

## Liverpool John Moores University

Title: Mobile Computing  
Status: Definitive  
Code: **6510ENGSBC** (119424)  
Version Start Date: 01-01-2012

Owning School/Faculty: Engineering  
Teaching School/Faculty: The Sino-British College

| Team            | Leader |
|-----------------|--------|
| Russell English | Y      |

**Academic Level:** FHEQ6  
**Credit Value:** 12.00  
**Total Delivered Hours:** 35.00  
**Total Learning Hours:** 120  
**Private Study:** 85

### Delivery Options

Course typically offered: Semester 2

| Component | Contact Hours |
|-----------|---------------|
| Lecture   | 20.000        |
| Practical | 15.000        |

**Grading Basis:** 40 %

### Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|----------|-------------------|-------------|---------------|---------------|
| Exam     | Exam              |             | 50.0          |               |
| Essay    | CW                |             | 50.0          |               |

### Aims

*This module will provide students with an introduction to mobile computing with emphasis on mobile communication technology and mobile application development.*

### Learning Outcomes

After completing the module the student should be able to:

- LO1 Understand the concepts of wireless voice and data communication technologies
- LO2 Use mobile application frameworks to develop mobile applications
- LO3 Design mobile applications using appropriate human-computer interaction design methods

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

|            |         |         |         |
|------------|---------|---------|---------|
| Exam       | LO<br>1 | LO<br>2 | LO<br>3 |
| coursework | LO<br>2 | LO<br>3 |         |

## Outline Syllabus

*Mobile technology overview; cellular networks; IEEE 802.11 wireless networks; wireless environment TCP/IP; global positioning systems; geolocation systems; Bluetooth; GSM; Mobile IP protocol; Java for mobile applications; iPhone SDK; Android SDK; low power and low resource computing; persistence; user interface guidelines.*

## Learning Activities

Delivered with a range of lectures and tutorials.

## References

|                        |                                 |
|------------------------|---------------------------------|
| <b>Course Material</b> | Book                            |
| <b>Author</b>          | Pahlavan, K; Krishnamoorthy, P  |
| <b>Publishing Year</b> | 2003                            |
| <b>Title</b>           | Principles of Wireless Networks |
| <b>Subtitle</b>        |                                 |
| <b>Edition</b>         |                                 |
| <b>Publisher</b>       | PHI/Pearson Education           |
| <b>ISBN</b>            | 10: 0130930032                  |

|                        |  |
|------------------------|--|
| <b>Course Material</b> | Book   |
| <b>Author</b>          | Mednieks, Z; Dornin, L; Blake Meike, G; Nakamura, M                            |
| <b>Publishing Year</b> | 2012   |
| <b>Title</b>           | Programming Android: Java Programming for the New Generation of Mobile Devices |
| <b>Subtitle</b>        |  |
| <b>Edition</b>         | 2  |

|                  |                |
|------------------|----------------|
| <b>Publisher</b> | O'Reilly Media |
| <b>ISBN</b>      | 10: 1449316646 |

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### **Notes**

This module will provide students with an introduction to mobile computing with emphasis on mobile communication technology and mobile application development.

Networking or Messaging Layer  
Responsible for the communication of network resources, mobility, code format and call-related management messages between various network entities

5. GSM Protocol Architecture. Layer 3 Layer 2 Layer 1 TDMA/FDMA

References:

1. Principles of Wireless Networks: A Unified Approach, K. Pahlavan, P. Krishnamurthy
2. [www.chu.edu.tw/~lhyen/wc/gsm.pdf](http://www.chu.edu.tw/~lhyen/wc/gsm.pdf)
3. [www.hit.bme.hu/~mihaly/mobil.hir/gsmbase.pdf](http://www.hit.bme.hu/~mihaly/mobil.hir/gsmbase.pdf)

Wireless Principles. Wireless communication is a communication type that is done over Radio Frequency (RF) Signals. As all communication types, here there is a sender and a receiver. For this communication both sides of the communication must use the same frequency or in other words same channel. Radio Frequency (RF) Spectrums and the Satellite Orbits of wireless communication are managed by International Telecommunication Union-Radio Communication Sector (ITU-R) all over the World. Beside Telecommunication Union-Radio Communication Sector (ITU-R) that manages RF spectrums and satellite orbits, wireless networking standards are managed by two organization all over the World. These are IEEE and Wi-Fi Alliance. Community Wireless Networks can be designed in many ways. To help you understand these different methods for designing networks, this document covers the basics of what different devices do in wireless networks, and how they can be used in different configurations.

Point to MultiPoint - Wireless Internet Service Provider model. If we combine the two principles used in the networks above - many client devices connecting to an Access Point, and more powerful antennas used for outdoor devices to create longer links - we can create Point to Multipoint networks. These are larger-scale Access Point networks, where there is a single device in the "center", controlling all of the Clients connected to it and bridging those connections to the Internet.