IT4404: Fundamentals of Multimedia
(Optional)

INTRODUCTION

This is one of the three optional courses designed for Semester 4 of the Bachelor of Information Technology Degree program. This course provides the most essential skills in handling multimedia tools and designing multimedia content in a development environment.

CREDITS: 04

LEARNING OUTCOMES

After successful completion of this course students will be able to

- Describe the key concepts in current multimedia technology

- Develop dynamic and interactive multimedia software titles

MINOR MODIFICATIONS

When minor modifications are made to this syllabus, those will be reflected in the Virtual Learning Environment (VLE) and the latest version can be downloaded from the relevant course page of VLE. Please inform your suggestions and comments through the VLE. http://vle.bit.lk

ONLINE LEARNING MATERIALS AND ACTIVITIES

You can access all learning materials and this syllabus in the VLE: http://vle.bit.lk, if you are a registered student of BIT degree program. It is very important to participate in learning activities given in the VLE to learn this subject.

ONLINE ASSIGNMENTS

The assignments consist of two quizzes, assignment quiz 1 (It covers the first half of the syllabus) and assignment quiz 2 (It covers the second half of the syllabus). Maximum mark for a question is 10, minimum mark for a question is 0 (irrespective of negative scores). Final assignment mark is calculated considering 40% of assignment quiz 1 and 60% of assignment quiz 2. Pass mark for the online assignments in a course is 50. You are advised to do online assignments before the final exam of the course. It is compulsory to pass all online assignments to partially qualify to obtain year 2 certificate.

FINAL EXAMINATION

Final exam of the course will be held at the end of the semester. Each course in the semester 4 is evaluated using a two hour question paper.

OUTLINE OF SYLLABUS

Topic	Hours
1-Introduction to multimedia	04
2-Developing text based objects / artifacts **	06
3- Working with images **	11
4-Enhancing your production with audio **	07
5-Creating video and animation **	11
6-Multimedia authoring concepts and practice **	14
7-Selected topics in multimedia	07
Total for the subject	**60 ****

*** In addition to the 60 hours allocated for this subject students need more time to do relevant practical work with special focus on the software such as Flash, Photoshop, Premiere and Director for the Topic Nos. 2, 3, 4, 5 and 6.*

REQUIRED MATERIALS

Main Reading

Ref 1: Tay Vaughan, "Multimedia: Making it work" 7th edition, Tata McGraw-Hill, 2008

Ref 2: Ze-Nian Li and Mark S. Drew, "Fundamentals of Multimedia" (Low Price Edition), Pearson Education, 2004

DETAILED SYLLABUS:

Topic 1: Introduction to multimedia (04 hrs)

Instructional Objectives

- Briefly define what multimedia is
- List the uses of Multimedia
- Describe some of the skills required for Multimedia projects

Material /Sub Topics

1.1. What is multimedia?   [Ref. 1: pg 1-4]

1.2. Uses of multimedia [Ref. 1: pg 5-12]

1.3. Multimedia skills [Ref. 1: pg 28-43]

    1.3.1. Multimedia team

    1.3.2. Project manager

    1.3.3. Multimedia designer

    1.3.4. Interface designer

    1.3.5. Writer

    1.3.6. Video specialist

    1.3.7. Audio specialist

    1.3.8. Multimedia programmer

    1.3.9. Web site producer

Topic 2: Developing text based objects / artifacts (06 hrs)

Instructional Objectives

- List typefaces and describe their usage
- Explain the usage of text in multimedia
- Explain the different methods of managing text in the computer
- Create animated text

Material /Sub Topics

2.1. Typography [Ref 1: pg 48-54 and Teacher's Note]

    2.1.1. Typefaces

    2.1.2. Serif and Sans Serif

    2.1.3. Type styles

    2.1.4. Kerning

    2.1.5. Line spacing and orientation

    2.1.6. Anti-alias, special effects

    2.1.7. Bitmap fonts

    2.1.8. Vector fonts

2.2. Using text in multimedia [Ref 1: pg 55-68]

    2.2.1. Designing with text

    2.2.2. Choosing text fonts

    2.2.3. Menus for navigation

    2.2.4. Buttons for interaction

    2.2.5. Symbols and icons

    2.2.6. Animating text using relevant recommended software

        2.2.6.1. Animating text using Flash

        2.2.6.2. Animating text using Director

        2.2.6.3. Animating text using Premiere

2.3. Computers and text [Ref 1: pg 68-90]

    2.3.1. Hypertext

    2.3.2. Anti-aliasing and small fonts.

    2.3.3. Managing your fonts

    2.3.4. ASCII, The extended character sets and Unicode

    2.3.5. Mapping text across platforms

    2.3.6. Font editing and designing tools.

Topic 3: Working with images (11 hrs)

Instructional Objectives

- Describe the basics of colour science and 2D graphics
- Explain the different file formats and image compression techniques
- Describe the basics in photography
- Summarize the basic image processing techniques
- List the basic features of Photoshop
- Perform simple vector and raster Image Processing operations

Material /Sub Topics

3.1. Colour Science [Ref 1: pg 151-163 and Teacher's Note]

    3.1.1. Colour

    3.1.2. Colour models

    3.1.3. Colour palettes

    3.1.4. Dithering

3.2. 2D Graphics, image compression and file formats [Ref 1: pg 132-151, Ref 2: pg 71-79 and Teacher's Note]

3.3.   Photography [Ref: Teacher's Note]

3.3.1.   Photography basics- SLR Camera

3.3.2.   Lens and chutter parameters

3.3.2.1.   Focal length

3.3.2.2.   Lens angle

3.3.2.3.   Wide angle lens

3.3.2.4.   Telephoto lens

3.3.2.5.   Aperture size

3.3.2.6.   Shutter speed

3.3.2.7.   F-stop

3.3.3.   Functional parameters

3.3.3.1.   Over exposure

3.3.3.2.   Under exposure

3.3.3.3.   Depth of field and factors affecting it

3.3.4.   Shooting moving objects

3.3.5.   Rule of third

3.3.6.   Digital cameras Vs conventional cameras

3.3.7.   How a digital camera works, Resolution

3.3.8.   Storage systems

3.3.9.   Digital shutter, digital zoom Vs optical zoom

3.4.   Basic image processing [Refer Photoshop and Flash Help]

3.4.1.   Use of image editing software

3.4.2.   White balance correction with Photoshop

3.4.3.   Dynamic range correction with Photoshop

3.4.4.   Gamma correction with Photoshop

3.4.5.   Photo retouching with Photoshop

3.4.6.   Creating complex shapes from Primitive vector shapes with Flash

Topic 4: Enhancing your production with audio (07 hrs)

Instructional Objectives

- Outline the basics of audio
- Compare the difference between MIDI and digital audio
- Explain the audio file formats and compression
- Outline the process of adding sound to a multimedia project
- Add sound to a multimedia project

Material /Sub Topics

4.1.   Audio basics [Ref 1: pg 96-98]

4.2.   Musical instrument digital interface (MIDI) [Ref 1: pg 106-113]

4.3.   Digital audio [Ref 1: pg 98-106,113-116]

    4.3.1.   Sampling, quantization

    4.3.2.   Clipping

    4.3.3.   Preparing digital audio files

    4.3.4.   Basic sound editing with Adobe Premiere

4.4.   Audio compression and file formats [Ref 1: pg 111-112, Ref 2, pg 374-376,378, 405, 412, 414, 415]

    4.4.1.   ADPCM in speech coding

    4.4.2.   Various MPEG audio standards

4.5.   Adding sound to your multimedia project [Ref 1: pg 116-124]

Topic 5: Creating video and animation (11 hrs)

Instructional Objectives

- Outline video and animation basics
- Outline the basic features of Adobe Premier
- Explain video file formats and compression
- Outline the process of shooting and editing a video
- Do the basic editing and exporting of a small sound editing clip

Material /Sub Topics

5.1. Video basics [Ref 1: pg 192-214]

   5.1.1. How video works

   5.1.2. Broadcast video standards

   5.1.3. Analog video

   5.1.4. Digital video

   5.1.5. Video recording and tape formats

5.2. Shooting and editing video [Ref 1: pg 215-219, Ref2: 37-40, Adobe Premiere Help]

   5.2.1. Capturing a video from camera to computer

   5.2.2. Editing videos with Adobe Premier CS

5.3. Video compression and file formats [Ref 2: pg 288-290, 312, 319-320, 332, 361-362, 369]

   5.3.1. Video compression based on motion compensation

   5.3.2. Various MPEG video standards

5.4. Animation with Flash and Director   [Ref 1: pg 170-185, Flash Help, Director Help]

   5.4.1. Creating symbols in the Flash Library

   5.4.2. Creating cast Members (Media Elements) in the Director cast

Topic 6: Multimedia authoring concepts and practice (14 hrs)

Instructional Objectives

- Explain authoring basics
- Explain the basic features of Macromedia Director and Flash
- Produce simple 2-D and 3-D animations using Macromedia Director
- Produce dynamic content with Flash

Material / Sub Topics

6.1 Multimedia authoring [Ref 1:pg 284-301]

    6.1.1 Timeline based tools (Flash, Director)

    6.1.2 Icon based tools (Authorware)

    6.1.3 Page & card based tools (Toolbook)

6.2 Some authoring tools

    6.2.1 Macromedia Director [Macromedia Director Help, Ref 2: pg 40-46]

        6.2.1.1 Introduction to the Director interface

        6.2.1.2 Drawing in the paint window using the pencil

        6.2.1.3 Vector drawing with the pen, in the vector Shape window

        6.2.1.4 Simple animations

        6.2.1.5 Text and 3D Text

        6.2.1.6 Publishing director files in other formats

    6.2.2 Flash [Flash Help, Ref 2: pg 46-51]

        6.2.2.1 Introduction to the Flash development interface

        6.2.2.2 Overview of the tools and property inspector

        6.2.2.3 The Flash timeline

        6.2.2.4 Creating objects from simple shapes with the selection tool

        6.2.2.5 Creating tweened animations

        6.2.2.6 Importing video and sound to flash

        6.2.2.7 Exporting video files into Flash Video format

        6.2.2.8 Masking

        6.2.2.9 Motion guides

        6.2.2.10 Publishing flash files in other formats

Topic 7: Selected topics in multimedia (07 hrs)

Instructional Objectives

- Describe VRML
- Explain the different kinds of multimedia hardware specified below
- Describe the issues related to Multimedia on networks

Material / Sub Topics

7.1   Virtual reality and VRML [Ref 2: pg 51-55,]

7.2   Selected multimedia hardware [Ref 1: pg 232 - 255]

   7.2.1   Connections

   7.2.2   Memory and storage devices

   7.2.3   Input devices

   7.2.4   Output devices

   7.2.5   Networking and communication devices

7.3   Multimedia on networks [Ref: Teacher's Note]

   7.3.1   Bandwidth

   7.3.2   Streaming

   7.3.3   Video conferencing

   7.3.4   Webcasting

PLATFORM

- Macromedia Director MX 2004 or above
- Macromedia Flash MX 2004 or above
- Adobe Flash CS4
- Adobe Premier
- Adobe Photoshop