## Available training programmes by I. R. of Iran Meteorological Organization (1995-2004)

### Major activities of RMTC in 1995

The Courses of Satellite and CLICOM were held with the participation of 25 students. In co-operation with the Tarbiat Modares university, a Course in M.Sc. in meteorology was held with 12 students. The Class III in meteorology course was held with 120 students; and Class I course in meteorology majoring in Agriculture and Synoptic Meteorology was held with 35 students.

### Major activities of RMTC in 1996

A CLICOM course in Farsi and English was held with 30 students. M.Sc. Course in Agricultural Meteorology in co-operation with University of Tehran was held with 5 students. B.Sc. Course in Applied Physics was also held in co-operation with Azad university with 50 students. Class I course in Meteorology was held with 20 students while Class III with 50 students.

### Major activities of RMTC in 1997

A course in Agricultural Meteorology was held with 10 students, while a Training of Internet was held with 10 students. International courses in English language in Satellite Meteorology, CLICOM and Agricultural Meteorology were held with 50 students form 23 countries.

A Class I course in Meteorology majoring in Agriculture was held with 35 students. Class III course in Meteorology was held both in Tehran and Mashhad with 50 students while Class II was held with 58 students.

### Major activities of RMTC in 1998

- A short advanced course in Synoptic and Dynamic Meteorology was held with 10 students. Class I course in Meteorology majoring in Synoptic was held with 25 students while those majoring in Climatology with 20 persons

### Major activities of RMTC in 1999

- A course in Class I Meteorology with majors in Synoptic and Climatology were held with 22 and 20 students respectively. Two courses in Class II Meteorology

were held with 28 and 20 students, while courses in Class III Meteorology with 27 and 23 students.

• A Short course on Weather Modification and Cloud Seeding also held in December in the year 1999.

## Major activities of RMTC in 2000

- RMTC, held the following courses in the year 2000.
  - Courses in Class I Meteorology majoring in synoptic, Climatology, Agricultural and Technical Equipment.
  - Four courses in Class I and Class III Meteorology.

And 6 Short Courses on

- Weather Modification and Cloud Seeding
- Marine Meteorology
- Agricultural Meteorology
- CLICOM
- Numerical Weather Prediction
- Satellite Meteorology

## Major activities of RMTC in 2001

- RMTC, held the following courses in the year 2001
  - Courses in Class I Meteorology majoring in synoptic, Climatology, Agricultural and Technical Equipment.
  - Four courses in Class I and Class III Meteorology

And 5 Short Courses on

- Aeronautical Meteorology
- Marine Meteorology
- Numerical Weather Prediction
- Statistics and Climatology

- Road Meteorology

## Major activities of RMTC in 2002

- RMTC, held the following courses in the year 2002
  - Four courses of Meteorological Technicians and 10 Short Courses on
  - Agrometeorology
  - Aeronautical Meteorology
  - Numerical Weather Prediction: Objective Analysis and Initialization
  - Cloud Physics: Precipitation Processes
  - Synoptic and Dynamic Meteorology in Mid-Latitudes
  - Numerical Weather Prediction: Physical Parameterization Schemes
  - Marine Meteorology
  - Satellite Meteorology and Nowcasting
  - Regional Climate Change: Modeling Aspects
  - Post Processing of NWP Products: Model Output Statistics

## Major activities of RMTC in 2003

- RMTC, held the following courses in the year 2003
- Meteorological Technicians (4 Classes)
- Meteorologist

And Short Courses on

- Agrometeorology
- Aeronautical Meteorology
- Numerical Weather Prediction: Objective Analysis and Initialization
- An Introduction to Linux & Grads
- Using MM5 Modeling System for Short Term Weather Forecasts
- Marine Meteorology and Physical Oceanography
- Numerical Weather Prediction: Numerical Methods

- Using Satellite Date for Weather Forecasting
- Cloud Physics
- Statistics and Climatology
- Post Processing of NWP Products: Model Output Statistics.

Organized Scientific Workshops by Climatological Research Institute (CRI) –Continued

Year: 2003-2004

| No. | Title of workshop | Name of cooperating organization | Date |
|---|---|---|---|
| 1 | Assessment of researching institution laws | Amir-kabir Institute | Apr. 2003 |
| 2 | Applied researches in Agro-Meteorology | Amir-kabir Institute | May. 2003 |
| 3 | Clustering in I.R. of Iran Meteorological Organization | I. R. of Iran Meteorological Organization (IRIMO) | May. 2003 |
| 4 | Time series | Amir-kabir Institute | May. 2003 |
| 5 | Capacity buiding of Management | I. R. of Iran Meteorological Organization (IRIMO) | June. 2003 |
| 6 | Cloud physics (RMTC) | Atmospheric Science and Meteorological Research Center (ASMERC) | June. 2003 |
| 7 | Application of computer in meteorology | ——— | Dec. 2003 |
| 8 | Information technology | ——— | Jan. 2004 |
| 9 | ERDAS software | Tabriz-University | Feb. 2004 |
| 10 | Application of radar in Meteorology | I. R. of Iran Meteorological Organization (IRIMO) | Jan. 2004 |

Organized Scientific Workshops by Climatological Research Institute (CRI)

Year: 2002-2003

| No. | Title of workshop | Name of cooperating organization | Dates |
|---|---|---|---|
| 1 | Application of statistical software in meteorology | Atmospheric science and Meteorological research center | May. 2002 |
| 2 | Synoptic studies of climate change | Tarbiat Moalem-University | May. 2002 |
| 3 | Approaches in order to combat with climate change | Institute of air & space | May. 2002 |
| 4 | Time series and deriving first and second component | I.R. of Iran Meteorological Organization (IRIMO) | June. 2002 |
| 5 | Applied climatology | Tabriz University | June. 2002 |
| 6 | Agrometeorology | Tarbiat Moalem-University | Aug. 2002 |
| 7 | Analysis of satellite images & GIS | IRIMO | Aug. 2002 |
| 8 | Numerical weather prediction | IRIMO | Oct. 2002 |
| 9 | Natural disaster risk management | IRIMO | Dec. 2002 |
| 10 | Air pollution and atmospheric chemistry | IRIMO | Jan. 2003 |
| 11 | Applied climatology and natural disaster risk management | IRIMO | Jan. 2003 |

# Introducing a Standard for Multimedia Courseware Production in I.R of Iran

## Introduction

Clearly, the advancement/affordability of computer and communication technologies during the past decade have had major effects on our everyday life. Computers and their applications have enhanced the quality of many courses, and as the technology advances, we are witnessing their impact in classroom lectures. Although there are still some questions, regarding the integration of new technologies into classroom instruction those who have used such an approach in their classroom teaching have experienced more classroom discussions, and more interest in subject matter. The overall responses from the students have also been very positive and encouraging.

Next, we will present a very brief discussion about learning styles and in particular active learning. For a more in-depth discussion about different learning styles and active learning, readers are referred to the references. We then present a definition for courseware approach and discuss some of the requirements that a courseware product should meet if it is to be used in an active learning environment.

## Learning Styles

Educators have come to realize that learners come in different styles. Some students learn best by seeing someone else do it. Usually, they like carefully sequence presentations of information. They prefer to write down what a teacher tells them. During class, they are generally quiet and seldom distracted by noise. These visual learners contrast with auditory learners, who often do not bother to look at what a teacher does or to take notes. They rely on their ability to hear and remember. During class, they may be talkative and are easily distracted by noise. Kinesthetic learners learn mainly by direct involvement in activity. They tend to be impulsive with little patience. During class, they may be fidgety unless they can move about and do. Of course, few students are exclusively one kind of learner. notes that in every group of 30 students, an average of 22 are able to learn effectively as long as a teacher provides a blend of visual, auditory, and kinesthetic activity. The remaining 8 students, however, prefer one of the modalities over the other two so strongly that they struggle to understand the subject matter unless special care is taken to present it in their preferred mode. This also suggests, as many other similar studies have concluded, that lecture-based instruction is not the best approach in teaching college courses. On the other hand, adding visuals to a

lesson increases retention from 14 to 38 percent. Moreover, the time required to present a concept is reduced up to 40 percent when visual aids are used to augment a verbal presentation. When teaching has both an auditory and a visual dimension, the message is reinforced by two systems of delivery. However, merely hearing something and seeing it is not enough to learn it.

## Active Learning

Active learning derives from two basic assumptions: that learning is by nature an active endeavor and that different people learn in different ways. Within this context, strategies promoting *active learning can be defined as instructional activities involving students in doing things and thinking about what they are doing and receiving useful feedback.* Two teaching corollaries seem to follow from these assumptions: first that students learn best when applying subject matter, learning by doing, and second, that teachers who rely exclusively on any one teaching approach often fail to get through to significant numbers of students. By including active learning strategies in our teaching, we increase the odds that students will leave the classroom with more than a notebook full of "facts." In classes that include active-learning strategies, teaching and learning are more collaborative. The teacher ceases to be the center of the attention, and traditionally passive students can assume a larger role in learning and applying most subject matter. Students may need a little prodding and encouragement to get started with active learning. To be actively involved, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation.

## Using Computers in Teaching

Researchers at the University of Michigan have constructed meta analyses of the effectiveness of computer education in schools from the elementary to collegiate levels. Their studies found that computer based instruction (CBI) had several positive features. First, students in CBI classes generally learned more. Based on 199 studies, students' average achievement rose from the 50th to 61st percentile. Second, compared to courses taught traditionally, students learned their lessons in two-thirds of the time. Third, students liked their classes more when they received help on the computer. And last, students in CBI developed more positive attitudes toward computers, an attribute that is important as society incorporates more technology into all aspects of work and home life. CBI can also affect students with different learning styles.

## Courseware Approach

Courseware approach means that the lectures will be produced by the help of multimedia software. Lectures will be put together by faculty and the results will be portable in a way that they can be accessed by the students at the computer laboratories and used at the state-of-the-

passages and explanations associated with the topic,

a place for students to enter their notes or questions at the bottom of each page,

scanned pictures or diagrams that are related to the topic,

a short video scene or slide show, simulation results of the theoretical concepts or examples that are being discussed (if applicable),

bibliography of new concepts,

gateways to other software packages that can enhance students' learning of the subject matter (if applicable),

interactive examples which students can perform calculations and/or simulations. These examples should include hints and they should not display the whole solution at once, and

quiz section at the end of each unit, consisting of concept oriented questions as well as work out problems. An appropriate feedback mechanism should be included in this section.

art classrooms.

## Active Learning and Courseware Approach

A wide variety of techniques promoting active learning are available, that have proven to be effective in promoting students' achievement, in enhancing students' motivation, and in changing students' attitudes. Among those are: Visual-Based Instruction, Writing in Class Problem Solving, Guided Design, Computer-Based Instruction, Simulations, and Peer Teaching. Clearly, most of these proven techniques are, or can be, a part of the courseware approach. Therefore, a courseware product including some or all of aforementioned techniques fits very nicely in an active learning environment, and based on the above references it should produce very good results. In the following sections, we discuss our approach for implementing some of these techniques.

## Our Approach

We believe that the classroom lectures should be conducted in a way that most students be active participants in the discussions. We believe that computer based instruction is a very useful approach that can enhance students' learning and the new technologies cannot replace the lectures, but they can enhance them. Like good lectures, they should have structure and the multimedia portion of these products should be used to enhance the subject material and not to overshadow it. Therefore, based on previous discussion we propose the following general requirements for multimedia courseware products for use as a lecture source in an active learning environment: