

- CHED Memoranda

- ☑ Policies and Standards for Graduate Program in I.T.
- ☑ Revised Policies and Standards for I.T. Education
- ☑ and Policies and Standards for Associate in Computer Technology



Republic of the Philippines
OFFICE OF THE PRESIDENT
COMMISSION ON HIGHER EDUCATION

CHED MEMORANDUM ORDER (CMO)
NO. 25 ;
Series of 2001

SUBJECT : REVISED POLICIES AND STANDARDS FOR
INFORMATION TECHNOLOGY EDUCATION (ITE)

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In accordance with the pertinent provisions of Republic Act (RA) No 7722, otherwise known as the "Higher Education Act of 1994," and for the purpose of rationalizing Information Technology (IT) education in the country with the end in view of keeping at pace with the demands of global competitiveness, the following policies and standards for Information Technology Education (ITE) are hereby adopted and promulgated by the Commission, thus:

ARTICLE I
MISSION STATEMENT AND OBJECTIVES

Section 1. General Objectives. - The Information Technology Education (ITE) prepares students to be professionals in this field. Specifically, students by the time they graduate are envisioned to:

- 1.1. have undergone training in abstract and analytical processes;
- 1.2. have developed personal and social values;
- 1.3. have acquired technical skills;
- 1.4. be grounded in appropriate concepts and principles; and
- 1.5. be adaptive to the work environment.

Section 2 Strategy on Attainment of Objectives. - ITE aims to equip students with one or more of the following, to wit:

- 2.1. the basic principles and foundation that underlie the science of this field;
- 2.2. practical knowledge of how Information Systems (IS) are installed, operationalized, managed, and administered; and
- 2.3. ability to conceptualize, design, develop, implement and maintain IS

ARTICLE II DEGREE PROGRAMS

Section 3. Degree Programs - The degree programs corresponding respectively to these specific areas shall henceforth be called Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Information Technology (BSIT), and Bachelor of Science in Information Management (BSIM).

ARTICLE III AUTHORITY TO OPERATE

Section 4. Authority to Operate - All Higher Education Institutions (HEIs) and Local Colleges and Universities (LCUs) intending to offer degree programs in Computer Science, Information Technology, and Information Management must first secure proper authority from the Commission in accordance herein. State Universities and Colleges (SUCs), however, that are already authorized by their respective charters to offer such course(s) may no longer get the authority from the Commission but should likewise strictly adhere to the provisions herein.

ARTICLE IV ADMINISTRATION

Section 5. Composition. - The implementation of an ITE program shall be administered by a well-organized and competent staff and faculty, meeting the appropriate professional qualifications set by the Commission.

Section 6. Dean/Department Chair. - A Higher Education Institution (HEI) offering an ITE program shall have a full-time member of the faculty administering the program. This administrator can be a Dean, Department Head, Director, Coordinator or equivalent based on the organization of the school.

Section 7. General Qualifications of Dean/Department Chair. - The Dean or Department Chair of an ITE program must possess at least one of the following, namely:

- 7.1. A master's degree in an ITE program namely Computer Science, Information Technology and Information Management;
- 7.2. A master's degree in another field plus at least one of the following.
 - 7.2.1 Completion of coursework requirements for a master's degree in an ITE program;
 - 7.2.2 Five (5) years experience in the IT profession such as in technical support, systems design, applications programming or equivalent;
 - 7.2.3 Bachelors degree in IT.

- 7.3. A doctorate in a physical science, math, engineering or business field plus five (5) years experience teaching ITE courses (beyond computer literacy level courses).

In addition, the Dean/Department Chair should have industry advisor(s) to assist him/her, especially if he/she does not have IT industry experience. This could be in the form of a Board of Industry Advisors that is a component of an industry-academe linkage program.

Section 8. General Functions and Responsibilities of the Dean/Department Chair. - The general functions and/or responsibilities of the IT Dean/Department Chair /Director/Coordinator should be as follows, thus:

- 8.1. To assist in the formulation of institutional policies, curriculum development and offerings;
- 8.2. To exercise educational leadership among the concerned faculty members by:
 - 8.2.1. initiating and instituting a faculty and staff development program;
 - 8.2.2. preparing and assigning the teaching load of the faculty members and directing them to advise students in their program of studies; and
 - 8.2.3. ranking and recommending the appointment, promotion, retirement, termination and instituting disciplinary actions on faculty members and non-teaching personnel of the institution vis-à-vis IT, subject to the HEI's policies and procedures;
- 8.3. To coordinate with the office concerned with student services;
- 8.4. To encourage research and extension activities among faculty and students;
- 8.5. To institute methodologies of instruction and adopt proper textbooks;
- 8.6. To exercise overall supervision of all academic and non-academic personnel of the IT college or department;
- 8.7. To oversee the formation, implementation and evaluation of plans and programs for development and the supervision/coordination of activities and services for the advancement of goals and objectives, and

- 8.8. To help enforce the concerned HEI's rules and the laws affecting education, and the procedures, policies, rules and regulations promulgated under authority of or as adopted by the Commission and/or the HEI.

Section 9. Teaching Load. - As a general rule, in case the dean/department chair/director/coordinator has to teach, his or her teaching load should not exceed twelve (12) units.

ARTICLE V FACULTY

Section 10. Faculty. - An ITE faculty member is one who teaches in either one of the ITE degree programs and should have at least one of the following, to wit:

- 10.1. A baccalaureate degree in one of the ITE programs;
- 10.2. A degree in engineering, physical sciences, mathematics or business field with eighteen (18) units of formal studies (bachelors/graduate courses) in ITE;
- 10.3. A degree in a field other than ITE plus at least three (3) years experience in the IT profession such as technical support, systems design, applications programming or equivalent;
- 10.4. A degree in a field other than ITE plus at least eighteen (18) units of master's study in ITE;
- 10.5. A master's degree in a field other than ITE plus at least two (2) years of experience in ITE research and twelve (12) units of graduate study in ITE.

Section 11. Department. - The IT Department must have the following:

- 11.1. At least two (2) full-time ITE faculty members, one of whom can be the Dean or the Department Chair/Director/Coordinator or equivalent.
- 11.2. For the Information Technology or Information Management programs, at least forty percent (40%) of the ITE faculty members must have a minimum of nine (9) units of master's study in ITE or two (2) years of IT-related industry experience.
- 11.3. For the Computer Science program, at least sixty percent (60%) of the ITE faculty must have a minimum of nine (9) units of master's study in ITE.

Section 12. **Assignment.** - The normal total load (that is, teaching, research or administrative assignments) of an ITE faculty member should conform to the policies of the school; However, the overload should not exceed six (6) units.

Section 13. **Faculty Development Program.** - Each full-time ITE faculty member shall be encouraged to participate in professional organizations and in programs of professional development in his /her field as well as in ITE graduate studies.

ARTICLE VI CURRICULUM

Section 14. **General Curriculum.** - ITE shall be built upon a core of Basic Subjects and a series of Professional Subjects leading to one or more of the three majors. A subject shall cover one or more of the topics specified hereinafter. The New General Education Curriculum as mandated by the Commission shall form part of the requirements for ITE. The science subjects should include a laboratory component.

Section 15. **Industry-Academe Linkage.** - Industry-academe linkage programs are important, especially for the Information Technology and Information Management majors, and thus, industry practicum, apprenticeship or internship should be included in the curriculum.

Section 16. **Topics for the Basic Core and Majors.** - The topics identified for the Basic Core and the Majors in Computer Science, Information Technology and Information Management are as follows, thus:

16.1 Basic Core Topics (All required)

16.1.1. Basic Non-ITE Core Topics (maybe classified with General Education Subjects)

1. Communication skills;
2. Technical writing / presentation skills;
3. Algebra /trigonometry;
4. Values Formation;
5. Probability / Statistics

16.1.2 Basic ITE Core Topics

6. Professional Ethics / Code of Ethics for the Filipino IT Professional;
7. Mathematical Logic / Discrete mathematics;
8. Problem Solving;
9. Quality Processes;
10. Fundamentals of programming / program logic formulation;

11. Introduction to the Internet / Web-based programming;
- 12 IT Fundamentals;
13. Computer Systems Organization.

16.2. Computer Science Topics (Topics 1 to 16 required)

1. Calculus;
2. Abstract Algebra;
- 3 Electromagnetism and electricity;
4. Digital electronics;
5. Data structures;
6. Algorithms;
7. Principles of programming languages (using C-language and other equivalent or higher level language);
- 8 Computer Architecture / Assembly Language;
9. Object Oriented programming;
10. Principles of operating systems;
11. Principles of file organization;
12. Principles of database management systems;
13. Compiler design;
14. Automata theory / Formal languages and Computation theory;
15. Principles of data communication and networking;
16. Modeling and simulation theory;
17. Software Engineering;
18. Multimedia systems;
19. Software Project; and
20. Other electives in mathematics or other advanced topics such as numerical analysis, artificial intelligence, robotics, hardware/software interface, computer graphics, software tools, computing, graph theory, linear algebra, parallel computing.

16.3. Information Technology Topics (Topics 1 to 14 required)

1. Art and style of programming,
2. At least two application programming languages such as C-language, COBOL, Visual C, Visual FOXPRO, Visual BASIC, JAVA and the like;
3. Operating systems such as DOS, LINUX, UNIX or Windows;
4. Database management system;
- 5 Relational Database Management Systems oriented development tools and programming languages;
6. Installation of computer system, hardware and software, with actual laboratory hands-on;
7. Local Area Network / Network technology;
8. Systems analysis and design;

9. Software integration, testing and documentation;
10. Systems management and administration,
11. Information resource management;
12. Accounting;
13. Data Communications and Principles of Telecommunications;
14. Multimedia systems;
15. Current / future trends in Information Technology;
16. Computer Systems and Data Security,
17. Systems Quality Assurance;
18. Entrepreneurship;
19. Wireless Applications;
20. Information Systems Security; and
21. Electives such as information systems, image processing, switching networks, software engineering.

16.4 Information Management Topics (Topics 1 to 22 required)

1. Business processes;
2. Organizational theory;
3. Human behavior / Human Resource Management;
4. Management principles and practices;
5. Accounting, financial processes;
6. At least two application programming languages such as C-language, COBOL, Visual C, Visual FOXPRO, Visual BASIC, JAVA and the like,
7. Integrated office productivity software such as Star Office, MS Office, Smart Suite, Perfect Office, etc.;
8. Application software for accounting, purchasing, manufacturing, etc.;
9. Introduction to E-Commerce,
10. Planning, estimation and project management;
11. Systems analysis and design;
12. Software design and development / Software Engineering;
13. Management information system/information strategy plan,
14. Software integration, testing and documentation;
15. Quality assurance;
16. Information resources / System management;
17. Information Systems Audit,
18. Customer Relations Management;
19. Management of Internet Services;
20. Data communication and networking technology;
21. Database Management Systems;
22. Executive Information System;
23. Systems Integration;
24. Human - computer interaction;
25. Expert system / prototyping,

26. Enterprise Resource programming;
27. Supply Chain Management, and;
28. Other business or management subjects such as marketing, managerial and cost accounting, quantitative methods, production management, etc.

Section 17. ITE Minimum Curricular Requirements

GENERAL EDUCATION	Units	Units
<i>LANGUAGES and HUMANITIES</i>		24
English	9	
Filipino	6	
Humanities (Literature, Arts, Philosophy, etc.)	9	
<i>MATHEMATICS, NATURAL SCIENCES</i>		15
<i>TECHNOLOGY</i>		
Mathematics	6	
Natural Sciences	6	
Electives (Math, Natural Science, Technology etc.)	3	
<i>SOCIAL SCIENCES & COMMUNICATIONS</i>		15
Social Sciences & Communications	15	
Psychology, Sociology, Anthropology, Economics (w/ Taxation & Agrarian Reform Integrated), Philippine History & Culture, Life & Works of Rizal, Asian/Western Civilization, Mass Comm., Society and Culture (with Family Planning), Politics & Governance (with Philippine Constitution)		
<i>BASIC ITE CORE SUBJECTS</i>		18
<i>ITE PROFESSIONAL/MAJOR SUBJECTS</i>		33
<i>ITE ELECTIVES</i>		12
<i>FREE ELECTIVES</i>		9
TOTAL		126

Section 18. Others. - Citizen's Military Training, Physical Education, and other similar subjects as required by pertinent laws, rules and regulations and/or by the Commission should be accordingly added.

ARTICLE VII INSTRUCTIONAL STANDARDS

Section 20. General Standards. The general instructional standards for ITE are, thus:

- 20.1. HEIs should at all times maintain a high standard of instruction and a system of evaluation of teaching competence and should adopt a

mode of supervision for compliance with rules and regulations governing academic standards;

- 20.2 The different curricular programs in IT should adopt textbooks which are up to date in methods of presentation and in content and are not violative of Philippine laws.
- 20.3. The Dean/Chair of ITE should see to it that instructors and students have the necessary textbooks. Proper arrangements should be made to enable students to acquire them.

ARTICLE VIII LIBRARY

Section 21. Librarian(s). - HEIs offering ITE should have at least a one (1) full-time librarian with a degree in Library Science or a licensed librarian. The librarian(s) shall participate in faculty meetings and activities and serve as (a) member(s) of the educational program planning committee.

The librarian(s) should be encouraged to join recognized librarian societies and associations for professional development.

Section 22. Book Collection. - The library collection of the HEI should meet the following requirements, namely:

- 22.1. To support HEI's curricular needs and to provide enough books for students, its library should have at least five (5) titles per subject and one (1) volume per subject of a particular year of the curriculum for every ten (10) students enrolled in that year. At least twenty percent (20%) of the books should have been published within the last four (4) years.
- 22.2. The library should include significant holdings of up-to-date computer magazines, journals and periodicals that are published locally and internationally, including at least two (2) local and two (2) foreign publications.
- 22.3. Students must have available programming languages, and system manuals, licensed software packages, as well as documentation of materials related to the development and use of systems.
- 22.4. Electronic library materials such as CD-ROM's or via the Internet may be considered as additional library holdings beyond the minimum requirements, if they are easily accessible for reading, and that the desired materials can be readily printed.

Section 23 Space Requirements. - The library should have a seating capacity of at least five percent (5%) of the total students enrolled. The total library space should at least be 60 sq.m. or 2 square meters per student.

ARTICLE IX PHYSICAL FACILITIES

Section 24. General Standards. - The general standards for the physical facilities of the HEI offering ITE are as follows, thus:

- 24.1. Site. The size and location of the site of the HEI offering ITE should be adequate to meet the needs of its current population and future expansion.
- 24.2. Physical Plants All physical plants should conform with existing laws, rules and regulations on the same.
- 24.3 Start-Up Facilities. When an HEI is starting an IT program, it should satisfy the requirements specified based on the curriculum year that it intends to offer the ITE program. The required facilities should preferably be on a contiguous piece of land or within a very short walking distance. A minimum of one thousand (1,000) square meters of floor area ready for use inclusive of outdoor sports area and the like is mandatory
- 24.4. Health and Safety
 - 24.4.1. All classrooms and laboratories in the HEI should be clean and properly maintained to meet public health and safety standards.
 - 24.4.2. Comfort rooms should be kept clean and properly maintained and should be free of obnoxious odors.
 - 24.4.3 Physical education and recreational areas should conform with all rules and regulations pertaining to safety and suitability. There should be at least one area of one hundred (100) square meters minimum where physical education classes are to be conducted.
 - 24.4.4. There should be an efficient fire alarm and fire fighting system conforming with established standards.
 - 22.4.5. Corridors should be free of obstructions.

24.5. Ventilation. Classrooms, libraries, laboratories and offices of the HEI should be well ventilated.

24.6. Lighting. Illumination levels within the HEI facilities should be adequate and should conform with existing standards

24.7. Classrooms. Classrooms space should at least be 1.2 square meters per student. For a class size of 40 students, for example, the room should be at least 48 square meters, for 50 students, 60 square meters. It should be well lighted and well ventilated and/or air-conditioned. There should be at least one classroom per one hundred thirty-five (135) students enrolled.

24.8. Laboratory. The school must provide for computer laboratories required for hands on training of the students. (additional heading for lab article)

24.8.1. Laboratory space requirements. The laboratory floor space should be at least 2.0 square meters per student. For the computer laboratory, there should be no more than two (2) students per terminal or workstation. The number of terminals or workstations should be such that a student is provided at least three (3) hours of individual hands-on computer time per week. On the basis that each computer terminal or work station operates effectively at least ten (10) hours a day and six (6) days a week, the computer time requirement should translate to at least one computer per twenty (20) students enrolled in the ITE program, the computers being exclusively for their use. At least one of the laboratories should be a multi-user or a networked system. Likewise, one printer is required per fifteen (15) computers. Computers should also be provided for the use of the faculty.

24.8.2. Laboratory Equipment. The required computer hardware and software should be able to respond to the objectives of the subjects in the curriculum. They should conform to generally accepted industry standards and be capable of providing training in the micro, mid-range or main-frame environments. At least twenty percent (20%) of the equipment should have been manufactured within the last three (3) years.

24.9. Other Facilities. The HEI should provide office space for faculty and administrators, sitting areas for students, and other regular common facilities required.

24.10. Water Supply. The building and other facilities of the HEI should be provided with adequate potable water supply in accordance with accepted standards.

24.11. Class Size. The maximum class size should be fifty (50) students only

Section 25. Audio Visual Facilities. - As a general rule, the HEI should provide the necessary audio-visual equipment in support of the teaching-learning process, such as overhead projectors, slide projectors, LCD projectors, etc.

ARTICLE X ADMISSION and RESIDENCE REQUIREMENTS

Section 26 Admission. - No applicant should be enrolled in any approved ITE course unless he/she is a high school graduate and has satisfied all the published internal requirements of the HEI. As a rule, no applicant should likewise be enrolled in any approved ITE course unless he/she presents the credentials required by the HEI before the end of the enrollment period. Students who believe that they have been unduly deprived of their transfer credentials may seek the assistance of the Commission through its Higher Education Regional Offices (HEROs).

Section 27. Residence. - No student should be permitted to take any ITE subject without having satisfactorily passed the required prerequisites for the same, except in special cases as decided upon by the appropriate HEI official delegated with such responsibility and authority. In order to graduate a student, he or she has to take at least the last curricular year in that HEI.

ARTICLE XI REPEALING CLAUSE

Section 28. Repeal. - Any and all administrative issuances which are contrary to or inconsistent with any of the provisions herein are hereby deemed automatically repealed, rescinded and/or modified accordingly.

ARTICLE XII EFFECTIVITY CLAUSES

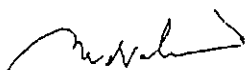
Section 29. New Programs. These policies and standards shall apply immediately to new programs necessitating issuance of permits to operate for Collegiate Year (CY) 2002- 2003.

Section 30. Existing Programs. - Existing (Recognized and Permit Status) programs should conform herein effective CY 2002 - 2003. However, the re-naming of the degree programs, i e., B.S. in Computer Science, B.S. in Information Technology, and B S in Information Management or a combination of the above thereof provided that there is only one BS degree and all of the requirements of each of the combined areas are met, should be accomplished by all HEIs offering ITE soonest. Furthermore, students in their second, third, or fourth years have the option to finish and complete the old curricular requirements.

Pasig City, Philippines, JULY 24, 2001



ESTER ALBANO GARCIA
Chairperson



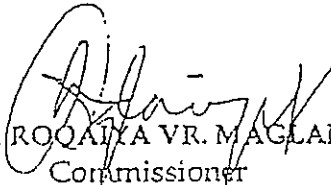
MONA D. VALISNO
Commissioner



ROBERTO N. PADUA
Commissioner



MANUEL D. PONZAL
Commissioner



HADJA ROQAIYA V.R. MAGLANGIT
Commissioner



Republic of the Philippines
OFFICE OF THE PRESIDENT
COMMISSION ON HIGHER EDUCATION

CHED MEMORANDUM ORDER

No. 02
Series of 2000

SUBJECT : POLICIES AND STANDARDS FOR GRADUATE
PROGRAM IN INFORMATION TECHNOLOGY

In accordance with the pertinent provisions of Republic Act (RA) No. 7722, otherwise known as the "Higher Education Act of 1994", and for the purpose of rationalizing graduate education in the country, the following updated policies and standards for graduate programs in information technology are hereby adopted and promulgated by the Commission, thus.

MASTER'S PROGRAM

ARTICLE I
OBJECTIVE

Section 1. General Objectives. The objective of the master's degree is to prepare a student who has finished an undergraduate degree program (bachelor's) for practical work in business and industry or to prepare the student for further academic studies in the field.

Section 2. Abstract The field of information technology is inherently cross-disciplinary in nature. It is expected that graduates from various disciplines will enroll in this field and will want to apply information technology in various ways. Accordingly, three master's degree programs are identified:

- 2.1. The master's degree program in Computer Science emphasizes comprehension and understanding of the principles and concepts needed for designing and formulating new systems and applications. It encourages the inquisitive pursuit and investigation of new ideas and developments to prepare the student for a subsequent doctoral degree program, for industrial research and for development of educational programs in the field.

It is assumed that students entering this degree program have completed undergraduate courses that provide the mathematical foundations for abstract algebra, mathematical logic, calculus, discrete mathematics, and statistics.

- 2.2. The master's degree program in Information Technology emphasizes the acquisition of concepts and technologies preparing and enabling the student for the industrial practice of systems integration, systems administration, systems planning, systems implementation and other activities that maintain the integrity and proper functionality of a system and its components.

It is expected that students entering this degree program have had undergraduate or

industry preparation that would have exposed the student to programming concepts and skills as well as the operating environment of a network system.

- 2.3. The master's degree program in Information Management prepares the student for industrial practice in project management, information systems planning, design, development and the management of technical personnel. It is expected that students in this program have had undergraduate preparation in any of the following fields: communications, psychology, management, business, accounting, industrial engineering, IT and related fields.
- 2.4. If a candidate does not have the proper background for the master's program, he must take the necessary remedial subjects to enter the program of his choice.

ARTICLE II TITLES OF MASTER'S DEGREE PROGRAM

Section 3. Graduate programs in Information Technology Education (ITE) lead to either a master's or a doctorate degree. The titles for master's degree programs are normally the following:

- 3.1 Master or Master of Science in Computer Science (MCS or MSCS)
- 3.2 Master or Master of Science in Information Technology (MIT or MSIT)
- 3.3 Master or Master of Science in Information Management (MIM or MSIM)

ARTICLE III AUTHORITY TO OPERATE

Section 4. A school with an existing CHED-recognized baccalaureate degree program in Computer Science may apply for the master's degree in Computer Science, Information Technology or Information Management. A school with an existing CHED-recognized baccalaureate degree program in Information Technology or Information Management may apply only for the corresponding master's degree program. The authorization, if granted, is only for the individual location of the school that applies.

ARTICLE IV ADMINISTRATION AND FACULTY

Section 5. The master's degree programs shall be administered by a full-time or part-time head. Part-time status is defined as rendering service to the school for at least three (3) working days per week. The college or department offering the master's program must have at least three (3) full-time faculty members

Section 6. The head and faculty must possess at least one of the following:

- 6.1 At least a master's degree in an ITE program;
- 6.2 At least a master's degree in another field plus at least twenty-four (24) units of master's study in ITE;
- 6.3 At least master's degree in Business Administration (MBA), Management (MM), Engineering, Natural Science or Mathematics, plus at least seven (7) years of experience in the IT profession such as technical support, systems design, or applications programming.

ARTICLE V
CURRICULUM FOR MASTER'S PROGRAM

Section 7. The master's degree curriculum shall consist of a minimum of thirty (30) units of classroom or laboratory instruction. An additional six (6) units shall be required in the form of thesis, independent study, practicum, or seminar work.

7.1. Computer Science

A minimum of twelve (12) units of core subjects shall be required. Core subjects are graduate level subjects that deal with the foundations and advanced theories relating to the following areas:

- a. Data Structure
- b. Algorithm
- c. Computer Organization
- d. Operating Systems and Compilers
- e. Programming Languages

Elective courses shall be directed towards the following areas:

- a. Theory of Computations
- b. Theory of databases
- c. Software Design Methodologies
- d. Architectures of Computer Designs

7.2. Information Technology

A minimum of twelve (12) units of core subjects shall be required. Core courses are graduate level subjects that provide the fundamental concepts in the following areas:

- a. Data structures
- b. Computer Organization
- c. Operating Systems
- d. Databases
- e. Programming Languages

Elective subjects shall be those that provide the fundamental ideas of current practice in the following areas:

- a. Data Communications
- b. Design of Computer Networks (local, wide, global)
- c. Network Management and Administration
- d. The Implementation of Contemporary Network Operating Systems
- e. Systems Programming
- f. Distributed Databases using client server
- g. Multimedia Systems

7.3. Information Management

A minimum of twelve (12) units of core subjects are required in the following areas:

- a. Data Structures
- b. Computer Organization
- c. Programming Languages
- d. Software Design and Development Methodology

Elective subjects shall be directed towards the following areas:

- a. Software Engineering

- b. Organization of Databases
- c. Organization, Management, and administration of Information Systems
- d. Business Organizations and their Administrative Processes
- e. Management Principles
- f. Effective Behavior in the corporate environment
- g. Effective Communications
- h. Foundations for quality processes and outputs
- i. Management Accounting

DOCTORATE PROGRAM

ARTICLE VI OBJECTIVE

Doctoral degree program shall prepare the candidate to perform original work, to initiate ideas, designs and concepts, or to develop advanced implementations on matters relating to the field of Information Technology.

ARTICLE VII TITLES OF DOCTORATE DEGREE PROGRAM

Section 8. The titles for graduate degree programs are normally the following.

- 8.1 Doctorate or Doctor of Philosophy in Computer Science (DCS or PhDCS)
- 8.2 Doctorate or Doctor of Philosophy in Information Technology (DIT or PhDIT)

The Technical Panel for Information Technology Education (TPITE) does not recommend a program in Doctorate or PhD in Information Management at present.

ARTICLE VIII AUTHORITY TO OPERATE

Schools that intend to offer a doctorate degree program in Computer Science or Information Technology shall apply with the CHED for authorization to operate the program. Only schools with an existing CHED-recognized master's program corresponding to the doctorate degree may apply. The authorization, if granted, is only for the individual location of the school that applies.

ARTICLE IX REQUIREMENTS FOR DOCTORATE PROGRAMS

Section 9. Academic programs for the doctoral degree must fulfill the following pre-requisites:

- 9.1 The school must have a minimum of three full-time faculty members, all of whom must have earned doctorate degrees with proven competencies in information technology gained from studies or industry experience. Furthermore, at least one of the faculty must have received a doctorate degree in information technology including computer science, or natural science, engineering or in mathematics.
- 9.2 The faculty must have existing projects and have published at least three (3) professional articles in information technology within the most recent three (3) years

- 9.3 The doctorate program must be administered by a full-time member of the faculty.
- 9.4 The doctoral degree program must require at least eighteen (18) units of academic instruction beyond the requirements for a master's degree plus twelve (12) units of research, independent study or design.

ARTICLE X
REPEALING CLAUSE

Section 10. Any and all administrative issuances that are contrary to or inconsistent with any of the provisions herein are hereby deemed automatically repealed, rescinded and/or modified accordingly.

ARTICLE XI
EFFECTIVITY CLAUSE

Section 11. New Programs - These policies and standards shall apply immediately to new programs necessitating permits to operate effective SY 2000-2001.

Section 12. Existing Programs - Schools with existing Masters Programs and Doctorate Programs in IT should conform to these policies by SY 2000-2001.

Pasig City, Philippines January 18, 2000 .

FOR THE COMMISSION:

(SGD.) MONA D. VALISNO
Commissioner
Officer-In-Charge
Office of the Chairman

(SGD.) MONA D. VALISNO
Commissioner

(SGD.) KATE C. BOTENGAN
Commissioner

(SGD.) ROBERTO N. PADUA
Commissioner

(SGD.) HADJA ROQAIYA MAGLANGIT
Commissioner

ANNEX

COURSE DESCRIPTION

DATA STRUCTURES - Abstract data types and their implementations; lists, stacks, queues, trees mappings, sets and graphs; searching and sorting techniques, dynamic storage management.

ALGORITHMS - Algorithm design techniques: use of data structures, divide and conquer, dynamic programming, greedy techniques, local and global search. Complexity analysis of algorithms: asymptotic analysis, worst case and average case, recurrences, lower bounds, NP-completeness.

COMPUTER ORGANIZATION AND MACHINE LEVEL PROGRAMMING - An introduction to computer organization and interfaces between hardware and software. Microcomputers systems: basic computer organization, interfacing, interrupt mechanism. Assembly language programming. Machine vs. Assembly vs. high level language. data structure representation, program control implementations, subroutines, parameter passing, recursion, direct video graphics, serial port communications.

OPERATING SYSTEMS - Processor management, memory management, file and disk management, resource management, networks and distributed systems.

COMPILERS - Fundamental conceptions in the design and implementation of compilers: lexical analysis, syntax analysis, code generation and optimization.

PROGRAMMING LANGUAGES - Study of the fundamental concepts in the design and implementation of current high-level programming languages syntax and translation, language definition structures, elementary and structured data types, abstraction mechanisms, sequence and data control, runtime considerations.

THEORY OF COMPUTATIONS - Finite automata and regular languages, push-down automata and context-free languages; Turing machines and recursively enumerable sets; linear-bounded automata and context-free languages; computability and the halting problem; undecidable problems; recursive functions and computational complexity.

DATABASES - Data models; relational, network and hierarchical models. Database management system, data definition and manipulation language. Data security, integrity, synchronization, protection and recovery. Principal database systems and query languages.

SOFTWARE ENGINEERING OR COMPUTER DESIGN METHODOLOGIES - Software life cycle from the requirement specification and design phases through the construction of actual software. Topics include planning a software project, cost estimation, software design, implementation, and software maintenance.

COMPUTER ARCHITECTURE - Advanced topics in computer systems organization from a designers' point of view : multiprocessing, pipelining, array processors associative processors; microprogramming, techniques for increasing primary memory bandwidths; modularization, interleaving, access path widening, cache and associative memories. virtual memory; bus structures; multiprogramming and time sharing organization; network principles and protocols, distributed resources.

DATA COMMUNICATION - Basic principles of data communications: design issues and protocols in the layers of data network.

NETWORKING - Network designs and applications. network management and administration



Republic of the Philippines
OFFICE OF THE PRESIDENT
COMMISSION ON HIGHER EDUCATION

CHED MEMORANDUM ORDER
No. 05
Series of 1998

SUBJECT: POLICIES AND STANDARDS FOR ASSOCIATE IN
COMPUTER TECHNOLOGY PROGRAM (ACT)

In accordance with the pertinent provisions Republic Act (RA) No. 7722, otherwise known as the "Higher Education Act of 1994", and as an addendum to the Policies and Standards for Information Technology Education (CHED ORDER No. 60, series of 1996), the following policies and standards for the offering of a non-degree program in Computer Technology are hereby adopted and promulgated by the Commission, thus:

ARTICLE I
OBJECTIVES

Section 1 General Objectives - The objectives of a non-degree program in Information Technology are to:

- 1.1 equip students with specific skills for entry into the information technology profession; and
- 1.2 prepare the students for eventual entry into the regular degree programs of the Bachelor of Science in Computer Science, Information Technology, *Information Management*.

ARTICLE II
TITLE OF THE PROGRAM

Section 2. PROGRAM TITLE - The program shall be called "Associate in Computer Technology" (formerly Associate in Computer Science). It is normally a two-year non-degree program leading to a diploma in "Associate in Computer Technology (ACT)". Although not exactly equivalent to the first two years of degree programs in Bachelor of Science in Computer Science (BSCS), Information Technology (BSIT), and Information Management (BSIM), the ACT may be considered as a "ladderized" program for the above mentioned degree programs in Information Technology. As such, the existing policies and standards for Information Technology Education (CHED MEMO ORDER NO. 60, series of 1996) shall be strictly followed with the following exceptions embodied in the succeeding sections of this CMO.

ARTICLE III
AUTHORITY TO OPERATE

Section 3. Training Centers - Schools that intend to offer only the Associate in Computer Technology program shall apply with the CHED for authorization. The authority to operate is for an individual location only. Schools having multiple locations shall apply for the permit to operate the

program for each location. If a school offering the ACT program wishes to offer the BSCS or BSIT or BSIM degree program, it may apply for approval of the first three years of the program, but in no case may it apply only for the third year.

Section 4. Colleges - Schools with a permit to offer any of the relevant Bachelor of Science degree program (BSCS, BSIT, BSIM) need not apply for a separate authority to offer the ACT program for the locations that have the degree program permits, provided that the ACT curriculum conforms to the policies specified below. However, they should formally inform the CHED in writing. They also have the authority to accept or not, the subjects taken by a student in the ACT program, from the same or another school, as credits toward the bachelor's programs. A school location that is offering only the associate program may not be called a "college" which is commonly understood to refer to a school offering a bachelor's degree program.

ARTICLE IV ADMINISTRATION

Section 5. Head - The ACT program shall be administered by a head who should render service to the school for at least three (3) regular working days (eight hours a day) per week.

Section 6. General Qualifications of Head - The Dean or Head of an IT program must possess at least one of the following namely:

- 6.1 A master's degree in an IT program;
- 6.2 A master's degree in another field plus at least fifteen(15) units of master's study in IT;
- 6.3 A master's degree in another field plus five (5) years experience in the IT profession such as technical support, systems design, or applications programming; or
- 6.4 A master's degree in another field and a bachelor's degree in IT.

In addition, the Dean /Head should have industry advisor(s) to assist him, specially if he does not have an IT industry experience. This could be in the form of a Board of Industry Advisors that is component of industry-academe linkage program.

ARTICLE V CURRICULUM

Section 7. General Curriculum - The curriculum of an ACT program shall be built upon the following:

- 7.1 a subset of the Basic General Education Subjects as defined by CHED ORDER No. 59, series of 1996 including the modifications for technical and professional programs;
- 7.2 a subset of the Basic Core Topics and Major Topics as defined by CHED ORDER No. 60, series of 1996;
- 7.3 other subjects that may be needed to allow the students to acquire specific IT skills (such as programming, use of personal computer software packages, etc.)

Section 8 ACT Minimum Curricular Requirements - The curriculum for ACT will have a minimum of sixty-six (66 units), of which the general education component comprises one-third to one-half of the total, excluding Physical Education and Citizens Military Training. A sample Curriculum (shown at Annex 1), which a school may choose to modify, is made an integral part hereof. The subject descriptions are the same as those of the Bachelor's degree programs in CS, IT, IM.

ARTICLE VI
PHYSICAL FACILITIES

Section 9. General Standards - Schools offering only the associate programs need not meet the minimum requirement of one thousand (1,000) square meters of floor or land area specified by CHED ORDER No. 60, Series of 1996. However, they should have at least the following for each location offering the program: one classroom, one computer laboratory, one library/study area, one faculty office, and one administrative office.

ARTICLE VII
REPEALING CLAUSE

Section 10. Repeal - Any and all administrative issuances that are contrary to or inconsistent with any of the provisions herein are hereby deemed automatically repealed, rescinded and/or modified accordingly.

ARTICLE VIII
EFFECTIVITY CLAUSES

Section 11. New Programs - These policies and standards shall apply immediately to new programs necessitating issuance of permits to operate effective Collegiate Year (CY) 1998 -1999.

Section 12. Existing Programs - Schools with existing Associate in Computer Science or other IT related programs should conform to these policies by (CY) 1998 -1999.

Pasig City, Philippines, 21st. January 1998

FOR THE COMMISSION:

(SGD.) ANGEL C. ALCALA
Chairman

