

# Mobile Computing and Communications

*This programme is no longer recruiting.*

<b>Final award</b>	BSc. (Hons)
<b>Intermediate awards available</b>	Cert. H.E., Dip. H.E.
<b>UCAS code</b>	
<b>Details of professional body accreditation</b>	N/A
<b>Relevant QAA Benchmark statements</b>	Computing
<b>Date specification last up-dated</b>	August 2013

## Alternative locations for studying this programme

Location	Which elements?	Taught by UEL staff	Taught by local staff	Method of Delivery
Hangzhou Dianzi University (China)	Levels 1 and 2	Yes	No	Block Mode and Blended Delivery

## Profile

### The summary - UCAS programme profile

#### BANNER BOX:

Are you interested in:

- Applications and computing services supporting the mobile user
- Network architectures, protocols, or service algorithms
- Performance characterization of mobile/wireless networks
- Network management for mobile and wireless networks
- Data management and databases for mobile environments

Mobile computing and communications permeates all aspects of modern society. Now, more than ever, the field holds the promise of new technologies and career opportunities.

#### ENTRY REQUIREMENTS

- 200 UCAS tariff points or equivalent
- Equivalent overseas qualifications and IELTS 6.0 or equivalent
- Relevant Access programme
- Mature students, without appropriate academic qualifications but with relevant work experience, attend for interview and aptitude test

If you are taking this programme at **Hangzhou Dianzi University (HDU)** in China, the entry requirement is set by HEI. That is Tier 1. The benchmark score in Zhejiang Province set by Tier 1 HEIs was 593/750. English: to achieve at least 100 out of the 150 points.

In addition to the above, students will (prior to admission on to the programme) have to complete two level 0 English Language UEL modules. These two modules will enable students to gain competencies and proficiency in English as well as providing preparation for the UK Higher Education systems.

## **ABOUT THE PROGRAMME**

### **What is Mobile Computing and Communications?**

Over the last few years, developers and consumers have seen an increase of mobile communications with the focus on mobile software, devices and most of all the emphasis of quality of service and value for money. This era is being compared by many experts as the golden era of mobile computing similar to the desktop computer growth in late eighties and early nineties. Every aspect of mobile telecommunications is based on software that needs constant improvements. The mobile industry is being termed as the fastest growing industry in today's business, thus the importance of developing more experts on the field. Studying in the field of mobile computing and communications is challenging and enjoyable, and can lead to a rewarding career. At UEL you will develop deep understanding of mobile technologies and the necessary technical, analytical and business skills required to apply these technologies to appropriate contexts.

### **Mobile Computing and Communications at UEL**

The Mobile Computing and Communications at UEL allows you to build extensive knowledge in a variety of computing subjects crucial for understanding of mobile networks, devices and applications. You will learn programming, computer systems architecture, mobile devices architecture, mobile operating systems, networking, communications security and the business contexts in which mobile computer-based are used in mobile telecommunications environment. Emphasis is placed on the acquisition of practical-based skills, including the opportunity for one year's work experience, which provides a solid foundation for a career in Mobile Computing and Communications.

### **Programme structure**

Computing programmes are three or four years in length, as the sandwich degrees include a one-year work placement. If you want to change to other degree it is easy to arrange.

### **Learning environment**

As well as the usual teaching and learning facilities such as laboratories, lecture and seminar rooms and a well-resourced library, students have access to a wide range of computing resources. Specialised labs are used for study of networking and operating system environments such as Symbian, Windows and UNIX. Students are provided with software tools for programming, database development, computer-aided software engineering, Internet access, mobile-based development and Web-based development. The virtual learning environment UELPlus is used to give extra support to students and allow easy

communication between students and staff. The placement year (which can take place abroad) is the ideal opportunity to add to the skills gained during the first two years of your programme.

### **Assessment**

A variety of assessment methods are used. Some modules are entirely assessed by coursework, although most modules are assessed by a combination of coursework and examination. Coursework assessment can take a number of different forms, including presentations, software demonstrations, research-based assignments and practical exercises involving system or program specification, coding and testing. Examinations might be multiple choice tests or more traditional unseen questions.

### **Work experience/placement opportunities**

On our sandwich programmes, students undertake a 48 week industrial placement during the third year. This placement is normally paid. The university has long-standing links with a large number of well-known employers who can provide UEL students with worthwhile work experience. Many students are offered permanent employment by their placement organisation when they graduate. In addition to enhancing employment prospects, the placement provides a valuable learning experience, the results of which feed into our students' final year of study.

At HDU: Although there is no formal placement system operating on this programme, if you find relevant voluntary or paid work during the summer months this would enhance your overall experience.

### **Project work**

Students complete a project in their final year. This is a major piece of work that allows students to choose the direction of their study, to develop their own ideas and to integrate the various subjects studied.

### **Added value**

In addition to the IT-related skills and knowledge acquired during the programme, you will develop a wide range of personal and professional skills including communication, presentation, negotiation, team working and time management skills. These sought-after skills will be useful throughout your working life and will increase your chances of finding a well-paid and interesting job after graduation.

## **IS THIS THE PROGRAMME FOR ME?**

### **If you are interested in...**

- Applications and computing services supporting the mobile user
- Network architectures, protocols, or service algorithms
- Performance characterization of mobile/wireless networks
- Network management for mobile and wireless networks
- Data management and databases for mobile environments

- Service integration and interworking of wired and wireless networks
- Interaction between different layers of mobile or wireless systems
- Security, scalability, and reliability issues
- Nomadic computing
- Wearable computing and networking
- Satellite communications
- Quality of service and integrated services in mobile or wireless networks
- Mobile Internetworking
- Intelligent network signalling
- Mobile VoIP
- Mobile ad hoc and sensor networks
- Power management and control algorithms
- User interfaces and systems design
- Theory/algorithms
- understanding mobile systems (e.g. your mobile telephone)
- determining the future of mobile communications
- how to develop mobile based software to solve business problems
- how to rectify problems in the mobile devices

### **If you enjoy...**

- working with mobile devices
- understand the current and future trends in mobile communications
- solving technical problems
- the challenge of finding a solution to seemingly insoluble problems
- listening to and working with others to identify and develop solutions

### **If you want...**

- the opportunity to work in a well-rewarded and fast-developing area
- sought-after and up-to-date skills
- to communicate and work with a wide variety of people to solve the problems in fast moving industry
- to combine your interest in mobile communications with computing

Then this programme could be for you!

### **Your future career**

There is a significant shortage of mobile computing skills in the world today. With the current demand of mobility the need of creativity and technical skills are in high demand. Organisations need to have access to these skills to make best use of computing and other relevant resources to keep up with the current pace.

Graduates of **Mobile Computing and Communications** degree programmes are qualified for a variety of jobs including the analysis, design and development of mobile-based information systems, mobile computing networking, mobile software development, and web-based development for mobile devices.

For graduates who wish to continue their studies at postgraduate level, the programme provides a suitable entry route to a variety of Masters Programmes, both at UEL and elsewhere.

### **How we support you**

- Personal tutor support throughout the programme
- Support for development of study skills, preparation for employment and research
- Placement Office with well-established links with employers to provide support for finding placements
- Specialist support for dyslexia and English as a second language
- Student advice services for accommodation, finance, careers, IT training, learning resources.

### **Bonus factors**

The proximity of London means that UEL is ideally placed for developing links with a wide range of well-established, prestigious and innovative employers. The Thames Gateway Technology Centre based at the Docklands Campus provides a natural channel between business and higher education, by making the knowledge and expertise of UEL available to local employers. The TGTC also provides a variety of opportunities including placements and final year projects to our students.

## **Outcomes**

### **Programme aims and learning outcomes**

#### **What is this programme designed to achieve?**

This programme is designed to give you the opportunity to:

- Gain skills and knowledge leading to a flexible career path as mobile computing and communications professional
- Gain sound knowledge and understanding of a wide range of current trends in the field with a wide variety of skills ranging from the mobile devices to networking structures
- Learn and work both independently and within groups
- Be aware of the management, professional, legal, social and ethical issues
- Develop the necessary skills and knowledge to pursue further study

#### **What will you learn?**

All learning outcomes are covered in the programme's single honours route and where Maj, J and/or Min is shown against a learning outcome, this confirms that the learning outcome is covered in the Major, Joint and/or Minor routes offered.

### **Knowledge**

- How to design and implement a mobile based software (Maj, J, Min)

- How computer hardware and software work together to provide a platform for mobile communications (Maj, J)
- Understand Networks in regard to mobile devices (Maj)
- How to develop web-based systems for mobile devices (Maj, J, Min)
- How can mobile devices be used in a business context

### **Thinking skills**

- Problem solving
- Evaluation and critical analysis (Maj, J)
- Self-appraisal and review of personal practice (Maj, J, Min)

### **Subject-Based Practical skills**

- Use of range of specialised mobile computing technology (Maj, J, Min), such as programming languages, web based systems (Maj, J, Min) and other means of dealing with mobile devices and networks
- Preparation of essays, reports and presentations (Maj, J)
- Production of major self-directed project (Maj)

### **Skills for life and work (general skills)**

- Communication skills (Maj, J and Min)
- Time management (Maj, J and Min)
- Learning and working both independently and in groups (Maj, J and Min)

## **Structure**

### **The programme structure**

#### **Introduction**

All programmes are credit-rated to help you to understand the amount and level of study that is needed.

One credit is equal to 10 hours of directed study time (this includes everything you do e.g. lecture, seminar and private study).

Credits are assigned to one of 5 levels:

- 0 - equivalent in standard to GCE 'A' level and is intended to prepare students for year one of an undergraduate degree programme
- 1 - equivalent in standard to the first year of a full-time undergraduate degree programme
- 2 - equivalent in standard to the second year of a full-time undergraduate degree programme
- 3 - equivalent in standard to the third year of a full-time undergraduate degree programme
- M - equivalent in standard to a Masters degree

## **Credit rating**

The overall credit-rating of this programme is 360 credits.

## **Typical duration**

The typical duration of this programme is three years full-time, four years sandwich or five years part-time if delivery is at the UEL Docklands campus. It is possible to move from full-time to part-time study and vice-versa to accommodate any external factors such as financial constraints or domestic commitments. Many of our students make use of this flexibility and this may impact on the overall duration of their study period.

If you are at HDU: The programme will be delivered over four (4) years with the final year (4<sup>th</sup> year) being taught at the UEL Docklands campus in London.

## **How the teaching year is divided**

The teaching year begins in September and ends in June. A typical full-time student will study the equivalent of 120 credits over the year. A typical part-time student will study for one day and one evening per week and will complete 60-80 credits.

## **What you will study when**

This programme is part of a modular degree scheme. A typical full-time student will take six 20 credit modules per year. An honours degree student will complete six modules at level one, six at level 2 and six at level 3.

If you are at HDU: In the first year a student will take the two level 0 English Language modules, in years two, three and four, six 20 credit modules per year.

It is possible to bring together modules from one subject with modules from another to produce a combined programme. Subjects are offered in a variety of combinations:

- Single - 120 credits at levels one, two and three with minimum of 40 credits drawn from University wide options
- Major - 80 credits at levels one, two and three with a minimum of 20 credits drawn from University wide options
- Joint - 60 credits at levels one, two and three with a minimum of 20 credits drawn from University wide options
- Minor - 40 credits at levels one, two and three.

Modules are defined as:

- Core - Must be taken
- Option - Select from a range of identified modules within the field
- University wide option - Select from a wide range of modules across the University

The following are the core and optional requirements for the single and major pathways for this programme

<b>LEVEL</b>	<b>TITLE</b>	<b>SKILLS MODULES (Insert Y where appropriate)</b>	<b>CREDITS</b>	<b>STATUS SINGLE</b>	<b>STATUS MAJOR</b>	<b>STATUS JOINT</b>	<b>STATUS MINOR</b>
1	Academic Skills for Computing	Y	20	Core	Core	Core*	
1	Introduction to Software Development		20	Core	Core	Core	Core
1	Introduction to Mobile Devices		20	Core	Core	Core	Core
1	Information Systems		20	Core			
1	Introduction to Computer Systems		20	Core			
1	Introduction to Computer Networking		20	Core	Core	Option	
2	Professional Issues	Y	20	Core	Core	Core*	
2	Analogue & Digital Communications		20	Core	Option		
2	Communications Security		20	Core			
2	Software Development		20	Core	Core	Core	Core
2	Network Systems and Technologies		20	Core	Option	Option	
2	Smart Mobile Systems Structures and Mechanisms		20	Core	Core	Core	Core
3	Research Skills	Y	20	Core	Core	Core*	
3	Advanced Topics in Networks		20	Core	Option	Option	
3	Network Programming		20	Core	Option	Core	Core
3	Mobile Information Systems Development		20	Core	Core	Core	Core

3	Programming Paradigms	20	Option	
3	Formal Methods in Software Engineering	20	Option	
3	Issues in Distributed Systems	20	Option	
3	Project	20	Core	Core

\* Students must either take this or the equivalent skills module from their other joint programme.

### Requirements for gaining an award

In order to gain an **honours degree** you will need to obtain 360 credits including:

- A minimum of 120 credits at level one or higher
- A minimum of 120 credits at level two or higher
- A minimum of 120 credits at level three or higher

In order to gain an **ordinary degree** you will need to obtain a minimum of 300 credits including:

- A minimum of 120 credits at level one or higher
- A minimum of 120 credits at level two or higher
- A minimum of 60 credits at level three or higher

In order to gain a **Diploma of Higher Education** you will need to obtain at least 240 credits including a minimum of 120 credits at level one or higher and 120 credits at level two or higher

In order to gain a **Certificate of Higher Education** you will need to obtain 120 credits at level one or higher

In order to gain an Associate Certificate you will need to obtain a minimum of 20 credits at level one or higher

### Degree Classification

Where a student is eligible for an Honours degree, and has gained a minimum of 240 UEL credits at level 2 or level 3 on the programme, including a minimum of 120 UEL credits at level 3, the award classification is determined by calculating:

$$\frac{\text{The arithmetic mean of the best 100 credits at level 3}}{\times 2/3} + \frac{\text{The arithmetic mean of the next best 100 credits at levels 2 and/or 3}}{\times 1/3}$$

and applying the mark obtained as a percentage, with all decimal points rounded up to the nearest whole number, to the following classification

- 70% - 100% First Class Honours
- 60% - 69% Second Class Honours, First Division
- 50% - 59% Second Class Honours, Second Division
- 40% - 49% Third Class Honours
- 0% - 39% Not passed

## **Assessment**

### **Teaching, learning and assessment**

#### **Teaching and learning**

Knowledge is developed through

- Participation in lectures, tutorials and workshops
- Directed and general reading
- Primary and secondary research, e.g. using the Internet or Learning Resource Centre

Thinking skills are developed through

- Successful completion of set assessment tasks
- Self-appraisal and self-evaluation
- Critical evaluation of concepts, assumptions, arguments and data

Practical skills are developed through

- use of general IT applications such as word processors and spreadsheets
- use of specialised IT applications such as program development environments and CASE tools
- investigation website development

Skills for life and work (general skills) are developed through

- working in groups to complete work set, such as presentations
- working during sandwich year as placement student
- managing time to complete assessments by deadlines

#### **Assessment**

Knowledge is assessed by

- examinations, both unseen and based on previously supplied case studies
- multiple choice tests
- extended essays and reports

Thinking skills are assessed by

- all assessment tasks set, particularly those requiring critical evaluation

- self-appraisal of performance
- use of appropriate problem solving skills

Practical skills are assessed by

- assessment tasks requiring use of general and specialised IT applications
- use of equipment in practicals and presentations

Skills for life and work (general skills) are assessed by

- evidence of group and team working
- completion of placement year
- ability to work to time constraints

## Quality

### **How we assure the quality of this programme**

#### **Before this programme started**

Before this programme started, the following was checked:

- there would be enough qualified staff to teach the programme;
- adequate resources would be in place;
- the overall aims and objectives were appropriate;
- the content of the programme met national benchmark requirements;
- the programme met any professional/statutory body requirements;
- the proposal met other internal quality criteria covering a range of issues such as admissions policy, teaching, learning and assessment strategy and student support mechanisms.

This is done through a process of programme approval which involves consulting academic experts including some subject specialists from other institutions.

#### **How we monitor the quality of this programme**

The quality of this programme is monitored each year through evaluating:

- external examiner reports (considering quality and standards);
- statistical information (considering issues such as the pass rate);
- student feedback.

Drawing on this and other information, programme teams undertake the annual Review and Enhancement Process which is co-ordinated at School level and includes student participation. The process is monitored by the Quality and Standards Committee.

Once every six years an in-depth review of the whole field is undertaken by a panel that includes at least two external subject specialists. The panel considers documents, looks at student work, speaks to current and former students and speaks to staff before drawing its

conclusions. The result is a report highlighting good practice and identifying areas where action is needed.

### **The role of the programme committee**

This programme has a programme committee comprising all relevant teaching staff, student representatives and others who make a contribution towards the effective operation of the programme (e.g. library/technician staff). The committee has responsibilities for the quality of the programme. It provides input into the operation of the Review and Enhancement Process and proposes changes to improve quality. The programme committee plays a critical role in the quality assurance procedures.

### **The role of external examiners**

The standard of this programme is monitored by at least one external examiner. External examiners have two primary responsibilities:

- To ensure the standard of the programme;
- To ensure that justice is done to individual students.

External examiners fulfil these responsibilities in a variety of ways including:

- Approving exam papers/assignments;
- Attending assessment boards;
- Reviewing samples of student work and moderating marks;
- Ensuring that regulations are followed;
- Providing feedback through an annual report that enables us to make improvements for the future.

### **Listening to the views of students**

The following methods for gaining student feedback are used on this programme:

- Module evaluations involving the collection of data via questionnaires
- Informal discussions/meetings between students and teaching staff, year and programme tutors
- Student representation on programme committees (meeting each semester)

Students are notified of the action taken through:

- circulating the minutes of the programme committee
- providing details on the programme notice board

### **Listening to the views of others**

The following methods are used for gaining the views of other interested parties:

- Discussions with Placements Officer and visiting tutors
- Liaison with placement employers

- Information provided by the British Computer Society
- Liaison with schools and colleges whose students apply for places on our programmes

## Further Information

### Where you can find further information

Our links with the British Computer Society ([www.bcs.org.uk](http://www.bcs.org.uk)) ensure that our staff and students are aware of the latest trends in industry.

Further information about this programme is available from:

- The UEL web site (<http://www.uel.ac.uk>)
- The programme handbook
- Module study guides
- UEL Manual of General Regulations and Policies <http://www.uel.ac.uk/qa/>
- UEL Quality Manual <http://www.uel.ac.uk/qa/>
- Regulations for the Academic Framework <http://www.uel.ac.uk/academicframework/>
- UEL Guide to Undergraduate Programmes
- School of Computing, Information Technology and Engineering at UEL  
<http://www.uel.ac.uk/cite/computing/>
- [Current External Examiners](#)
- External examiner reports (available from UEL virtual learning environment (UELPlus or Moodle))