TEL3213 MOBILE COMMUNICATIONS SYSTEMS

Hours per Semester				Weighted Total Mark	Weighted Exam Mark	Weighted Continuous Assessment Mark	Credit Units
LH	PH	TH	CH	WTM	WEM	WCM	CU
45	30	00	60	100	60	40	4

Rationale

This course discusses component and system concepts in mobile communications and their applications in different life scenarios.

Course Objectives

- To understand the application of information theory and digital communications concepts in the design of mobile communication systems.
- To appreciate the operational conditions and constraints of today's mobile communication systems and appreciate the requirements of tomorrow's systems.

Detailed Course Content:

Introduction: **[6 Hours]**
Overview of wireless communication systems; Paging and 1st generation cellular services; Transition from analog cellular to digital cellular (US vs. European experience); Features and services of 2G, 2.5G, 2.75G, and 3G systems (i.e. advanced calling services, mobile data, mobile internet, and etc.).

Wireless Communication Concepts: **[6 Hours]**
Propagation models; multiple access methods; Wireless layer protocols; Antennas

Cellular System Concepts: **[8 Hours]**
Market and technology overview; Cell splitting; Cellular system economics, cellular design concepts; intersystem operation and roaming

Personal Communications Services: **[10 Hours]**
Overview, PCS philosophy, Advanced calling services and features, Worldwide spectrum allocations and implementations; 2nd Generation FDMA/TDMA Cellular Systems: over-the-air design concepts; Handoff; Roaming; Security; CDMA Cellular Systems: CDMA concepts; IS-95 (CDMAone) – over-the- air design concepts; IS-95 Handoff; Power Control; Security; CDMA2000

Transition to Third Generation GSM (2.75G): **[8 Hours]**
GSM data service evolution from circuit-switched to packet-switched, packet switching center, Mobile IP; SMS, MMS, E-SMS; GPRS and EDGE (EGPRS); WCDMA – The move to 3rd Generation GSM: Over-the-air concepts; Handoff; Power Control; Security; HSDPA and HSUPA Competitive/Complementary Technologies: Satellite Mobile Systems; WiFi and WiMax **[7 Hours]**

Learning outcomes

This subject, along with other subjects within the study area will provide the foundation for further work within the area of modern wireless communication systems, within Norwegian telecom companies or for further research (Ph.D studies).

Method of Teaching /Delivery

The course will be taught by using lectures, tutorials and assignments.

Mode of Assessment

Assignments, tests and final examination. Their relative contributions to the final grade are :

Requirement	**Percentage contribution**
Course work (Assignments, tests)	40
% Final examination	60
% **Total**	**100%**

Recommended Books and References

- T.S.Rappaport, "Wireless Communications: Principles and Practice, Second Edition, Pearson Education/ Prentice Hall of India, Third Indian Reprint 2003.
- R. Blake, " Wireless Communication Technology", Thomson Delmar, 2003.
- W.C.Y.Lee, "Mobile Communications Engineering: Theory and applications, Second Edition, McGraw-Hill International, 1998.

Possible Lecturers:

Dr. J. Butime
Dr. D. Okello
Dr. Ing. L. L.
Kaluuba Mr. D.
Nsubuga Mubiru
Mr. S. Mwanje
Mr. A Wasswa Matovu
Mr. D. Sebbaale
Mr. I. Kitone