ELEC8343 Numeric Protection, Communications and Transducers

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 Faculty Policy on Assessment Practices and Procedures at http://www.ecm.uwa.edu.au/for/students/assess

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

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

See the Charter of Student Rights at http://www.secretariat.uwa.edu.au/home/policies/charter

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: 624.601, ENGT8343

Outcomes: Students develop an in-depth understanding in the area of power systems protection. They achieve a thorough knowledge and technical competence in a wide range of numeric protection systems together with the communications and transducers that support the operation of the protection system.

Content: This unit comprises the following topics: (1) numeric protection—numeric distance protection; elements of signal processing involved; direct online evaluation of impedances using Fourier transform, curve fitting and Kalman filtering; differential equation method based on primary system model; steady-state and dynamic response evaluations; digital current differential protection for transmission circuits; synchronous and non-synchronous data sampling; time alignment of data; numeric evaluation of protection operating and bias signals; digital transformer differential protection; digital techniques for harmonic biasing; digital overcurrent protection; numerical low-impedance busbar protection; (2) communications in power networks—requirements in terms of telemetering, data, control signal and voice communications; transmission media; communication links based on the conductor systems of power lines; microwave; optical fibre; (3) transducers—electromagnetic transducers; wound voltage transformers; capacitor-voltage transformers; current transformers; transducer modelling; frequency and transient response evaluations; and (4) optical current transformer operating principles; fibre optical links; digital outputs; steady-state and dynamic performance requirements; and optical voltage transducers based on electro-optical effect.

Assessment: This includes an examination and/or assignments/projects. The examination assesses the students' in-depth understanding of the subject matter presented and discussed in the lectures and tutorials. The assignments/projects test their ability in applying the theory and materials to solve practical problems related to power systems protection.

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/elec8343
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

Nguyen, T. T. and Humpage, W. D. *Distance Protection*: Energy Systems Centre, The University of Western Australia 1993

Nguyen, T. T. and Humpage, W. D. *Teleprotection*: Energy Systems Centre, The University of Western Australia 1992

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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**CRICOS Provider Code: 00126G**

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