

**UNIVERSITY OF NORTHERN BRITISH COLUMBIA
COLLEGE OF SCIENCE & MANAGEMENT
SCHOOL OF BUSINESS**

COMM 251

Fall-2016-Section A1

Management Science

Instructor: Balbinder S. Deo

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Class Schedule:

Class Times:	Wednesday	Class Room
Section A1	8.30 AM to 11.20 AM	5-177

Office Hours: Wed 11.30 AM - 12.30 PM and Thursday 2.30 PM to 3.30 PM or by appointments

BACKGROUND:

One of the basic responsibilities of a manager is to take decisions in addition to the day-to-day operational chores. The students admitted in the business program are offered a package of courses for study to help them learn the art and science of management decision-making process.

Decisions are taken on the basis of inputs from various ends and it may be of qualitative and/or quantitative in nature. In most cases the input provided is too complex to be used in decision-making in raw form and in such cases a manager needs appropriate tools and techniques to make the inputs usable or consumable for decision processes.

Management Science (In some cases, might be titled as Operations Research) is the course that includes various tools and techniques that are useful for processing the complex inputs into usable input/s for decision-making. The knowledge of these tools and techniques makes a manager more efficient in generating the usable inputs from raw data and then using that information for arriving at better decisions. A manager not well versed in the use of these tools and techniques generally remain dependent on some body else for getting complex inputs converted into useful information.

The tools and techniques covered in this course are generic in nature and can be useful not only in Operations Management but also in Marketing, Marketing Research, Accounting and Finance, Civilian as well as Military projects. These tools are also useful to students going in for professions such as Forestry, Engineering, Medicine, Nursing, and other natural and physical sciences.

In fact, the Operations Research tools and techniques were applied in the WW-2 and later its use was recommended and used for Business and other Civilian applications as well.

COURSE CONTENT:

There is large variety of qualitative and quantitative tools and techniques available in literature and all of them cannot be covered in the number classes provided in one semester. However, some of the most commonly usable and useful generic tools and techniques that have applications in Operations Management, Marketing, Marketing Research, Project Management, Accounting & Finance, and also in Civilian and Military projects are going to be discussed.

The topics such as Linear Programming and its applications in various areas; Network models related to Transportation, Assignment of resources, and Transshipment of goods, Shortest routes for cars/trucks, Maximal flow of materials through a system; Integer programming, multi-criteria decisions, Project management, Inventory models, Decision analysis, Waiting line models, and Simulation techniques are the parts of the course package.

In a contemporary business environment, business organizations are trying hard to win over customers on the basis of cost, quality and timely delivery of products and services. To achieve this end, world-class companies work hard to reduce the cost of operations, to improve the quality of their output, and deliver products at customers' doors as and when required in an environment friendly manner. All this happens through taking decisions and the decisions are made using the useful inputs often created by applying the appropriate tools and techniques discussed in Management Science course.

LEARNING OBJECTIVES:

In this course the students are expected to understand and apply the concepts and techniques used in the description and formulation of models, using inputs to come up with useful solutions by using models. The students are also expected to understand and **use common software available with the text book** related to various models and also expected to learn the interpretation of software outputs for decision-making purposes.

TEXT: **An Introduction to Management Science –Quantitative Approaches to Decision Making (14th Edition) by Anderson, Sweeny, Williams, Camm, Cochran, Fry and Ohlman, Cengage Learning-2016, represented in Canada by Nelson Education, Ltd.**

Course Material;

- Students are expected to acquire the textbook for study material, for working on examples in the class and at home, and also for assignments.
- Students also require Student CD or permission to get/use software from/at publisher's website for understanding the use of software and its applications in generating usable and useful input/s to decision making.
- Lectures/class notes would be available on the UNBC / Blackboard

Computer hardware:

Students also need to have a computer of appropriate specifications that can be used to run the software that comes with the textbook or access the software at publisher's website.

SUPPLEMENTS: Reading material may also be distributed in the class if required

COURSE EVALUATION:

Attendance & participation	10%
Homework assignments (To be announced in the class)	10%
Mid-term exam-1	20%
Mid-term exam-2	20%
Final exam	<u>40%</u>
Total	100%

Class:

Students are advised to be punctual and attend classes on regular basis, and are encouraged to respect the class discipline. Students are encouraged to ask questions and to discuss the relevant issues in such a way that it involves the whole class.

Attendance, participation and class discussions:

Students are expected to be aware of the contents of the topics to be discussed in the class. It is the responsibility of the student to keep track of the topics that are already discussed in the class. Participation and attendance marks will be based on attendance, punctuality, positive contribution of students to enrich class discussions, respect for others in the class, and class discipline.

Assignments:

Teacher will announce assignment/s in the class from time to time. It is the responsibility of a student to enquire about an assignment/s if he/she misses a class due to any reason/s. Completed assignments are to be submitted in the beginning of the class on the due date.

There is a possibility of two home assignments to be given (One before the mid-term-2 and the other after mid-term-2) for solving at home. Assignment/s submitting date and time will be discussed and announced in the class.

Assignment/s problems will be selected from the text and other related sources.

Late assignment submission may be accepted with penalty but prior permission is required from the teacher. The penalty would be;

Up to 1 day late = 20%

Up to 2 day late = 50%

Up to 3 day late = 75%

Up to 4 day late = 100%

Understanding the mechanism of problems to be solved will help students to get ready for the exams.

Assignment/s solutions will be marked on the basis of systematic step-by-step mechanism shown leading to the solution. **Systematic step-by-step mechanism leading to the solution is more important than the final answer/s. Students are encouraged to ask questions to the instructor about assignment problems if they get stuck.**

Students are also encouraged to discuss the assignment, after it is marked by the teacher, during office hours.

Note: Numerical problems solved in assignments may be very helpful in exams as well.

Mid-Term & Final Exams:

The format of midterm and final exams is as follows:

Each exam will be having two main parts.

Part A- Short answer type questions (about 30 –40 % weight)

Part B – Problems to be solved (about 60 –70 % weight)

Conduct in examinations

Students must present appropriate identification upon entering the examination room.

Appropriate identification is defined as a UNBC student card and/or some other form of photo identification acceptable to the proctor. The following regulations apply to the conduct of examinations:

- a. Books, papers, or other materials or devices must not be in the possession of the student during an exam except by the express permission of the examiner. Specifically, without such permission no laptop computers, mobile phone sets, handheld electronic devices or the like may be in possession of the student in the examination room (see Regulation 43 (b)).
- b. No candidate is permitted to enter the examination room more than 30 minutes after the beginning of the examination, or permitted to leave within 30 minutes after the examination has started.
- c. Candidates must not communicate in any way with other candidates in the examination room.
- d. Candidates must not leave their seats, except when granted permission by the proctor / invigilator.

- e. Candidates must turn in all materials, including rough work, upon leaving the examination room.
- f. Food and beverages other than water are not permitted in the examination room.

Missing a midterm or exam

Advance notice must be given when a student is unable to appear for an examination. Only duly authenticated bereavement, illness and legitimate reasons are admissible justifications for absence from a scheduled examination (eg. Writing an LSAT or CGA exam and if there is a time conflict).

Do not schedule travel during the midterm exam period and during final exam period!

If you have missed a final examination

Satisfactory explanation, with supporting documentation as appropriate, for any final examination missed must be made by the student or designate to the Office of the Registrar within 48 hours from the time the examination was written.

Within 48 hours of receiving a submission, the Registrar or designate may direct the Program under which the course is offered to arrange the writing of a special examination in the case of an examination which was missed.

Normally, for explanations of sickness, a doctor's certification is required.

GRADING SYSTEM: Grading System (see the Academic Calendar 2013-14)

<u>Excellent</u>	A+	=	90-100
	A	=	85-89.9
	A-	=	80-84.9
<u>Good</u>	B+	=	77-79.9
	B	=	73-76.9
	B-	=	70-72.9
<u>Satisfactory</u>	C+	=	67-69.9
	C	=	63-66.9
<u>Marginal</u>	C-	=	60-62.9
	D+	=	57-59.9
	D	=	53-56.9
	D-	=	50-52.9
<u>Failure:</u>	F	=	0-49.9

Plagiarism and Academic Misconduct

It is the student's responsibility to be aware of UNBC's Academic regulations, policies and procedures as described in the University calendar.

A definition of academic misconduct includes:

Cheating (using unauthorized material, information, or study aids in academic exercise), plagiarism, falsification of records, unauthorized possession of examinations, intimidation and any and all other actions that may improperly affect the evaluation of a student's academic performance or achievement, assisting others in any act, submission of the same work for grades in two courses without permission of the instructor or attempts to engage in such acts.

The regulations on plagiarism apply to all material submitted for a grade: essays, exams, assignments, cases, presentations, quizzes, and practice sets. Any case of suspected academic misconduct will be reported to the campus registrar. If the student is found guilty of academic misconduct there are both grade penalties and disciplinary penalties. Before there is any intention (on your part) or suspicion (on the part of your instructor or your peers) of wrongdoing, please see the instructor to discuss any problems of this nature. If your paper closely resembles a paper from this class or any other class (either written by you or another student, in this semester or any other), this will be considered an infraction of the academic misconduct code.

Respect

Please demonstrate respect to your fellow students who express their thoughts and explore new ideas in the course.

Ethical Standards

The following behaviors are considered unethical:

- Telling the instructor that you "need" a certain grade
- Asking for extra assignments for the purpose of raising a grade
- Asking that the grade be raised because it is very close to the next higher grade
- Asking that the grade be raised because you did very well on one part of the course or grading scheme
- Asking for a higher grade because you don't like the grading scheme
- Asking to be allowed to turn in an assignment late - even a few minutes late - because of computer or printer problems or any other reason
- Asking to be treated better than other students by making an exception to the rules
- Asking for any other unfair advantage in grading.

Missed Quizzes/Midterms

If you have missed a quiz or midterm, the student should contact the instructor immediately to ask permission to make up the missed quiz/midterm. If permitted by the instructor, all makeup test sessions will be held on a Saturday morning at 8:30 am. Please make arrangements with your instructor.

Final Exams

In addition to the above comments on examinations, please see the calendar regarding details on UNBC expectations.

Access Resource Centre

If there are students in this course who, because of a disability, may have a need for special academic accommodations, please feel free to meet with the instructor to review your specific needs or contact the Access Resources Centre located in the Teaching and Learning Centre, Main Floor West Block Room 10-1048 Tel 250-960-5682 or via email arc@unbc.ca For more information, please visit their website www.unbc.ca/arc

Academic Advising

For academic advising please contact the Recruitment and Advising Centre Room 7-714, by email: advising@unbc.ca or via phone at 250-960-6494.

Access Success Centre

For tutoring online or in person; download handouts on writing, math, and referencing; receive study assistance; and much more, please see the Learning Skills Centre. Their website is www.unbc.ca/asc

The Learning Skills Centre is committed to supporting and enhancing student learning and to providing the skills students will need to become life-long learners. Through collaborative partnerships, we offer services and resources that empower students to take responsibility for their own learning. Our students' success is our ultimate measure of accomplishment.

This site provides you with access to:

- Free online tutoring
- Downloadable handouts for writing, study skills, math, and presentation skills
- Access to self-assessment sites for learning styles, grammar, math, etc.
- Information about face-to-face tutoring and how to book an appointment
- Special programs and workshops offered through the Centre

For more information, please contact the Academic Success Centre located in the Teaching and Learning Building, Room 10-2584 or via Tel 250-960-6367 Fax 250-960-5425 or via email asc@unbc.ca. Their website is www.unbc.ca/asc

DISABILITY SERVICES

"If there are students in this course who, because of a disability, may have a need for special academic accommodations, please come and discuss this with me, or contact Disability Services."

DETAILED OUTLINE OF CLASS LECTURES:

Students are required to make arrangements for log-in to Blackboard for information and correspondence. The detailed outline of the structure of class lectures will be posted on Blackboard at least about two days before each lecture. This information may be handy in getting ready for class discussions, taking brief notes if needed, solving problems and getting ready for exams.

COURSE OUTLINE

NO.	TOPIC	CHAPTER
1.	Introduction to management Science	Chapter 1
2.	Introduction to linear programming	Chapter 2
3.	Linear programming; Sensitivity analysis	Chapter 3
4.	Linear programming applications	Chapter 4
5.	Transportation problem	Chapter 6
6.	Assignment problem	Chapter 6
7.	Shortest route, and maximal flow problem	Chapter 6
8.	Integer linear programming	Chapter 7
9.	Project scheduling: CPM / PERT	Chapter 9
10.	Inventory models	Chapter 10
11.	Waiting line models	Chapter 11
12.	Decision analysis	Chapter 13
13.	Simulation	Chapter 12
14.	Multi-criteria decisions	Chapter 14

Tentative Management Science Class Schedule –Fall 2016*- Section A1
Class time: Wednesday from 8.30 AM to 11.20 AM
Class Room # 5-177

1	Sep 07 (W)	Class introduction Course Introduction Introduction to linear Programming	Chapter 1 & chapter 2
2	14 (W)	Linear Programming	Chapter 2 & Chapter 3
3	21 (W)	Linear programming applications	Chapter 3 & 4
4	28 (W)	Distribution & Network Models: Transportation Problems, Assignment Problems, and Transshipment problems	Chapter 6
5	Oct 05 (W)	Mid-term exam 1 Distribution & Network Models: shortest route problem, and Maximal Flow problem	Chapter 6
6	12 (W)	Integer programming	Chapter 7
7	19 (W)	Project Scheduling: PERT /CPM	Chapter 9
8	26 (W)	Inventory Models	Chapter 10
9	Nov 02 (W)	Mid-term exam 2 Waiting line Models	Chapter 11
10	9 (W)	Simulation	Chapter 12
11	16 (W)	Decision analysis	Chapter 13
12	23 (W)	Multi-criteria Decisions/	Chapter 14 Questions from Students
13	30 (W)	Overview or leftover topic/s	
		Final exam	Date & time to be announced by the University

- **There is a possibility of some minor changes in class schedule and the class will be informed about it.**

Balbinder S. Deo