# City University of Hong Kong

## Information on a Course
**offered by Department of Computer Science**
**with effect from Semester A in 2012 / 2013**

**Part I**

**Course Title**: Internet and Distributed Systems Programming

**Course Code**: CS6282

**Course Duration**: One Semester

**Credit Units**: 3

**Level**: P6

**Medium of Instruction**: English

**Prerequisites**: Nil

**Precursors**: CS5222 Computer Networks and Internets or
CS5281 Internet Application Developments or
CS6223 Distributed Systems

**Equivalent Courses**: Nil

**Exclusive Courses**: Nil

**Part II**

**Course Aims**
This course aims to develop technical competence in programming applications and services over TCP/IP networks and in designing reliable and high performance distributed systems.

**Course Intended Learning Outcomes (CILOs)**
Upon successful completion of this course, students should be able to:

| No. | CILOs | Weighting (if applicable) |
|---|---|---|
| 1. | explore and identify the challenges and requirements in distributed applications, including cloud computing; | 10% |
| 2. | program at TCP/IP and socket levels; | 20% |

| | | |
|---|---|---|
| 3. | program multi-thread concurrent applications; | 30% |
| 4. | apply distributed application development methods, including use of cloud administration and application development tools and API; | 20% |
| 5. | develop a distributed system and related algorithms for reliability and performance. | 20% |

## Teaching and Learning Activities (TLAs)
*(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)*

Teaching pattern:
Suggested lecture/tutorial/laboratory mix: 2 hrs. lecture; 1 hr. tutorial.

| CILO No. | TLAs | Hours/week (if applicable) |
|---|---|---|
| CILO 1 | Readings/ Lectures/ Tutorials / Quiz | |
| CILO 2 | Readings/ Lectures/ Tutorials / Quiz / Assignment / Group project | |
| CILO 3 | Readings/ Lectures/ Tutorials / Quiz / Assignment / Group project | |
| CILO 4 | Readings/ Lectures/ Tutorials / Quiz / Assignment / Group project | |
| CILO 5 | Readings/ Lectures/ Tutorials / Quiz / Assignment | |

## Assessment Tasks/Activities
*(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)*

| CILO No. | Type of Assessment Tasks/Activities | Weighting (if applicable) | Remarks |
|---|---|---|---|
| CILO 1 | Students are required to conduct a survey on contemporary distributed applications and technologies used in cloud computing. The quality and relevancy of their research findings will be a measure for this ILO. | 10% | |
| CILO 2 | Students are required to implement an application with network communication. The robusty and features of their system will be a measure for this ILO. | 20% | |
| CILO 3 | Students are required to implement an application multi-thread features. | 30% | |

| | | | |
|---|---|---|---|
| | The efficiency and features of their system will be a measure for this ILO. | | |
| CILO 4 | Students are required to provide analysis and justification on the usage of different technologies in cloud computing. The precision and thoughtfulness of the analysis will be a measure for this ILO. | 20% | |
| CILO 5 | A programming project is designed to measure students' ability in designing and applying distributed algorithm to real-life scenario. The efficiency and correctness of their system will be a measure for this ILO. | 20% | |

**Grading of Student Achievement:** Refer to Grading of Courses in the Academic Regulations for Taught Postgraduate Degrees.

*Examination duration:*   2 hours

*Percentage of coursework, examination, etc.:*   50% CW; 50% Exam

*Grading pattern:* Standard (A+AA-…F)

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

## Part III

### Keyword Syllabus

Socket level API's, Java Networking, RMI Programming, Session Tracking, Multithreaded Programming, Programming for Distributed Services, JavaBeans and EJB Technologies, XML Parsers, SAX and Cloud API's, SOAP, Web Services, Programming for Reliability, Load Sharing and Balancing, Cloud Computing, Virtualization, SOA, Utility Computing, SaaS, PaaS, IaaS.

### Recommended Reading

**Text(s)**

*M. L. Liu, Distributed Computing: Principles and Applications, Addison-Wesley, 2004.*

*Thomas Erl, SOA: Principles of Service Design, Prentice Hall, 2007.*

*Andrew S. Tanenbaum, Maarten van Steen, Distributed Systems: Principles and Paradigms, 2nd Edition, Prentice Hall, 2007.*

### Online Resources