Engineering Scholarship Examinations 2018

Topics for XSCH3101 Engineering Science I: General mathematics and computer science

Coordinator: Assist. Prof. John Waldron (john.waldron@tcd.ie)

This paper contains 8 questions in two parts (Mathematics and Computing). Students to attempt 4 questions, with 2 questions from each part.

2 questions from 1E1, 1E2:
Chapters 6, 7, 8, 9 of the book Calculus by Anton, Bivens and Davis (10th ed) (the text for the course) and Chapter 1 of Elementary Linear Algebra – Applications Version, Anton and Rorres

2 Questions from 2E1:
Chapters 3 - 6 of Anton-Rorres' book "Elementary Linear Algebra (with applications)"

2 questions from 1E3:
Loops, functions and multi-dimensional arrays. Any question will not require detailed specific knowledge of any part of the syllabus, but will be a general problem-solving question such as (from 2008 Foundation Scholarship exam) "Design a program to play othello ... and provide C++ code for specified small parts of the problem."

2 questions from 2E3:
Problem solving using C++ object orientated data structures and algorithms. Includes various number systems covered in 2E3 and binary arithmetic.

Topics for XSCH3102 Engineering Science II: General mechanics and materials

Coordinator: Prof. David Taylor (dtaylor@tcd.ie)


These topics roughly follow the courses and labs associated with 1E4; 1E5; 1E7; 1E10; 2E4.

The paper will have 7 questions, 4 to be attempted.

Topics for XSCH3103 Engineering Science III: General electronics, electricity and instrumentation

Coordinator: Prof. Luiz DaSilva (dasilval@tcd.ie)

1E11 Experimental Methods (2015-16 Syllabus Profs Geraghty, Burke, Caulfield)
Static and Dynamic Characteristics of instruments; Quantifying experimental error and line fitting; Data Conversion: analogue-to-digital conversion; Traffic demand and forecasting.

1E6 Electrical Engineering (Prof. Harte)
Introductory DC and AC Circuit Analysis; Kirchhoff’s Laws; Thévenin’s Theorem; Maximum Power Transfer. Analysis of RC circuit transients. Number representation and binary arithmetic; signed numbers; Boolean algebra and standard forms; Karnaugh map minimisation; combinational design and standard combinational elements

2E6 Electronics (Profs Dowling and Quinn)
AC network analysis; transient analysis; AC power; DC motors and generators; amplifiers and their equivalent circuits; operational amplifiers (op-amps); introduction to analogue-digital conversion.

The paper will have 5 questions, 4 are to be attempted

School of Engineering

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