# Meru University of Science and Technology
# School of Computing and Informatics
# Department of Computer Science

**Course Title: DATA COMMUNICATION AND NETWORKS**

**Course Code: CIT 3152**

**Year of study:** ONE **Semester:** TWO

**Pre-requisite** CIT 3117

## Purpose of the Course

This unit of study prepares gives an in depth understanding in the areas of data communications and networking.

## Expected Learning Outcomes

At the end of this unit of study, the student should be able to:

a) Explain fundamental principles of data communications and networks.
b) Describe current networking technologies, services and solutions.
c) Relate data communication with computer networks.

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| Week 1 | Introduction to Data communication &networks | • Data Communications Concepts<br>• DTEs, DCEs. Interfaces, standard codes. |
| Week 2 | CAT 1 | Introduction cit 3152 and 3117 computer networks |
| Week 3 | Transmission medium | • Transmission modes<br>• Categories of cables<br>✓ Guided<br>✓ Advantages and disadvantages |
| Week 4 | Transmission medium | • Categories of Cables<br>✓ Unguided |
| Week 5 | Standards in telecommunication | • Examples & Reasons for standards<br>• ISO model |
| Week 6 | Standards in telecommunication | • TCP/IP<br>• Structure and functionality<br>• LANS<br>✓ Advantages |
| Week 7 | Standards in telecommunication | • LANS<br>✓ Topologies<br>✓ Examples of LAN protocols |
| **Week 8** | **CAT 2** | |
| WEEK 9 | Internetworking. | • Networking equipment's<br>• IP addressing:<br>✓ classes, public vs private,<br>✓ static vs dynamic, |
| WEEK 10 | End to End Communication | • Packet switching |

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| | | • Circuit switching networks. |
| WEEK 11 | Wireless Telecommunication:<br><br>GROUP ASSIGNMENT submission | • cellular and CDMA, GSM/TDMA/GPRS; Wi – Fi. TCP over MPLS.<br>• Multimedia Communications QoS: Performance and quality issues.<br>• Multiplexing<br>. |
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| WEEK 12 | Voice digitization and Carrier systems<br><br>Voice over IP (VOIP).<br>Security issues | • Carrier Systems<br>✓ DS0 – DS3<br>• SONET and ISDN<br>• VPNs.<br>• ISPs |
| Week 13 | Access and security issues.<br>Revision | Security breaches |
| WEEK 14 &15 | EXAMINATION | |

LECTURER: DOROTHY M. KALUI

Mobile : 0717544508 or 0784661850 (NOT TWIN SIM)

Consultation Hrs : Fridays 9,00am – 1.00 pm

**Mode of delivery**

Lectures,and individual and group assignments and exercises –(no practical )

**Instructional Materials**

Overhead projector and laptop, handouts, white boards, appropriate

**Course Assessment**

| Type | Weighting (%) |
|---|---|
| Examination | 70% |
| Continuous Assessment (2 sit CATs in and group assignment) | 30% |
| Total | 100% |

**Core Reading Material**

1. Jerry FitzGerald, Alan Dennis (2005). Business Data Communications and Networking (8th Edition). John Wiley & Sons, Inc. ISBN: 0-471-65924-X. YES SHELVES
2. Victor Olifer, Ukerna (2005). Computer Networks: Principles, Technologies and Protocols for Network Design. John Wiley & Sons, Inc. ISBN: 0470869828

**Recommended reference material**

1. James F. Kurose and Keith W. Ross (2002). Computer Networking: A Top-Down Approach Featuring the Internet(2nd Ed.) Addison-Wesley. ISBN: 0201976994.
2. Alberto Leon-Garcia and Indra Widjaja (2000). Communication Networks: Fundamental Concepts and Key Architectures. McGraw-Hill. ISBN: 0-07-242349-8.