CHED MEMORANDUM ORDER (CMO)
NO. _60_
Series of 1996

SUBJECT : UPDATED POLICIES AND STANDARDS FOR INFORMATION TECHNOLOGY EDUCATION (IT)

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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 apace 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 Private Higher Education Institutions (PHEIs), CHED-supervised Higher Education Institutions (CHEIs) 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 IT 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 IT program shall have a full-time Dean or Department Chair for the same.

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

    7.1. A master's degree in an IT program;

    7.2. A master's degree in another field plus at least fifteen (15) units of master's studies in IT;

    7.3. A master's degree in another field plus five (5) years experience in the IT profession such as in technical support, systems design or applications programming; or

    7.4. A master's degree in another field and a bachelor's degree in IT.

In addition, the Dean/Department Chair should have industry advisor(s) to assist him, especially if he does not have an 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 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.

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

ARTICLE V
FACULTY

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

10.1.   A degree in IT;

10.2.   A degree in Engineering, Natural Sciences or Mathematics with studies or experience in IT;

10.3.   A degree in other fields plus at least two (2) years experience in IT;

10.4.   A degree in other fields plus at least twelve (12) units of master's study in IT.

Section 11.   Department. - The IT Department must have, thus:

11.1.   At least two (2) IT faculty members, one of whom can be the Dean or the Department Chair.

11.2.   For the Information Technology or Information Management programs, at least twenty percent (20%) of the IT faculty members must have a minimum of nine (9) units of master's study in IT or two (2) years of IT related industry experience.

11.3.   For the Computer Science program, at least forty percent (40%) of the IT faculty must have a minimum of nine (9) units of master's study in IT.

Section 12.   Assignment. - The maximum total load (that is, teaching, research or administrative assignments) of an IT faculty member should not exceed twenty four (24) units per term (semester or trimester), if he is full-time in the academe, and nine (9) units if he has a full-time non-academic (for example, industry) job in addition to his/her being a part-time IT faculty member.

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

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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)

1. Communication skills;
2. Technical writing / presentation skills;
3. Algebra / trigonometry;
4. Mathematical logic / discrete mathematics;
5. Problem solving / quality process;
6. Values formation / professional ethics;
7. Code of Ethics for the Filipino IT Professional;
8. Orientation in information technology;
9. Computer fundamentals;
10. Fundamentals of programming / program logic formulation; and
11. Probability / statistics.

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. Computer systems organization;
8. Principles of programming languages;
9. Assembly language or C-language or Pascal;
10. Principles of operating systems;
11. Principles of file organization;
12. Principles of database management systems;

13. Compiler design;
14. Theory of computations;
15. Automata theory;
16. Principles of data communication and networking;
17. Modeling and simulation theory;
18. Data communication and networking technology;
19. INTERNET;
20. Multimedia systems; and
21. Other electives in mathematics or other advanced topics such as numerical analysis, artificial intelligence, robotics, hardware/software interface, software engineering, graphics, software tools, computing, graph theory, linear algebra, parallel processing, object-oriented programming languages .

16.3. Information Technology Topics (Topics 1 to 15 required)

1. Art and style of programming;
2. Skill in C-language and one application programming language such as COBOL, FOXPRO, Clipper, Dbase and the like;
3. Operating systems such as DOS, Windows UNIX, or OS/2;
4. Database management system;
5. 4th generation language;
6. Laboratory experience in computer installation, hardware and software;
7. Network technology;
8. System analysis and design;
9. System management & administration;
10. Information resource management;
11. System programming;
12. Software testing;
13. Documentation;
14. Accounting;
15. Distributed database systems;
16. INTERNET;
17. Multimedia systems;
18. Current / future trends in information Technology; and
19. Electives such as information systems, image processing, switching networks, system integration, software engineering, object-oriented programming.

16.4.   Information Management Topics (Topics 1 to 19 required)

1. Business processes;
2. Organizational theory;
3. Human behavior;
4. Management principles and practices;
5. Accounting, financial processes;
6. Operating systems such as DOS, Windows or OS/2, and one application language;
7. Integrated application softwares such as Office, Smart Suite, Perfect Office, etc.;
8. Application software such as accounting, purchasing, manufacturing, etc.;
9. Planning, estimation and project management;
10. System analysis and design;
11. Software engineering;
12. Management information system/information strategy plan;
13. System requirement specification, documentation;
14. Quality assurance;
15. System management and administration;
16. Information resource management;
17. System integration;
18. Decision support system;
19. Human-computer interaction;
20. Data communication and networking technology;
21. Distributed database systems;
22. Expert system / prototyping; and
23. Other business or management subjects such as marketing, managerial and cost accounting, quantitative methods, production management, etc.

Section 17.   ITE Minimum Curricular Requirements

	Units	Units
GENERAL EDUCATION		
LANGUAGE and LITERATURE		24
English	9	
Filipino	9	
Literature	6	
MATHEMATICS and the NATURAL SCIENCES		15
Mathematics	6	
Natural Sciences	6	
Computer Literacy	3	
HUMANITIES, SOCIAL SCIENCES & COMM.		24
Humanities	6	
Philosophy, Logic, Ethics, Art, Music		
Social Sciences & Communications	18	
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)		
BASIC IT CORE SUBJECTS		18
IT PROFESSIONAL / MAJOR SUBJECTS		33
IT ELECTIVES		12
FREE ELECTIVES		9
TOTAL		135

Section 18.   **Sample Curricula.** - Shown at ANNEX 1 which is made an integral part hereof are the sample curricula for ITE. The HEI may modify or add subjects in accordance with its objectives and thrusts, provided that the minimum requirements of ITE are met.

Section 19.   **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. 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 books, 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 may be considered as library holdings if they are easily accessible for reading, and that the desired materials can be readily printed. In this regard, sufficient equipment with enough quantity should be made available.

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 2.5 square meters per student.

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 and   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 or land space ready for use 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 laboratory floor space should be at least 2.0 square meters per student. For a computer laboratory, there should be no more than two (2)students per terminal or work station. In addition, the number of terminals or work stations should be such that a student is provided at least three (3) hours of 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 IT 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 for fifteen (15) computers. Computers should also be provided for the use of the faculty.

24.9. **Computer 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 four (4) years.

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

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

24.12. **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, RESIDENCE and OTHER 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.

Section 28.   Other Requirements. - As a general rule, a student may be allowed to carry a maximum load of twenty one (21) academic units each semester or eighteen (18) academic units per trimester. However, a student may be allowed to take units in excess of this policy if he is graduating after that term.

ARTICLE XI
REPEALING CLAUSE

Section 29.   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 30.   New Programs. -   These policies and standards shall apply immediately to new programs necessitating issuance of permits to operate for Collegiate Year (CY) 1997- 1998.

Section 31. **Existing Programs.** - Existing (Recognized and Permit Status) programs should conform herein effective CY 1997 - 1998. 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, 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.

SO ORDERED.

Pasig City, Philippines, ___October 18, 1996___

ANGEL C. ALCALA
Chairman

MONA D. VALISNO
Commissioner

KATE C. BOTENGAN
Commissioner

ESTER A. GARCIA
Commissioner

ROLANDO S. DELAGOZA
Commissioner