SUBJECT DESCRIPTION FORM

Subject title: Mobile Computing and Data Management

Subject code: COMP5527

Credit value: 3

Pre-requisite: (Subject title and code no, if any)

Operating Systems (COMP304) and Foundations of Database Systems (COMP311) and Computer Communications Networks (COMP312) or equivalent
(waived for Software Technology students)

Recommended background knowledge:

Programming skills in C/C++/Java.

Mutual exclusions: NIL

Learning approach:

42 hours of Class activities including - lecture, tutorial, lab, workshop seminar where applicable

Assessment:

Continuous assessment	45%
Test, and Examination	55%

Objectives:

To provide students with knowledge in the area of mobile computing models, architectures, algorithms and techniques and to train them with the ability to

- acquire fundamental knowledge in mobile computing and mobile data management
- learn about mobile computing concepts
- understand limitations and appreciate innovative solutions
- apply the knowledge in mobile computing application development and problem solving

The Department reserves the right to update the syllabus contents. Please note that the learning approach for the same subject could vary slightly due to different delivery modes.

Learning Outcomes:

After completing the subject, students should be able to:
1. better understand mobile computing and mobile data management;
2. be aware of innovative solution and limitations; and
3. apply different techniques to various applications.

Keyword syllabus:

- Introduction to mobile computing
  Motivations; ubiquitous and pervasive computing; mobile computing infrastructure, wireless communication and protocol, GPRS and 3G; mobile computing applications.

- Mobile data management
  Data communication; data dissemination; broadcast disk; data caching and invalidation; data consistency and integrity; mobile data access; mobile databases and transaction processing.

- Disconnected and weakly-connected operations
  File hoarding and disconnected file systems, CODA; version and divergence control; data synchronization and reintegration.

- Location-aware computing
  Location management; mobility and handoff; spatial data and query processing; trajectory; location-dependent computing.

- Mobile applications and web services
  Transcoding and proxy services; wireless web access; mobile agents; Java card; M-commerce (mobile) and L-commerce (location-aware).

- Selected current topics
  Sensor networks; streaming query processing; data recharging; power-aware computing; wearable computers; nano-technology.

Indicative reading list and references:

Books

Burkhardt, J., Henn, H., Hepper, S., Raindtorff, K. and Schaeck, T., 2002, *Pervasive Computing: Technology and Architecture of Mobile Internet Applications*, Addison-Wesley.

Tan, K.L. Tan and Ooi, B.C., 2002, *Data Dissemination in Wireless Computing Environments,* Kluwer Academic Publishers.

Milojicic, D.S., Douglis, 1999, F. and Wheeler, R.G., *Mobility: Processes, Computers and Agents*, Addison-Wesley.

Jing, J. and Joshi, A., 1999, *Mobile Data Management and Applications,* Kluwer Academic Publishers.

Pitoura, E. and Samaras, G., 1997, *Data Management for Mobile Computing,* Kluwer Academic Publishers.

Imielinski, T. and Korth, H.F., 1996, *Mobile Computing,* Kluwer Academic Publishers.

Journals

IEEE Transactions on Mobile Computing, IEEE.

IEEE Pervasive Computing, IEEE.

Articles from other journals, magazines and conference proceedings.

Others

Proceedings of International Conference on Mobile Computing and Networking, ACM.
Proceedings of International Conference on Mobile Data Management / Mobile Data Access, IEEE and Springer-Verlag.