

**COURSE DESCRIPTION**  
**Bachelor of Science Program in Information Technology**  
**DPU International College, Dhurakij Pundit University**  
**135 Credits**

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**General Education Course Description**

**Science and Mathematics**

**MA150 Mathematics and Statistics for Daily Life** **3 (3-0-6)**

Percentage and ratio, introductory logic, simple and complex interest calculations; current and future value of money; mathematics and insurance business; introduction to money and capital markets; statistics in life and work; data and information; introduction to data collection, analysis and presentation.

**SC150 Sciences and Technology for Quality of Life and Society** **3 (3-0-6)**

Concepts and processes of science, energy, nutrition, and medicine for health care; relations between living things and natural resources; atmospheric changes, electricity, communications; environmental problems and remedial technology; application of modern sciences and technologies for better living.

**Humanities**

**IL150 Information for Research** **1 (1-2-4)**

Information system types and sources of information; components and categories of information resources; reference information; electronic information and internet research; research and report production; component of research reports; footnoting and referencing of printer and electronic materials.

**GE150 Physical Education for Quality of Life** **1 (1-1-1)**

Basic knowledge and skills for physical fitness and mental health; physical exercise and recreational activities to promote values, ethics, sportsmanship, and quality of life.

**GE169 Holistic Approaches to Life****1 (1-1-2)**

Knowledge regarding physical, psychological, social interaction and the value of life necessary for self-development, setting life goals, academic life, society and personality.

**GE151 Man and Reasoning****3 (3-0-6)**

Recognition and perception of human beings, principles and methods of analysis, synthesis, and logical sequence of ideas, as well as the use of reasoning process for problem-solving and decision-making both in theory and practice, and analyzing case studies taken from current affairs and daily life.

**GE152 Philosophy and Life****3 (3-0-6)**

Theories, concepts, and principles of philosophy; application of philosophy in analyses and criticisms of various issues in life and society; adoption of ethical, moral, and philosophical.

**GE153 Thai Studies****3 (3-0-6)**

Foundations of Thai civilization; changes and developments in various aspects including history, politics, governance, economy, society, religion and arts; preservation of Thai identity and adjustment of life style to fit in with present and future Thai society.

**GE154 Thai Folk Wisdom****3 (3-0-6)**

Definition, scope and importance of culture; regional and national culture in Thailand; types of Thai wisdom; factors for emergency of Thai folk wisdom; the four necessities and livelihood of people in the four regions of the country; value, perpetuation, and dissemination of Thai folk wisdom; its application in present day life.

**GE161 World Civilization****3 (3-0-6)**

Historical and cultural background together with different ways of living based on developments which enable human beings to gain insights in politics, economies, society, culture, as well as values, religions, and beliefs.

## **Social Sciences**

### **BA 151 Managing Business for New Entrepreneur**

**3 (3-0-6)**

Format and establishment of business, business opportunity, laws and regulations concerning business; study of related components including marketing, accounting, production, finance and human resources; functions and management of each component; and strategies for successful business operation.

### **BA152 Business Analysis and Planning**

**3 (3-0-6)**

Components of business; setting business goals, making business plans, analysis of business environment, market, customers and competitors, market share, selection of target markets, financial estimate, financial analysis, production management, human resources management, business performance monitoring and evaluation, business operation, case studies to practice proposing ideas for business operations together with business plans and business plan analysis.

### **GE155 Politics, Economy and Society**

**3 (3-0-6)**

Interrelationships of society, economy and politics; social, economic and political evolution in the world and Thai contexts; institutional concepts and existing institutions; democratic rule; political, economic and social problems.

### **GE156 Psychology for Quality of Life**

**3 (3-0-6)**

Fundamentals of psychology, principles and theories of psychology, for improvement of quality of life and self-development including personality, motivation, creative thinking, good interpersonal relationships, temperament, mental health, self-adjustment, planning for better life and successful career, leadership and team spirit, as well as application of psychological processes for a happy life.

### **GE167 Public Mind for Community**

**3 (3-2-6)**

Theories on communities; communities and (in) Thai society; the needs to create public-mindedness among students; identification of needs within a community and types of service to be volunteered to meet these needs.

**LW150 Introduction to the Study of Laws**

**3 (3-0-6)**

The sources, development and the concept of laws; the fundamental principles of civil laws, criminal laws, public laws and various procedural laws.

**Language**

**LE101 English Use 1**

**3 (3-0-6)**

Consolidation and further development of students' fundamental English skills, placing an emphasis on how English speakers communicate in a variety of contexts and situations; interpersonal interactions in on-campus and off campus life; politeness strategies; issues in cross-cultural communication.

**LE102 English Use 2**

**3 (3-0-6)**

Prerequisite: LE101 English Use 1

Continuation of the objectives set forth in English Use 1, namely to improve communication skills, both oral and textual in a variety of situations and requirements.

**TH150 Communication Skills in Thai**

**3 (3-0-6)**

Thai words and meanings, writing sentences and correcting inappropriate sentences; summarizing; compiling information to write essays; writing of paragraphs and essays.

**TH160 Communication Skills in Thai for Non-Native Speakers**

**3 (3-0-6)**

Introduction to Thai language for daily life with an emphasis on appropriate expressions, intonation, pronunciation and behavior in a variety of contexts in the phonetic approach.

## Description of Required Courses

### Core Courses

#### **ET201 Discrete Mathematics**

**3 (3-0-6)**

Logic; relations and functions; basic set theory; countability and counting arguments; proof techniques and mathematical induction; graph theory; combinatorics; discrete probability; recursion and recurrence relations; number theory.

#### **ET206 Information Technology**

**3 (3-0-6)**

Evolution of computer and communication technologies; overview of computer and communication systems; semiconductor and microprocessor technologies; input and output technologies; storage technologies; communication technologies (telecommunications and network systems); software technologies (types of programming languages, application software and system software); database technologies; examples of information systems with applications; ethical and social issues; emerging information technologies and their impacts.

#### **ET207 Multimedia Technology**

**3 (2-2-6)**

Multimedia systems; theories, elements, and hardware/software components of multimedia; types of multimedia data; multimedia data acquisition and production; processing of multimedia data; multimedia data transmissions; multimedia file formats and storage devices; presentation of multimedia data and multimedia applications; digital image editing; digital sound and video editing; animation; web page development; interactive presentation.

#### **ET208 Computer Program Development 1**

**3 (2-2-6)**

Concepts involved in high-level languages and program development process; writing of useful and interesting computer programs that are easy to read and modify; basic aspects of recursion; parameter passing; file I/O; classes and objects; arrays; functional decomposition to enable top-down design.

**ET209 Computer Program Development 2****3 (2-2-6)**

Prerequisite: ET208 Computer Program Development 1

Object-oriented programming development such as in Java and C++; programming style, modularization, data abstraction, abstract data types, and selection and analysis of algorithms; programming using a structured approach; recursion; pointers; files; elementary data structures including stacks, queues, linked lists, and binary trees.

**ET210 Computer Systems Organization****3 (3-0-6)**

Relationships between computing hardware and machine language instruction sets; digital logic level and computer arithmetic; central processing unit, memory, system buses and I/O; operating system concepts; multiprocessor systems.

**ET211 Data Communications and Networking****3 (3-0-6)**

Basic internetworking concepts, including the use of internetworking software applications; routing/switching hardware, security, distributed client/server applications and architecture; intranets and intranet servers and browsers; networks and network servers; LANs/WANs; internetworking technologies; OSI reference model for networking protocols; routing and routing algorithms; TCP/IP implementation; frame relay; FDDI; X.25; ISDN services; the Internet; the World Wide Web; intranets; related software applications.

**ET212 Data Structures and Algorithms****3 (2-2-6)**

Prerequisite: ET208 Computer Program Development 1

Overview of mathematics including mathematical induction; introduction to recursive programming; design and analysis of algorithms; data types, data structures and abstract data type; running time calculation; basic data structures such as listing, stacking and queuing; dynamic data structures such as linked list, and basic terminology of trees; binary trees, binary search trees, and AVL trees; sorting and searching.

**ET215 Database Systems****3 (2-2-6)**

Design and implementation of database and knowledge-based system using various data model, principles, structures, analyses, and modern techniques; physical and logical design; normalization; security, and integrity; relational, entity-relationship, object-oriented, and semi-structured models; scope and limitations of current database models.

**ET217 Electronic Office and Desktop Publishing****3 (2-2-6)**

Development of skills needed in the electronic procedure of producing and editing spreadsheets and publications; improved productivity of electronically produced spreadsheets, newsletters, flyers, brochures, reports, advertising materials, and other publications; practical tools based on open standards.

**MA250 Principles of Statistics****3 (3-0-6)**

Application of statistics in decision making and in planning for daily life and work; random variables; probability and continuous probability distributions; frequency distribution; population and sampling; estimation theory; test of statistical hypothesis; chi-square test; the computation and measurement of dispersion; central tendency; regression; correlation and time-series analysis.

**BB210 Business Research Methods****3 (3-0-6)**

Concepts, objectives, and benefits of business research; challenges and problems in business which needs a research as the decision making tool; research process, research method, and data analysis; package softwares for data recording and data analysis; writing a research proposal and conduct research.

**LA143 English for Business Communication 1****3 (2-2-6)**

The English language used in business, such as conversation with customers and colleagues, making inquiries and arrangements as well as job search, applications, interviews and offers; practice of communication in various business situations.

**LA144 English for Business Communication 2****3 (2-2-6)**

Prerequisite: LA143 English for Business Communication 1

Preparation for future professional career; cultural aspects in business communication, advertising, business negotiation; an extensive acquisition of career information and self-presentation both in speaking and writing.

**Compulsory Courses****ET301 Multimedia Software Design and Development****3 (2-2-6)**

Theoretical knowledge and activities needed in the development process of a multimedia system with detailed techniques of systems analysis, design and implementation; application of the theories learned in the seeking of solutions to practical problems in multimedia system development.

**ET302 Network Management and Design****3 (2-2-6)**

Prerequisite: ET211 Data Communications and Networking

Networking concepts; equipment and components of a typical network system; network management activities such as fault management, accounting management, performance management, and security management; network management systems, architecture and frameworks with a focus on network design concepts, basic traffic attributes, tele-traffic engineering, concept of voice, data, multimedia and integrated communications; concepts of network architecture, system analysis and design, and system performance; quality of service; traffic analysis; synthesis of network topologies; voice, data and integrated network topologies; planning process; strategic, tactical and operational planning process.

**ET303 Software Engineering****3 (3-0-6)**

Software development life cycle; requirement specifications; alternative development models for software design including data driven, object-oriented, and function-oriented designs; formal methods; CASE design support tools; user interface design; software portability, re-usability, and maintainability; software tools, testing and debugging; verification and validation; code inspection; reliability support tools; software engineering environment; project planning; software cost estimation; configuration management; change

control; source control systems and documentation; discussion of Capability Maturity Model Integration (CMMI).

**ET304 Laws and Ethics for Information Technology** **3 (3-0-6)**

Rules of conduct and moral code; ethical guidelines based on values and attitudes that an information technologist must possess in his practice of information technology in a professional, responsible, ethical manner; laws related to information and information technology.

**ET305 Management and Information Technology** **3 (3-0-6)**

Role of information systems in organizations; relationships between information systems and organizational objectives and structure; points of view, information flows, nature of information systems in an organization; computers and information systems integral to all modern organizations; combination of technical and managerial materials required to understand the operational and strategic uses of computers in organization; benefits of information technology in the management of an organization.

**ET308 Object-Oriented Analysis and Design** **3 (3-0-6)**

Software development processes; object-oriented technologies and the Unified Modeling Language (UML); a primer on OO technology and software development methodologies; requirements gathering and analysis; system architecture and design, implementation, testing, and deployment; comparisons between structured and object-oriented analysis and design.

**ET309 Electronic Commerce** **3 (2-2-6)**

Concepts of electronic commerce as facilitated by the Internet and related technologies; catalysts for e-commerce (both B2B and B2C); technological challenges; legal and regulatory framework; behavior and education challenges; strategies for e-commerce.

**ET310 Human-Computer Interaction** **3 (3-0-6)**

HCI design process; the underlying scientific principles, HCI design methodology; user-interface technology used in the implementation of HCI; human cognition; HCI theories; user observation and task

analysis; prototyping and evaluation techniques; user interface modalities; graphical user interface components and accessibility.

**ET311 Web Application Development** **3 (2-2-6)**

Development of web applications; web servers and web application servers; web application development methods; client side and server side scripting; web application development techniques.

**ET312 Graphic Design for Digital Media** **3 (2-2-6)**

Basic elements of design, effective visualization and communication; fundamental principles of graphic design for new media; various tools used for idea formulation; testing of digital media projects.

**ET313 Web Design** **3 (2-2-6)**

Production of web pages and web sites; skills in the composition of HTML, CSS and the optimization of a site via core elements of typography, images, sound and animation; creativity, usability and functionality; examples of simple and sophisticated web sites; practice in the creation of web pages that demonstrate an understanding and a use of good design principles.

**ET329 Information Systems Security** **3 (3-0-6)**

Overview of computer security, physical protection, and system security and control; threats to security and computer crime; security measures, protection from natural disasters, access control, contingency planning and disaster recovery; hardware security, software security, and encryption and decryption techniques; database security, network security, security management, and legal and ethical issues.

**ET406 Information Technology Project Preparation** **3 (0-0-9)**

Prerequisite: Must have completed at least 2 years of study

Independent individual or group projects under the supervision of a faculty member where students are required to present a project proposal and elementary results obtained from the study; solving practical or academic problems in the information technology field.

**ET407 Information Technology Project****3 (0-0-9)**

Prerequisite or co-requisite: ET406 Information Technology Project Preparation

Independent individual or group projects under the supervision of a faculty member where students are required to presenting a complete result of the project previously or concurrently conducted for ET406 Information Technology Project Preparation; approval of the Program Director is required for this course.

**Elective Courses****ET322 Decision Support Systems****3 (3-0-6)**

Human decision-making processes; system and models; types of decision support system; information requirements; theory and principles of information interpretation for decision making; external information resources; efficient system for storing and retrieving information under changing environment; study of DSS development process, DSS software tools, DSS hardware, DSS models, and case study of DSS.

**ET332 Network Security****3 (3-0-6)**

Security attacks, security services, security mechanisms, message confidentiality, message authentication, authentication applications, electronic mail security, IP security, and web security; network management security; intruders and intrusion detection systems; malicious software and firewall technologies.

**ET335 Advanced Web Application Development****3 (2-2-6)**

Prerequisite: ET311 Web Application Development

Development of advanced web application skills which include web application security, session management, design patterns and reusable web application components; study and practice in advanced topics such as XML and web services.

**ET336 Mobile Application Development****3 (2-2-6)**

Development of applications on mobile and wireless computing platforms; the processes, tools and frameworks required to develop applications for current and emerging mobile computing devices.

**ET337 Game Development****3 (2-2-6)**

Introduction to the programming of computer games; the use of game engines to write a game as an application of the engine; efficient utilization of variables and data structures; run-time optimization; real-time debugging; version control maintenance; management of bug lists.

**ET338 Advanced Database Systems****3 (2-2-6)**

Prerequisite: ET215 Database Systems

Advanced database system design and implementation; advanced topics in modern database systems including object-oriented databases, XML databases, distributed databases, and on-line analytical processing.

**ET339 Knowledge Management****3 (3-0-6)**

Core concepts and theories of knowledge management; stages in the knowledge management process; implications of knowledge management systems and the underlying technologies; means and cautions in the exploitation of knowledge management in an organization or the business sector.

**ET340 Spreadsheet Modeling****3 (2-2-6)**

Designing and using of spreadsheets for decision-making; development of spreadsheet models; techniques for seeking solutions; graphical techniques for the display of results.

**ET341 3D Modeling****3 (2-2-6)**

Use of application software for modeling, texturing, and rendering of three-dimensional digital objects and environments; lighting and color as well as concepts of three-dimensional space; geometric transformation and smoothing methods; working from conceptual art; modeling "pipeline"; composition theories and methods.

**ET342 Computer Animation****3 (2-2-6)**

Use of application software for creating two- and three-dimensional digital animation from conceptual art to rendered scenes; lighting, rendering, shading, and texture painting; digital and non-digital

methods for analysis and production of animation through project content focusing on character and scene design.

**ET343 Game Design**

**3 (2-2-6)**

Principles of game design including an understanding of games as formal, social, and cultural systems; rapid prototyping and play testing of game concepts; methods for game analysis and production.

**ET344 Advanced Web Design**

**3 (2-2-6)**

Prerequisite: ET313 Web Design

Fundamentals and key concepts of advanced Web design through a series of technical and design workshops; the latest Web authoring tools used to optimize between design and currently available technology.

**ET345 Information Technology Project Management**

**3 (3-0-6)**

Basic principles of good project management; identifying of resources and project scheduling; project flow charts and critical path planning and evaluation reports; critical role of staff selection and team management.

**ET404 Current Topics in Information Technology**

**3 (3-0-6)**

Current topics of interest selected by the instructors in the field of information technology.

**ET405 Special Topics in Information Technology**

**3 (3-0-6)**

Special topics of interest selected by the instructors in the field of information technology.

**ET410 Cooperative Education**

**6 (600 hrs)**

Prerequisite: Must have completed at least 2 years of study

Cooperative education with a minimum of 600 person-hour industrial internship aiming at preparing students for the real challenges in information technology profession; a link between academic study and practical work experience as an integral part of the degree program.