**City University of Hong Kong**
**Course Syllabus**

**offered by Department of Electronic Engineering**
**with effect from Semester B in 2017/2018**

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## Part I Course Overview

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|---|---|
| **Course Title:** | Networked Multimedia |
| **Course Code**: | EE6804 |
| **Course Duration:** | One Semester (13 weeks) |
| **Credit Units**: | 3 |
| **Level**: | P6 |
| **Medium of Instruction:** | English |
| **Medium of Assessment:** | English |
| **Prerequisites**: *(Course Code and Title)* | EE6805 Video and Speech Compression<br>and<br>[EE5412 Telecommunication Networks or<br>CS4285 High Speed Multimedia Networks or<br>CS5275 High Speed Multimedia Networks or Equivalent] |
| **Precursors**: *(Course Code and Title)* | Nil |
| **Equivalent Courses**: *(Course Code and Title)* | Nil |
| **Exclusive Courses**: *(Course Code and Title)* | Nil |

**Part II Course Details**

## 1. Abstract

The aim of this course is to provide students with fundamental knowledge of Internet technology and to simulate students' interest in learning the technologies behind practical Internet multimedia applications. The issues on the multimedia content delivery over the network are addressed. Voice over IP and packet video are examined in details to illustrate how a particular multimedia data type is employed in communications over Internet. Practical multimedia applications over Internet are reviewed.

## 2. Course Intended Learning Outcomes (CILOs)

*(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)*

| No. | CILOs | Weighting (if applicable) | Discovery-enriched curriculum related learning outcomes (please tick where appropriate) | | |
|---|---|---|---|---|---|
| | | | *A1* | *A2* | *A3* |
| 1. | Understand the multimedia content delivery over the network. | | ✓ | ✓ | |
| 2. | Analyze the issues in voice over IP and packet video. | | ✓ | ✓ | ✓ |
| 3. | Identify the technologies behind practical Internet multimedia applications. | | ✓ | ✓ | |
| | | 100% | | | |

*A1:* *Attitude*
*Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

*A2:* *Ability*
*Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.*

A3: *Accomplishments*
*Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

## 3. Teaching and Learning Activities (TLAs)

*(TLAs designed to facilitate students' achievement of the CILOs.)*

| TLA | Brief Description | CILO No. | | | | | | Hours/week (if applicable) |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | | | | |
| Lecture | Key concepts of internet multimedia are illustrated | ✓ | ✓ | ✓ | | | | 2 hrs/wk |
| Tutorials | Key concepts are worked out based on questions and problem solving | ✓ | ✓ | ✓ | | | | 1 hr/wk |
| Work-along exercises | Demonstrate the working principles and apply key concepts of practical problems | ✓ | ✓ | ✓ | | | | |
| Software demonstration | Software demonstration for applying key concepts to solve practical problems | ✓ | ✓ | ✓ | | | | |
| In-class exercises | Demonstrate understanding of key concepts | ✓ | ✓ | ✓ | | | | |
| Problem Q&A | Demonstrate understanding of key concepts | ✓ | ✓ | ✓ | | | | |
| Group discussion | Demonstrate understanding of key concepts | ✓ | ✓ | ✓ | | | | |
| Case study | Demonstrate understanding of key concepts | ✓ | ✓ | ✓ | | | | |
| Assignments | Demonstrate understanding of key concepts | ✓ | ✓ | ✓ | | | | |

## 4. Assessment Tasks/Activities (ATs)

*(ATs are designed to assess how well the students achieve the CILOs.)*

| Assessment Tasks/Activities | CILO No. | | | | | | Weighting | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | | | | | |
| Continuous Assessment: 40% | | | | | | | | |
| Quizzes and at least 3 assignments (assignments, project presentation, demonstration, group discussions, case study etc.) | ✓ | ✓ | ✓ | | | | 40% | |
| Examination: 60% (duration: 2hrs) | | | | | | | | |
| | | | | | | | 100% | |

**Remark:**

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.

Students are encouraged to develop a strong sense of curiosity in this course. Students are expected to ask and answer questions actively and demonstrate critical thinking in weekly tutorial group discussion. For case study and project presentation, students are encouraged to discover and self-study relevant research papers and other reading materials and to synthesize knowledge across disciplines.

**5. Assessment Rubrics**

*(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)*

| Assessment Task | Criterion | Excellent (A+, A, A-) | Good (B+, B, B-) | Fair (C+, C, C-) | Marginal (D) | Failure (F) |
|---|---|---|---|---|---|---|
| 1. Examination | Achievements in CILOs | High | Significant | Moderate | Basic | Not even reaching marginal level |
| 2. Coursework | Achievements in CILOs | High | Significant | Moderate | Basic | Not even reaching marginal level |

## 6. Constructive Alignment with Programme Outcomes

| PILO | How the course contribute to the specific PILO(s) |
|---|---|
| 1 | An ability to describe current and anticipated trends in the selected areas. |
| 2 | An ability to evaluate and analyze new technologies in the selected areas. |
| 3 | An ability to apply specialist knowledge in the selected areas. |
| 4 | An ability to assess, evaluate and formulate solutions to problems or specifications, in the selected areas. |
| 5 | Research and develop new technologies and products in the selected areas. |

**Part III Other Information (more details can be provided separately in the teaching plan)**

**1. Keyword Syllabus**

Multimedia Content Delivery

Streaming Media, Real-time Broadcast, Media on Demand, Web Caching

Voice over IP

Review of G.7xx, H.26x, T.12x encoding standards for voice, image and data. Protocols for voice over IP, Basic call control, H.323 protocol stack architecture, multilevel gatekeeper hierarchal structure for large-scale VoIP system, quality of service. Migration from POTS.

Packet Video

Packet Video Network Architecture Model, Quality of Service, Video in Multimedia Communications.

Practical Applications

Video Conferencing, eLearning, Video Surveillance, Web radio, Digital entertainment.

**2. Reading List**

**2.1 Compulsory Readings**

*(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)*

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|---|---|
| 1. | Ming-Ting Sun and Amy R. Reibman : Compressed Video over Networks, (Marcel Dekker Inc., 2000, ISBN: 0824794230). |
| 2. | Aggelos Katsaggelos and Nick Galatsanos : Signal Recovery Techniques for Image and Video Compression and Transmission, (Kluwer Academic Publishers, 1998, ISBN: 0792382986). |

**2.2 Additional Readings**

*(Additional references for students to learn to expand their knowledge about the subject.)*

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|---|---|
| 1. | George Colouris, Jean Dollimore, and Tim Kindberg : Distributed Systems: Concepts and Design, (3rd edition, Addison-Wesley, 2000, ISBN: 0201619180). |
| 2. | Ze-Nian Li and Mark S. Drew : Fundamentals of Multimedia, (Prentice Hall, 2004, ISBN: 0130618721). |

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| 3. | Mohammed E. Al-Mualla, C. Nishan Canagarajah and David R. Bull : Video Coding for Mobile Communications, (Academic Press, 2002, ISBN: 0120530791). |
| 4. | Gil Held : Voice & Data Internetworking (3rd edition, McGraw-Hill, 2001, ISBN: 0072131837). |
| 5. | Marcus Goncalves : Voice Over IP Networks, (McGraw-Hill, 1998, ISBN: 0079137830). |
| 6. | Uyless Black : Voice Over IP, (Prentice Hall, 1999, ISBN: 0-13-022463-4). |
| 7. | Uyless Black : Internet Telephony: Call Processing Protocols, (Prentice Hall, 2000, ISBN: 0-13-025565-3). |