



University
of Glasgow

Digital Communications UESTC4004 Course Guide

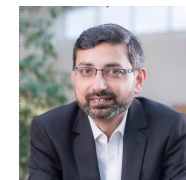
**WORLD
CHANGING
GLASGOW**

**THE AWARDS
2020** | **UNIVERSITY
OF THE YEAR**



Teaching Team

- Dr Kayode Onireti(course coordinator)
Oluwakayode.Onireti@glasgow.ac.uk
- Dr Sajjad Hussain
Sajjad.Hussain@glasgow.ac.uk
- Prof Muhammad Imran
Muhammad.Imran@glasgow.ac.uk





Course Aims

This course aims to introduce the theory and systems engineering of modern digital communication systems and enhance understanding of communication systems protocols.



University
of Glasgow

Intended Learning Outcomes

- Explain the fundamentals of digital communications.
- Solve the standard problems related to the Physical Layer of a communication system.
- Critically analyse the performance of various Physical Layer blocks of a communication system.
- Design a typical communication system with given constraints.
- Develop a digital communication system using appropriate simulation tools.



Course Syllabus

- Digital Modulation and Demodulation/Detection
- Channel and Source Coding
- Synchronization
- Multiplexing and Multiple Access
- Orthogonal Frequency-Division Multiplexing (OFDM)
- Communications Link Analysis



Method of Delivery

- The course consists of 20 lectures and 4 lab sessions
- The course also consists of 2 tutorial sessions
- The use of online interactivity tools – Level Up! & Zoom Polls
- We'll use Moodle Forum for course-related asynchronous discussions.
- Practice sheet made available on the Moodle platform for self-feedback as well as peer feedback.
- Review questions integrated into the lecture slide for self-reflection.



University
of Glasgow

Remote Delivery Arrangements

- Lectures will be delivered online via zoom
- Labs will be MATLAB based simulation to be implemented in the Lab under the supervision of UESTC academics and a team of graduate teaching assistants (GTAs)
- Tutorial sessions will be delivered online via zoom/face to face
- Additional support is available to the students by directly contacting the lecturer via email.



Course Schedule

Lectures

Week 1	Introduction to Digital Communications	Week 9 &10	Channel coding
Week 2	Digital Modulation; Demodulation and Detection	Week 11 &12	OFDM
Week 3	Shannon Capacity; Carrier Recovery	Week 13	Introduction to wireless communication
Week 4	Carrier Recovery; Pulse Shaping	Week 14	The evolution of mobile technologies
Week 5	Channel Equalization	Week 15	LTE and LTE A
Week 7	Multiple access	Week 16	Link Budget; Transmission design at the physical layer
Week 8	Entropy coding		

Labs

Week 7	Modulation/Demodulation
Week 9	Channel Equalization
Week 11	Channel Coding
Week 13	Multicarrier Modulation and OFDM



Labs

- Lab manual is available on **Moodle under “Labs” tab.**
- The assessment criteria for labs is given in the **“Labs”** section on Moodle.
- When you have completed an exercise (milestone) and lab report, you can call a demonstrator to show your work, output and report for grading
- **You must answer all the questions about each exercise**
- **Remember** – most of the lab work can be done at home and therefore you should pace yourself appropriately with all lab sessions.
- **Strongly recommended Pre-lab activity** – opportunity for you to refresh your Matlab skills by following Introduction to Matlab document before your first lab session



Assessments

- **Labs (10%)** – in-class performance evaluation in each lab session. Lab reports are due on Fridays of the weeks following the lab session weeks (11:59pm China Time)
- **Mid-term exam (15%)** – Date to be communicated
- **Final exam (75%)** – Date to be communicated



University
of Glasgow

Requirements for Grade

- To receive a grade at the end of the course, you must:
 - attend all the labs (total 4 lab sessions)
 - attend all the exams (midterm and final)
- If you fail to fulfil any of the above requirement, you will not receive grade, you will be given “CW”.
- CW (Credit Withheld) means that you have not completed some part of the assessment (exam, laboratory report, etc.) but can still do so before the next academic year. Contact the course lecturer if you are in doubt as to what you need to do.

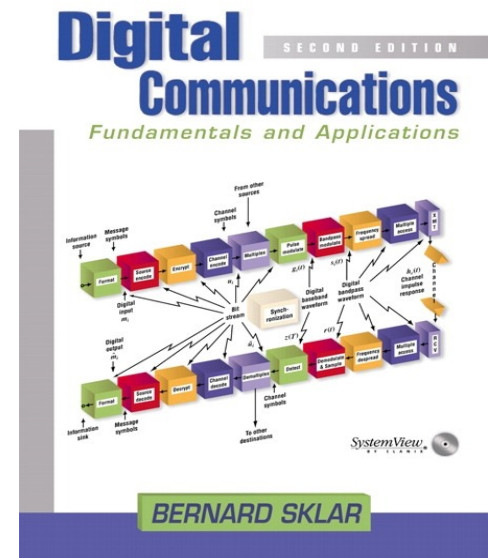


University
of Glasgow

Resources

- Moodle: <https://moodle.gla.ac.uk/course/view.php?id=34359>
- Textbooks: You are **not required** to buy any textbook
- Recommended book for reference

Authors	Title, edition	Publisher	Year	ISBN
Bernard Sklar	Digital Communications: Fundamentals and Applications, 2nd Edition	Prentice Hall	2001	ISBN-13: 978-0130847881, ISBN-10: 0130847887





University
of Glasgow

Tips to Help You Pass the Course

- Attend all the lecture and Lab sessions
- Lots of self-study
- Solve all the questions in the practice sheet, quizzes, and reflect on the feedback provided in the tutorial sessions.
- Solve problems from the book
- Solve past exam papers



Other Key Contacts

- Teaching office contact:

Ruoli Zhong ruoli.zhong@glasgow.ac.uk

Xiaojuan Song Xiaojuan.Song@glasgow.ac.uk

Laboratory contact:

Liling Liu lilingliu@uestc.edu.cn

- Lead GTA contact:

Bang Huang 15320295034@163.com

Complaints Procedure

Follow below process to contact us (more information can be found on Complaints Procedure Policy)

1. Academic Team (course coordinator)



Dr Kayode Onireti Oluwakayode.Onireti@glasgow.ac.uk

2. Programme Director



Dr Faisal Tariq (Coms)



Dr Sajjad Hussein (IE)



Dr Frederic Surre (ME)

3. Co-Director (GC-UESTC CEDI): Prof Kelum Gamage



4. Vice Dean: Prof Joao Ponciano



5. Dean: Prof. Muhammad Imran





University
of Glasgow

Finally, remember

**YOU ARE RESPONSIBLE FOR YOUR
SUCESS**

#UofGWorldChangers



@UofGlasgow