O.2 There is congruency between actual educational practices and activities with the following

O.2.3. Objectives Program.

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

CHED MEMORANDUM ORDER (CMO)
NO. 25 ;
Series of 2015

SUBJECT : REVISED POLICIES, STANDARDS, AND GUIDELINES FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS), BACHELOR OF SCIENCE IN INFORMATION SYSTEMS (BSIS), AND BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSIT) PROGRAMS

In accordance with the pertinent provisions of Republic Act (RA) No. 7722, otherwise known as the "*Higher Education Act of 1994*," in pursuance of an outcomes-based quality assurance system as advocated under CMO 46 s. 2012, and by virtue of the Commission en banc Resolution No. 268-2015 dated May 25, 2015 the following policies, standards and guidelines (PSGs) are hereby adopted and promulgated by the Commission.

ARTICLE I
INTRODUCTION

Section 1 **Rationale**

Based on the Guidelines for the Implementation of CMO 46 s 2012, this PSG implements the "shift to learning competency-based standards/outcomes-based education." It specifies the 'core competencies' expected of graduates of *Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Information Systems (BSIS), and Bachelor of Science in Information Technology (BSIT)*, "regardless of the type of HEI they graduate from." However, in "recognition of the spirit of outcomes-based education and ... of the typology of HEIs," this PSG also provides "ample space for HEIs to innovate in the curriculum in line with the assessment of how best to achieve learning outcomes in their particular contexts and their respective missions ..."

The field of computing is ever dynamic; its advancement and development had been rapid and its evolvement is a continuous process (O'Brien, 2008). To face the challenges of advancement, the Commission recognizes the need to be responsive to the current needs of the country. It is essential and important that the country's computing capability be continually developed and strengthened to be at par globally.

It is the objective of the Commission to develop and promote the Policies, Standards and Guidelines (PSG) for BSCS, BSIS and BSIT, to provide a minimum standard for Higher Education Institutions (HEIs) offering or intending to offer these programs. The PSG is developed with consultations from all stakeholders, from the academe to industry (Sarmiento, 2009).

The PSG contains provisions that cultivate the culture of excellence in offering these programs. This is in line with the vision of the Commission to have HEIs produce competent graduates that shall cater to the needs of the industry. The PSG is also designed for all HEIs to exercise their innovativeness and creativity in the development of their curricula in the offering of BSCS, BSIS, and BSIT programs (RA 7722, 1994).

ARTICLE II
AUTHORITY TO OPERATE

Section 2 Government Recognition

All Higher Education Institutions (HEIs) including private HEIs, State Universities and Colleges (SUCs), and Local Universities and Colleges (LUCs) intending to offer BSCS, BSIS, and BSIT must first secure proper authority from the Commission in accordance with this PSG. All HEIs with existing BSCS, BSIS, and/or BSIT programs are required to shift to outcomes-based approach pursuant to this PSG and must inform the Commission of such shift. SUCs and LUCs should likewise strictly adhere to the provisions in these policies, standards and guidelines.

ARTICLE III
GENERAL PROVISIONS

Section 3 The succeeding articles provide minimum standards and other requirements and prescriptions. The minimum standards for each program are expressed as minimum sets of desired program outcomes which are given in Article IV Section 6. The Commission designed **sample** curricula to attain such outcomes and these are shown in Article V Section 9. The total number of units for each program is here prescribed as the "minimum unit requirement" under Section 13 of RA 7722. In designing the curricula, the Commission employed curriculum maps which are shown in Article V Section 10 as **sample** curriculum map.

Using a learner-centered/outcomes-based approach, the Commission provided sample curricula delivery methods shown in Article V Section 11. The sample course syllabi given in Article V Section 12 show some of these methods.

Based on the curricula and the means of their delivery, the Commission determined the physical resource requirements for the library, laboratories and other facilities and the human resource requirements in terms of administration and faculty, as indicated in Article VI.

Section 4 The HEIs are allowed to design curricula suited to their own contexts and missions provided that they can demonstrate that the same leads to the attainment of the required minimum set of outcomes, albeit by a different route. In the same vein, they have latitude in terms of curriculum delivery and in terms of specification and deployment of human and physical resources as long as they can show that the attainment of the program outcomes and satisfaction of program educational objectives can be assured by the alternative means they propose.

The HEIs can use the **CHED Implementation Handbook for Outcomes-Based Education (OBE) and the Institutional Sustainability Assessment (ISA)** as a guide in complying with Sections 16, 17 and 22 of Article VII, hereof.

This PSG is based on the 10-year basic education system and on the existing General Education (GE) program. It reflects the reform towards outcomes-based education as well as international trends in computer science, information systems and information technology curricula. However, this does not yet include necessary changes as a consequence of the K-12 reform. The latter shall be addressed subsequently.

ARTICLE IV
PROGRAM SPECIFICATIONS

Section 5 Program Description

5.1 Degree Name

A. Bachelor of Science in Computer Science (BSCS)

Graduates of this program shall be conferred the degree of **Bachelor of Science in Computer Science (BSCS).**

B. Bachelor of Science in Information Systems (BSIS)

Graduates of this program shall be conferred the degree of **Bachelor of Science in Information Systems (BSIS).**

C. Bachelor of Science in Information Technology (BSIT)

Graduates of this program shall be conferred the degree of **Bachelor of Science in Information Technology (BSIT).**

5.2 Nature of the Field of Study

5.2.1 Bachelor of Science in Computer Science (BSCS)

The BS Computer Science program includes the study of computing concepts and theories, algorithmic foundations and new developments in computing. The program prepares students to design and create algorithmically complex software and develop new and effective algorithms for solving computing problems.

The program also includes the study of the standards and practices in Software Engineering. It prepares students to acquire skills and disciplines required for designing, writing and modifying software components, modules and applications that comprise software solutions.

5.2.2 Bachelor of Science in Information Systems (BSIS)

The BS Information Systems Program includes the study of application and effect of information technology to organizations. Graduates of the program should be able to implement an information system, which considers complex technological and organizational factors affecting it. These include components, tools, techniques, strategies, methodologies, etc.

Graduates are able to help an organization determine how information and technology-enabled business processes can be used as strategic tool to achieve a competitive advantage. As a result, IS professionals require a sound understanding of organizational principles and practices so that they can serve as an effective bridge between the technical and management/users communities within an organization. This enables them to ensure that the organization has the information and the systems it needs to support its operations.

5.2.3 Bachelor of Science in Information Technology (BSIT)

The BS Information Technology program includes the study of the utilization of both hardware and software technologies involving planning, installing, customizing, operating, managing and administering, and maintaining information technology infrastructure that provides computing solutions to address the needs of an organization.

The program prepares graduates to address various user needs involving the selection, development, application, integration and management of computing technologies within an organization.

5.3 Program Goals

The BSCS, BSIS, and BSIT graduates are expected to become globally competent, innovative, and socially and ethically responsible computing professionals engaged in life-long learning endeavours. They are capable of contributing to the country's national development goals.

5.4 Specific Professions/careers/occupations for Graduates

A. Bachelor of Science in Computer Science (BSCS)

Primary Job Roles

- Software Engineer
- Systems Software Developer
- Research and Development computing professional
- Applications Software Developer
- Computer Programmer

Secondary Job Roles

- Systems Analyst
- Data Analyst
- Quality Assurance Specialist
- Software Support Specialist

B. Bachelor of Science in Information Systems (BSIS)

Primary Job Roles

- Organizational Process Analyst
- Data Analyst

- Solutions Specialist
- Systems Analyst
- IS Project Management Personnel

Secondary Job Roles

- Applications Developer
- End User Trainer
- Documentation Specialist
- Quality Assurance Specialist

C. Bachelor of Science in Information Technology (BSIT)

Primary Job Roles

- Web and Applications Developer
- Junior Database Administrator
- Systems Administrator
- Network Engineer
- Junior Information Security Administrator
- Systems Integration Personnel
- IT Audit Assistant
- Technical Support Specialist

Secondary Job Roles

- QA Specialist
- Systems Analyst
- Computer Programmer

5.5 Allied Fields

In general, subject to the specific provision below, the following may be considered as allied fields:

1. Basic Sciences, Math and Engineering
2. Programs that have at least 50% of core and professional courses of a specific ITE program
3. Any program deemed to be an allied program by the TPITE such as the following:

A. Bachelor of Science in Computer Science (BSCS)

- Applied Mathematics
- Computer Engineering
- Electrical Engineering
- Electronics Engineering
- Entertainment and Multimedia Computing
- Mathematics
- Physics
- Statistics

B. **Bachelor of Science in Information Systems (BSIS)**

- Applied Mathematics
- Industrial Engineering
- Information Management
- Library and Information Science
- Statistics
- Informatics

C. **Bachelor of Science in Information Technology (BSIT)**

- Computer Engineering
- Electrical Engineering
- Electronics Engineering
- Informatics
- Information Management

Section 6 Program Outcomes

The minimum standards for the BSCS, BSIS, and BSIT programs are expressed in the following minimum set of graduate outcomes. The graduate outcomes common to all programs, and those common to the discipline are further mapped into the expanded graduate outcomes specific to the sub-disciplines of CS, IS, and IT, as outlined in Section 6.3.

6.1 **Common to all programs in all types of schools**

The graduates have the ability to

a) articulate and discuss the latest developments in the specific field of practice. (Philippine Qualifications Framework (PQF) level 6 descriptor) (Graduate Outcomes: CS10, IS10, IT13)
b) effectively communicate orally and in writing using both English and Filipino (Graduate Outcomes: CS08, IS08, IT10)
c) work effectively and independently in multi-disciplinary and multi-cultural teams (PQF level 6 descriptor) (Graduate Outcomes: CS07, IS07, IT08)
d) act in recognition of professional, social, and ethical responsibility (Graduate Outcomes:CS09, IS09, IT12)
e) preserve and promote "*Filipino historical and cultural heritage*" (based on RA 7722)

6.2 **Common to the discipline**

The graduates of BSCS, BSIS, and BSIT must have the ability to

a) analyze complex problems, and identify and define the computing requirements needed to design an appropriate solution (Graduate Outcomes:CS02, IS02-03, IT03)
b) apply computing and other knowledge domains to address real-world problems (Graduate Outcomes: CS01, IS01, IT01)
c) design and develop computing solutions using a system-level perspective (Graduate Outcomes: CS03-05, IS04-05, IT05)
d) utilize modern computing tools (Graduate Outcomes: CS06, IS06, IT07)