MODULE 1: PROGRAMMING IN JAVA

Week 1

Most Essential Learning Competencies: *At the end of the course, you must be able to:*

1. Discuss the relevance of the course
2. Explain job opportunities for Computer Programming as a career
3. Develop Personal Entrepreneurial Competencies (PECs), align competencies
4. Determine Environment and Market (EM)

Reading Activity

Introduction to the Course

This course is designed to develop knowledge, skills, and attitudes a Computer Programmer must achieve in order to develop and write program codes needed to enable him to lead workplace communication, lead small teams, develop and practice negotiation skills, solve problems related to work activities, use mathematical concepts and techniques, use relevant technologies and apply quality standards and performing computer operations. It includes core competencies such as Programming using JAVA.

- **Java** is a general-purpose, concurrent, class-based, object-oriented language that is specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere". Java is currently one of the most popular programming languages in use and is widely used from application software to web applications.
- **Java Applications** are typically compiled to bytecode (class file) that can run on any Java Virtual Machine (JVM) regardless of computer architecture.

A. What is TESDA?

Figure 1.1 TESDA Main Office

The Technical Education and Skills Development Authority (TESDA) was established through the enactment of Republic Act No. 7796 otherwise known as the "Technical Education and Skills Development Act of 1994", which was signed into law by President Fidel V. Ramos on August 25, 1994.

This Act aims to encourage the full participation of and mobilize the industry, labor, local government units and technical-vocational institutions in the skills development of the country's human resources.

The merging of the **National Manpower and Youth Council** (NMYC) of the Department of Labor and Employment (DOLE). **The Bureau of Technical and Vocational Education** (BTVE) of the **Department of Education**, **Culture and Sports** (DECS), and The Apprenticeship Program of the **Bureau of Local Employment** (BLE) of the DOLE gave birth to TESDA.

The fusion of the above offices was one of the key recommendations of the 1991 Report of the Congressional Commission on Education, which undertook a national review of the state of Philippine education and manpower development. It was meant to reduce overlapping in skills development activities initiated by various public and private sector agencies, and to provide national directions for the country's technical-vocational education and training (TVET) system. Hence, a major thrust of TESDA is the formulation of a comprehensive development plan for middle-level manpower based on the National Technical Education and Skills Development Plan. This plan shall provide for a reformed industry-based training program that includes apprenticeship, dual training system and other similar schemes.

TESDA is mandated to:

1. Integrate, coordinate and monitor skills development programs;
2. Restructure efforts to promote and develop middle-level manpower;
3. Approve skills standards and tests;
4. Develop an accreditation system for institutions involves in middle-level manpower development;
5. Fund programs and projects for technical education and skills development; and
6. Assist trainers training programs.

At the same time, TESDA is expected to:

1. Devolve training functions to local governments;
2. Reform the apprenticeship program;
3. Involve industry/employers in skill training;
4. Formulate a skills development plan;
5. Develop and administer training incentives;
6. Organize skills competitions; and
7. Manage skills development funds.

Overall, TESDA formulates manpower and skills plans, sets appropriate skills standards and tests, coordinates and monitors manpower policies and programs, and provides policy directions and guidelines for resource allocation for the TVET institutions in both the private and public sectors. Today, TESDA has evolved into an organization that is responsive, effective and efficient in delivering myriad services to its clients. To accomplish its multi-pronged mission, the TESDA Board has been formulating strategies and programs geared towards yielding the highest impact on manpower development in various areas, industry sectors and institutions.

B. What is Training Regulation (TR)?

It is a TESDA-promulgated document that serves as basis for which the competency-based curriculum and instructional materials and competency assessment tools are developed. This document represents a specific qualification. It defines the competency standards for a national qualification and how such qualification can be gained, assessed and be given recognition.

C. What is Competency-Based Curriculum (CBC)?

- A competency-based curriculum is a framework or guide for the subsequent detailed development of competencies, associated methodologies, training and assessment resources.
- The CBC specifies the outcomes which are consistent with the requirements of the workplace as agreed through the industry or community consultations.
- CBC can be developed immediately when competency standards exist.
- When competency standards do not exist, curriculum developers need to clearly define the learning outcomes to be attained. The standard of performance required must be appropriate to industry and occupational needs through the industry/enterprise or specified client group consultations.

C.1. Course Design

This course is designed to develop knowledge, skills, and attitudes a Computer Programmer must achieve in order to develop and write program codes needed to enable him to lead workplace communication, lead small teams, develop and practice negotiation skills, solve problems related to work activities, use mathematical concepts and techniques, use relevant technologies and apply quality standards and performing computer operations. It includes core competencies such as Programming using JAVA.

Entry Requirements:

Candidate/trainee must possess the following qualifications:

- Must have completed at least 10 yrs. basic education or an ALS grade 10 certificate of rating holder
- Can communicate either oral or written.
- With basic computer skills

Assessment Methods:

- Hands on
- Direct observation
- Practical demonstration/Performance Test
- Oral and written exam

Course Delivery:

- Lecture-demonstration
- Modular
- Role Play/Simulation
- Field Trip
- Film Showing
- Brainstorming
- Self-paced instruction
- Group discussion
- Case Studies/Project Method
- On the job training

Resources:

Table 1.1

Tools	Equipment	Materials
• Computer Software (Java Version 6 or Higher) • Internet Access • Application Servers (SQL Server Express 2012 or Higher, IIS Express)	• Network Computer (Windows 7 or Higher) with peripherals • Network Printer • White Board • LCD Projector and Screen • Ergonomic Chairs and Tables	• Practice Materials • Hands-Outs • Reference Books • Learning Materials/Guide

D. Job opportunities in Programming .Net technology

A person who has achieved this Qualification can be employed in any or more of the following:

- Java Programmer
- Java Programming support staff
- Software developer
- Application developer
- User Interface Developer

E. National Assessment and Certification Arrangements

To attain the National Qualification of **Programming (Java) NC III**, the candidate must demonstrate competency in all the units listed in Section 1. Successful candidates shall be awarded a **National Certificate level III** signed by the TESDA Director General.

The qualification of Programming (Java) NC III may be attained by passing the following exams:

Certification Exam 1 - Java SE 7 Programmer I 1Z0-803 which will assess the following unit of competencies:

- **Perform object-oriented analysis and design in Java technology**

Certification Exam 2 – Java SE7 Programmer II – 1Z0 – 804 which will assess the following unit of competencies:

- **Create and fine tune Java technology applications using object-oriented programming concept**

Upon accumulation and submission of Certification Exams 1 and 2, an individual shall be issued the corresponding **National Certificate**.

- Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.
- The following are qualified to apply for assessment and certification:
- Graduate of formal, non-formal, and informal, including enterprise-based, training programs.
- Experienced workers (wage employed or self-employed)
- The guidelines on assessment and certification are discussed in detail in the "Procedures Manual on Assessment and Certification" and "Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS)".

F. Personal Entrepreneurial Competencies (PECs)

Entrepreneurial competency or competencies is a concept of a collective set of abilities (could be non–academic—a person's inherent positive character, trait, or attitude) and/or skills, sufficient enough or more than sufficient to organize, manage, and assume the risk of a business or enterprise profitably.

Competencies of a Programmer:

Behavioral Competencies — Is a set of competencies that refers to the general competencies or characteristics that an individual should have in order to establish a well– balanced professional attitude.

Such competencies require the programmer to be:

- **Analytical Thinker –** This could be one of the most important competencies on being a programmer. It can also be considered as a technical competency.
- **Continuous learner** – He should be able to learn and adapt to different domains in order to create and deliver his services. He must be quick to learn different domain processes in order to make his skills relevant or identify and focus on a specific domain to be a specialist in that specific domain.
- **Results–Oriented** – This refers to being able to meet commitments and delivering services on time. A good programmer is always focused on producing results. Not just any result, but a working and good quality result.
- **Team Player** – A collaborative programmer should not only cooperate (passive) but also contribute (proactive) to the team (e.g., share information and resources that could help in the development of the project).
- **Technical Competencies—** is a set of competencies that refer to the standard skills a programmer should possess in order to perform and deliver his services effectively and efficiently. Thus, he must possess the following fundamental skills in:

Programming – Refers to the knowledge and application of fundamental components of programming, i.e., program logic formulation, algorithms, data structures, and system architecture.

- **Software Development** – Refers to the knowledge and application of the techniques and management of the whole development cycle starting from the identification and statement of the problem to analysis and validation, to programming and testing, up to documentation.
- **Business Analysis** – Refers to the knowledge and skill in identifying business needs and providing solutions to address such needs.
- **Database Design and Management –** Almost everywhere you can find opportunities to develop database systems from the simplest contact information management system to the most sophisticated customer relationship management (CRM) system.
- **Data/Information Security** – He must be adept in the different techniques like encryption and other technology available to ensure that any data his system is handling and managing is kept private for all stakeholders of the system.
- **Identifying Platform and Emerging Technology** – Platform refers to the different medium, whether hardware or software, on which the system will run. As a programmer, knowledge and application of how to make your programs run in cross platform is a great advantage.

G. Environment and Market (EM)

As a programmer, acquiring core competencies will allow you to have some flexibility in choosing the type of programming you are most comfortable with

Key specialist types of a programmer:

- **System Programmer –** Writes programs that are used to control computer systems and its peripherals. They usually use low–level instructions in programming that directly communicates and controls the computer itself and its peripherals.
- **Application Programmer** – Creates programs targeted for end–users. Programs created by application programmers are rather more specific in nature and would mostly be in aid of data manipulation and business processes.
- **Game Programmer** – Creates programs focused on entertainment, specifically computer games.
- **Web Programmer** – Creates and develops websites and other programs that is needed by some of its components to function.

Watch Video Resources

1. **Four Reasons to Learn Java**
   https://youtu.be/Zv8-hrGiGno
2. **What is a Computer Program?**
   https://youtu.be/taO7nfcoCT0

Self-Check

Quiz 1.1

Instructions: *Write your answer on the Answer Sheet (AS) provided in this module.*

A. Definition/Enumeration. (2-points each)

1. What is Java?
2. What is Java Application?
3. What is Programming?
4. Enumerate the Competencies of Java Programmer (PECs).
5. Enumerate the Job Opportunities for Java Technology Developer/Programmer.
6. Enumerate the Key Specialist Types of a Programmer.
7. What is Behavioral Competencies?
8. What is Competency-Based Curriculum (CBC)?
9. What is TESDA?
10. What is Training Regulation (TR)?

B. Spell-out the following acronyms: (2-points each)

1. TESDA
2. DOLE
3. BTVE
4. DECS
5. NMYC
6. TR
7. CBC
8. PECs
9. EM
10. JVM

Internet References

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4. Phoenix Publishing House Inc.