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# **Handbook on In-house Style for Course Development**

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**Santosh Panda**

**The Commonwealth of Learning,  
Vancouver, Canada**

**and**

**National Open School of Trinidad & Tobago,  
Ministry of Education,  
Republic of Trinidad & Tobago**

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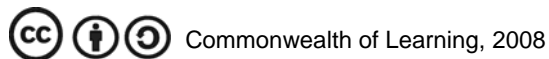
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## Preface

The design and development of this *Handbook on In-house Style* was conceived, authorised and inspired by Frances Ferreira, Education Specialist, The Commonwealth of Learning to facilitate adaptation of CXC CSEC curriculum in different subject areas at the Ministry of Education, Republic of Trinidad and Tobago for distance teaching-learning, and for development of self-learning course materials initially to facilitate persisters and dropouts of O-level to complete certification successfully, and later to offer as distance learning courses, within the basket of blended learning, for exclusive non-classroom learning and CXC certification. The handbook largely owes to the proceedings and outcomes of the SLMD workshop held at Trinidad and at Tobago during August 20–September 15, 2007 and to the efforts of Ainsworth Ovid, Lystra Sampson-Ovid and Elia Grant-Fraser. The handbook is based on some of the course structures and units developed and revised by some of the workshop participants (especially William Clarke, Karima Mohammed, Patrick Medford and Kishore Ramnaraine) mentored by the author. The examples from their course units may inspire others to develop still better and more learner-friendly course units for open schoolers and distance learners at basic and secondary school levels.

The handbook is intended to be used by the course writers and editors to give shape to their distance education curriculum/course structure and course units, and also by the trainers who may orient/train faculty new to distance teaching-learning to be able to design and develop self-learning materials for distance learning. The handbook can be used by teachers and course writers from any part of the globe for their courses. Basically intended to facilitate development of course materials in print, it can provide a base to further development of interactive multimedia learning materials. The facilitation by The Commonwealth of Learning and the Distance Education Unit and NOSTT, MoE, Republic of Trinidad and Tobago is highly appreciated.

December 2007

**Santosh Panda**

## **Section 1: About the Handbook**

## **Handbook Aims**

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The aims of this *Handbook on In-house Style* are to provide all those faculty engaged in developing self-learning materials for learners of open schools and distance learners at basic and school education with an understanding of how to develop new curriculum or adapt existing classroom curriculum for open schooling, as well as acquire the knowledge and skills involved in developing self-learning materials for school level distance learners. Examples from the context of open schooling have been provided which you can relate to your own contexts and discipline/subject area for developing and finalising modules and units.

## **Handbook Objectives**

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This handbook is designed to facilitate those involved in writing and developing self-learning materials, in the contexts of open schooling, school level distance learning, and open basic education. After going through the handbook, you should be able to:

- Decide and frame the curriculum structure for your course/subject area and also in relation to modularity and course credits/student workload;
- Understand and apply the COL Template and the in-house style template for writing course units.
- Transform existing curriculum structure to conform to distance learning.
- Develop and write self-learning materials/units for the specified target group of learners.

## **Handbook Workload**

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This handbook has been designed so that your reading and comprehension, combined with working through the set activities, should take you about 15 hours of study. There are three activities (Handbook Activities) which you should work through while going through the handbook or after reading through it. Read the handbook in the way it has been sequenced; this will better facilitate your understanding.

## **Handbook Structure**

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You will notice there are five sections in the handbook. While the first section, which you are going through right now, gives you an idea of the way the handbook has been designed and how to use it, Section 2 focuses on briefly outlining open and distance learning, the nature of learners of open schools, and the instructional design principles to take into consideration when finalising curriculum and developing course units so that student learning is facilitated. (You may, of course, read more on these aspects from some of the readings suggested at the end of this handbook). In Section 3, the very basic elements of curriculum adaptation including workload and credits is discussed, and the course in-house style is described. Section 4 briefly outlines the contents of the in-house style for course units. Section 5 expands the discussion on working with the template and offers examples and activities to help you develop the

understanding and skills you will need to design self-learning units for open and distance learners.

## **Handbook Layout and Use**

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The handbook uses a user-friendly design which, we hope, you will find easy to navigate; we hope you find the in-house style template simple and learner-friendly, too. We have given explanations and examples for some of the important parts of the template, such as structure/contents, introduction, outcomes, activities, etc. which you may find useful, and these examples may facilitate you to develop the other parts, especially the presentation of the content, with ease.



## Section 2: Open and Distance Learning

## **Distance Learning**

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Distance education, as an evolutionary improvement over the earlier correspondence education, brings in all the possible media to deliver instruction and learner support to facilitate independent self learning by the distance learner. As an out-of-classroom and out-of-regular-campus method and system, it is based on the following characteristics:

- Learners are away from the educational institution, and study mostly alone by themselves with the help of self-learning materials delivered by the institution, with tutorial/mentoring support provided mostly at a distance.
- There is quasi separation of the teacher/tutor and the learner, since sometimes they can occasionally meet at learning centre or designated workshops or field visits to interact in peer groups and also individually.
- Learners are at a distance most of the time (therefore, there is no possibility of regular face-to-face contact such as going to a school or an institution). They may be busy doing a job, doing extra work in or outside the home, or studying other courses, too. Each learner has different study habits and learning styles. Therefore, all possible media – print, audio, video, multimedia, conferencing, web, and face-to-face interaction – are brought together in a judicious media mix to deliver content (that is, teaching) as well as provide learner support. In most cases, learning materials are produced and delivered before learners read them, and printed materials dominate the basket of learning materials.

Therefore, learning materials, assignments, practical exercises, tutorials, assessment systems and support systems need to be carefully designed and developed to facilitate effective student learning at a distance.

## **Open Learning**

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Open learning refers to both a philosophy and a learning strategy, and may be practiced within regular institutional activities and within distance learning. As a philosophy, open education provides for removal of all the institutional and other constraints for distance learners to study effectively – removal of restrictions of place of study, pace of study, entry qualifications and age, etc. As a learning strategy, it allows for greater learner control over their learning; learners largely choose what to study, in what way to study, what assessment strategies to follow, and in what way to accumulate credits. There are, of course, limits to providing openness to the learners. Distance learning may take place without any provision of openness and flexibility; however, open schools and open universities (besides practicing openness) heavily depend on the distance education methodology for educational delivery and interaction. Therefore, open learning packages address the issues of learner autonomy and variety of learning styles.

## **The Open School Learners**

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The learners of open schools may belong to any age group, from ages 18 to 80. However, most of the learners are either school dropouts or have not had a chance to go to school regularly to complete O-level or A-level certification. In case of the National Open School of Trinidad and Tobago (NOSTT), there are above 2000+ school dropouts, most of whom belong to the age group of 17-23. They are largely unemployed, scattered all over the country, and from all levels of socio-economic status. They need to complete the O-level through distance learning, but they need to be compensated for poor understanding of the school subjects both at foundation and higher levels. Most of them face difficulty in some of the difficult units/lessons in each course and need special focus or facilitation. They have the motivation to complete the school certification, and deserve special attention.

Similarly, the open schoolers/distance learners need facilitation in learning and study skills, and also training in how to study at a distance. Further, learning materials need to be prepared to address subject-specific needs. Therefore, design and development of self-learning materials (in print) requires special ability and consideration.

## **Instructional Design and Learning**

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It is important for us to design our instructional content in a logically and learner-friendly way to facilitate student self-learning at a distance. Our instructional design is generally based on one or many learning theories (for example, elective instructional design). We need to design our curriculum and course units for distance teaching-learning to take advantage of what learning theories have to offer. Learning theories have evolved beyond early behaviourism to the present day understanding of constructivism. Let's look at the broader groups of learning theories and their use of learning devices.

### *Behaviourism*

This theory of learning believes that learning in human beings occurs only when there is observable change in their behaviour. Therefore, learning must be organized in chunks, and present learning should be sequenced with prior learning and subsequent learning in a chain.

### *Cognitivism*

The cognitivist theories of learning are based on the belief that learning as cognitive/mental activity is less expressed in human behaviour than what happens inside the human mind. Human perception is important to learning; and learning involves conceptual understanding, problem solving, procedures, rules, etc.

### *Constructivism*

Comparatively more recent than the earlier two groups, the constructivists assert that, based on their own perception and personal interpretation, learners construct their own knowledge and understanding. Each learner is unique and brings his/her own unique experiences and contexts to learning new things. Therefore, learning is meaningful only when the learning contexts and materials are based on the learner's cognitive structure and socio-cultural context.

Table 1 relates the three groups of learning theories to their corresponding use of learning devices (Freeman, 2005).

**Table 1: Learning theories and learning devices**

<i>Learning theory</i>	<i>Learning devices</i>
Behaviourism	<ul style="list-style-type: none"> <li>• Statement of learning objectives</li> <li>• Breaking down learning tasks into small steps</li> <li>• Right or wrong answers for each task</li> <li>• Learner assessment based on the learning objectives</li> <li>• Prescription of learning in the learning package</li> </ul>
Cognitivism	<ul style="list-style-type: none"> <li>• Statement of learning objectives</li> <li>• Breaking down tasks into small steps</li> <li>• Provision of a wide variety of tasks</li> <li>• Small and meaningful chunk of materials</li> <li>• Use of advance organisers to clarify the structure of learning materials (i.e. concepts and sub-concepts)</li> <li>• Relationship to simple real-world contexts</li> <li>• Prescription of learning in the learning package</li> </ul>
Constructivism	<ul style="list-style-type: none"> <li>• Choice of learning task or situation by the learner</li> <li>• Provision of authentic and real-world tasks</li> <li>• Use of case studies</li> <li>• Provision of collaborative learning tasks</li> <li>• Learning through real observation of the contexts</li> <li>• Open ended learning package</li> <li>• Self evaluation</li> </ul>

Source: Freeman, R. (2005). *Creating Learning Materials for Open and Distance Learning: a handbook for authors and instructional designers*. Vancouver: Commonwealth of Learning.

From the above, we may derive the following implications for designing courses and learning materials:

- There should be a comprehensive understanding, through needs analysis and analysis of learner characteristics, of who the learners are, what their needs are, what their facilitators and constraints are, and how they learn.
- There is a need to conduct analysis of instructional needs, environment, and preparedness for a particular teaching-learning material. These shall include the level of the course, the nuances and requirements of the discipline, and the goals of learning.
- The instructional events and experiences should be woven around the context of the learner (that is, his/her workplace, family, cultural background, etc.). Since the socio-cultural, personal and professional contexts are inextricably related to the learner's cognitive structure (how the learner perceives and learns accordingly), learning events and experiences need to be designed to be situated in that context. Culture plays an important part in determining what and how to learn.

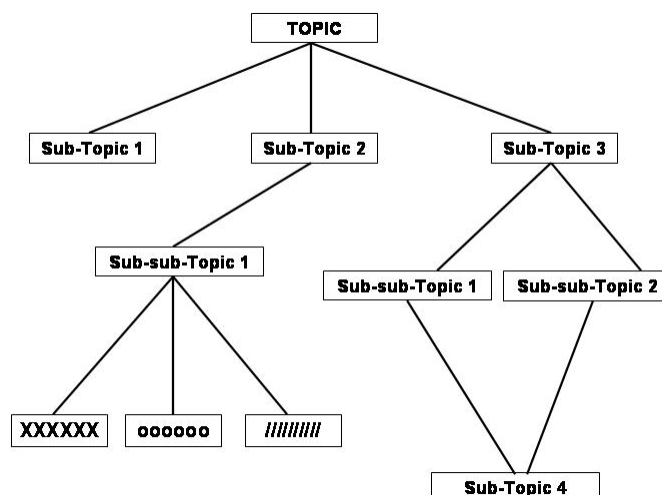
- The learner needs to be provided freedom and flexibility in choosing what and how to study, including the pace of learning. However, attempts must be made, within and around the learning resources, to empower and facilitate learners to be able to reflect on what they are doing and learning, including its wider applicability. This involves helping them move towards deep and transformative learning. The study skills, tips, and activities given inside the course units, along with mentoring provided at the learning centres, should facilitate this. Additional handbooks for study skills and reading skills may be developed for this purpose.
- The choice of media used for instruction/learning should be governed by largely learner choice and capacity, and the learning goals. Blended learning may be considered, though in which self-learning course units shall form the base and dominate the media basket.
- Learning occurs most easily when it is applied and woven around individual and social problems. Such problems, based on the discipline, area and level of study, and chosen from the context of the learner should be selected, designed and integrated into the instructional events and experiences. Examples, illustrations, case studies, and activities given inside the course units should address this aspect.
- The learning materials should include helpful transitions to emphasise the connection between concepts or provide a link from one section to the next. The content/text, learning objectives, self evaluation and activities, examples and case studies, study guides and study skills, facilitation for reflection, advance organisers and reflective conclusions should all be in line with the logical/modular sequencing of the unit.



## Section 3: Curriculum Design

## Curriculum Adaptation

The next step in the process is to select content for your course and sequence it logically. One way to do this is to list the contents by topics and sub-topics, and establish linkages among them. See Figure 1 for a diagrammatic representation of this topic-oriented approach to selecting and sequencing content.



**Figure 1: Topic approach to course design**

Try filling in these boxes yourself to see how your course is shaping up. Another widely used approach is to develop ‘concept maps’ for your course or module, and select the best map based on which sequencing of concepts and sub-concepts is most logical. Figure 2 shows three concept maps for a module on ‘Tutor Comments’ on student assignments. Which concept map do you appreciate most? What teaching-learning principles are involved in each concept map? (In Section 5, you’ll find another ‘concept map’ on ‘Universe and Earth’ under the heading ‘Unit Structure’; how does it relate to the concept maps shown below?)

Concept map 1	Concept map 2	Concept map 3
1.1 Types of tutor comments	1.1 Tutor comments and distance tutor	1.1 Discovering the distance tutor
1.1.1 Harmful comments	1.2 Various types of tutor comments	1.1.1 General functions of a classroom teacher
1.1.2 Hollow comments	1.2.1 Harmful comments	1.1.2 Identifying a distance tutor
1.1.3 Misleading comments	1.2.2 Hollow comments	1.2 Significance of Tutor comments
1.1.4 Positive comments	1.2.3 Misleading comments	1.2.1 Academic communication
1.1.5 Negative comments	1.2.4 Positive comments	1.2.2 Personal communication
1.1.6 Null comments	1.2.5 Negative comments	1.2.3 Supplemental communication
1.1.7 Constructive comments	1.2.6 Null comments	1.3 Types of tutor-comments
1.1.8 Global comments	1.2.7 Constructive comments	1.3.1 Harmful comments
1.2 Role of distance tutor	1.2.8 Global comments	1.3.2 Hollow comments
1.3 Importance of tutor comments		1.3.3 Misleading comments
		1.3.4 Null comments
		1.3.5 Negative comments
		1.3.6 Positive comments
		1.3.7 Constructive comments
		1.3.8 Global comments
		1.3.9 Personal comments

**Figure 2: Concept map on ‘Tutor Comments’**  
(Source: Handbook 5, STRIDE, IGNOU, 2005)

The most crucial aspect at this stage is to decide on how to sequence the content for presentation. An important consideration generally will be whether there are existing textbooks in that area where some logical ordering has been done. There may be existing equivalent curriculum structure (with a particular sequencing of chapters) meant for classroom teaching. Should one follow that? Will the learners appreciate that sequencing? Will all the teachers of the discipline or subject agree to that? There may be many more such questions that come up at this stage. The existing sequencing done in classroom-based curriculum and textbooks may need serious examination, and all the concepts and topics may need to be reorganised and restructured into new modules or units within each module. Rowntree (1990) suggests these ways of sequencing:

- Sequencing by *topic* in order.
- Sequencing *chronologically* when the content to be taught is shown to have developed over a period of time.
- Sequencing by establishing *cause and effect* relationship.
- Sequencing by *structural logic*; for example, subjects like mathematics.
- *Spiral* approach to sequencing where one comes back and forth to the same content but treated at a greater depth each time this is revisited.
- Sequencing by *backward chaining* where the end results are presented, and one comes back deducing how the results were arrived at. In other words, one comes back from an overall understanding of the concept of its parts and their inter-relationships.
- Sequencing by *networks*. This is most applicable in the context of multimedia-based or on-line learning where lots of horizontal and vertical links are provided to move around while studying.

You may like to adopt any of the above or a combination of various ways to sequence your content. However, in distance education, two important aspects need to be looked into irrespective of any sequence one follows.

i) One is that the content should be composed of modules, and the content organisation should be *modular* such that learners need to complete each one in order to continue. Another aspect is that the modules should be designed so that as a teacher you can take a module from one course and use it with minor adaptation in another course.

ii) Second is that the course design should be credit-based, that is, the courses and the entire learning experiences they represent (for example, course modules, assignments, practical, projects, audio and video materials, study centre counselling/tutoring, examination, etc.) are expressed in terms of *credits*.

## **Course Workload and Course Credits**

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We need to take special care that whatever average time that distance learners put in for one year of study (the student workload) should be equivalent to the workload of the regular school students for the same subject areas. Whatever compulsory subjects or courses the student needs to take, to for instance the O-level certification, should

be completed within the stipulated time meant for the regular school students. However, distance learners (and especially those who have dropped out of school) may need more time and more effort to complete the courses. However, it must be emphasised that while the quality of the courses and therefore, the quality of learning, cannot be compromised, what is required is development of self-learning packages appropriate to the level of learners to facilitate their understanding and course completion.

Each of the courses for the O-level needs to be converted into modules and each module into units (lessons). While each unit may take about 4-6 hours of study, all course units, along with associated assignments, compulsory face-to-face contact/tutorials and practical exercises should total the needed course credits, and each course should be equivalent to the rest of the courses in terms of credit hours and student workload. For expression of courses, course modules and course units in credits, one *may* consider the equation: 1 credit = 30 student study hours (which includes studying the units, doing the assignments, attending compulsory tutorials and practical, etc.).

## Course In-house Style

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It is important to develop an in-house style or template for your course which should be the same for all other courses that the student will study to successfully complete the certification. You need to develop a separate booklet on the 'course curriculum structure' for your course (and all others). The structure should include all the aspects noted in the illustration here. This curriculum/course book may also include information about other media used to transact the curriculum as well as the assessment strategies. The 'student handbook/prospectus' shall detail what the student needs to do in order to successfully complete the course.

Course Cover Page
Course Credits Page
Course Contents Page
<b>COURSE DESCRIPTION</b>
INTRODUCTION
COURSE GOALS
GENERAL OBJECTIVES
COURSE CONCEPT MAP
MODULES AND UNITS
Module 1: .....
Unit 1: .....
Unit 2: .....
Unit 3: .....
Unit 4: .....
Module 2: .....
Unit 1: .....
Unit 2: .....
Unit 3: .....
and so on.

Let's consider these aspects for a course on Geography for grade X students (cf: Clarke & Mohammed, T&T Workshop). Can you see ways to improve the course structure?? How would you develop a course structure based on the example above?

## COURSE DESCRIPTION

Geography is the study of the Earth as the home of human beings. It is concerned with spatial patterns, human and natural systems and the interrelationships between them. This course will help you to understand the issues involved in the use and development of natural resources and in conserving the natural environment.

The subject matter provides the skills and knowledge of the **natural and human systems**, which will guide you in making informed rational decisions in using and managing natural resources. It will also contribute to your enjoyment of travel and leisure.

## INTRODUCTION

The material in this study guide will satisfy your desire to acquire a foundation in Geography. It will also provide guidance to you as an independent candidate for the **CXC CSEC Geography Examination**.

## COURSE GOALS

The material is intended to satisfy the aims of the CSEC Syllabus:

1. Develop an understanding of geographical phenomena.
2. Stimulate interest in the nature of Natural and Human Systems and their interaction.
3. Promote an understanding of the processes at work in Natural and Human Systems.
4. Develop an understanding of the interrelationships between the natural and the human environment.
5. Foster an awareness of the need for the sustainable use of our resources.
6. Develop practical skills to enhance geographical knowledge.
7. Promote knowledge and understanding of geography at the local, regional and global scales.

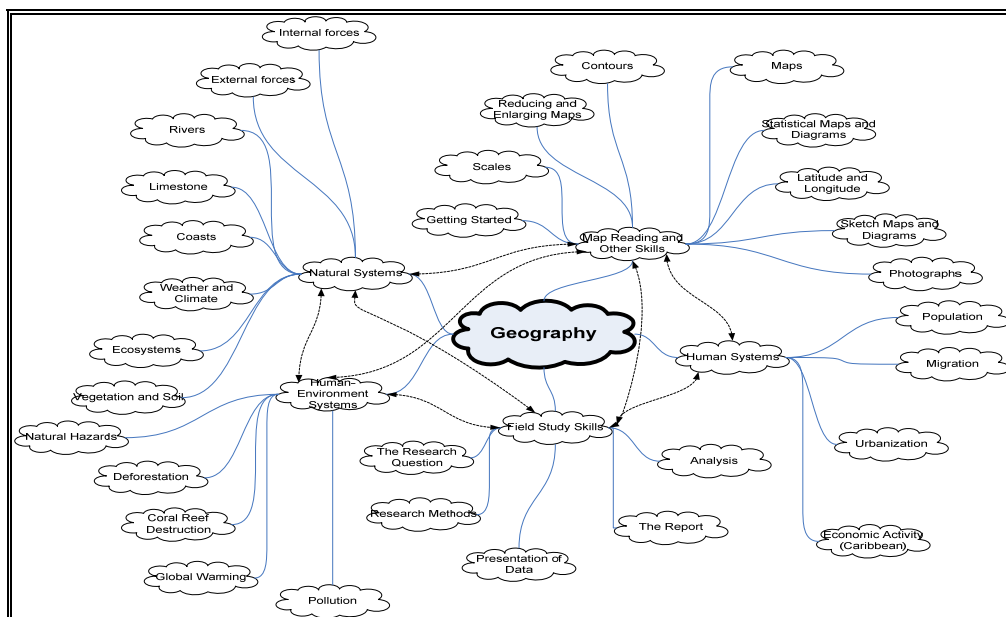
## GENERAL OBJECTIVES

On completion of this programme it is hoped that you will be able to achieve the objectives of the CSEC Geography Syllabus:

1. Understand geomorphic, atmospheric and biotic processes.
  2. Acquire appropriate skills and techniques used in geography.
  3. Appreciate the forces affecting the spatial development and distribution of human population;
  4. demonstrate knowledge of the types, functions and growth of human settlements;
  5. develop an awareness and understanding of the factors influencing patterns and changes in economic activity;
- appreciate the relationship between the natural and human systems.

The above description is based on the concept map for the course shown in Figure 3. The concept map sets out the linkages among the concepts and sub-concepts.

## COURSE CONCEPT MAP



### **Figure 3: Course map for Geography**

*(Source: Clarke and Mohammed, T&T Workshop)*

The course has been divided into 5 modules and 32 units as given below (based on the concept map presented in Figure 3).

#### **MODULES AND UNITS**

##### **MODULES**

There are five modules in the course:

- MODULE 1 Map Reading and Other Skills
- MODULE 2 Natural Systems
- MODULE 3 Human Systems
- MODULE 4 Human-Environment Systems
- MODULE 5 Field Study Skills

##### **Module 1 – Map Reading and Other Skills**

- Unit 1 Getting Started
- Unit 2 Scales
- Unit 3 Reducing and Enlarging Maps
- Unit 4 Contours and Cross-Sections
- Unit 5 Map Description
- Unit 6 Map Interpretation
- Unit 7 Statistical Maps and Diagrams
- Unit 8 Latitude and Longitude
- Unit 9 Drawing Sketch Maps and Diagrams
- Unit 10 Photographs

##### **Module 2 - Natural Systems**

- Unit 1 Internal Forces
- Unit 2 External Forces
- Unit 3 Rivers
- Unit 4 Limestone Environment
- Unit 5 Coasts
- Unit 6 Weather and Climate
- Unit 7 Vegetation and Soil
- Unit 8 Ecosystems

##### **Module 3 – Human Systems**

- Unit 1 Population
- Unit 2 Migration
- Unit 3 Urbanization
- Unit 4 Economic Activity in the Caribbean

##### **Module 4 – Human-Environment Systems**

- Unit 1 Natural Hazards
- Unit 2 Pollution
- Unit 3 Global Warming
- Unit 4 Coral Reef Destruction
- Unit 5 Deforestation

##### **Module 5 – Field Study Skills**

- Unit 1 The Research Question
- Unit 2 Research Methodology
- Unit 3 Presentation of Data
- Unit 4 Analysis Unit
- Unit 5 The Report

*(Source: Clarke and Mohammed, T&T Workshop)*

## Example of Concept Map for Module 1

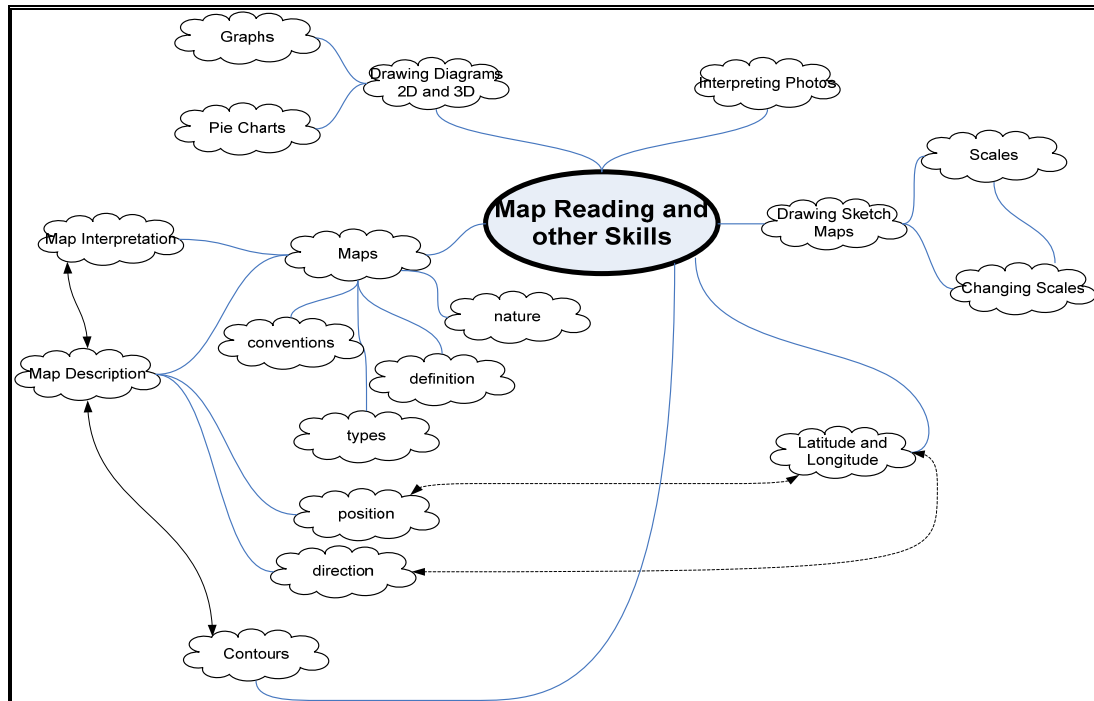


Figure 4: Concept map for 'Map Reading and Other Skills'

### MODULE 1: MAP READING AND OTHER SKILLS

#### Overview and Concept Map

Maps are essential tools for geographers. This module will give you the skills you need to read and use maps effectively. You will also learn simple techniques to present, describe and analyse data. The inter-relationships of various broader concepts included in this module are shown in Figure 4.

#### Objectives

After studying this module, you will be able to:

- Locate places, using four and six-figure grid references.
- Use scales to measure distance.
- Give direction in terms of grid bearing and the 16 points of the compass.
- Read and interpret conventional symbols.
- Reduce and enlarge a section of the map.
- Draw and interpret cross sections and sketch sections.
- Calculate gradients using ratios.
- Describe the following: drainage, vegetation, land use, settlement, and communications.
- Describe landforms through the reading of contours.
- Explain the relationship among the patterns of relief, drainage, vegetation, land use settlement, communications.
- Draw sketch maps.
- Describe and interpret geographical aspects of photographs.
- Draw diagrams of geographical features.
- Locate a place from its latitude and longitude.
- Calculate the difference in time between places.

This module is divided into eleven units:

- Unit 1 Getting Started
- Unit 2 Distances
- Unit 3 Reducing and Enlarging Maps
- Unit 4 Contours and Cross Sections
- Unit 5 Map Description
- Unit 6 Map Interpretation
- Unit 7 Statistical Maps and Diagrams
- Unit 8 Latitude and Longitude
- Unit 9 Drawing Sketch Maps and Diagrams
- Unit 10 Photographs

The units are further subdivided as follows:

### Unit 1: Getting Started

Maps : Nature and Elements

- Definition of a map
- The Nature of Maps
- Elements of a map

Types of Maps and Conventions

- Types of Maps
- Conventions
  - *Colours*
  - *Symbols*
  - *Labels*

Finding positions on a map

- Latitude and longitude
- Grid References
  - *National Grid*
  - *Other Grids*

Orientation

- Compass Direction
- Bearings

### Unit 2: Scales

Types of scales

Measuring distances

- Using the line scale
- Measuring lines

### Unit 3: Reducing and Enlarging Maps

- Methods of reducing and simplifying a map
- Constraints on enlarging maps

### Unit 4: Contours and Cross Sections

- Definition of a contour line
- Properties of a contour line
- Common contour patterns
  - Spurs
  - Valleys
  - Peaks
  - Ridges
  - Plateaux
  - Passes
  - Plains
  - Coastal features
  - Types of slopes
- Definition of a cross section/profile
- Drawing a cross section
- Cross Sections of Common Landforms
- Calculating and comparing gradients as ratios

**Unit 5: Map Description**

- Natural features
  - Landforms
  - Drainage
  - Vegetation
- Human features
  - Land use
  - Communications
  - Settlement

**Unit 6: Map Interpretation**

- Landforms
- Drainage
- Vegetation
- Land use
- Communications
- Settlement

**Unit 7: Statistical Maps and Diagrams**

- Construction and Interpretation of:
  - Bar graphs
  - Line graphs
  - Pie Charts
- Interpretation of:
  - Tables
  - Dot maps
  - Choropleth maps
  - Isopleth maps

**Unit 8: Latitude and Longitude**

- Shape of the Earth
- Measurement of latitude
  - North and South Poles
  - Important lines of latitude:
    - ✓ Equator
    - ✓ Tropic of Cancer
    - ✓ Tropic of Capricorn
    - ✓ Arctic Circle
    - ✓ Antarctic Circle
- Measurement of longitude
  - Important lines of longitude
    - ✓ Prime Meridian
    - ✓ 180° line
  - Time and Time Zones
  - International Date Line

**Unit 9: Drawing Sketch Maps and Diagrams**

- Elements of a map:
  - Title
  - Key and/or labels
- Diagrams
  - 2-D and 3-D Views

**Unit 10: Photographs**

- Types of photographs
- Elements of a photograph
  - Interpretation and description of photographs
  - Drawing diagrams or sketches from photographs

(Source: Clarke and Mohammed, T&T Workshop)



## Handbook Activity 1

At this stage, pause and reconsider your own course structure. Develop a 'concept map' for your course with proper linkages among various concepts/themes, and divide your course into various modules, and each module into units. You may take about *two hours* to do this activity.

## Section 4: COL Template

## Template Structure

---

In our Geography course example, we followed the template structure developed by the Commonwealth of Learning (COL) for in-house course development. Below is the structure that you need to follow so that all your courses follow the same pattern. The bullet list below each item details the information that needs to be included.

### **Cover page**

- Document type
- Module title
- Module sub-title
- Institute name
- School/department name

### **Copyright page**

- Institute's copyright text
- Address details

### **Acknowledgements page**

- Any acknowledgements applicable to development of the course materials/units

### **Contents page**

- Lists the table of contents

### **Module overview/structure page**

- Welcome
- Module overview and concept map
- Module outcomes/objectives
- Time frame for the module
- Assignments (about)
- Assessments (about)

### **Unit 1 (title)**

- Unit structure
- Introduction
- Outcomes/learning objectives
- Time
- Study skills
- First topic heading (and sub-headings)
- Second topic heading (and sub-headings), and so on
- Summary
- Readings
- Assignment

















Repeat for the rest of the Units.

### **Module end assessment**

## Template Icons

---

These icons have been used in the COL Template and in the Unit Template that we have selected as the in-house style for developing course units.

	Outcomes
	Terminology
	Time
	Study skills
	Activity
	Case study
	Discussion
	Note it!
	Group activity
	Help
	Tip
	Reflection
	Summary
	Reading
	Assignment
	Assessment

In the next section, we show how the course template and icons can be used to develop a course unit. While we all need to follow this format/template, we do have complete freedom to develop our content (text, examples, illustrations, tables, figures, activities, and so on) based on our course requirements and our experience as teachers, trainers and curriculum developers.

## **Section 5: In-house Style for Course Units**

## The In-house Style

---

Examine the in-house style template given below at one go so that you have a comprehensive picture of how a unit should look and what it should include. You may choose to use some or all of the template features; for example, case study, discussion, note it, group activity (which may be undertaken at the learning centre), help, tips, reflection, and readings may all be useful for your course. Use any ones you like, but keep in mind that some features are required ones for each unit.

### Example of Inhouse style

UNIT 1.....

#### CONTENTS

- .....
- .....
- .....
- .....

#### INTRODUCTION

.....



#### OUTCOMES (learning objectives)

After going through this unit, you should be able to:

- .....



#### TIME

.....



#### STUDY SKILLS

.....

#### HEADING 1

.....

Sub-heading 1.1

.....

Sub-heading 1.2

.....



#### ACTIVITY 1

.....



#### CASE STUDY

.....



## DISCUSSION

HEADING 2

Sub-heading 2.1



## ACTIVITY 2



### NOTE IT

- 

Sub-heading 2.2



## GROUP ACTIVITY



### HELP



### TIPS

- 



## ACTIVITY 3



### TIPS

- 



## ACTIVITY 4

HEADING 3



ACTIVITY 5



REFLECTION



SUMMARY



READINGS



ASSIGNMENT



TIPS



ASSESSMENT

## Unit Structure/Contents

We are generally tempted to look at how a unit needs to be organised and presented (that is, taught, or in other words, in what order the students should learn the contents) from the point of view of how it has already been taught or how we have taught the lesson/topic in the classroom. In the case of distance teaching (or, independent self-learning), we need to revisit how it should be taught (organised and presented). There are many principles to help us, including ‘simple to complex’, ‘known to unknown’ and ‘concrete to abstract’. What could help us more is a combination of the knowledge base of the discipline or the subject itself (as reflected in the chapterization of a text book) and the creativity of the teacher as to how to logically sequence and link the main concepts in a unit.

Let’s look at an example of a Unit on ‘Universe and Earth’ for higher secondary school students. Three concept maps showing the order the contents should be organised for the unit are given in Figure 5. Go through the concept maps to find out which one is the most logical and appropriate for you.

Concept map 1	Concept map 2	Concept map 3
1. Light year: Unit of distance stars and galaxies	1. Universe and its origin	1. Earth: surface as we know it
2. Universe – Colonies of stars – Galaxies	1.1. Galaxies and constellations	Land
3. Constellation – group of bright stars	1.2. Light year	Inside the earth Lithosphere – Crust– mantle-core
4. Solar system – part of Milky Way	1.3. Milky way	Outside the earth Hydrosphere – Atmosphere, Biosphere
5. Big-bang Hypothesis	2. Solar systems	2. The system Earth belongs to
6. Solar system – Sun+9 planets (earth)	3. Earth	Planets, comets
7. Earth – Atmosphere, Hydrosphere, Lithosphere	3.1. Atmosphere	The Sun-solar system
8. Rock cycle – three major groups of Rocks	3.2. Hydrosphere	3. The system, the Solar system belongs to
9. Earth – Crust, Mantle, Core	3.3. Lithosphere (Rocks)	Milky way
	3.4. Structure of Earth	Galaxy – types, etc.
		4. The system galaxies belong to Universe
		Size of Universe (Light Year)
		5. How was the Universe created
		5.1 Theory 1
		5.2 Theory 2

**Figure 5: Concept map on ‘Universe and Earth’**

These concept maps were chosen from about 20 concept maps created by the participants in a workshop (see IGNOU Handbook 5). The three selected are all based on some principles of teaching or learning. The second concept map is logically stronger than the first concept map, though the third concept map may score highest overall since it moves from something that is known (the earth), and then proceeds to a description of the system and a discussion on the unknown or abstract (the universe and its creation).

Here are further examples of unit structure and concept maps (for three units – geography, chemistry and physics) created by the participants of the 2007 T&T workshop. How do they compare with your unit structure and concept map? Can you think of ways to make your unit structure and concept map even more logical than the ones given in the examples?

<b>Structure on ‘Natural Hazards’ by Karima Mohammed</b>	
<b>UNIT 1: NATURAL HAZARDS</b>	
<b>CONTENTS</b>	
1.1	Introduction
1.2	Outcomes
1.3	Time
1.4	Study skills
1.5	The Caribbean
1.5.1	Definition of a natural hazard
1.5.2	Natural hazards in the Caribbean
1.6	The impact on life and property of:
1.6.1	Volcanic eruptions
1.6.2	Earthquakes
1.6.3	Hurricanes
1.6.4	Flooding
1.7	Response to natural hazards
1.7.1	Individual level
1.7.2	National level
1.7.3	Regional level
1.8	Summary
1.9	Assignment

### Structure on 'Polymers' by Patrick Medford

---

#### UNIT 1: POLYMERS

##### CONTENTS

- 4.1 Introduction
- 4.2 Outcomes
- 4.3 Definition of polymers
- 4.4 Reactions in the formation of polymers – addition and condensation
- 4.5 Polymers formed by addition and condensation reactions
- 4.6 Formulae of monomers
- 4.7 Uses of polymers
- 4.8 Linking of monomers in the structure of a polymer
- 4.9 Differences between a monomer and its polymer
- 4.10 Summary
- 4.11 Assignment

### Structure on 'Force' by Kishore Ramnarine

---

#### MODULE 2: MECHANICS

##### CONTENTS

- 1.1 Introduction
- 1.2 Outcomes
- 1.3 Time
- 1.4 Study skills
- 1.5 Types of forces
  - 1.5.1 Gravitation force
  - 1.5.2 Magnetic force
  - 1.5.3 Electrical force
- 1.6 Effects of forces
  - 1.6.1 Change in state of rest or motion
  - 1.6.2 Deformation
  - 1.6.3 Turning effect
- 1.7 Summary
- 1.8 Activities
- 1.9 Assignment

## Introduction

---

Each unit needs an introduction. The introduction acts as signpost or advance organiser for the students, and also provides a link with the preceding unit (or preceding modules if required). Therefore, in the introduction to the unit, you need to do three things – link up with the preceding unit(s), provide a brief explanation about the logical sequencing of the concepts and sub-concepts in the present unit, and explain what is expected from the students. Let's look at three sample introductions, which are based on the preceding examples of geography, chemistry and physics unit structures.

## Introduction from Unit 'Natural Hazards' (Geography)

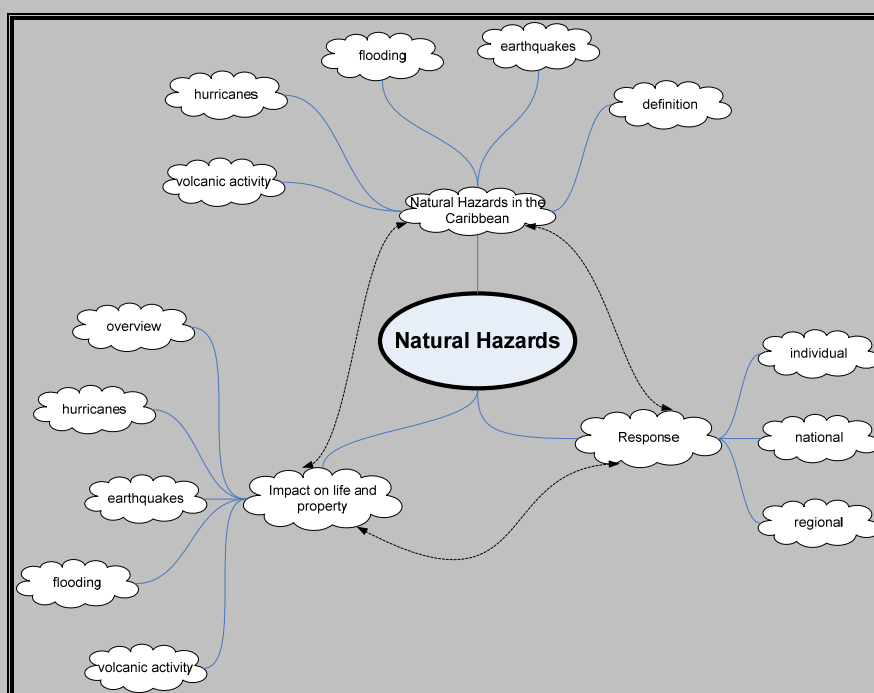
### 1.1 INTRODUCTION

The Caribbean is not different from any other part of the world in that it is prone to hazards. This unit looks at some of the natural hazards which affect the region. The unit is divided into four areas:

- Definition of a natural hazard
- Natural hazards in the Caribbean
- The Impact on life and property of these hazards
- Response to natural hazards

On completion of the unit, you will develop an understanding of the natural hazards faced in the region, and the way in which these hazards impact on the lives of the people and economies of the region. You may like to look at the concept map for the unit as given below, and see what concepts and sub-concepts are included in the unit and in what way there are related to each other and to the main theme of the unit.

Concept Map for Unit 1: Natural Hazards



## Introduction from Unit 'Polymers' (Chemistry)

### 1.1 INTRODUCTION

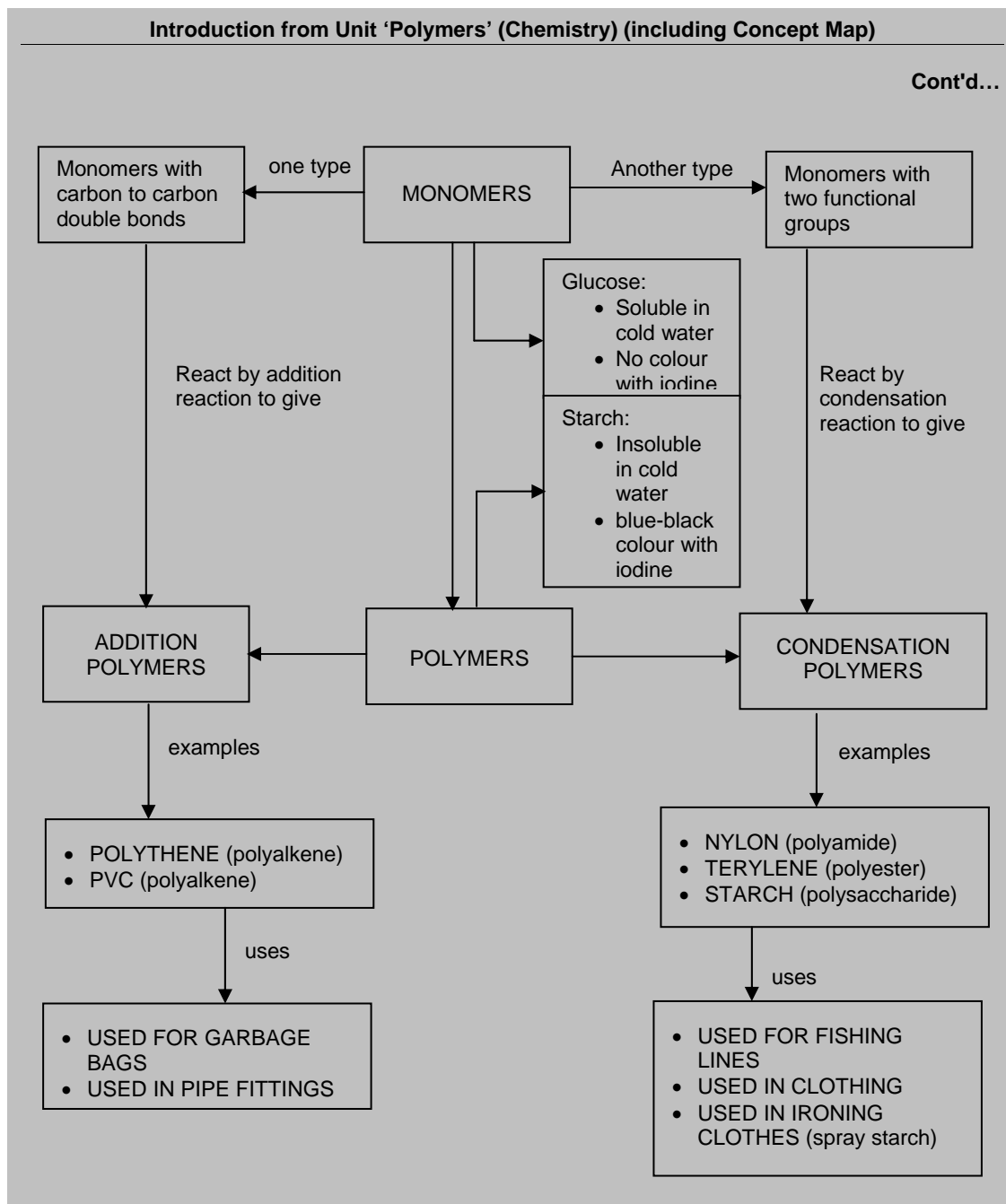
In this fourth unit of this module you will learn about polymers. Do you know what polymers are?

I am sure that you have already encountered them, probably without even knowing about them. Take, for example, the foods that we eat. They contain proteins and starch (polysaccharides). These are polymers. They occur naturally. You usually put your rubbish in a plastic garbage bag or bin. The plastic bag or bin is a polymer. You may also have seen plastic water lines, and you may have heard them called PVC lines, in your home. A plastic water line is also a polymer and you may have drunk a cold drink in a styro-cup or other plastic cup which again are some more examples of polymers. The plastics are not natural but human-made polymers which Chemists have made by the very reactions you will learn in this Unit.

You may want to look at Unit 3 in this Module. There you were introduced to the polymers, proteins and polysaccharides, as sources of carbon compounds.

Also in Unit 1 of this Module you learnt that carbon compounds can form single and double covalent bonds and you have identified carbon compounds by their functional groups in Unit 2 of this Module.

Furthermore you were also introduced to addition and condensation reactions in Unit 2 of this Module. You will be using all these concepts in this Unit. So what are we going to study in this Unit? Let us look at a concept map of the Unit and see in what way the main concepts that you are going to study are related.



You will notice that the course writers of the two preceding examples have included the unit concept map as part of the 'Introduction' to the unit. You need to take a decision for its placement in the unit, and this should be maintained throughout the course. Let's look at the third example of an introduction, which does not have a concept map, but explains the unit fully.

## Introduction from Unit 'Force' (Physics)

### 1.1 INTRODUCTION

'Force' is the first unit of the second module that you are studying. You have heard and read about forces often in your everyday life situations, but what do you think of any force?

A force is a push or a pull.

You may think of many types of forces, but these fall into four classes. They are:

- Gravitational forces
- Magnetic forces
- Electrical forces
- Nuclear forces

Gravitational forces are forces due to the pulling or attraction to the earth. Magnetic forces arise out of attraction and repulsion between poles of magnets. Electrical forces are there because of positive and negative charges in all substances. Nuclear forces bind small particles inside atoms.

A force can cause:

- a change in motion,
- deformation of a body, and
- a turning effect.

Force can cause change in motion, that is, it can cause a body at rest to move, a moving body to move faster or slower or change direction. A force can also cause deformation of a body; it can be compressed, changed in shape or stretched as in the case of springs or rubber bands. A force can also have a turning effect as in a see-saw.

Force is measured in Newtons. The Newton which is the unit for force is named after the great scientist Sir Isaac Newton. The symbol for Newton is N. Forces can be expressed as 12 N, 91.6 N, 68.3 N, and so on.

Forces are vector quantities. You will read more about vector quantity in Module 1: Unit 3. For your general understanding here, you should note that a vector quantity is one in which magnitude and direction are of equal importance; for instance, if two trucks are pulling with a force of 1000 N each, in the same direction, then there is a total force of 2000 N. Think of a situation where the same two trucks are pulling in opposite directions with the same force of 1000 N each. Here the forces will cancel each other and the total force acting will be zero N. 3 N and 5 N acting in the same direction gives a total of 8 N. 3 N and 5 N acting in opposite directions gives a total of 2 N in the direction of the larger force (i.e. in the direction of the 5 N). Two forces acting in the same direction gives a total which is the sum of the two and acts in that same direction. Two forces acting in opposite directions gives a combined effect which is the difference of the two and acts in the direction of the greater force. Think of two boys pushing each other in opposite directions; the resultant motion would be in the direction in which the stronger boy is pushing. The resultant force is always in the direction of the greater force. All these discussions are organised under two sections: types of forces and effects of forces.

## Outcomes/Learning Objectives

Learning objectives are the most important component of self-learning materials. In fact, the first step in the development of any material is to develop the learning objectives from the learners' point of view. The objectives indicate to the course team the quantity and quality of learning to be taught/achieved, the examples and activities to be given, and the way learners will be assessed. For most distance teachers, Bloom's Taxonomy for formulating learning objectives has proven to be very useful. The taxonomy suggests that the human mind can be divided into three domains: cognitive, affective, and psycho-motor. The widely used cognitive domain – starting

from the low level of ‘knowledge’ to the highest level of ‘evaluation’ is summarised in Table 2. Look at the table and examine the six levels; each level has corresponding explanations, examples, and action verbs to be used in formulating learning objectives.

**Table 2: Levels of learning in Bloom’s taxonomy**

Level	Explanation	Example	Action Verb
Level 6: Evaluation	Ability to judge the value of something in a holistic manner.	<ul style="list-style-type: none"> <li>Evaluate the efficacy and appropriateness of.</li> <li>Determine the value of something for some purpose.</li> </ul>	Judge, evaluate, defend, support, determine, recognise
Level 5: Synthesis	Ability to pull together the parts to a cohesive whole.	<ul style="list-style-type: none"> <li>Collate the issues into a comprehensive whole-based on some theoretical backup.</li> </ul>	Argue, summarise, organize, derive, conclude, generalise, collate
Level 4: Analysis	Ability to analyse different components and establish relationships.	<ul style="list-style-type: none"> <li>Differentiate among various categories.</li> <li>Compare two/three sets of premises with arguments.</li> </ul>	Differentiate, separate, compare, justify, criticise.
Level 3: Application	Ability to apply in context or in new situations.	<ul style="list-style-type: none"> <li>Compute the value by using the formula.</li> <li>Select and classify on the basis of certain parameters.</li> </ul>	Compute, construct, predict, demonstrate, use, choose, select.
Level 2: Comprehension	Ability to explain.	<ul style="list-style-type: none"> <li>Explain the reasons why.</li> <li>Illustrate the concept further.</li> <li>Classify the sequence into various parts.</li> </ul>	Explain, illustrate, identify, formulate, contrast, classify.
Level 1: Knowledge	Ability for rote learning, and to recall/reproduce facts.	<ul style="list-style-type: none"> <li>Reproduce paragraphs, definitions, points.</li> <li>State parts of a definition; list the characteristics.</li> </ul>	Define, state, list, recall, reproduce.

Learning objectives are the most crucial aspect of the course unit. While these objectives need to be expressed from the learner’s point of view (rather than what we have been thinking about the traditional view of a teacher’s instructional objectives), they also need to match with and conform to the unit concept map/unit content structure, the unit introduction, as well as the goals of the learning activities and their outcomes given at various intervals inside the text. These also need to be related to the unit/module assignments as well as the overall assessment mechanism and goals for the course. Below are three examples of unit objectives/outcomes. based on the geography, chemistry and physics concept maps used earlier. How well do the three –

content structure/concept map, introduction, and learning objectives/outcomes – match each other?

### Learning Objectives (Unit on 'Natural Hazards')

#### Objectives

After completing this unit, you should be able to:

- Define a natural hazard.
- Outline the different categories of disasters.
- Describe the impact of volcanic eruptions on life and property.
- Describe the impact of earthquakes on life and property.
- Describe the impact of hurricanes on life and property.
- Outline the individual responses to natural hazards in the Caribbean.

### Learning Objectives (Unit on 'Polymers')

#### Outcomes (learning objectives)

After completing this unit, you should be able to:

- Define polymers.
- Distinguish between addition and condensation as reactions in the formation of polymers.
- Name examples of polymers formed by (i) addition reaction, and (ii) condensation reaction.
- Draw diagrams to represent the formulae of monomers.
- State at least one use of each of the following types of polymers: (i) polyalkene, (ii) polyamide, (iii) polyester, and (iv) polysaccharide.
- Show how the monomers are linked in the structure of the polymer.
- Demonstrate the differences in properties between a monomer and the polymer it forms.

### Learning Objectives (Unit on 'Force')

#### Outcomes

After completing this unit, you should be able to:

- Recall that a force can cause a change in the size, shape or motion of a body.
- Identify forces in real life situations.
- Determine the type and effects of forces in real life situations.
- Determine the weight of objects using the relationship (weight = mass  $\times$  gravitational field strength)  $W = mg$  ( $g = 10 \text{ N Kg}^{-1}$ ).
- Investigate the relationship between extension and force for springs and elastic bands.
- Solve problems involving the proportional relationship between force and the extension it causes.
- State Newton's first law of motion.
- Identify situations in which a turning effect of a body will result from the application of a force.

You will notice the objectives are written from the learner's point of view, that is, what he/she will be able to do after going through the Unit. You may use the objectives and corresponding action verbs for all three domains – cognitive, psychomotor, and affective – in formulating your objectives.

## Time

---

It is important that you formulate an understanding of the average time that all your learners will take to go through and comprehend the unit, including working on various self-assessment questions and/or activities that you have set (or will have to set) for your unit. The student workload for one unit cannot be seen in isolation; you need to take into account the entire course workload and its distribution across the modules and units. As the workload or credit value of each module varies, the workload across units will also vary – some involve more hours of study and some less. The total time estimated for a unit includes the time needed for reading and comprehending the unit and the time required for working on the various activities.

## Study Skills

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You need to determine and mention all prior skills that the learner needs to have in order to comprehend the course unit. This may include prior understanding of some concepts, prior reading of certain course units or texts, prior knowledge of or completion of certain exercises and experiments, certain types of study and reading skills needed to access the text, as well as all the materials (notebook, workbook, course unit, instruments, etc.) the student will need to assemble before starting the course unit work.



### Handbook Activity 2

Based on what you have studied so far and based on the examples of unit concept map, content structure, introduction, and outcomes/learning objectives, select one of your course units and develop all the information the student will need about the time it will take to complete each unit and the study skills required. Give yourself *two hours* to do this activity.

## Headings and Sub-Headings

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The most crucial aspect of the unit is the presentation of the main text – concepts and sub-concepts – through headings and sub-headings. The unit template presented earlier showed that each heading needs to be numbered separately and in sequential order, and that there may not always be sub-headings below a heading. A heading is a main concept in the unit. The heading or the concept needs to be expanded or explained with facts, figures, tables and charts, examples and illustrations, and activities to engage the learner in the content.

Keep in mind that:

- The content should be presented in small sentences and simple sentences.
- Sentences and paragraphs should flow like a storyline and all be logically related.

- Paragraphs should be written in simple language using short sentences rather than complex ones. The language should maintain a conversational and personalised style. Use ‘you’ and ‘we’ to address the student directly; this way the student feels as if the teacher is there with him/her to guide and explain..
- Sentences should be grammatically correct.
- Linkages should be established among the concepts throughout the unit, and with other units and modules in the course.
- Both text and presentation should involve ‘in-text questions’ to keep discussion going, engage the learner, and to emphasise connections between concepts. For example, phrases like ‘By now you may have realised ...’; ‘What do you think of this at this stage ...’; ‘Can you think of any alternative to ...’; and ‘Consider the explanation provided below, and see if you agree with it ...’; are all ways to prompt the student to reflect on the concepts they have been studying.
- There should be plenty of appropriate examples and explanations to support the concept being discussed; a student may not understand fully if only one example is given. Content should be presented from multiple perspectives with alternative or parallel examples.
- Text should be supported by or replaced by tables, diagrams, figures and illustrations. The content should include a variety of activities designed to engage the learner. (You’ll learn more about activities in the next section.)

Language (and its difficulty level) is very important to reading and self- learning. It is important to keep sentences simple and short. Long, complex sentences increase the difficulty level and make it harder for learners to comprehend the text. Look at the two examples given below; the first uses complex sentences, and the second one has been rewritten in simple language. Which style do you prefer? Are there changes you could add to make it simpler and more engaging?

**Example 1:** “When the entire country was devastated by furious floods and murderous famine, when the people of the land, finding no alternative to keep their bodies and souls together started slaughtering the emaciated cattle and hunting for grass, nuts and roots, when the foreign enemy was amassing his soldiers and arms with a view to inflicting a defeat such as one that would never allow either the ruled or the ruler to recover from the bleeding, mortal wound and the internal foes were at each other’s throats to grab the spoils from whatever was left undestroyed by the fury of the natural elements, the frolicking, slothful, irresponsible, cowardly old monarch was employing all the faculties of his lazy brain in inventing ways of keeping himself blissful in the company of young dancing girls of ravishing beauty and the brimming cups of wine kept in vintage for decades and centuries, and the deceitful, selfish, lecherous, treacherous, cruel and gambling friends.”

**Example 2:** “The whole country was ruined by floods and famine. People were killing the cattle and collecting grass, nuts and roots to survive on. The foreign enemy was preparing to attack the country and bring it under his rule. The internal enemies were trying to plunder the wealth of the country. The old king was keeping company with wine, women and gamblers!”

## Activities

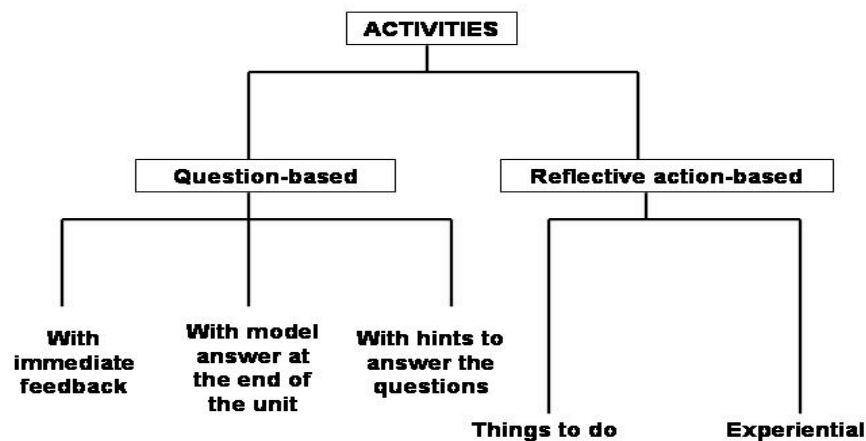
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So far you may have noticed the use of terms like ‘self-assessment questions’, ‘self-check questions’, ‘check your progress’, ‘exercises’, ‘activities’, etc. to allow the learner to pause and assess his/her own progress in learning. These are all called ‘Activities’ in this in-house style template. Students need to do something while they study in order to be *actively engaged in their learning*.

Activities, given inside the text, can facilitate or engage the learners in many ways:

- Engage them in self-reflection and thinking for themselves.
- Help them draw their own inferences based on the content of the text.
- Locate special/important features in an argument.
- Engage in carrying out or repeating an exercise and see the consequences of doing things differently.
- Help them develop arguments or explanations and solutions to existing problems.
- Relate their ideas to the context of the text and to real life situations.

Activities can take the form of any one or a combination of the following types given in Figure 6.



**Figure 6: Variety of activities**  
(Source: Mishra and Gaba, 2001)

Any activity that you design should contain the following:

- Activities should be based on the self-learning unit being studied; they should be based on the context of what one is reading.
- We need to explain the rationale of the activity – what topic does it relate to; what is expected of the learner; what materials can be used to do the activity; what benefit is derived from doing it; etc. There should be proper and comprehensive instructions to do the activities.
- Every activity must include the average time to be taken to complete it – this allows learners to plan their time and make sure that they are progressing.
- Sometimes it’s necessary to provide some kind of feedback for the learner. This can be in model answers at the end of the unit, explanatory text immediately after the activity, and so on.

Let's look at some examples of student activities designed within a variety of self-learning materials.

#### Activity on Instructional Design (Panda, 2007)

### ? ? ? Activity 6

Look at Figure 9 (on page 22 of the text). After reviewing the content, consider how you might rewrite the beginning part to improve it further, or develop the introductory part of the unit which you selected earlier. You may take one hour to do this task.

#### Activities on Module 'Map Reading and Other Skills' (Geography) (by Michael Clarke, T&T Workshop)

##### Activity 11

What aspects of a map of Central Trinidad drawn in 1975 would be unreliable at this time?

##### Activity 14

Take about 5 minutes to examine the world maps in your atlas. List them under two headings: Human and Natural. Compare your list with the one at the end of the Unit.

##### Activity 17

(a) Study the keys for the Physical maps of Trinidad and Tobago, Guyana, Dominica and Jamaica and complete the sentences below.

1. The colour used for the lowest layer of land is \_\_\_\_\_.
2. The sequence of colours is \_\_\_\_\_ on all the maps.
3. The values shown by the colours are the same/different.
4. The colour used for water is \_\_\_\_\_.

(b) Study the keys for the Density of Population maps of Trinidad and Tobago and North America and complete the sentences below.

1. The colour used for the areas with the highest population densities is \_\_\_\_\_.
2. The colour used for the lowest population density is \_\_\_\_\_.
3. The values shown for each colour are different/the same.

(c) Examine the annual rainfall maps of Trinidad and Tobago and Dominica.

1. The colour used to show rainfall is \_\_\_\_\_.
2. The darker the shade, the \_\_\_\_\_ the rainfall.

(d) Formulate a rule on the use of colours based on your observations in the 3 tasks above.

When colours are used to show different values, the \_\_\_\_\_ shade shows highest values.

On Physical maps, \_\_\_\_\_ shows water bodies and \_\_\_\_\_ lowland.

### Activities on Mathematics (IGNOU Handbook 5)

Polynomials consisting of one, two and three terms are known as monomial, binomial and trinomial, respectively.

E 5) Identify the polynomials from amongst the following and label them as monomial, binomial or trinomial.

- i)  $x + 3a^2$
- ii)  $3ab^2c^3d^4e^5 + 10^{30}$ ; where a, b, c, d, e are all variables.
- iii)  $(1/2)p + (1/3)q + (1/4)r$ ; where p, q, r are variables.
- iv)  $\frac{x + 9^{64}}{y - 9^{64}}$
- v)  $x/y$
- vi) 1.

A term of a polynomial may be composed of several factors. For example,  $2xy$  has 3 factors 2, x and y. Each factor is known as the **co-efficient** of the rest of the term. Thus, in  $2xy$ , 2 is the co-efficient of  $xy$  and x is the co-efficient of  $2y$ . The numerical factor is called the **numerical co-efficient**. For example, 3 is the numerical co-efficient in  $3a$  or  $3xy$ . The co-efficient of x in the term x is 1 (since  $x=1x$ ) and that in  $-x$  is  $-1$ .

E 6) Find the co-efficient of x, y and z in each of the following terms:

- i)  $xyz$
- ii)  $3x^2yz$
- iii)  $-yzx^5$

What are their numerical co-efficients?

#### Activity

1) Match the items given in column 1 with those in column 2.

COLUMN 1	COLUMN 2
a) Head-to-toe development	i) The child initially uses the whole arm to reach for an object. Gradually she learns to use the muscles of the wrist and fingers to pick up an object.
b) Centre-to-end development	ii) First the child learns to control the movements of the neck and later develops the coordination of lower limbs, which enables her to learn to crawl and walk.
c) Differentiation	iii) The understanding of numbers leads to learning of more complex concepts like addition and subtraction.
d) Integration	iv) The child learns to recognize the mother's voice from other people's voices.

(Source: Block 1: Introduction to the Child Care and Development, Unit 3: Principle of Development, IGNOU, p.38)

### Activity: Family Welfare Centre

You have already learned in Block 2 of this course (PGDMCH-1) about the providing of MCH services in urban areas through urban family welfare centres, MCH centres and four types of health posts. You must visit one urban F.W. Centres or MCH centre of type 'D' health post functioning in a city/town.

During the visit to the particular centre you must study:

- Staffing pattern
- Services being provided
- Infrastructure services available to provide these services
- Records/reports
- Population coverage
- Problems being faced in providing the desired services

The information on above points can be collected by you through:

- Observation of various activities being carried out there
- Study of records
- Discussions with health staff at the centre.

You must record the findings along with his observations and get it signed by the academic counsellor.

(Source: PGDMCH1: Preventive MCH, Block 5: Practical Manual, Unit 4: Field Visits, IGNOU, p. 46)



### Handbook Activity 3

Based on the above discussion and examples, design at least two types of activities for your course unit(s) mentioning context, rationale, time needed, and feedback mechanism. You may take *one hour* to do this activity.

## Case Study

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At some points in the text, you may need to use a brief case study to exemplify a process, an issue, a situation, an event, or a product. The case study may be put in a box with proper linkage to the preceding text (and sometimes the preceding units) and also continuity with further explanations in the succeeding texts. The case study should relate to the ideas under discussion, and should probe the concept deeper so as to further enlighten the learner. Case studies may be followed by reflective questions for the learners to reflect on and record responses.

## Discussion

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Distance learners do not find many occasions to be face-to-face with their tutors and peers. Therefore, you may like to locate some questions in some of the units which may be taken up for group discussion by the learners and their tutor at the learning/study centres. Such questions or issues may need further clarification, debate, reflection, and negotiation of meaning in group contexts. An example of a group discussion activity is given below.

### **Group Discussion on a Unit on 'Human-Environment Interactions' by Karima Mohammed**

Hazards can turn into disasters, but only under certain conditions. Reflect on those conditions, and deliberate if such conditions can be prevented in the national context of Trinidad and Tobago. Discuss this in your study centre with the tutor and fellow learners, and prepare a brief report of about 250 words and pass on to your tutor for comments.

## **Note It**

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You may wish to provide some space within a unit for students to jot down important points, or ask the students to make their notes in a separate workbook. Alternatively, you can list the important points from the unit under the heading 'Note It' to make it easy for students to refer back to when they want to review what they learned.

## **Group Activity**

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Unlike discussions, (which the student can discuss individually or with their tutor), some issues can be identified within the unit for all the students to discuss and undertake as a group activity to be done and reported either at the study centre or at any place they decide to meet. Given below is an example of a group activity from the unit 'Human-Environment Interactions'.

### **Group Activity**

When you meet at your NOSTT centre, get together with some friends and complete the following:

- Make a list of all the things you should keep in your home in preparation for a natural disaster.
- Identify a plan of action which you would implement to deal with each of the three major hazards which impact on the Caribbean countries.
- Remember to include neighbours, disabled persons, and animals/pets in your plan of action.

## **Reflection**

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It is also important for us as teachers to engage our learners at different intervals in a course of study to take a pause and critically reflect on what they have learnt. This may mean 'reflection-in-action', that is, reflecting while studying, or 'reflection-on-action' (or reflecting on what they have studied so far). This instrumentality is essential if we would like to take our students towards deep learning. Besides designing reflective activities within the text, consider also providing 'questions for critical reflection' at the end of each unit, or at the end of each module. You will notice that the 'activities', 'questions for critical reflection', 'assignments' and 'summative assessment' are inextricably related to each other to jointly achieve the stipulated course objectives. Review the example below; are there ways for you to design 'questions for critical reflection' in your course units?



## Questions for critical reflection

1. Consider your experiences at a recent training programme you attended. Determine if the instructional method used was appropriate or if you could have learned more had the instructor used a different method or a combination of methods.
2. Reflect on a training session you conducted. How did you prepare for conducting the session? Review your lesson plan, and analyse what changes you would like to make if you were to do it again
3. Examine the learning outcomes described in this unit, and consider how you would design a training programme on instructional design. (Source: S. Mishra, 2007)

## Summary

The summary is a precise but comprehensive abstract of what has gone into the unit – it recaps and logically relinks the main concepts and sub-concepts (themes and sub-themes), and also tells what is emerging from the unit and in what way this is related to succeeding unit(s). The summary also takes into consideration the outcomes or learning objectives set at the beginning of the unit. The summary can be presented in any form: in paragraphs, in a table, in bullet points, or as a tree diagram. Below are some examples of summaries.

### Summary

In this unit we discussed instructional design as a process. We defined instructional design as a systematic process of designing instructional solutions by identifying the learning needs and causes of learning problems, specifying learner objectives, and identifying methods, media and strategies to deliver instruction. In the process we also considered the importance of formative and summative evaluation to receive continuous feedback about the process of instruction and assess its overall quality. We also discussed about ten different models of instructional design and then grouped them into three major categories: classroom-based, product-based and systems-based. The last category is often used in an organizational context, while the product-based models are more suitable to design instructional materials in print, audio, video and multimedia. We concluded by identifying the 14 common tasks in instructional design and listed the first principles of instruction given by David Merrill. The first principles of instruction will guide instructional designers in whatever model they use. We also briefly discussed the constructivist approach to instructional design. By combining the constructivist approach, first principles and an appropriate instructional design model, instructional designers can design effective instructions for most situations, though we also understand that none of the models fit all situations. Thus, it is the situation and the problem at hand that will guide you as instructional designers to use appropriate design models. (Source: Unit on 'Instructional Design Processes', S. Mishra, 2007)

Since self-learning packages or self-learning units usually contain all the content students need, you may not need to suggest any additional readings. However, sometimes you may want to make students aware of other exercise notes, educational games, textbooks, or practice books so that they can get additional benefit from working with alternative materials. You may also wish to include a 'glossary' of important terms used in the unit/module (either at the end of the unit or the end of the

module). Keep in mind that you should only suggest additional materials when further reading is essential. The materials must be low cost and easily available to the students.

## Assignments

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Assignments are an integral part of any instructional system, and are of utmost importance for distance learning, too. They form part of continuous assessment in distance education and you will need to decide the number of assignments to be included in a course. The workload involved in completing the assignments should be counted in terms of student study hours and be included in the credit hour calculation for your course.

The purpose of assignments is twofold: i) to provide opportunities for the learners to interact with their tutors and receive feedback (essentially they are learning tools); and ii) to evaluate students with a grade or score and let them see where they stand in the group, and also assess their progress in the course. Tutors are required to write constructive and teaching comments on students' assignments and send them back for feedback, further motivation, and self-learning.

Assignment questions can be *essay type* (for example, open questions, practical questions, theoretical/conceptual questions, project-based, and so on) with a specified length or word limit (perhaps 1200 or 1500 words); *short-answer type* (where a student is required to write a short answer of 300 words); and *objective type* (for example, true/false, fill-in the blanks, yes/no, multiple choice, matching, etc). Assignments can be *tutor-marked* (for all of the above types, the tutor reviews the student's work and teaches through tutor comments and awards a grade or score), or *computer-marked* (the student needs to write responses on OMR sheets, and the OMR Reader reads, evaluates and scores the assignment). However, in all cases, assignments are treated as home work and returned to the students with tutor comments and grades.