SCHOOL OF ELECTRICAL, ELECTRONIC AND COMPUTER ENGINEERING
THE UNIVERSITY OF WESTERN AUSTRALIA

ELEC8344 Power Quality and Corona Noise

**Unit Co-ordinator:** Professor T. T. Nguyen

**Lecturer & Tutor**

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**Assessment**

The course unit assessment comprises an assignment. The assignment submission date is Friday 05 June 2009 (by 5 pm).

All work submitted must be the individual student’s own work. Each submission MUST include a completed Blue Cover Sheet to confirm that work submitted is that of the individual student and has no part been copied or reproduced by plagiarism.

**Penalties**

Assignment will receive 10% (of the assignment assessment) penalty for each day late.

**Faculty Policies**

Unit marks may be scaled in line with the Faculty’s Policy on Assessment Practices and Procedures.


See the University Guidelines on Academic Misconduct at [http://www.ecm.uwa.edu.au/for/students/plagiarism](http://www.ecm.uwa.edu.au/for/students/plagiarism)

See Faculty Policy on Appeals at [http://www.ecm.uwa.edu.au/for/students/exams](http://www.ecm.uwa.edu.au/for/students/exams)


No supplementary examinations will be available for the unit.
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The availability of units in Semester 1, 2, etc. was correct at the time of going to press but may be subject to change.

Credit: 6 points  Availability: Semester 1 (see Timetable)  Old unit code: 624.603, ENGT8344

Outcomes: Students develop an in-depth understanding and technical competence in power quality assessment and harmonic analysis in power systems and evaluating the performance of power transmission lines in terms of their corona power losses and noise.

Content: This unit comprises the following topics: (1) power quality—indices of quality of supply; voltage magnitude variations; system frequency errors; operating imbalances; quantifying waveform distortions; harmonic distortion; sources of harmonics; adverse consequences of harmonics; harmonic measurements; transducers for harmonic measurements; locating harmonic sources by measurements; harmonic analysis methods; parametric techniques; statistical approach to harmonic analysis; network models for harmonic analysis; harmonic resonances; harmonic filtering; optimal harmonic filter design; and (2) corona—corona noise; conductor surface states and weather conditions; evaluation of noise levels; noise data recordings; signal-to-noise ratio and the quality of reception; television interference; noise measurement principles; radio-noise meters; bandwidth; ANSI and CISPR standards; frequency spectrum of noise; discharge pulse waveshape; the excitation function in power spectral-density form; radiated noise fields; lateral profiles and frequency spectra; computer-based evaluation procedures; principal design options; radiated noise fields; comparison of noise field levels for different design options; evaluation of active-power loss due to corona; nonlinear voltage-charge characteristics; dependences of corona loss on weather conditions, conductor surface conditions and surface gradient; separation into reduced loss and reduction factor, and typical loss evaluation.

Assessment: This includes an examination and/or assignments/projects. The examination assesses the students' understanding of the materials related to power quality and corona phenomena discussed in the lectures and tutorials. The assignments/projects test students' competence in applying the methods in solving practical problems in relation to power quality and corona performance of transmission lines.

Supplementary assessment is not available in this unit.

Location: UWA (Crawley)
Mode: on-campus

Unit Rules:
Advisable prior study: assumed prior knowledge in power systems (at a level equivalent to ELEC3305 Power and Machines and ELEC4307 Power Transmission and Control)
Contact hours—52 (lectures: 26 hrs; tutorials: 11 hrs; project: 15 hrs)

Unit Web Page: http://student.ee.uwa.edu.au/units/elec8344
Note: Some unit web pages are still under construction and will be available in 2009.

Note: This is a unit for students enrolled in the Master of Engineering.
**Texts**

Lecture notes together with lists of references are provided.

Assistance with study skills, including English language skills, is available free of charge from Student Services for all enrolled students (see [http://www.studysmarter.uwa.edu.au/](http://www.studysmarter.uwa.edu.au/)). Student Services location: Second Floor, South Wing, Guild Village; telephone: 6488 2423.

*Books and other material wherever listed may be subject to change. Book lists relating to 'Preliminary Reading', 'Recommended Reading' and 'Textbooks' are, in most cases, available at the University Co-operative Bookshop (from early January) and appropriate administrative offices for students to consult. For first-year units the Bookshop will endeavour to make available photocopies of book lists for individual units. Books marked with an asterisk (*) are available in paperback.*

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