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**FDRE Ministry of Education (MOE)**

**Identified Competencies and Core Courses for**

**National Exit Examination**

**Program: B.Sc. Degree in Information Technology**

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# **Introduction**

Information Technologyinvolves the design, implementation and maintenance of technology solutions and support for users of such systems. Information Technology curricula focus on crafting hardware and software solutions as applied to networks, security, client-server and, web applications, multimedia resources, communications systems, and the planning and management of the technology lifecycle. According to this some of curriculum was developed for B.Sc. in Information Technology based on international experiences with some professionals at different university level. In Ethiopia, the first Information Technology harmonized curriculum was started in 2004 EC and the new roadmap harmonized curriculum were designed and implemented in 2012 EC.

In education system, the main purpose is to produce high competent students with high quality and competence that acquired knowledge and skills on their professions. The output of this competent man power will be useful for solving the community problems as well as involving in the economic development of the country. One of the best tools to assure the quality of education is exit exam for graduate students, where its results provide a trust on Higher Education Institutes outcomes. This is because it aims to measure the competencies and learning outcomes of each of the academic programs for a Bachelor's of Science degree in Information Technology. By recognizing this, the guideline is very important for the proper administration of the national exit examination for all undergraduate of Information Technology students in Ethiopian Higher Education Institutes.

Ministry Of Education (MOE) has proceeded according to some existing experiences in Health and Law programs done so far. This was represented in a set of procedures, including the stages of building question banks and linking them to learning outcomes in the curricula. By considering the current job opportunity of graduating students this guideline is designed to implement the National Exit Examination to be held in the 2015 EC. Therefore, this guideline is focusing on the graduate profile, competencies, learning outcomes and industry demands of the professionals. Based on this, the courses were listed and categorized for the exit exam.

# **Expected Graduate profiles**

The expected graduate profile of Information Technology should acquire the basic knowledge and skills in adapting and utilization of new technology with minimum effort and resources. Accordingly, the B.Sc. in Information Technology graduates will have the following graduate profiles:

## **Cognitive skill**

* Analyse, identify and define the IT requirements that must be satisfied to address problems or opportunities faced by organizations or individuals.
* Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to Information Technology.
* Identify and evaluate current and emerging technologies and assess their applicability to address the user’s needs.
* analyse, adopt and demonstrate IT best practices, standards and their application.
* analyse the impact of technology on individuals, organizations and society, including ethical, legal and policy issues;
* Identify and analyse user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
* Demonstrate an understanding of best practices and standards and their application;

## **Technical skill**

* Use and apply current technical concepts and practice in the core area of Information Technology.
* Design effective and usable IT-based solutions and integrate them into the user environment.
* Assist in the creation of an effective project plan.
* Demonstrate independent critical thinking and problem-solving skills
* Use current techniques, skills, and tools necessary to maintain and administer computer-based systems.

## **Attitude skill**

* Collaborate in teams to accomplish a common goal by integrating personal initiatives
* Communicate effectively and efficiently with clients, users and peers both verbally and in writing, using appropriate terminology.
* Understand and explain the quantitative dimensions of a problem.
* Manage one’s own learning and development, including time management and organizational skills
* Keep abreast of current developments in the discipline to continue one’s own professional development.
* Recognize and be guided by the social, professional, and ethical issues involved in the use of computer technology

# **Competency and learning outcomes**

This guideline incorporates the ideas of Competence Based Education (CBE) on the Bachelor of Science in Information Technology national harmonized curriculum in 2013 EC. The competencies are identified according to the graduate professional profiles, measurable and achievable.

* Understand the basic Components of computer Organization and Architecture, Operating system and technical support system
* Develop skills in designing, coding, debugging and documenting large programs using programming languages and Rapid Application Development for immediate problem solving.
* Identify problems, apply approaches and techniques in SDLC to support software project management and the production of high-quality software.
* They will design, develop databases, and write SQL queries and database programs used for transaction management, distributed database and database administration
* Acquire the skills of developing static and dynamic websites, in creating Server/client-side scripts for commercial and scientific programs.
* Have knowledge on data communication, transmission media, protocols and networking standards, network configuration, Network administrations and security management
* They will properly identify threats, Risks and vulnerabilities, data Security Policies/Admin Security, information Systems Security concepts, and designing secure systems.

# **Courses included for exit examination**

According to the competencies and learning outcomes correlated with graduate profiles, the following courses are selected for the national exit examination. The exit examination focuses on the key knowledge and skill of undergraduate Information Technology graduates.

**Table 1: List of selected Courses**

|  |  |  |
| --- | --- | --- |
| SN | Courses  | Course code |
|  | Operating System | ITec2022 |
|  | Computer Maintenance and Technical Support | ITec3031 |
|  | Fundamentals of Programming  | ITec2041 |
|  | Advanced Programming | ITec3056 |
|  | Event driven programming | ITec3054 |
|  | System Analysis and Design | ITec3061 |
|  | Database System (Fundamentals and Advanced)  | ITec2071, ITec3071 |
|  | Internet Programming (I, II) | ITec2092, ITec3093 |
|  | Data communications and Computer Networks | ITec2102 |
|  | System & Network Administration  | ITec4112 |
|  | Network Device & configuration | ITec4111 |
|  | Multimedia System | ITec3121 |
|  | Information Assurance and Security | ITec4133 |
|  | **Total Cr. hrs./ECTS** | **45/74** |

# **Courses Thematic Categories**

The courses selected for the exit examination are thematized according to their relatedness. The four thematic areas are formed and listed as follows.

**Table 2: List of course and course themes**

|  |  |  |
| --- | --- | --- |
| **SN** | **Course Thematic** | **List of Courses** |
|  | **Computer System** | 1. Operating System
2. Computer Maintenance and Technical Support
 |
|  | **Programming/Software Development** | 1. Fundamentals of Programming
2. Advanced Programming
3. Event driven programming
4. Internet Programming
5. System Analysis and Design
6. Multimedia System
 |
|  | **Database System** | 1. Database System (Fundamentals and Advanced)
 |
|  | **Computer Networking**  | 1. Data communications and CN
2. System & Network Administration
3. Network Device & configuration
4. Information Assurance and Security
 |

# **Conclusion**

This guideline is designed to implement the National Exit Examination for B.Sc. in Information Technology undergraduate programs throughout Ethiopian Higher Education Institutes. To prepare this guideline the following criteria were considered into account.

* Professional graduate profiles,
* Competency and learning outcomes of the programs
* Correlation of graduate profiles and competency of the program
* Selection of core competency courses

The key competencies of the program are selected and the courses which matches the competency areas are selected for exit exam. The exam contents will focus on key knowledge of the program from each course and the courses which match the exit exam types. Accordingly, 13 courses are selected for exit exam which are grouped into different four thematic areas. The selected courses are thematized to groups according to their similarities.

The exit exam focuses on fundamental knowledge and skill of Information Technology. This guideline will be modified and change the categorized courses based on the adaptability and customization techniques when the curriculum is revised.