



**Program P10449**  
**MSc INFORMATION AND COMMUNICATIONS TECHNOLOGY**  
**(Medway Campus)**

**2010/2011**  
**Information to MSc Students**  
**By Ismael ESSOP, Prof. Predrag Rapajic**  
**[Programme Leader]**

Updated: Nov 2010

**School of Engineering**

**MSc in Information and Communications Technology**

**(1 year Full-time, 2 years Part-time)**

***Introduction***

This programme aims to provide graduates with the state-of-the-art technical and management knowledge that is urgently needed by the competitive and global industry of exploiting information technologies in business. The programme blends engineering, management and ICT to help broaden the skills and experience of the user. Students on this programme tend to come from the United Kingdom, European, Asian and African regions, and this programme provides an excellent platform for sharing of rich academic and professional experiences.

## ***Content and Structure***

### ***Content:***

The MSc Programme consists of three elements worth 180 credits in total.

- The first element consists of courses worth 30 credits (total worth), which provide students with **General Management and Transferable Skills**.
- The second element consists of specialised **Theme and Focus Courses** worth 90 credits (total), which is 50% of the MSc degree. Some Courses could be shared with other Programmes which provides opportunity for interaction and integration between the Programmes.
- The third element is the individual project worth 60 credits, which is designed to provide students with skills such as independent working, project management, public presentation and applied research skills. The industrial weeks provide opportunities for the students to communicate with, and learn from leading industrialists and business leaders.

### **General Management and Transferable Skills Courses (GMTSC)**

Strategy and management (15 credits); Research methodology (15 credits)

### **Theme and Focus Courses (TFC)**

E-Technology (30 credits); Database Security and Administration (15 credits), Advanced Database Applications (15 credits), Engineering of Advanced Distributed Systems (30 credits).

### **Individual Project** (60 credits)

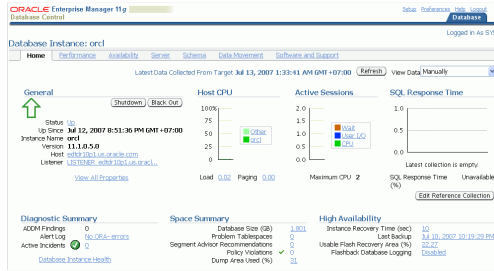
Thesis reporting project work associated with the School's research and enterprise programs; Formal presentation of project results; Two Industrial Weeks including visits to companies, industrial seminars and Keynote speeches by senior industrialists.

*Time Structure – Stages (semesters)*

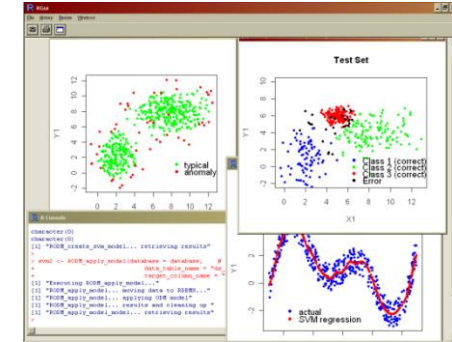
Stage 1 Sep-Jan or Jan-May	E-technology (30) (TFC)
	Research Methodology (15) (GMTSC)
	Database Security and Administration (30) (TFC)
Stage 2 Jan-May or Sep- Jan	Advanced Database Applications (30) (TFC)
	Engineering of Advanced Distributed Systems (30) (TFC)
	Strategy & Management (15) (GMTSC)
Stage 3	Project (60)

**Selected list of past projects:**

1. Fraud investigation in the Telecoms industry using data mining techniques. (Winner of **Best Project within the School of Engineering**).
2. Investigation into the design and development of visualisation techniques of database systems.
3. Design and development of a spatial application for the 2012 Olympics.
4. Migration of a desktop application to a web-based application using Oracle database server and APEX.



Oracle 11g™  
Database Server

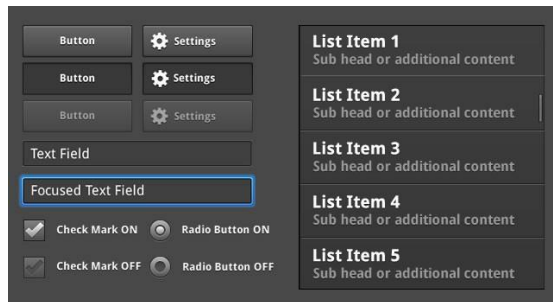


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## ***Career Opportunities***

Graduates from this Programme will provide good preparation for working in the exciting field of ICT. The courses are regularly reviewed so that they meet industry requirements. Typical job functions are data analyst, software and sales engineer, and ICT related research and consultancy. Previous graduates have been working in a range of fields including IT consultancy [HP], logistics [IBI Group], and software development [Microsoft Bangalore]. Here is a selection of testimonials from recent graduates.



### **Kelvin Summoogum - Senior Transportation Consultant** **BEng. MSc ICT, Chartered Member of Institute of Logistics and Transport**

Kelvin is a public sector Intelligent Transport System specialist with a proven track record in managing highly complex technical projects at both strategic and corporate level. He has over 10 years of experience working as an ITS Project Manager with local Authorities and is currently fulfilling a technical advisory role on the London 2012 Olympics. My time at University of Greenwich doing an MSc in ICT has been momentous and has resulted in an increased sense of self esteem and feeling of accomplishment. The 12 months have been arduous but along with that came a rewarding advancement to a high-profile and technically challenging position at the epic-centre of the UK transportation sector. The Medway Campus has been a great place to study, with professional lecturers, great ambiance and top facilities with a state-of-the-art building to support perfect learning environment. Greenwich University has also totally *changed my paradigm about academia v/s practical industry experience. Much of my course had a very strong industry focus and has provided a very good grounding towards consultancy.*

### **Marouen Mraïhi - HP Technical Consultant**

#### **MSc. ICT**



I am from Tunisia and I joined the MSc ICT program in 2006. I graduated the following year. 2 years before I joined the university, I spent a year volunteering in Africa and this inspired me with a new found goal: to use my IT expertise to help disadvantaged people, especially in places where IT is barely used and has enormous potential to give communities access to knowledge and to opportunities. I'm a geek and an activist for ICTs for development. I'm committed to fighting the digital divide, both in my country and in my region. During my time in Africa, I was a trainer in community wireless network workshops sponsored by the Association for Progressive Communication (APC) and IDRC in South Africa, Senegal and Morocco, and before that he was system administrator and staff trainer for the Association Municipalités du Mali in Bamako (Mali) as part of the Cyber-Volunteers program. After graduating from the MSc ICT in the School of Engineering, I went back to Tunisia and began working for HP as a technical consultant for IT Service Management area. I also just obtained the ITIL v3 Foundation certification thanks to what I have learned on my degree in the UK.

**Syed Iman Rafizadeh -  
MSc. ICT with Distinction – (Sept 2009-2010)**



I had one year full of valuable experience at the University of Greenwich. The M.Sc. ICT programme has not only exposed me to professional environment but also developed my analytical thinking and problem solving skills. Medway campus has been exceptional with cutting-edge and well-equipped facilities such as Drill Hall Library with open access to IT facilities and comfortable environment. Furthermore, the ICT lecturers have been greatly helpful and friendly as well as encouraging and inspiring. The ICT courses have given me profound knowledge and skills to conduct professional research. Those skills were practically demonstrated in my highly successful M.Sc. dissertation which included a combination of IT and Business skills. The nature of ICT programme has confidently prepared me to take professional positions. The strong academic background that I gained during this one-year programme, has given me great confidence to fulfil my personal goal which is to work at the forefront of Information Technology and provide innovative solutions to businesses.

**Mazeen Mahfal -  
MSc. ICT with Merit – (Sept 2009-2010)**



I obtained my MSC in ICT from the school of engineering in 2010. The ambience of the University was very welcoming and all throughout I enjoyed my course. Its massive library and the very well equipped computer labs were a great advantage. All the tutors were very approachable, encouraging, and supportive. The syllabus of this course contained a wide range of topics which broadened my knowledge in many spheres rather than narrowing my mind on one particular area. This enabled me to have wider options in the current job market. The students came from various countries with different backgrounds, this diversity added value to the whole university experience. I must admit that this course made me confident to face any challenges that I might come across in a job. I am pleased that I have been successful in securing a job at British Telecom – one of the leading FTSE 100 companies in the UK as an IT Accounts Manager.

### ***Who Might Apply?***

New or recent graduates in engineering, management, computer science or other disciplines who wish to work in, or provide service to the ICT industry are encouraged to apply. We particularly welcome IT professionals, engineers or managers currently work in industry to take either the part-time route to extend their qualifications and update their knowledge.

### ***Entry Dates***

The program has 2 starting dates in a year: The September starting date and the January starting date.

### ***Entry Requirements***

As with all engineering programmes, an important criterion for entry to the MSc is the interest and commitment of a student towards the programme. Interviews will be held if there is an element of doubt, but in addition all students will be offered the opportunity of discussing their application in person with the School's Admissions Co-ordinator, Programme Leader or appropriate Head of Department.

Students are expected to show a proficiency in English. For International students an English qualification such as IELTS of 6, a TOEFL of 550 (paper based), or equivalent is required. Entry will usually be by one of the following:

- The normal entry requirement for the MSc is a first degree in a science, technology or management discipline with at least a second class award.
- Students with overseas qualifications will be considered on an individual basis.
- Students without a first degree, but with appropriate professional and vocational experience, e.g., with Incorporated Engineer or Chartered Engineer status, may be considered for the programme subject to demonstrating the potential to succeed on the programme.

### ***The Academic Team***

The programme is delivered and managed by a recognised team of experts with combination of excellent academic reputation and industrial experience in ICT, research & development and project management.

Program Delivery Team (course coordinators):

Prof. James Gao: [http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory/Profiles/GaoJames](http://www.gre.ac.uk/schools/engineering/contact/staff_directory/Profiles/GaoJames)

Prof. Predrag Rapajic: [http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory/Profiles/RapajicPredrag](http://www.gre.ac.uk/schools/engineering/contact/staff_directory/Profiles/RapajicPredrag)

Ismael Essop: [http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory/Profiles/EssopIsmael](http://www.gre.ac.uk/schools/engineering/contact/staff_directory/Profiles/EssopIsmael)

Dr. Alec Coutroubis: [http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory/Profiles/CoutroubisAlec](http://www.gre.ac.uk/schools/engineering/contact/staff_directory/Profiles/CoutroubisAlec)

Radi Doncheva: [http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory/Profiles/DonchevaRadi](http://www.gre.ac.uk/schools/engineering/contact/staff_directory/Profiles/DonchevaRadi)

### ***For further information please contact:***

The Admissions Co-ordinator

Medway School of Engineering, University of Greenwich at Medway Chatham Maritime, Kent ME4 4TB, UK.

Telephone: +44 (0)1634 883495

Fax: +44 (0)1634 883153 Email: [eng-courseinfo@gre.ac.uk](mailto:eng-courseinfo@gre.ac.uk) Website: [www.gre.ac.uk](http://www.gre.ac.uk)

# COURSE SPECIFICATIONS

LEVEL M (Compulsory)

Research Methodology ([Professor James Gao](#))

Database Security and Administration ([Ismael Essop](#))

E- Technology ([Ismael Essop](#))

Engineering of Advanced Distributed Systems ([Radi Doncheva](#))

Strategy and Management ([Dr Alec Coutroubis](#))

For individual web pages of course coordinators please visit

[http://www.gre.ac.uk/schools/engineering/contact/staff\\_directory](http://www.gre.ac.uk/schools/engineering/contact/staff_directory)

<b>Course Code:</b>	<b>ELEC0023</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>Research Methodology</b>		
<b>Course Coordinator:</b>	<b>Professor Dr James Gao</b>		
<b>Level: M</b>	<b>Credit: 15</b>	<b>Department:</b>	<b>Systems/CCE</b>

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## **Introduction and Rationale**

A thorough appreciation of methodologies of research is essential to engineers involved in research and development projects. Such methods also form an essential part of the individual project undertaken on MSc programmes, which is itself research based.

## **Aims**

To equip students with perspectives in the philosophy, methodology and communicative skills required to undertake effective scientific and engineering research.

## **Learning Outcomes**

On successful completion of the course, the student will be able to:

- carry out a comprehensive literature survey on a selected topic using computer database and library facilities;
- identify the current status of a particular research area and define the current state of art in that research area;
- identify and formulate further research which could usefully be undertaken in a defined area of technology;
- plan a research project, including the definition of objectives, project management, experimental design and data collection and processing within time and resource constraints;
- undertake research using logical and effective methodologies;
- communicate with peers in a given technical field by way of conference and journal publications.

## *Indicative Content*

**Introduction.** Research, researchers, research methodology.

**Literature survey.** Surveys using CD-ROMs, on-line databases, inter-library loan facilities, private communications, etc. Identification of a technical area worthy of research, definition of the state of the art in the given field, definition of the research project, and research proposals.

**General knowledge of research.** Choosing the field of interest, seeking opportunities, choosing topics. Concept of originality. Background theory, focal theory, data theory. Financial aspects. Timetabling and time management. Filing and data management. Research contracts and agreements. Confidentiality, intellectual property rights, design rights and registered designs, patents, patent rights and know-how, copyright and copying, royalties.

**Research process.** MSc research projects. MPhil/PhD research projects. Academic research, industrial R&D. Project proposals, theories, data collection, data analysis and presentation. Publication of research results.

**Publications.** Structure, content and procedures. Project reports and theses. Journal and conference papers. Technical Presentations. References. Submission, refereeing and modifications.

**Presentations.** Objectives, contents, structure. Audience analysis. Rehearsal and delivery. Design of visual aids. Use of computerised projection facilities. Multi-media approach.

**Data Analysis.** Statistical analysis. graphical techniques. Experimental design. Problem solving.

<b>Course Code:</b>	<b>COMP 1622</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>Database Security &amp; Administration</b>		
<b>Level:</b>	<b>7</b>	<b>Credit:</b>	<b>30</b>
<b>Department:</b>	<b>Computer and Communications Engineering</b>		
<b>Course Coordinator:</b>	<b>Ismael Essop</b>	<b>Pre-requisites:</b>	<b>None</b>

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### **Introduction and Rationale:**

This course aims to cover some aspects of data management that are critical to anyone who will be involved in managing and securing database systems and applications. Nowadays databases contain much sensitive personal information. Thus it is crucial to design systems which can limit the disclosure of private information. Administration of a database in its widest sense, in addition to its creation, includes tasks such as maintenance, the management of users and the implementation of a diverse range of security mechanisms to prevent unauthorized access or intentional or unintentional damage to the data. This will allow the students to have a balanced view of what the system can do or how a particular application can be executed more efficiently or implemented better.

### **Aims:**

- To monitor and manage a database management system [DBMS] using established industrial techniques.
- To critically review security measures on the database to protect the data from a variety of security violations.

### **Learning Outcomes:**

On completion of the course the student will be able to:

- explore in detail the key components of a DBMS's physical and logical architecture,
- apply a range of tools and techniques that support the database administrator's activities,
- demonstrate a critical appreciation of the principal challenges that have to be addressed in the development of secure database system,
- critically assess secure policies to guard proprietary data against unauthorized access.

**Indicative Content:****Installation:**

DBMS' architectural components and administration tools, managing an instance and creating a database,

**Enterprise tools:**

Using data dictionary views, managing control/redo log files, managing tablespaces, etc..

**Security problems in databases:**

Threats and security controls, designing database security, developing security plans, controlling user access, virtual private databases, sql injection, database auditing.

<b>Course Code:</b>	<b>ELEE 1018</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>E-Technology</b>		
<b>Level:</b>	<b>7</b>	<b>Credit:</b>	<b>30</b>
<b>Department:</b>	<b>Computer &amp; Communications</b>		
<b>Course Coordinator:</b>	<b>Co- Ismael Essop</b>	<b>Pre-requisites:</b>	

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**Introduction and Rationale:** This course provides the core knowledge and understanding for the 'E' Engineering programme. Students who need want to be part of teams with enterprises that are developing or looking to develop 'E' commerce, Business to Business Communications solutions or virtual environments will be typical of the cohort.

**Aims:**

- To ensure that students are aware of the range and diversity of technologies and the challenges they pose to businesses and enterprises that wish to take advantage of these technologies to support, enhance their businesses or work in this area of product development.
- To ensure that all students have a broad understanding of the possible applications of 'E' technologies in enterprises and are familiar with the methods of implementation.

**Learning Outcomes:**

On successful completion of the course the student will be able to:

- demonstrate reflective and critical process in the review of existing 'E' business applications;
- understand the challenges of developing 'E' (& 'M') applications with particular reference to existing IT systems and 'Virgin Territory' innovation;
- to recognise and use an establishes system development methodology to design and build e-systems;
- explore, reflect and evaluate a range of methods & technologies available to business in developing products and systems in this area.

**Content:****Review of applications:**

Mobile, e-learning, b2b, e-government

**Architectures of applications:**

Client-server, 3 tiers, cloud, scalability of e-systems, performance issues, information and systems architectures.

**Modelling:**

Systems modelling, web development methodology (such as WebML) wireframes.

**Implementation:**

SQL, PL/SQL, HTML, Oracle Application Express.

<b>Course Code:</b>	<b>ELEE 1054</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>Engineering of Advanced Distributed Systems</b>		
<b>Level:</b>	<b>7</b>	<b>Credit:</b>	<b>30</b>
<b>Department:</b>	<b>Computer &amp; Communications</b>		
<b>Course Co-ordinator:</b>	<b>Radi Doncheva</b>	<b>Pre-requisites:</b>	

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## **Introduction and Rationale**

Students who see their future in the development of distributed software systems need a solid understanding of the challenges and opportunities and underpinning technologies associated with such systems. This course is designed to build upon students' knowledge of classical software engineering and programming techniques and enhance it with up-to-date methods and techniques on how to design, implement and test large distributed software systems within various industrial application areas.

## **Aims**

- To develop students' in-depth understanding of the technical challenges associated with distributed software systems development.
- To provide students with an understanding of the up-to-date technologies used for distributed software systems building
- To provide students with relevant background in distributed software systems' applications in various business areas
- To develop students' ability to build distributed software systems.

## **Learning Outcomes**

At the end of the course the student will be able to:

- demonstrate a thorough understanding of the distinctive nature of widely differing industrial and commercial distributed software systems
- identify the key features of distributed software systems with particular attention to technical and management challenges
- demonstrate the ability to develop distributed software systems in various application areas
- reflectively compare and contrast various available technologies for distributed software systems building
- demonstrate an in depth understanding of distributed software models and their applications in various industrial areas.

## **Indicative Content**

- Process modelling for distributed software systems
- Investigation of distributed software systems technologies (e.g. client/server systems, multi-agent systems)
- Methods and tools for multi-agent systems development in various business domains and application areas
- Methods for data mining and data warehousing
- Methods and techniques for distributed systems programming

<b>Course Code:</b>	<b>GEEN 1016</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>Strategy and Management</b>		
<b>Level:</b>	<b>M</b>	<b>Credit:</b>	<b>15</b>
<b>Department:</b>	<b>Systems Engineering</b>		
<b>Course Co-ordinator:</b>	<b>Dr Alec D. Coutroubis</b>	<b>Pre-requisites:</b>	<b>None</b>

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### **Introduction and Rationale:**

The inclusion of management studies in postgraduate engineering programmes acknowledges the importance of the knowledge and practice of management at a strategic level. Such knowledge is fundamental for engineers in management positions in industry and is an educational requirement / prerequisite endorsed by the Engineering Council. This course provides the essential background knowledge that technology managers require for the understanding of the theory and the practice of strategic issue management.

### **Aims:**

- Developing an in-depth understanding of the strategic vision and the decision making process and the link with operational management.
- Developing the knowledge and skills required for measuring competitiveness and the impact of the remote and operating environments.
- Understanding the boundaries and mechanics of the value chain.
- Understanding the importance of the dynamic design of the portfolio of offers and the respective roles of the corporate parent and the strategic business units in the ownership of capabilities and competences.
- Comprehending the importance of corporate culture, the certainty of change and options available in the competitive arena.
- Understanding the role of stakeholders and the importance of issue handling, including corporate governance.
- Understanding the importance of strategic planning, management and control
- Providing a conceptual framework as an under-pinning for particular issues and examples.

### **Learning Outcomes:**

On successful completion of this course the student shall be able to:

- Reflect on the importance of strategic planning in engineering management. Understand the importance of developing a 'positive' attitude towards the subject.
- Demonstrate their ability to critically reflect on impact of organisational culture and its leadership on the structure, management and performance of an organisation

- Demonstrate their ability to reflect on the environmental factors affecting an organisation and by using analytical tools determine the organisation's position in the competitive arena
- Demonstrate their ability to critically reflect and compare available options and formulate choices for the successful advancement of an organisation
- Become familiar with available investment analysis tools and demonstrate their ability to critically select the ones that are more relevant and appropriate for specific evaluation applications
- Demonstrate their ability to critically reflect on the options available for strategic growth and based on such reflection be able to formulate original ideas and innovative proposals
- Appreciate the value of change in modern management and demonstrate their ability to formulate innovative proposals for the management of the planned or the unanticipated change
- Demonstrate their ability to critically reflect on significance of strategic control for the current and future operation of the corporation
- Demonstrate their ability to reflect on the complexities in selecting a portfolio and its relationship in knowledge acquired through in depth understanding of the operating environment
- Demonstrate their ability to critically reflect on the issues of establishment of the portfolio of in a dynamic environment and the value of innovative alternative
- Demonstrate their ability to critically reflect on the complex issues of ongoing portfolio management in a changing environment
- Demonstrate their ability to deliver recommendations on the outcome of their investigation into a manufacturing company's affairs and be able to defend their original arguments and proposal under the scrutiny of a public debate.

#### **Indicative Content:**

- Introduction to Corporate Strategy, Vision
- Overview of General Strategy Design Framework
- Managers & Leaders and Engineers in Management
- Organisational Culture
- Mission Statements
- The Business Environment – Competitor analysis
- SWOT and PEST Analysis
- Strategic Options
- Investment Analysis, Financial Accounting and related issues
- Strategic Choice
- Strategic Change Management
- Strategic Control
- Portfolio Identification
- Establishing the Portfolio and Ongoing Portfolio Management

<b>Course Code:</b>	<b>COMP 1621</b>	<b>School:</b>	<b>Engineering</b>
<b>Course Title:</b>	<b>Advanced Database Applications</b>		
<b>Level:</b>	<b>7</b>	<b>Credit:</b>	<b>15</b>
<b>Department:</b>	<b>Computer and Communications Engineering</b>		
<b>Course Co-ordinator:</b>	<b>Ismael Essop</b>	<b>Pre-requisites:</b>	<b>None</b>

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### **Introduction and Rationale:**

The course is designed to be of interest and use to anyone who wishes to be involved with more advanced database development concepts. This course will expose the students to the challenges faced by organizations in providing productive and user-friendly interaction with database management system software. There will be a strong focus on the use of SQL queries and their impact on database performance, particularly on the web platform. Finally, the students will have an opportunity to explore some emerging database application areas where they can develop an interest to pursue some more advanced research at a later stage.

### **Aims:**

- To design and develop complex web-enabled database applications.
- To gain an insight into special topics in database applications, such as data mining, spatial databases, mobile databases, multimedia databases etc..

### **Learning Outcomes:**

On completion of the course the student will be able to:

- build a fully functional web-based applications using established methodology optimized for the unique challenges of high-volume web applications,
- demonstrate an ability in the use of advanced SQL features of database management system, such as triggers, stored procedures, PL/SQL,
- reflect and address performance issues related to database development,
- explore and critically reflect the state of database research in areas such as engineering, science and businesses.

**Indicative Content:**

**Data Warehousing and Data Mining:**

Pre-processing, classification and prediction, clustering.

**Transaction:**

Management, ACID properties, concurrency, locking mechanisms.

**Research topics in databases:**

Multimedia, spatial, distributed databases, query optimization.