

750741, Mobile and Distributed Computing

3 hours per week, 3 credit hours, prerequisite: **none**

Teaching Method: 37 hours Lectures (2-3 hours per week), 8 hours Seminars (1 per 2 weeks)

Aims: The goal of this module is to provide an in depth understanding of the fundamental problems in

the area of mobile computing and study the existing and proposed solutions for these problems from both research and development perspective. Several topics including wireless communication, location management and mobility tracking, software engineering for mobile computing and applications are covered in this module.

Learning Outcomes:

On completion of this module, the student should:

- Understand the area of mobile computing.
- Have knowledge on some aspects of software engineering for mobile computing.
- Be able to do a research work in mobile computing.

Textbooks and Supporting Materials:

I. Textbooks

1. K. S. Gupta, F. Adelstein, G. Richard and L. Schweibert, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill, 2004.
2. J. Schiller, Mobile Communications, Second edition, Addison Wesley, 2003.
3. Bhaskar Krishnamachari, Networking Wireless Sensors, Cambridge Press, 2005.
4. C. E Perkins, Ad-Hoc Networking, Addison Wesley, 2001.
5. Formal Methods for Mobile Computing, 5th International School on Formal Methods for the Design of Computer, Communication, and Software 2005, Advanced Lectures Series: Lecture Notes in Computer Science, Vol. 3465.

6. Pan, Yi and Xiao, Yang, Design and Analysis of Wireless Networks, Wireless Networks and Mobile Computing, Volume 1, (Georgia State University) Pan, Yi - Series Editor, 2005.

II. Selected research Papers

III. Selected Mobile Programming Environments.

Synopsis:

1. Introduction to Mobile and Pervasive Computing: Mobile and wireless networks (cellular, ad hoc, sensor based); Applications (data broadcasting, context-aware); Challenges.
2. Mobile Networking: Mobile-IP; Ad-Hoc Networks; Sensor Networks; Wireless TCP; Session Mobility.
3. Mobility Management: Location management scheme; Handoff schemes.
4. Software Engineering for Mobile Computing: Mobile Computing Models; Formal methods for Mobile Computing: Software Architectures for mobile Systems, Languages.
5. Mobile Applications and Services: Mobile Agents; Transcoding and Proxy Architecture; Wireless Web and WAP; Peer-to-Peer Computing in Mobile Ad-Hoc Environment

Assessment: Two 1-hour midterm exams (15% each); Assignments (10%); Seminars (10%); 2-hours

Final Exam (50%)