

COLLEGE OF COMPUTER STUDIES

COURSE CATALOG

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

General Education

GEC 1- Understanding the Self

Nature of identity; factors and forces that affect the development and maintenance of personal identity.

Course Credit : 3 units

Prerequisite : None

GEC 2 - Readings in the Philippine History

Philippine History viewed from the lens of selected primary sources in different periods with local history added, analysis and interpretation.

Course Credit : 3 units

Prerequisite : None

GEC 3 – The Contemporary World

Globalization and its impact on individuals, communities and nations: challenges and responses.

Course Credit : 3 units

Prerequisite : None

GEC 4 – Mathematics in the Modern World

Nature of mathematics, appreciation of its practical, intellectual, and aesthetic dimensions, and application of mathematical tools in daily life.

Course Credit : 3 units

Prerequisite : None

GEC 5 – Purposive Communication

Writing, speaking and presenting to different audiences and for various purposes.

Course Credit : 3 units

Prerequisite : None

GEC 6 – Art Appreciation

Nature, function and appreciation of the arts in contemporary society.

Course Credit : 3 units

Prerequisite : None

GEC 7 – Science, Technology and Society

Interactions between science and technology and social, cultural, political and economic contexts which shape and are shaped by them; specific examples throughout human history of scientific and technological developments.

Course Credit : 3 units

Prerequisite : None

GEC 8 - Ethics

Principles of ethical behavior in modern society at the level of the person, society, and in interaction with the environment and other shared resources.

Course Credit : 3 units

Prerequisite : None

GEC 9 – Life and Works of Rizal

The study of the life of Rizal and his literary works.

Course Credit : 3 units

Prerequisite : None

GEC 10 – History of Muslim Filipinos and of the Indigenous Peoples of Mindanao

A historical overview of Muslim Filipinos and of the Indigenous Peoples of Mindanao, the Sulu Archipelago, Palawan since pre-colonial times to the present; of how they fought against the forces of foreign and local domination which threaten their very existence; of the significance of this study within the broad context of Philippine History.

Course Credit : 3 units

Prerequisite : None

GEC 11 – Language, Gender, and Society

This course examines the meaning of gender in the contemporary world and the relationship of language use, gender, and society. It aims to explore the use of language and the cultural views of men, women, lesbian (LGBT) from the cross-cultural and sociolinguistic perspective. It gives emphasis to the different types of gender and possible causes of these differences by using various theories on ideologies, feminism, and queer.

Course Credit : 3 units

Prerequisite : None

GEC 12 – Ecocriticism and the Conservation of Nature

This course is anchored on the interconnection between ecology and literature which discusses on the importance of nature, environment, and man's notion of wilderness (desert, forestry, boondocks, and the wild) and the frontier in different seasons and places in the Philippines.

Course Credit : 3 units

Prerequisite : None

Additional Math Requirement

MATH 101 – Calculus I

This course is an introduction to calculus with analytic geometry. It covers lines, circles, conic sections, special functions, limits, continuity, derivatives and their applications, differentials, antiderivatives, definite integral and their applications.

Course Credits : 5 units

Pre-Requisite : None

MATH 102 – Calculus II

This course covers techniques of integration, improper integrals, sequences and series of constant terms, power series, differential calculus of functions of two or more variables, and double integrals.

Course Credits : 5 units

Pre-Requisite : MATH 101 – Calculus I

MATH 103 – Linear Algebra

This course covers matrices, systems of linear equations, vector spaces, linear independence, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization, and inner product spaces.

Course Credits : 3 units

Pre-Requisite : MATH 101 – Calculus II

Common Courses

CC 101 - Introduction to Computing

This course provides an overview of the Computing Industry and Computing profession, including Research and Applications in different fields; an Appreciation of Computing in different fields such as Biology, Sociology, Environment and Gaming; an Understanding of ACM Requirements; an Appreciation of the history of computing; and Knowledge of the Key Components of Computer Systems (Organization and Architecture), Malware, Computer Security, Internet and Internet protocols, HTML4/5 and CSS.

Course Credits : 3 units

Pre-Requisite : None

CC 102 – Fundamentals of Programming

The course covers the use of general purpose programming language to solve problems. The emphasis is to train students to design, implement, test, and debug programs intended to solve computing problems using fundamental programming constructs.

Course Credits : 3 units

Pre-Requisite : None

CC 103 – Intermediate Programming

This course is a continuation of CC101 – Introduction to Computing. The emphasis is to train students to design, implement, test, and debug programs intended to solve computing problems using basic data structures and standard libraries.

Course Credits : 3 units

Pre-Requisite : CC102 – Fundamentals of Programming

CC 104 – Data Structures and Algorithms

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.

Course Credits : 3 units

Pre-Requisite : CC103 – Intermediate Programming

CC 105 – Information Management

This course covers information management, database design, data modeling, SQL, and implementation using relational database system.

Course Credits : 3 units

Pre-Requisite : Co-Requisite CC 104 – Data Structures and Algorithms

CC 106 – Applications Development and Emerging Technologies

Development of applications using web, mobile, and emerging technologies with emphasis on requirements management, interface design, usability, testing, deployment, including ethical and legal considerations

Course Credits : 3 units

Pre-Requisite : IM 101 – Fundamentals of Database Systems

Professional Courses

DS 101 - Discrete Structures 1

This course introduces the foundations of discrete mathematics as they apply to computer science. Topics include functions, relations and sets, basic logic, proof techniques, basics of counting and introduction to digital logic and digital systems.

Course Credits : 3 units

Pre-Requisite : None

AL 101- Design and Analysis of Algorithms

This course explains how the performance of a computer is measured and the principal factors which limit design, such as the power wall. It also includes the instruction set of a modern RISC processor, including how constructs in high-level languages are realized.

Course Credits : 3 units

Pre-Requisite : DS 101 – Discrete Structure 1
CC 104 – Data Structures and Algorithms

SDF 101 – Object-Oriented Programming

This course provides the students with the fundamental understanding of object-oriented programming using Java. It introduces the different concepts that are commonly associated with object programming.

Course Credits : 3 units

Pre-Requisite : CC 103 – Intermediate Programming

DS 102 – Discrete Structure 2

Continues the discussion of discrete structure introduced in DS 101. Topics in the second course include predicate logic, recurrence relations, graphs, trees, matrices, computational complexity, elementary computability, and discrete probability.

Course Credits : 3 units

Pre-Requisite : DS 101 – Discrete Structure 1

PL 101 – Programming Languages (Design & Implementation)

This course provides students the fundamental features and concepts to different programming languages. Topics include overview of programming languages, Introduction to language translation, type systems, data and execution control, declaration and modularity, and syntax and semantics.

Course Credits : 3 units

Pre-Requisite : CC 104 – Data Structures & Algorithms

AR 101 – Architecture & Organization

This course introduces the principles of computer organization and basic architecture concepts. This emphasizes performance and cost analysis, memory technology, memory hierarchy, virtual memory management, I/O systems, and pipelining. This includes both hardware and software technologies to secure computer system.

Course Credits : 3 units

Pre-Requisite : DS 101 – Discrete Structure
CC 104 – Data Structures & Algorithms

OS 101 – Fundamentals of Operating Systems

This course provides an introduction to the concepts, theories and components that serve as the bases for the design of classical and modern operating systems. Topics include process and memory management, process synchronization and deadlocks.

Course Credits : 3 units

Pre-Requisite : CC 104 – Data Structures & Algorithms

AL 102 – Automata Theory & Formal Language

This course introduces the formal models of computing and their relation to formal languages.

Course Credits : 3 units

Pre-Requisite : AL 101 – Design & Analysis of Algorithms

FBA 101 – Fundamentals of Business Analytics

This course stresses the factors that impact the performance of business decision makers and the data management and analysis methods that have value to them. This course includes lectures, presentations, and demonstrations that emphasize discussion and illustration of methods, as well as hands-on, practical exercises that provide both a sound base of learning and an opportunity to test and develop skill.

Course Credits : 3 units

Pre-Requisite : CC 101 – Introduction to Computing

SE 101 – Software Engineering 1

This course is aimed at helping students build up an understanding of how to develop a software system from scratch by guiding them thru the development process and giving them the fundamental principles of system development with object oriented technology using UML. The course will initiate students to the different software process models, project management, software requirements engineering process, systems analysis and design as a problem-solving activity, key elements of analysis and design, and the place of the analysis and design phases within the system development life cycle.

Course Credits : 3 units

Pre-Requisite : SDF 101 – Object-Oriented Programming
CC 105 – Information Management

HCI 101 – Fundamentals of Human Computer Interaction

The course is intended to introduce the student to the basic concepts of human-computer interaction. It will cover the basic theory and methods that exist in the field. The course will unfold by examining design and evaluation. Case studies are used throughout the readings to exemplify the methods presented and to lend a context to the issues discussed. The students will gain principles and skills for designing and evaluating interactive systems. Among the topics studied are the design and evaluation of effective user interaction designs, including principles and guidelines for designing interactive systems.

Course Credit : 3 units

Prerequisite : PL 101 – Programming Languages (Design & Implementation)

THS 101 – CS Thesis 1

This course orients the student to a structured approach in developing applied research in the field of information technology and computer science. Putting theories learned into practice, students will write and defend their undergraduate thesis proposal to a panel of faculty members. Through the course, various concepts, tools and techniques in research methodology are introduced to the students.

Course Credits : 3 units
Pre-Requisite : 3rd Yr. Standing

EDM 101 – Fundamentals of Enterprise Data Management

This course is designed to introduce students to the fundamentals of database management systems, enterprise data management using data warehouse, which can be used for further data mining, reporting and data analysis purposes. It describes various activities involved in data mining task like data anomaly detection, data association rule learning, data clustering, data classification, data regression, and data summarization.

Credit : 3 units
Prerequisite : CC 101 – Introduction to Computing

SE 102 – Software Engineering 2

This course provides the students with software analysis and design techniques that result in the development of maintainable and reliable software that meets the customer's needs. In practical terms, this course is meant to provide students with an approximation of a real-world experience of software development.

Course Credits : 3 units
Pre-Requisite : SE 101 – Software Engineering 1

NC 101 – Networks and Communication

This course provides the detailed introduction to the hardware and software, architectural components for communications in local area networks. The components that are focused upon include understanding the basics of computer networks, switching, routing, protocols and security.

Course Credits : 3 units
Pre-Requisite : CC 103 – Intermediate Programming

SIP 101 – Social Issues & Professional Practice

This course studies the social impact, implications, and effect 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.

Course Credits : 3 units

Pre-Requisite : SE 102 – Software Engineering 2

IAS 101 – Information Assurance & Security

This course provides the foundations of information assurance and security from a business prospective. Topics covered include human factors, compliance with regulations, personnel security, risk assessment and ethical considerations.

Course Credits : 3 units

Pre-Requisite : CC 105 – Information Management

THS 102 – CS Thesis 2

A continuation to THS 101, it is in this course where students will implement and test output of their project.

Course Credits : 3 units

Pre-Requisite : THS 101 – CS Thesis 1

FAM 101 – Fundamentals of Analytics Modeling

An introduction to important and commonly used models in Analytics, as well as aspects of the modeling process.

Course Credits : 3 units

Pre-Requisite : FBA 101 – Fundamentals of Business Analytics
EDM 101 – Fundamentals of Enterprise Data
Management

PRAC 101 – Practicum (486 hrs.)

This course is an immersion program wherein the students will have the chance and opportunity to be with the IT industry.

Course Credits : 9 units

Pre-Requisite : Completed all Professional Courses

SEMTOUR – Seminars and Tour

Topics offered at the graduate level which is not covered in regular courses. Students participate in preparing and presenting discussion material and expected to play a major role in planning and carrying out activities to meet the course objectives.

Course Credits : 3 units

Pre-Requisite : 4th Yr. Standing

CS Professional Electives

Computational Science

This course provides the scientific investigation of problems through modeling, simulation and analysis of physical processes on a computer.

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

Graphics and Visual Computing

This course provides a basic introduction to the theory and practice of 3D computer graphics (using C/C++ and OpenGL, WebGL), animation, and game design and implementation (using game engine Vizard). The focus is on fundamental topics in computer graphics, 3D animation and simulation, multimedia, and etc.

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

Parallel and Distributed Computing

This course will investigate programming issues surrounding modern concurrent and distributed platforms, including symmetric multiprocessors, multi-cores and many-cores, clusters and Grid in the scientific computing realm. Each student will complete several programming exercises on parallel paradigms such as MPI, OpenMP, CUDA and ZPL as introduced in the course. Students should be able to answer questions on whether, when, and how to perform parallel computing. The primary purpose of this course is to guide students on how to approach, investigate, consider, analyze, use and apply parallel computing methods to address problems they may encounter in real world work environment, this course also intend to build a solid foundation for advanced topics such as concurrent algorithms, scientific computing, etc

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

Intelligent Systems

This course introduces students to the field of Artificial Intelligence (AI) with emphasis on its use to solve real world problems for which solutions are difficult to express using the traditional algorithmic approach. It explores the essential theory behind methodologies for developing systems that demonstrate intelligent behavior including dealing with uncertainty, learning from experience and following problem solving strategies found in nature.

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

System Fundamentals

This course will introduce assembly language programming and essential concepts of computer organization and architecture. The focus of this course is on the computer organization of a computer system, including the processor architecture and the memory system. In particular, we will discuss the internal representation of information, performance evaluation methodology, instruction set architectures and implementation techniques for computer arithmetic, control path design, and pipelining

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

Computer Science Electives

Mobile Application Development

This course is intended for students who have some prior programming experience. The course will introduce you to have the basics of the Android platform, Android application components, Activities and their lifecycle, UI design, Multimedia, 2D graphics and networking support in Android.

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

Natural Language Processing

This course introduces the theory and methods of natural language processing (NLP). NLP systems understand and produce human language for applications such as information extraction, machine translation, automatic summarization, question-answering, and interactive dialog systems. The course covers knowledge-based and statistical approaches to language processing for syntax (language structures), semantics (language meaning), and pragmatics/discourse (the interpretation of language in context). For graduate students, the course will also cover aspects of current research in NLP.

Course Credits : 3 units
Pre-Requisite : 3rd/4th Yr. Standing

Modeling and Simulation

This course introduces the students to modelling and simulation concepts. Topics discussed in the course includes, system analysis and classification., abstract and simulation models, continuous, discrete, and combined models, heterogeneous models. It also covers pseudorandom number generation and testing, queuing systems, Monte Carlo method, and continuous simulation.

Course Credits : 3 units
Pre-Requisite : 3rd/4th Yr. Standing

Game Development

This purpose of this course is twofold: to provide a strong foundation in software engineering, programming, and the C# language; and to work on all major aspects of developing video games using the Unity engine.

These two purposes are closely tied: a large part of video game development centers on programming and software development, and to be a game developer requires a high level of knowledge in a modern, object-oriented language like C#. Through this course, students will learn programming by working on games, and will learn to write code to run every part of their game, from physics to AI to game servers.

Course Credits : 3 units
Pre-Requisite : 3rd/4th Yr. Standing

Geographical Information System

This course introduces the hardware and software components of a Geographic Information Systems and review GIS applications. Topics include data structures and basic functions, methods of data capture and sources of data, and the nature and characteristics of spatial data and objects.

Course Credits : 3 units
Pre-Requisite : 3rd/4th Yr. Standing

Cloud Computing

This course introduces the learning of how to use Cloud as the infrastructure for existing and new services. The course will also utilize open source implementations of highly available clustering computational environments, as well as RESTful Web services, to build powerful and efficient applications.

Course Credits : 3 units

Pre-Requisite : 3rd/4th Yr. Standing

PE

PE 1 – Physical Activities Toward Health and Fitness 1 (PATH-FIT 1):

Movement Competency Training

The course introduces the fundamental movement patterns that consist of non-locomotor and locomotor skills, which are integrated with core training (stability, strength and power) to meet the demands of activities of daily living and sports performance. The training shall be in conjunction with fitness concepts, exercise and healthy eating principles. Emphasis will be on exercise progression and regression for the enhancement of fitness; adaptation of movement competencies to independent physical activity pursuits and the periodic evaluation of PA and eating patterns to monitor one's progress and achievement of personal fitness and dietary goals.

Course Credit : 2 units

Prerequisite : None

PE 2 – Physical Activities Toward Health and Fitness 2 (PATH-FIT 2):

Fitness Training

The course builds on the Movement Competency Training course which focused on the fundamental movement patterns and core training. Based on the primary movement (squat, hinge, lunge, vertical push and pull, horizontal push and pull), fitness training starts with body weight training to improve balance, coordination, endurance and flexibility, then progresses to training for core strength and power, with or without resistance training equipment. Emphasis is on exercise progression and regression for the enhancement of skill-related fitness components in preparation for and/or in conjunction with vigorous physical activities, such as sports participation.

Course Credit : 2 units

Prerequisite : PE 1 – Physical Activities Toward Health and Fitness 1 (PATH-FIT1): Movement Competency Training

PE 3 – Physical Activities Toward Health and Fitness 3 (PATH-FIT 3):

Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor and Adventure Activities

This course tackles the fundamental skills of the dance/sport/martial arts/group exercise/outdoor and adventure activity that include (specify here activity-specific skills; for ex. Table tennis-ball control (grip, stance and footwork), strokes (forehand and backhand push), the serve and return of serve). It also engages the learner in game play with some basic strategies or tactics (applicable only to sports). Through skills training in class, pursuit of recreation (or independent physical activities) beyond the classes and in conjunction with fitness and healthy eating concepts, fitness levels are enhanced. PA and eating habits are also periodically evaluated to monitor one's progress and achievement of personal fitness and dietary goals.

Credit : 2 units

Prerequisite : PE 2 – Physical Activities Toward Health and Fitness 2 (PATH-FIT 2): Fitness Training

PE 4 – Physical Activities Toward Health and Fitness 4 (FATH-FIT 4):

Menu of Dance, Sports, Group Exercise, Outdoor and Adventure Activities

The course tackles the fundamental skills of the dance/sport/martial arts/group exercise/outdoor and adventure activity that include (specify here activity-specific skills; for example, table tennis-ball control (grip, stance and footwork), strokes (forehand and backhand drive, forehand and backhand push), the serve and return of serve. It also engages the learner in game play with some basic strategies or tactics (applicable only to sports). Through skills training in class, pursuit of recreation (or independent physical activities) beyond the classes and in conjunction with fitness and healthy eating concepts, fitness levels are enhanced. PA and eating habits are also periodically evaluated to monitor one's progress and achievement of personal fitness and dietary goals.

Course Credit : 2 units

Prerequisite : PE 3 – Physical Activities Toward Health and Fitness 3 (PATH-FIT 3): Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor and Adventure Activities

NSTP

NSTP 1 – ROTC/CWTS/LTS

Course Credit : 3 units

Prerequisite : None

NSTP 2 – ROTC/CWTS/LTS

Course Credit : 3 units

Prerequisite : NSTP 1