

MINISTRY OF EDUCATION AND HIGHER EDUCATION

CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

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**INFORMATICS CURRICULUM**

**BASIC EDUCATION - INTERMEDIATE LEVEL (Grades: 7 - 8 - 9)**

**&**

**SECONDARY EDUCATION**

# INFORMATICS CURRICULUM

## Table of Content

	<u>Page</u>
<b>Introduction</b>	1
<b>Goals</b>	2
<b>Table of Distribution of Periods per Week/Year</b>	3
• <b>Basic Education</b>	4
• <b>Intermediate Level</b>	
- Objectives	5
- Scope and Sequence	6
Grade Seven	8
<b>Content</b> Grade eight	10
Grade Nine	12
• <b>Secondary Education</b>	14
- Objectives	15
- Scope and Sequence	16
First Year	19
Second Year - Humanities	20
Second Year - Sciences	21
<b>Content</b> Third Year - Literature & Humanities	22
Third Year - Sociology & Economics	23
Third Year - General Sciences / Life Sciences	24

# Informatics Curriculum

## Introduction:

The purpose of this document is to establish curriculum guidelines to teach informatics as a new instructional subject. It emphasizes teaching the most common computer skills and concepts, and encourages the use of computers in teaching/learning other subjects.

This new curriculum draws on known international and local experiences in the area of computer education, and is in line with the principles of the Educational Reform Plan set by the National Center for Educational Research and Development.

Since informatics is an evolving subject and unique in its need for equipment, teaching should take place in computer labs to emphasize practice in building concepts and knowledge.

**Goals:**

*This curriculum aims at helping students achieve the following goals:*

1. To develop positive attitudes toward computer, and reinforce student's self-confidence through the efficient use of this technology.
2. To value the educational and economic role of the computer as well as its function in facilitating communication.
3. To interact with other cultures and civilizations through various programs and computer networks.
4. To develop creativity, logical thinking, problem solving, and analysis abilities through programming.
5. To recognize the uniqueness of the computer as a programmable machine which can perform specific tasks upon the user's orders.
6. To acquire basic computer concepts and their use in various cultural, industrial, and commercial domains.
7. To acquire information management skills: navigating through information, sending, receiving, storing, and retrieving it.
8. To acquire database management techniques.
9. To use the computer efficiently and to manipulate its peripherals for various purposes.
10. To acquire the basic computer skills needed in the labor market.

***Table of distribution of periods per week/year***

Stages	Basic Education									Secondary Education						
	Elementary Level						Intermediate Level			1st Year	Second Year		Third Year			
Cycles	First Cycle			Second Cycle								Humanities	Sciences	Literature & Humanities	Sociology & Economics	General Sciences
School Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th							
Weekly Periods							1	1	1	1	1	1	1	1	1	1
Yearly Periods							30	30	30	30	30	30	30	30	30	30

# Basic Education

***Intermediate Level:***

**Objectives:**

1. Acquainting the learner with the computer, its main components and functions.
2. Developing keyboard and mouse skills as well as simple file management, electronic drawing, and typing.
3. Developing word processing concepts and skills to perform school and personal tasks, and to acquire useful skills for later professions.
4. Using spreadsheet techniques to organize data and perform arithmetic and statistical applications suitable for the students' level.
5. Searching for, retrieving, and demonstrating various types of information extracted from computer multimedia applications.
6. Practicing simple programming to experience the potential of the computer as a programmable machine that helps in developing problem-solving skills.

## Scope and Sequence

Grade Level Subject	Seventh		Eighth		Ninth	
	Content	Time	Content	Time	Content	Time
<b>1. Computer Components</b>	<ul style="list-style-type: none"> <li>• Utility and types of computers.</li> <li>• Basic computer components.</li> </ul>	2	<ul style="list-style-type: none"> <li>• Memory.</li> <li>• The Central Processing Unit (CPU).</li> <li>• Peripherals: printer and scanner.</li> </ul>	2		
<b>2. Operating System</b>	<ul style="list-style-type: none"> <li>• Operating system environment.</li> <li>• Windows handling.</li> <li>• Files and folders.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Types of files</li> <li>• Manipulating programs.</li> <li>• Customizing desktop.</li> <li>• Formatting disks.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Print management</li> <li>• Disks diagnosis and files maintenance</li> </ul>	2
<b>3. Word Processing</b>	<ul style="list-style-type: none"> <li>• Word processing environment.</li> <li>• Parts of a text.</li> <li>• Manipulating documents.</li> </ul>	8	<ul style="list-style-type: none"> <li>• Style</li> <li>• Page setup and Print Preview</li> <li>• Table</li> </ul>	6	<ul style="list-style-type: none"> <li>• Templates</li> <li>• Columns</li> <li>• Improving editing productivity.</li> </ul>	6
<b>4. Electronic Drawing</b>	<ul style="list-style-type: none"> <li>• Environment of the electronic drawing software.</li> <li>• The drawing and coloring tools.</li> <li>• Drawing projects.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Design principles.</li> <li>• Inserting text into drawing.</li> <li>• Modifying an existing drawing.</li> <li>• Drawing projects.</li> </ul>	4		
<b>5. Spreadsheet</b>			<ul style="list-style-type: none"> <li>• Spreadsheet environment.</li> <li>• Worksheet.</li> </ul>	6	<ul style="list-style-type: none"> <li>• Page setup and Print Preview.</li> <li>• Workbook.</li> <li>• Charts.</li> <li>• Simple statistical applications.</li> </ul>	8

Grade Level Subject	Seventh		Eighth		Ninth	
	Content	Time	Content	Time	Content	Time
<b>6. Programming *</b>	<ul style="list-style-type: none"> <li>• Programming environment</li> <li>• Fundamental instructions</li> <li>• Repetition statement</li> <li>• Arithmetic operators (+,-,*, / )</li> <li>• Simple Procedures</li> <li>• The Editor</li> </ul>	12	<ul style="list-style-type: none"> <li>• Words and Lists</li> <li>• Variables</li> <li>• Procedures with variables</li> <li>• Procedures management</li> </ul>	8	<ul style="list-style-type: none"> <li>• Interactive programming</li> <li>• Logical operators (NOT, AND, OR)</li> <li>• Conditional statement (If ...Then)</li> <li>• Applications: constructing interactive programs.</li> </ul>	8
<b>7. Electronic Presentation Techniques</b>					<ul style="list-style-type: none"> <li>• The presentation software environment.</li> <li>• Selecting a model for the presentation.</li> <li>• Inserting multimedia elements in the presentation.</li> <li>• Running a presentation.</li> <li>• Students Projects.</li> </ul>	6
<b>Total Number of Periods</b>		30		30		30

*\* Remark : The programming curriculum for the intermediate level was designed according to the basic concepts of LOGO programming language. Other programming language(s) may be adopted in the future if they prove to be more adequate while maintaining similar concepts.*

## Grade Seven

### Content

#### **1. Computer Components:**

- Utility and types of computer.
- Basic computer Components.
  - The screen
  - The keyboard
  - The mouse
  - The disks

#### **2. Operating System:**

- Operating system environment.
  - Programs
  - Desktop
  - Accessories
- Windows handling.
  - Switching between windows.
  - Moving and sizing windows.
- Files and folders.
  - Browsing files.
  - File manager.

#### **3. Word Processing:**

- Word processing environment.
  - The default menu.
  - The toolbars.
- Parts of a text.
  - Selecting parts of a text.
  - Editing a text.
  - Insertion of text and pictures.
- Manipulating documents.
  - Using the spelling checker.
  - Printing documents.
  - Creating and saving documents.

#### **4. Electronic Drawing:**

- Environment of the electronic drawing software.
  - - The default menu.
  - - The Toolbox.
- The drawing and coloring tools.
  - The drawing tools.
  - Selecting shapes of the drawing tools.
  - The color palette.
- Drawing projects.

## Grade Seven

### Content

#### **5. Programming:**

- Programming environment.
- Fundamental instructions.
  - Instructions for controlling the screen.
  - Basic instructions in the interactive mode.
  - Producing and printing drawings.
- Repetition statement.
  - Notion and utility of the repeat instruction.
  - Parameters and syntax of the repeat instruction.
- Arithmetic operators (+, -, \*, /).
  - The four basic operations.
  - Priorities and use of parentheses.
- Simple procedures.
  - Syntax and execution of procedures.
  - Sub procedures.
- The editor.
  - Introducing the editor.
  - Managing the procedures library.
  - Saving and loading files from the editor.

**Content**

**1. Computer Components:**

- Memory.
  - Memory and storage.
  - Types of memory.
  - Common storage devices.
- Central Processing Unit (CPU).
- Peripherals.
  - printer:
    - *Function and common types.*
    - *Connection computer-printers.*
  - Scanner:
    - *Functions and uses.*
    - *Connection computer-scanner.*

**2. Operating System:**

- Types of files.
  - Executable files.
  - Text files.
  - Graphic files.
- Manipulating programs.
  - Installation of programs.
  - Running programs.
- Customizing desktop.
  - Shortcuts.
  - Screen saver.
- Formatting disks.

**3. Word Processing:**

- Style.
  - Applying style to text.
  - Indentation.
- Page setup and Print Preview.
  - Setting the pages.
  - Margins.
  - Header and footer.
- Table.
  - Creating a table.
  - Editing within a table.
  - Formatting a table.

**4. Electronic Drawing:**

- Design principles.
  - Balance between elements.
  - Kinds of design.
- Inserting text into drawing.
- Modifying an existing drawing.
- Drawing projects.

## **Grade Eight**

### **Content**

#### **5. Spreadsheet:**

- Spreadsheet environment.
  - The default menu.
  - The toolbars.
- Worksheet.
  - Editing.
  - Formulas.

#### **6. Programming:**

- Words and Lists.
  - Syntax for printing words and lists.
  - Applications: typing short texts and captions for graphics.
- Variables.
  - Notion and types of variables.
  - Assignment primitive.
- Procedures with variables.
  - Syntax of procedures with variables.
  - Executing procedures with variable(s).
  - Sub procedures with variable(s).
- Procedures management.
  - Listing, modifying, and erasing procedures.
  - Saving, loading, and deleting files.

## Grade Nine

### Content

#### 1. Operating System:

- Print management.
- Disk diagnosis and files maintenance.
  - Defragmentation
  - Scandisk

#### 2. Word Processing:

- Templates.
  - Formatting a document using a template.
  - Style Gallery
- Columns.
  - Dividing a page into columns.
  - Setting columns number and width.
- Increasing editing productivity.
  - Finding and replacing text.
  - Automatic insertion (Auto text).
  - Automatic correction.

#### 3. Spreadsheet:

- Page setup and Print Preview.
  - Page setup.
  - Print area.
- Workbook.
  - Relative and absolute reference.
  - Sheet handling within a workbook.
- Charts.
- Simple statistical applications.

#### 4. Programming:

- Interactive programming.
  - Running and interpreting a ready-made interactive program.
  - Notion of interactive programming.
  - Function and use of the instructions for data entry.
- Logical operators.
  - TRUE or FALSE values of statements.
  - NOT, AND, and OR operators.
- Conditional statement (IF ...THEN).
  - Function and components of the conditional statement.
  - Use of the conditional statement.
  - The STOP primitive.
- Applications: constructing interactive programs.

## **Grade Nine**

### **Content**

#### **5. Electronic Presentation Techniques:**

- The presentation software environment.
  - The default menu.
  - The toolbars.
- Selecting a model for the presentation.
  - Selection of an existing model.
  - Modification of display characteristics.
  - Inserting texts.
- Inserting multimedia elements in the presentation.
  - Selecting images from different sources.
  - Inserting tables, sounds, and graphic charts.
- Running a presentation.
  - Manual presentation.
  - Programmed presentation.
- Students' projects.

# Secondary Education

**Objectives for Secondary Education:**

**1. Objectives Common to all Sections and Years:**

- Using database management techniques to organize data, filter it, classify it, and produce meaningful reports out of it.
- Producing applications that combine various types of information using multimedia techniques.
- Acquaintance with communication network tools and their benefits.

**2. Objectives specific to Humanities Sections:**

- Acquaintance with modern programming techniques.
- Applying advanced spreadsheet and word processing techniques.

**3. Objectives specific to Sciences Sections:**

- Practicing modern programming techniques to enhance problem solving and decision making capacity.

## Scope and Sequence

Grade Level	First Year		Second Year - Humanities -		Third Year - Literature & Humanities -	
Subject	Content	Time	Content	Time	Content	Time
<b>1. Programming *</b>	<ul style="list-style-type: none"> <li>• Computer programming and problem solving.</li> <li>• Programming environment.</li> <li>• Program structure and elements.</li> <li>• Simple programming applications.</li> </ul>	18				
<b>2. Database</b>	<ul style="list-style-type: none"> <li>• Database concepts.</li> <li>• DBMS environment</li> <li>• Table structure.</li> <li>• Manipulating an existing table.</li> <li>• Sorting and filtering data.</li> <li>• Creating a table.</li> <li>• Creating simple forms.</li> </ul>	10	<ul style="list-style-type: none"> <li>• Creating simple reports.</li> <li>• Creating simple queries.</li> <li>• Index.</li> <li>• Using OLE.</li> <li>• Applications.</li> </ul>	14	<ul style="list-style-type: none"> <li>• Relating tables.</li> <li>• Creating sub forms.</li> <li>• Joint table queries.</li> <li>• Complex and parameter queries.</li> </ul>	10
<b>3. Multimedia</b>			<ul style="list-style-type: none"> <li>• Sound production and editing.</li> <li>• Techniques of producing multimedia electronic presentations.</li> <li>• Students Projects.</li> </ul>	12	<ul style="list-style-type: none"> <li>• Hypermedia.</li> <li>• Producing interactive Hypermedia presentations.</li> </ul>	10
<b>4. Network Communication</b>			<ul style="list-style-type: none"> <li>• Network concepts.</li> <li>• Internet.</li> <li>• Electronic mail.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Internet services.</li> <li>• Internet research techniques.</li> </ul>	2
<b>5. History of Computers</b>	<ul style="list-style-type: none"> <li>• Important developments in the history of the computer.</li> </ul>	2				
<b>6. Word Processing and Desktop Publishing</b>					<ul style="list-style-type: none"> <li>• Designing and producing a simple publication.</li> </ul>	8
<b>Total Number of Periods</b>		30		30		30

*\* Remark: The programming curriculum for the secondary level was designed according to the programming concepts of MS Visual Basic 4.0. Other programming language(s) may be adopted in the future if they prove to be more adequate while maintaining similar concepts.*

## Scope and Sequence

Grade Level	First Year		Second Year - Humanities -		Third Year - Sociology & Economics -	
Subject	Content	Time	Content	Time	Content	Time
<b>1. Programming</b>	<ul style="list-style-type: none"> <li>• Computer programming and problem solving.</li> <li>• Programming environment.</li> <li>• Program structure and elements.</li> <li>• Simple programs.</li> </ul>	18				
<b>2. Database</b>	<ul style="list-style-type: none"> <li>• Database concepts. DBMS environment</li> <li>• Table structure.</li> <li>• Manipulating an existing table.</li> <li>• Sorting and filtering data.</li> <li>• Creating a table.</li> <li>• Creating simple forms.</li> </ul>	10	<ul style="list-style-type: none"> <li>• Creating simple reports.</li> <li>• Creating simple queries.</li> <li>• Index.</li> <li>• Using OLE.</li> <li>• Applications.</li> </ul>	14	<ul style="list-style-type: none"> <li>• Relating tables.</li> <li>• Creating sub forms.</li> <li>• Joint table queries.</li> <li>• Complex and parameter queries.</li> </ul>	10
<b>3. Multimedia</b>			<ul style="list-style-type: none"> <li>• Sound production and editing.</li> <li>• Techniques of producing multimedia electronic presentations.</li> <li>• Students Projects.</li> </ul>	12	<ul style="list-style-type: none"> <li>• Interactive Hypermedia.</li> <li>• Running interactive Hypermedia presentations.</li> </ul>	10
<b>4. Network Communication</b>			<ul style="list-style-type: none"> <li>• Network concepts.</li> <li>• Internet.</li> <li>• Electronic mail.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Internet services.</li> <li>• Internet research techniques.</li> </ul>	2
<b>5. History of Computers</b>	<ul style="list-style-type: none"> <li>• Important developments in the history of the computer.</li> </ul>	2				
<b>6. Statistical and Administrative Applications</b>					<ul style="list-style-type: none"> <li>• Executing a project using the built-in spreadsheet statistical functions.</li> </ul>	8
<b>Total Number of Periods</b>		30		30		30

## Scope and Sequence

Grade Level	First Year		Second Year - Sciences -		Third Year <i>General Sciences / Life Sciences</i>	
Subject	Content	Time	Content	Time	Content	Time
<b>1. Programming *</b>	<ul style="list-style-type: none"> <li>• Computer programming and problem solving.</li> <li>• Programming environment.</li> <li>• Program structure and elements.</li> <li>• Simple programming applications.</li> </ul>	18	<ul style="list-style-type: none"> <li>• Programming techniques: comments, scrolling, dialog boxes, menus.</li> <li>• Loops and decision statements.</li> <li>• Student's projects.</li> </ul>	16	<ul style="list-style-type: none"> <li>• Programming techniques: graphics, multimedia, OLE.</li> <li>• Students' projects.</li> </ul>	18
<b>2. Database</b>	<ul style="list-style-type: none"> <li>• Database concepts.</li> <li>• DBMS environment</li> <li>• Table structure.</li> <li>• Manipulating an existing table.</li> <li>• Sorting and filtering data.</li> <li>• Creating a table.</li> <li>• Creating simple forms.</li> </ul>	10	<ul style="list-style-type: none"> <li>• Creating simple reports.</li> <li>• Creating simple queries.</li> <li>• Index.</li> </ul>	10	<ul style="list-style-type: none"> <li>• Relating tables.</li> <li>• Creating sub forms.</li> <li>• Joint table queries.</li> <li>• Complex and parameter queries.</li> </ul>	10
<b>3. Network Communication</b>			<ul style="list-style-type: none"> <li>• Network concepts.</li> <li>• Internet.</li> <li>• Electronic mail.</li> </ul>	4	<ul style="list-style-type: none"> <li>• Internet services.</li> <li>• Internet research techniques.</li> </ul>	2
<b>4. History of Computers</b>	<ul style="list-style-type: none"> <li>• Important developments in the history of the computer.</li> </ul>	2				
<b>Total Number of Periods</b>		30		30		30

*\* Remark : The programming curriculum for the secondary level was designed according to the basic concepts of MS Visual Basic 4.0. Other programming language(s) may be adopted in the future if they prove to be more adequate while maintaining similar concepts.*

## First year

### Content

#### 1. Programming:

- Computer programming and problem solving.
  - Strategies of problem solving.
  - Simple flowchart.
- Programming environment.
  - The basic elements of the main menu.
  - The help system.
- Program structure and elements.
  - Components of a program.
  - Procedures.
- Simple programming applications.
  - Code generated by the system.
  - Code entered by the user.
  - Variables.
  - Arithmetic operators.

#### 2. Database:

- Database concepts.
  - Basic database concepts.
  - Basic DBMS concepts.
- DBMS environment.
- Table structure.
  - Record.
  - Field.

- Manipulating an existing table.
  - Opening a table.
  - Changing field values.
  - Reports displaying
- Sorting and filtering data.
  - Quick sort.
  - Filtering by selection.
- Creating a table.
  - The design process.
  - The creating process.
  - Changing a table design.
- Creating simple forms.
  - Automatic creation of a form.
  - Creating a form with form Wizards.

#### 3. Computer History:

- Important development in the history of the computer.
  - Pre-computer stages.
  - Beginnings of automatic calculator.
  - The four computer generations.
  - Computer today.

## **Second year: Humanities**

### **Content**

#### **1. Database:**

- Creating simple reports.
  - Creating an automatic report.
  - Creating reports with wizards.
- Creating simple queries.
  - Research criteria.
  - Creating selection queries.
  - Modifying a query's description.
- Index.
  - Creating an index.
  - Deleting an index.
- Using OLE.
  - OLE types.
  - Inserting OLE objects in a field, form, and report.
- Applications.

#### **2. Multimedia:**

- Sound production and editing:
  - Creating sound files.
  - Manipulating sound files.
- Techniques of producing multimedia electronic presentation:  
Importing graphs, tables, movies, etc...
  - Students' projects.

#### **3. Network Communication:**

- Network concepts.
- Internet.
  - Internet history.
  - Internet services.
  - Internet and education.
- Electronic mail.
  - Utility of electronic mailing.
  - Sending and receiving messages.

## **Second year: Sciences**

### **Content**

#### **1. Programming:**

- Programming techniques:
  - Comments.
  - Scrolling.
  - Dialog Boxes.
  - Menus.
- Loops and decision statements.
  - Conditional statements IF... THEN... ELSE
  - Loops FOR... NEXT
- Students' projects.

#### **2. Database:**

- Creating simple reports.
  - Creating an automatic report.
  - Creating reports with wizards.
- Creating simple queries.
  - Research criteria.
  - Creating selection queries.
  - Modifying query's description.
- Index.
  - Creating an index.
  - Deleting an index.

#### **3. Network Communication:**

- Network concepts.
- Internet.
  - Internet history.
  - Internet services.
  - Internet and education.
- Electronic mail.
  - Utility of electronic mailing.
  - Sending and receiving messages.

**Third year: Literature and Humanities**

**Content**

**1. Database:**

- Relating tables.
  - One to many relation.
  - Manipulating data in linked tables.
- Creating sub forms.
  - Creating sub forms with the form wizard.
  - Changing the display of a sub form.
- Joint table queries.
- Complex and parameter queries.

**2. Multimedia:**

- Hypermedia.
- Producing interactive Hypermedia presentations.

**3. Network Communication:**

- Internet services.
  - Information research.
  - Files transfer.
- Internet searching techniques.

**4. Word Processing and Desktop Publishing:**

- Designing and producing a simple publication.

**Third year: Sociology and Economics**

**Content**

**1. Database:**

- Relating tables.
  - One to many relation.
  - Manipulating data in linked tables.
- Creating sub forms.
  - Creating sub forms with the form wizard.
  - Changing the display of a sub form.
- Joint table queries.
- Complex and parameter queries.

**2. Multimedia:**

- Hypermedia.
- Running interactive Hypermedia presentations.

**3. Network Communication:**

- Internet services.
  - Information research.
  - Files transfer.
- Internet searching techniques.

**4. Statistical and Administrative Applications:**

- Executing a project using the spreadsheet built-in statistical functions.

**Third year: General Sciences/ Life Sciences**

**Content**

**1. Programming:**

- Programming techniques.
  - Graphics.
  - Multimedia
  - OLE
- Projects.

**2. Database:**

- Relating tables.
  - One to many relation.
  - Manipulating data in linked tables.
- Creating sub forms.
  - Creating sub forms with the form wizard.
  - Changing the display of a sub form.
- Joint table queries.
- Complex and parameter queries.

**3. Network Communication:**

- Internet services.
  - Information research.
  - Files transfer.
- Internet research techniques.