THE UNIVERSITY OF WESTERN AUSTRALIA
SCHOOL OF MATHEMATICS AND STATISTICS

Short Unit Information – 2nd Semester 2012
MATH3321 3OR: Operations Research

Lecturer: Prof. Song Wang, Rm: 2.29, Tel: 6488 3350, email: swang@maths.uwa.edu.au
http://www.maths.uwa.edu.au/students/units
http://www.maths.uwa.edu.au/~swang/units/3OR.

Prerequisite: Prerequisites: MATH2224 Operations Research.

Assessment: 3 assignments totalling 30%. Final 2-hour Examination 70%.

Text: No text is required. Lecture notes will be put on the website.


Policies: The faculty has policies on assessment, plagiarism, appeal, calculators etc.
For details please see http://www.ecm.uwa.edu.au/students

3OR Outline

(1) Introduction – optimization, consulting, modelling and algorithms.
(2) Linear Programming – Review of basic concepts and notation, formulation and
solution using software.
(3) Project Management and Scheduling – Scheduling a project, use of network, Critical
Path Method (CPM), Programme Evaluation and Review Technique (PERT).
(4) Integer Programming – Formulation and numerical solution by Branch & Bound
and cutting plane algorithms.
(5) Dynamic Programming – Dynamic programming principle, shortest path algo-
ithm, continuous and discrete dynamic programming problems, deterministic dy-
namic programming.
(6) Nonlinear Programming – Types of nonlinear programming problems, 1D search,
gradient based search, non-linear programming in multi-dimensions, convex anal-
ysis, constrained and unconstrained optimisation problems, Langrange Multipliers
method, Kuhn-Tucker conditions.
(7) *Queuing Theory – Examples, exponential distribution, birth-and-death process,
queue models.