



Mehran University of Engineering and Technology, Jamshoro
Department of Software Engineering

ORIGINAL SUBMITTED SYLLABUS

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| Title of Subject | : | Computer Network Design & System Security |
| Code | : | SE880 |
| Discipline | : | Software Engineering (1 st Semester) |
| Effective | : | 19PhD-IICT Batch and onwards |
| Pre-requisite | : | None |
| Assessment | : | 10% Sessional 30% Mid Semester 60% Final Semester Examination |
| Credit Hours | : | 03 + 0 |
| Minimum Contact Hours: | | Marks : 100 |

Specific Objectives of course:

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

- Explain key concepts of information security such as design principles, cryptography
- Apply various security and risk management tools for achieving information security and privacy.
- Identify appropriate techniques to tackle and solve problems in the discipline of network security.

Course outline:

- Introduction, Protocols and standards: Definition and Uses of Computer Network, Classification of Computer network, Network Architecture, Internet Standards, Internet Administration; Overview of reference models: H/W selection. , Telephone networks, networking principles.
- Overview and architectures, Deployment, Error Control, Rate Adaptation, Spatial re-use, Cellular re-use, Frequency Allocation, Power Control, Adhoc Networks, Routing in Adhoc networks, making best use of broadcast, mobility.
- Overview of Cryptography and Wireless Networks, Security in Wireless LANs, Security in Cellular Networks, Bluetooth Security, Ad hoc and sensor network security.
- Cellular technology to 2G, 3G,4G and 5G as well as the emergence of WLAN and WPAN as broadband ad hoc networks.
- Internet protocols: Internet basics, IP, TCP, UDP, ICMP, HTTP; World Wide Web (WWW), Security in Internet, E-mail Security.

Economics of security ,User-centered design of security systems ,Cryptographic primitive design ,Security modeling ,Foundational cryptography ,Threat assessment and analysis ,Protocol design
Provable security, Security heuristics, Lightweight cryptography, Malware, Network security, Privacy, Security auditing, Security and computer forensics, Trusted computing.

BOOKS RECOMMENDED

1. Peterson I.; Davie B., "Computer Networks A Systems Approach", Prentice Hall, Latest Edition.



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2. Kurose J.F.; Rose K.W.; "Computer Networking — A Top Down Approach Featuring the Internet", Addison-Wesley, Latest Edition.
 3. Stevens W.R.; "TCP/IP Illustrated, Volume I, Addison-Wesley, Latest Edition.
 4. Stevens, "UNIX Network Programming, vol. 1: Networking APIs: Sockets and XTI," Latest ed.
 5. Computer Security: Principles and Practice (Latest Edition), by William Stallings and Lawrie Brown.
 6. Guide to Wireless Network Security, by Vacca
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Approval:

Board of Studies:

Res.No.01

Dated:25-09-2018

AS&RB:

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Academic Council:

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