COURSE DETAILS

Credits

This is a 6 UoC course and the expected workload is 15 hours per week throughout the 10-week term.

Relationship to Other Courses

This is a 3rd-year course in the School of Electrical Engineering and Telecommunications.

Pre-requisites and Assumed Knowledge

Pre-requisite for the course: ELEC2134 and MATH2099.

It is essential that the students have shown competency in mathematics, electronics, signals and systems in Year 1 and Year 2. They are strongly advised to review previous ELEC2134 and MATH2099 courses materials.

Following Courses

TELE3113 is a pre-requisite for all professional electives offered for BE in Telecommunications. This course builds the ground for courses like TELE4651, TELE4652, and TELE4653.

Learning outcomes

After successful completion of this course, you should be able to:
1. Have a good understanding of both time and frequency domain representations of signals;
2. Demonstrate competency in analogue modulation and demodulation techniques;
3. Demonstrate competency in digital modulation and demodulation techniques; and
4. Implement noise and error analysis of an analogue or digital telecommunication system.

This course is designed to provide the above learning outcomes which arise from targeted graduate capabilities listed in *Appendix A*. The targeted graduate capabilities broadly support the UNSW and Faculty of Engineering graduate capabilities (listed in *Appendix B*). This course also addresses the Engineers Australia (National Accreditation Body) Stage I competency standard as outlined in *Appendix C*.

Syllabus

Fundamentals: Free space propagation characteristics, Fourier transform, phasors, spectrum analysis, random signals.

Analogue communications: Continuous wave modulation (AM, DSB, SSB, VSB, QAM, FM, and PM)6(o)-9(n)-8(

Lectures

The lectures provide the students with an explanation of the core materials in the course. There will be 4 hours of lectures per week, with corresponding lecture notes.

Tutorial classes

The tutorials enable students to apply various methods to quantitatively analyse the fundamentals of communication systems. You should attempt all of your problem sheet questions in advance of attending the tutorial classes. The importance of adequate preparation before each tutorial cannot be overemphasized, as the effectiveness and usefulness of the tutorial depend to a large extent on this preparation. Group learning is encouraged. Answers for these questions will be discussed during the tutorial class and the tutor will cover the more complex questions.

Laboratory program

The laboratories provide the student with hands-on experience to analyse, design, and test communication systems. The laboratory experiments are concerned with modelling various signals on the one hand, and with carrying out different operations upon signals (e.g. filtering, sampling, demodulating) on the other. This approach intends to provide insights into the properties of, and