities, with an understanding of the limitations to accomplish a common goal.
5. Acquire knowledge and understanding of information security issues in relation to the design, development and use of information systems.
6. Work with a range of technologies employed within the game industry, such as hand-held devices, desktop devices, and consoles
7. Utilize the tools and techniques used in the development of mobile systems

8. Use scientific method such as data science in analyzing and interpreting data.

9. Utilize new and emerging technologies, such as artificial intelligence, cloud technology and natural language processing, as a necessity for life-long learning

10. Formulate solution to the complex problem using a programming language, mathematics, algorithms, data structures, or an appropriate blend of technologies.

11. Communicate effectively with the computing community and with society at large by being able to comprehend and write effective reports, design documentation, make effective presentations, and give clear instructions.

12. Adopt appropriate industry practices in resolving the real world issues with legal, social, ethical and professional consideration involved in the utilization of computing technology

13. Engaged in research as an individual and as a member or leader for continued development of the individual, organization, and society in a multidisciplinary setting.

Admission Requirements

1. Senior High School graduates and transferees seeking admission to the BSCS program must meet the criteria and cut-off scores set by the University for the BSCS program.

2. Shiftees and Transferees from other courses may be admitted regardless of the number of failed units incurred.

Retention Policies

1. Students who fail in 50% or more of the subjects taken during the previous semester will be advised to shift to another program in the following semester. Courses Dropped are considered failed.

2. Students who fail in 2 or 3 subjects in one semester shall be put on probation and will be advised a maximum load of 18 units the following semester.

3. Student must not incur more than two failures in the same Math or Professional courses; otherwise they will be advised to drop from the program.

4. Shiftees and Transferees who accumulated 24 credit units of failures in the program will be advised to shift to another program.

Teaching and Learning Activities

1. Lecture and Classroom discussions
2. Programming demonstration
3. Guided Hands-on Programming Sessions
4. Guided Design and Development of Project Specifications
5. Independent Project Requirements Gathering, Design and Implementation
6. Mentorship and Monitored Internships.
7. Case Analysis and Case Studies

FIRST YEAR First Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
CompF	Computing Fundamentals	3	3	0	3	None
Prog1	Programming Essentials	3	0	3	3	None
LITEP	Living in IT Era (for Computing Profession)	3	0	3	3	None
2D	2D Animation	3	0	3	3	None
IGG	Group Guidance 1	1.5	1.5	0	1.5	None
IRS1	LaSallian Spirituality	3	3	0	3	None
MATHMW	Mathematics in the Modern World	3	3	0	3	None
PATHFit 1	Movement Competency	2	2	0	2	None
STS	Science, Technology and Society	3	3	0	3	None
	Total	**24.5**	**15.5**	**9**	**24.5**	

FIRST YEAR Second Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
Prog2	Advanced Programming	3	0	3	3	Prog1
Python	Introduction to Python	3	0	3	3	None
SAD	Systems Analysis and Design	3	3	0	3	None
3D	3D Animation	3	0	3	3	2D
CWRLD	The Contemporary World	3	3	0	3	None
ETHICS	Ethics	3	3	0	3	None
IRS2	Christian Morality	3	3	0	3	None
MATH1D	College Algebra	3	3	0	3	None
PATHFit 2	Physical Fitness Activities	2	2	0	2	PATHFit 1
	Total	**26**	**17**	**9**	**26**	

SECOND YEAR First Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
DatSci	Data Science	3	0	3	3	Python
DStruc	Data Structures and Algorithms	3	3	0	3	Prog2
GameMath	Applied Math for Games	3	3	0	3	None
Infom1	Information Management 1	3	3	0	3	Prog2
OOPro	Object-Oriented Programming	3	2	3	5	Prog2
SofEng	Software Engineering	3	3	0	3	SAD
MATH3DS	Discrete Structures	3	3	0	3	MATH1D
NSTP1	National Service Training Program 1	3	3	0	3	None
PATHFit 3	Sports/Dance (Swimming and Rhythmic Activities)	2	2	0	2	PATHFit 2
	Total	**26**	**22**	**6**	**28**	None

SECOND YEAR Second Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
ADA	Analysis and Design of Algorithms	3	3	0	3	DSTRUC
CompOrg	Comp. Org. w/ Microcontroller Programming	3	2	3	5	DSTRUC

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
Infom2	Information Management 2	3	0	3	3	Infom1
ProElec1	Professional Elective 1 in Game Dev.	3	2	3	5	None
Techno	Technopreneurship	3	3	0	3	None
MATH3C	Analytical Geometry and Calculus	3	3	0	3	None
NSTP2	National Service Training Program 2	3	3	0	3	None
PATHFit 4	Sports/Dance (Individual / Dual/ Teamsports and Rhythmic activities)	2	2	0	2	PATHFit 3
USELF	Understanding the Self	3	3	0	3	None
	Total	26	21	9	30	

THIRD YEAR First Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
Automata	Automata Theory and Formal Languages	3	3	0	3	ADA
CloudApp	Cloud-based Application Development	3	0	3	3	INFOM2
HCI	Usability, HCI and User Interaction Design	3	0	3	3	2D
Methods	Research Methods and Writing 101	3	3	0	3	None
ProElec2	Professional Elective 2 in Game Dev.	3	2	3	5	None
IRS3E	Religions, Religious Experiences and Spirituality	3	3	0	3	None
Math4pS	Probability and Statistics	3	3	0	3	None
PCOM	Purposive Communication	3	3	0	3	None
RHIST	Readings in Philippine History	3	3	0	3	None
	Total	27	20	9	29	

THIRD YEAR Second Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
MobApp	Mobile-based Application Development	3	2	3	5	OOPRO
ProLan	Programming Languages	3	3	0	3	DSTRUC
ProElec3	Professional Elective 3 in Game Dev.	3	2	3	5	None
Thesis1	Thesis 1	3	3	0	3	Methods
WebDev	Web Development Technologies	3	2	3	5	CLOUDAPP

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
ARTAP	Art Appreciation	3	3	0	3	None
GENSOC	GE Electives 3 (Gender And Society)	3	3	0	3	None
SocPro	Social Issues and Professional Practice	3	3	0	3	None
	Total	24	21	9	30	

FOURTH YEAR First Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
CSSAC	CS Trends, Seminars and Certifications	3	2	3	5	4th Year Standing
InfoAs	Information Assurance and Security	3	3	0	3	INFOM
NETW1	CCNA: Introduction to Networks	3	2	3	5	None
OS	Operating System	3	3	0	3	COMPORG
PROELEC4	Professional Elective 4 in Game Dev.	3	2	3	5	None
THESIS2	Thesis 2	3	3	0	3	Thesis 1
RIZAL	Life and Works of Rizal	3	3	0	3	None
	Total	21	18	9	27	

FOURTH YEAR Second Semester

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
INTERNSHIP	Internship(324 hrs.)	6	Field	Field	6	THESIS 2 & 4th Year Standing

Summary

	Credit Units	hrs. lec	hrs. lab	Total Assessed Units
Total	180.5	134.5	60	200.5

Game Design and Development Specialization

Course Code	Course Description	Credit Units	hrs. lec	hrs. lab	Total Assessed Units	Prerequisite
GameProg1 **ProElec1**	Introduction to Game Design and Development	3	2	3	5	GameMath

ProElec2	GameProg2	Advance Game Design and Development	3	2	3	5	GameProg1
ProElec3	GameTech	Game Technologies	3	2	3	5	GameProg2
ProElec4	GameAI	AI for Games	3	2	3	5	GameTech

Thesis Research Project

Topics on
Multiplayer Collaboration and Strategy Games, Fitness Gamification with AR, Emerging Technologies in Games etc.

SUMMARY OF REQUIRED COURSES
BS Computer Science
Specialization in Game Design and Development

Category	Course Code	Course Description	Units	Total Units
General Education Courses	MATHMW	Mathematics in the Modern World	3	**27**
	PCOM	Purposive Communication	3	
	STS	Science, Technology, and Society	3	
	CWRLD	The Contemporary World	3	
	USELF	Understanding the Self	3	
	ARTAP	Art Appreciation	3	
	RIZAL	Life and Works of Rizal	3	
	ETHICS	Ethics	3	
	RHIST	Readings in Philippine History	3	
Mathematics	MATH1D	College Algebra	3	**12**
	MATH3C	Analytical Geometry and Calculus	3	
	MATH3DS	Discrete Structures	3	
	MATH4PS	Probability and Statistics	3	

Other Non-Technical Courses	IGG	Group Guidance 1	1.5	**10.5**
	IRS1	LaSallian Spirituality	3	
	IRS2	Christian Morality	3	
	IRS3E	Religions, Religious Experiences, and Spirituality	3	
General Education Electives	GENSOC	Gender and Society	3	**3**
Physical Education	PATHFit 1	Movement Competency	2	**8**
	PATHFit 2	Physical Fitness Activities	2	
	PATHFit 3	Sports/Dance (Swimming & Rhythmic Activities)	2	
	PATHFit 4	Sports/Dance (Individual, Dual, and Team Sports)	2	
NSTP	NSTP1	National Service Training Program 1	3	**6**
	NSTP2	National Service Training Program 2	3	
CS Core Courses	CompF	Computing Fundamentals	3	**18**
	Prog1	Programming Essentials	3	
	Prog2	Advanced Programming	3	
	DStruc	Data Structures and Algorithms	3	
	Infom1	Information Management 1	3	
	WebDev	Web Development Technologies	3	
CS Professional Courses	OOPro	Object-Oriented Programming	3	**84**
	SAD	Systems Analysis and Design	3	
	CloudApp	Cloud-Based Application Development	3	

	LITEP	Living in IT Era (for Computing Profession)	3
	SofEng	Software Engineering	3
	Infom2	Information Management 2	3
	ADA	Analysis and Design of Algorithms	3
	CompOrg	Computer Organization w/ Microcontroller Programming	3
	HCI	Usability, HCI and User Interaction Design	3
	Automata	Automata Theory and Formal Languages	3
	ProLan	Programming Languages	3
	MobApp	Mobile-Based Application Development	3
	OS	Operating System	3
	InfoAs	Information Assurance and Security	3
	NETW1	CCNA: Introduction to Networks	3
	DatSci	Data Science	3
	AI	Artificial Intelligence	3
	Thesis1	Thesis 1	3
	Thesis2	Thesis 2	3
	Internship	Internship (324 hours)	6
	SocPro	Social Issues and Professional Practice	3
	CSSAC	CS Trends, Seminars and Certifications	3
	Methods	Research Methods and Writing 101	3
CS Electives (Game Dev Specialization)	GameProg1	Introduction to Game Design and Development	3	**12**
	GameProg2	Advance Game Design and Development	3

GameTech	Game Technologies		3
GameAI	AI for Games		3
Grand Total			**180.5**

CompF   **3 units**
COMPUTING FUNDAMENTALS (LECTURE)
This course provides an overview of the Computing Industry and Computing Profession, including Research and Applications in different fields, the key components of computer systems. At the end of the course, the students are expected to put up an exhibit as part of an information awareness on the latest ICT software and hardware innovations, computer security and viruses.

Prog1   **3 units**
Programming Essentials (LABORATORY)
This course emphasizes problem-solving using a general-purpose programming language, with a focus on training students to design, implement, test, and debug programs that address computing problems using fundamental programming constructs. The course incorporates CISCO programming standards to ensure best practices in software development. By the end of the course, students are expected to apply their skills and techniques to analyze requirements and develop project prototypes that solve industry and societal problems and to take an entry level programming certification.

LITEP   **3 units**
Living in IT Era (for Computing Profession) (LABORATORY)
Living in the IT Era (for Computing Profession)" is designed to equip students with essential skills and knowledge to thrive in today's rapidly evolving technology landscape. The course emphasizes the importance of critical and logical thinking, using flow-charting and pseudo-coding as foundational tools for problem-solving and programming. Students will learn to analyze complex problems, develop structured solutions, and effectively communicate their ideas through visual representations and pseudo-code.

2D   **3 units**
2D ANIMATION (LABORATORY)
In this course, the fundamentals of animation (which includes timing, physics, and movement arcs) and design and production of 2D digital animation using appropriate software are reviewed. Technique in preparing 2D assets for use in games will be covered including automatic generation of 2D animation assets through programming. Students explore the range of possibilities and limitations of dynamic media and digital animation. At the end of the course students will prepare game assets including character design, environment, game objects, animation and its behavior in terms of game art.

Prog2   **3 units**
Advanced Programming(LABORATORY)
This course emphasizes problem-solving using a general-purpose programming language, focusing on training students to design, implement, test, and debug programs that address computing challenges through the use of advanced programming techniques, data structures, and standard libraries. The course follows CISCO programming standards to ensure adherence to industry best practices. By the end of the course, students are expected to apply these advanced skills to analyze requirements and develop project prototypes that address industry and societal problems and to take an intermediate or professional programming certification.

PYTHON   **3 units**
(Introduction to Python) (LABORATORY)
Introduction to Python" is designed for beginners who want to learn the fundamentals of programming using Python, one of the most popular and versatile programming languages today. This course covers basic concepts such as variables, data types, control structures, functions, and error handling, while also emphasizing best practices in coding and problem-solving. Students will engage in hands-on coding exercises and projects to solidify their understanding and apply their skills to real-world scenarios. Additionally, the course will introduce libraries and frameworks commonly used in Python for data manipulation, web development, and automation. By the end of the course, students will have a strong foundation in Python programming, enabling them to pursue further studies in computer science or software development.

SAD   **3 units**
SYSTEM ANALYSIS AND DESIGN (LECTURE)
This course introduces established and evolving methodologies for the analysis, design, and development of an information system. Emphasis is placed on system characteristics, managing projects, prototyping, CASE/OOM tools, and systems development life cycle phases. Upon completion, students should be able to submit a report which includes the analysis of a problem and the design of an appropriate solution using a combination of OOM tools and techniques.

3D   **3 units**
3D ANIMATION (LABORATORY)
In this course, students learn the fundamental concepts of 3D animation.Students are introduced to the different principles behind the creation of the

3D virtual world. Students will be taught to design different computer-based 3D imagery and produce a simple 3D animation sequence using a 3D software. Use of scripting language to manipulate 3D animation sequences will also discuss. As part of microcredentialing, students are encouraged to obtain relevant 3D certifications, such as Autodesk Certified Professional (Maya or 3ds Max), Unity Certified 3D Artist, or other industry-recognized credentials to enhance their expertise and employability in the field. By the end of this course, students are expected to create and design a 3D animation, using a 3D animation software, based on the specification provided. Students are also expected to create 3D assets for game applications.

DatSci   3 units
DATA SCIENCE (LABORATORY)
This course provides an introduction to data science, focusing on techniques used to extract valuable insights from data. Data science is a problem-solving and data analysis-oriented field that applies scientific methods to address practical challenges in an interdisciplinary context. The course covers foundational topics such as data mining, machine learning, information visualization, and big data, utilizing Python programming for practical applications. By the end of the course, students will develop a simple research project employing a data science approach, showcasing their ability to analyze and interpret data effectively using Python. Additionally, students have the option to earn Data Science certifications as part of micro-credentialing requirements.

DStruc   3 units
DATA STRUCTURES AND ALGORITHMS (LECTURE)
The course covers the standard data representation and algorithms to solve computing problems efficiently (with respect to space requirements and time complexity of algorithm). This covers the following: Stacks, Queues, Trees, Graphs, Maps, and Sets. Thorough discussion of sorting and searching algorithms and hashing is covered. At the end of the course, the students are expected to choose among which alternative data structure is most efficient to solve specific data-representation and algorithmic problems.

GameMath   3 units
APPLIED MATH FOR GAMES(LECTURE)

This course covers the mathematics used in game development. Students will learn and develop a foundation for applications in collision detection and motion. Specific topics in vector algebra, matrixes, and analytical geometry and probability and statistics as applied to modelling and simulation.
At the end of this course, students are expected to

develop a game using various mathematical equations and functions to represent behavior

Info1   3 units
INFORMATION MANAGEMENT 1 (LECTURE)
This course covers information management, database design, data modeling, SQL, and implementation using a relational database system. At the end of the course, the students are expected to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model using SQL.

OOPro   3 units
OBJECT ORIENTED PROGRAMMING (WITH LABORATORY)
Introduces students to the object-oriented programming paradigm using Java. It focuses on definition of classes along with the fundamental principles of object-oriented design such as data encapsulation, inheritance, and polymorphism. Students are expected to describe simple abstract data types and design implementations, using abstraction functions to document them. Develop a program that applies technique of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.

SofEng   3 units
SOFTwARE ENGINEERING (LECTURE)
This course provides an overview of the software engineering process, integrating project management principles and ethical considerations that influence industry practices. It covers key stages of software development, including requirements analysis, modeling, software design fundamentals, implementation of object-oriented models and programming, software testing, quality assurance, and software maintenance. By the end of the course, students will apply project management methodologies to develop a software project. They will extract user requirements, translate them into formal models, and present their designs using UML-based visualization. Additionally, students will prepare comprehensive written documentation, detailing the overall system architecture, and transform their system design into a fully functional running program while managing timelines, resources, and deliverables effectively.

Math3DS   3 units
DISCRETE STRUCTURES (LECTURE)
The purpose of this course is to understand and use (abstract) discrete structures that are backbones of computer science. This course covers topics such as logic, proofs, sets, relations, functions, induction and recursion, discrete probability, and finite state machines with an emphasis on applications in computer science At the end of the course students

develop the mathematical foundations necessary for more specialized subjects in computer science, including data structures, algorithms, and compiler design. Upon completion of this course, you will have the mathematical know-how required for an in-depth study of the science and technology of the computer age.

ADA   3 units
ANALYSIS AND DESIGN OF ALGORITHMS (LECTURE)
This course enhances the critical thinking of the students because designing and analyzing algorithms in terms of time and space must be taken into consideration in any program. Designing an algorithm involves knowledge of the problem domain, a thorough knowledge of the data structures that are available and suitable and a good measure of creativity. The course will also cover useful algorithmic design techniques, the methods for analyzing algorithms, the divide and conquer strategy for designing searching and sorting algorithms. Students are expected to identify appropriate algorithm to certain requirement and apply it in a running program. They are also expected to describe the behavior and running time of various searching, sorting and graph algorithm. By doing so they will be thinking critically about the analysis and design of algorithm and ensure that they gain in-depth knowledge about programming as a practice profession in computer science.

CompOrg   3 units
COMP. ORG. W/ MICROCONTROLLER PROG. (WITH LABORATORY)
This course deals with an overview of the architecture and organization of a computer. It includes discussion of the Central Proccessing Unit, internal and external memory, Input/Output organization and peripherals. Micro-controller assembly and programming will be introduced in in this course to familiarize students with basic in this type of technology. Students are expected to discuss computer works, both internally and externally and identify the structures and functions of a computer system. They will be able to create programs and execute computer interfacing with different electronic components.

Info2   3 units
INFORMATION MANAGEMENT 2 (LABORATORY)
This course include concepts on advanced database design and normalization, query optimization and performance tuning, transaction management and concurrency control, distributed and parallel databases, NoSQL and emerging database technologies, data warehousing and OLAP, and database security and privacy. Students will demonstrate competence and understanding of the principles

and practices of advanced database management and their impact on the design, administration, and optimization of modern data-driven systems.

This course covers advance features of DBMS and research integration in designing domain-specific DBMS models. Topics include database objects, concurrency and locking, database security and backup and recovery. At the end of the course, the students are expected to work in a team to develop a system and database structure using any programming language.

Techno   3 units
TECHNOPRENEURSHIP (LECTURE)
This course covers the theories and principles of technopreneurship, the development of IT business plans, and the management of IT businesses. Students are expected to create a business model for an approved product or service that integrates all the concepts discussed in class. The business model should be logical, feasible, and focused on practical technology applications. Students must also defend their business model. As a final requirement, students will take part in an inter-class startup competition or compete in a regional or national startup pitching event. This competition aims to improve their marketing ideas and refine their business strategies, providing practical experience in launching their solutions and exploring potential market impact.

Automata   3 units
AUTOMATA THEORY AND FORMAL LANGUAGES (LECTURE)
This course is an introduction to the fundamental ideas and models underlying computing; finite automata, regular sets, regular languages and expressions, formal grammars and languages, push-down automata, context-free grammars, compiler theory, undecidability and complexity theory. At the end of the course, the students will be able to apply skillful reasoning as a guide to problem solving in automation adherence to the computer science standards. They will also develop proficiency in using reasoning as an application to thesis algorithms, a commitment to develop and maintain intellectual traits of the mind and habits of thought.

CloudApp   3 units
CLOUD-BASED APPLICATION DEVELOPMENT (LABORATORY)
This course focuses on the development of applications using web, mobile, and emerging technologies, with an emphasis on requirements management, interface design, usability, testing, deployment, and ethical and legal considerations. Additionally, the course aims to expose students to various cloud services, enhancing their

understanding of modern application development. By the end of the course, students are expected to design and develop a system that incorporates emerging technologies, such as web and/or mobile solutions, along with cloud services.

HCI — 3 units
Usability, HCI and User Interaction Design(LABORATORY)
This course equips students with techniques to make software more intuitive and user-friendly, ensuring ease of learning and use for target users. Emphasizing the importance of user experience (UX) in system flow, the course covers principles of human-computer interaction (HCI) and user interface (UI) design techniques. Students will be expected to conduct a usability test for an existing software application and use an integrated development environment (IDE) to develop a simple application that incorporates a graphical user interface (GUI), applying UI/UX principles throughout the design process.

Methods — 3 units
RESEARCH METHOD AND WRITING 101(LECTURE)
Research Method and Writing 101" is designed to prepare students for their thesis proposal by providing a comprehensive understanding of research methodologies and effective writing techniques. The course covers qualitative, quantitative, and mixed-method approaches, enabling students to select the most appropriate methodology for their research questions. Emphasis will be placed on developing strong research skills, including literature review, data collection, and analysis techniques relevant to each methodology. Students will also learn to construct and organize Chapters 1, 2, and 3 of their thesis documentation, focusing on the introduction, literature review, and research design. By the end of the course, students will be equipped to confidently defend their title proposal and articulate their research plans effectively, laying a solid foundation for their academic journey in research.

MobAp — 3 units
MOBILE-BASED APPLICATION DEVELOPMENT (WITH LABORATORY)
This course provides students with a comprehensive understanding of tasks related to the development of enterprise-level mobile applications. The course focuses on creating mobile solutions for modern platforms and frameworks, including major mobile operating systems, with an emphasis on mobile games. By the end of the course, students are expected to develop a mobile game that fully utilize the capabilities of the chosen platform or framework, and work with software and hardware tools to develop, test, and debug mobile applications.

ProLag — 3 units
PROGRAMMING LANGUAGES (LECTURE)
This course is an introduction to basic concepts in the design of programming languages. Comparative study of programming languages from both theoretical and applied viewpoints. Typical issues include syntax and semantics, scope and binding times, storage allocation, parameter- passing techniques, control structures, run-time representation of programs and data. Detailed examples from the imperative, functional, parallel, object-oriented, web ad logical programming paradigms. Students are expected to already be familiar with the C++ or Java programming languages. Examples of concepts will be presented using specific languages. At the end of the course students will be familiar with the concepts that are commonly available in widely used programming languages that be used in the development of their thesis.

Thesis1 — 3 units
THESIS 1 (LECTURE)
This course offers students the opportunity to integrate their accumulated knowledge in Data Science, Artificial Intelligence, and system development. It allows them to explore topics aligned with their personal interests, future goals, and skill levels to create computing solutions. The course focuses on providing practical experience in the entire development process, from analysis and design to implementation and testing. By the end of the course, students are expected to successfully present their proposal to a panel of evaluators with 50% of the work dedicated to AI or analytic system development.

WebDev — 3 units
WEB DEVELOPMENT TECHNOLOGIES (with LABORATORY)
This course introduces students to the applications and tools commonly used in systems development, including frameworks, front-end tools, project management tools, version control systems, and other technologies utilized throughout the development process, emphasizing game development, the course equips students with practical skills for building and analyzing interactive systems. By the end of the course, students, working in groups, are expected to develop and present a system using the discussed technologies, accompanied by the appropriate documentation.

SocPro — 3 units
SOCIAL ISSUES AND PROFESSIONAL PRACTICE (LECTURE)
This course studies the social impact,

implications, and effects of computers, and the responsibilities of computer professionals in directing the emerging technology. Specific topics include an overview of the history of computing, computer applications and their impact, the computing profession, the legal and ethical responsibilities of professionals, and careers in computing. The students are expected to put up an exhibit as part of an information awareness campaign about IT security and computer threats.

CSSAC   **3 units**
CS Trends, Seminars and Certifications (WITH LABORATORY)
This course introduces various trends in computing, highlighting the motivations behind new innovations and envisioning the future as these inventions mature and become widely adopted. Topics may include advanced game design, new technologies in game development, game implementation, and other emerging trends relevant at the time the course is offered. The course will also include seminars, hands-on training sessions, and opportunities to obtain national or international certifications. Additionally, optional field trips will be offered to enhance real-world learning experiences. Students are expected to apply and present their understanding of these emerging trends through a prototype or case study based on the concepts discussed in the course.

InfoAs   **3 units**
INFORMATION ASSURANCE AND SECURITY (LECTURE)
This course intended to provide students an introduction to information assurance from the perspective of web-based applications. The course covers fundamental concepts necessary to understand the threats to security and privacy as well as various defenses against those threats. At the end of the course, the students are expected to examine the relationship between threats, vulnerabilities, countermeasures, attacks, compromises and remediation throughout the entire system life cycle; explain the key factors involved in the authentication and how they are used to verify identify and grant access to the system; and describe the legal and ethical considerations related to the handling and management of enterprise information assets.

NETW1   **3 units**
CCNA: Introduction to Networks (with Laboratory)
This course begins by introducing the fundamental building blocks of modern networking, including protocols, topologies, hardware, and network operating systems. It then provides in-depth coverage of key concepts in contemporary networking, such as TCP/IP, subnetting, and security, aligned with CISCO standards. Students will receive a technical and operational overview of digital computer networks, which serve as the foundation for all modern information systems and services. This course will develop students' abilities to install, configure, and troubleshoot computer networks, equipping them with highly marketable and exciting skills in the field of networking.

OS   **3 units**
OPERATING SYSTEM (LECTURE)
This course provides an introduction to the concepts, theories and components that serve as the basis for the design of the classical and modern Operating Systems. Topics include concepts on Computer and operating system structures, Process and memory management, Process synchronization and communication, Virtual memory management, Secondary Storage Management, File systems Management and Protection and Security. Students will demonstrate competence and understanding of the concepts, structure and design of operating systems and its impact on application system design and performance.

THESIS 2   **3 units**
THESIS 2 (LECTURE)
This course challenges students to develop computing solutions in game development projects, based on their approved thesis proposals. The project will demonstrate the students' ability to analyze, synthesize, and evaluate information, as well as design, develop, and deploy their solutions. A strong emphasis is placed on project deployment and measuring traction. Conducting system quality assurance or system testing using specialized tools to verify that the developed software meets the required quality standards and complies with national or international regulations. By the end of the course, students are required to submit comprehensive written documentation covering all chapters of their thesis and deliver a successful oral presentation before a panel of evaluators.As a final requirement, students are tasked with deploying their systems in real-world settings, gaining practical experience in launching their games, system solutions and exploring potential market impact.

Internship   **6 units**
INTERNSHIP (LECTURE/FIELD)
Aims to expose students to appropriate training sites equipped with the latest technologies and where current methodologies in software development are employed. The internship program is meant to provide students with an opportunity to complement their formal learning with practical knowledge, skills and desirable attitudes and to gain hands on experience in recognized Industry Partner. After 324 hours of

training with Industry Partner, students interning under mentorship of an IT Professional should be able to learn the importance of constant upgrading of knowledge and skills particularly in the field of game design and development in order to remain competitive in this fast-changing field; recognize, prioritize and complete assigned task on time; develop skills in verbal, non-verbal & written communication without neglecting respect for authority and the ideas & opinion of other people in the organization; and submit an Internship Portfolio that highlights a complete project or task such as a game program or system created, web application or other similar outputs reflecting the technical skills they obtained during their internship experience and integrate the Lasallian Graduate Attributes in their reflection.

Professional Electives:Game Design and Development

GameProg1   **3 units**
INTRO TO GAME DESIGN AND DEVELOPMENT(WITH LABORATORY)
The course gives an overview of the game development process from conception to production. It also discusses a history of game development here and abroad, and exposure to the positions, job responsibilities that each member of a game development team has along with the industry requirements for the creation of a game design document (GDD) and technical design document (TDD). Game design includes game play, storytelling, challenges, and basic interactive design, which includes interface design, information design, and world interaction. Students are expected to design a small casual game and understand the complexities in developing these projects and produce proper documentation (GDD and TDD). The experience will be used as foundation for more advanced courses in the program

GameProg 2   **3 units**
GAME DESIGN and Development (WITH LABORATORY)

This course provides students with skills needed for game development using software environment of a game engine and its scripting language. The students will learn fundamental concepts for 2D environment, development roles, interactivity, audio and programming which are important aspects of a 2D game application. This course concludes with the students having created their own complete arcade style game and a basic understanding of how more advanced game creation tools and game engines work. As part of the course requirements, students must obtain a game certifications, such

as Unity, unreal or godot certification.

GameTech   **3 units**
PRO ELECTIVE 3 Track 1 - GAME TECHNOLOGIES (with LABORATORY)
This course covers the different tools and devices in game development. Students are able to utilize different application programming interfaces (API's) such as google play services, virtual reality, augmented reality and motion sensors for multi platform game development. At the end of this course, the students are expected to develop immersive game that uses various game development API.

GAMEAI   **3 units**
AI FOR GAMES (WITH LABORATORY)
"AI for Games" is designed to immerse students in the principles and practices of artificial intelligence specifically applied to game development. The course explores various AI techniques, including pathfinding, decision-making, machine learning, and procedural content generation, that enhance gameplay and create immersive player experiences. Students will learn how to implement algorithms and frameworks to develop intelligent behaviors for non-player characters (NPCs) and optimize game mechanics using AI. Through hands-on projects and real-world case studies, participants will gain practical experience in integrating AI solutions within game engines. By the end of the course, students will be equipped with the knowledge and skills to create dynamic and responsive game environments, preparing them for careers in the rapidly evolving field.