EN1054 Introduction to Telecommunications Engineering
Semester 2, 2025

Department of Electronic and Telecommunication Engineering
University of Moratuwa

1 Introduction

The assignment is to create and present a poster on a topic of your choice and be approved by the lecturers in charge of EN1054. Students will work in groups of 3.

Learning Outcomes

- Recognize the historical evolution, the current status, concerns, and future trends of the telecommunications industry.

- Carry out a simple independent research on a given topic related to, or extending the course content.

- Create a poster to present information in a concise, informative and attractive manner.

Deliverables

- A smart poster of A2 size with links (QR Codes) to further reference sources

- A list of reference sources you used in your study

- A short oral presentation of your poster

Evaluation and deadlines

- Evaluation will be based on the level of achievement of the outcomes listed above.

- Submission of the interim poster: 23rd June 2024. (Feedback will be given after the interim submission)

- The date for the final submission and presentation will be notified in due course.

2   Topics

Communication Theory

- Millimetre-wave and terahertz communications

- Molecular communications

- Physical layer security and privacy

- Semantic communications

- Source coding and data compression

Mobile and Wireless Networks

- Reconfigurable wireless networks

- Integration of terrestrial and non-terrestrial networks

- Wireless mesh networks

- UAV networks

- Cell-free wireless networks

- Medium access control

- Routing and path selection

- Flow and congestion control

IoT and Sensor Networks

- Protocols, architectures and applications for IoT

- Tactile Internet and AR/VR technologies

- Connected car, automotive, intelligent transportation

- Underwater and underground sensor and actuator networks

- Wearables, body sensor networks, smart portable devices

- Aerial IoT networks

- Artificial intelligence and machine learning for IoT

- Security, privacy, and trust issues in IoT networks

Green Communication Systems

- Energy-efficient communications, computing and networking

- Green optical wireless communications

- Green wireline communications and networking

- AI for energy efficiency and green operation in communication systems

- Standardization, policy and regulation for green communications and computing

Next-Generation Networking and Internet

- Free Space Optical (FSO) networks and Visible Light Communication (VLC)

- Future Internet and next-generation networking architectures

- Hybrid fiber-coax (HFC) networks

- Mobile Cloud Computing (MCC) and Mobile Edge Computing (MEC)

- Networking flying vehicles such as UAVs and drones

- Software Defined Radio (SDR) and cognitive radio networks

- Routing and switching

- Internet economics, pricing, accounting, and growth modeling

e-Health

- Telemedicine and mobile telemedicine

- Wearable medical wireless sensors

- In-body medical sensor communications

- Satellite-based remote e-Health

- Autonomic diagnosis and situation awareness (Fall, Activity, etc.)

Miscellaneous

- Wi-Fi sensing for indoor positioning and target detection

- Satellite and space communications and networking

- Smart grid and power line communications

- Artificial Intelligence for social networks and applications

- Quantum communications