Basic Operations Research Laboratory

SECTION I: Course Overview

Course Code: BUS329DUB / MIS329DUB
Subject Areas: Business, Management Information Systems
Prerequisites: See Below
Language of Instruction: English
Total Contact Hours: 15
Recommended Credits: 1
 *Note: This course must be taken in conjunction with the Basic Operations Management course
(BUS334/MIS334)

COURSE DESCRIPTION

This 1-credit course is assignment-based, using Microsoft's Excel software, and is intended to complement
the 3-credit *Basic Operations Management* course (BUS334 / MIS334). More specifically, it consists of weekly,
one-hour laboratory sessions in which students develop their skills in the application of Excel in order to
resolve Operational Research problems. Emphasis will therefore be placed on the practical implementation
of real world models, building on competencies acquired in the 3-credit BOM course. The laboratory
sessions are informal and students are expected to contribute in a positive manner.

LEARNING OBJECTIVES

The active learning approach intends to enhance the students' competence in building and using models
based on Excel while allowing students to put theory into practice.

Upon successful completion of this course, you will be able to:

- Write comprehensive, clear, and mathematically rigorous analyses that foster decision-making
  processes.

- Create an effective spreadsheet by understanding the importance and relationship of specific
  variables.

- Conduct coherent and effective presentations /defenses.

PREREQUISITES

Prior to enrollment, this course requires you to have completed one introductory course in Business and/or
Information Systems. This course must be taken in conjunction with the *Basic Operations Management* course
(Course Code: BUS334 / MIS334).

CROSS-LISTED COURSE

Due to the interdisciplinary nature of the content, this course is cross-listed with Business (BUS329) as well as Managing Information Systems (MIS329). The instructor will provide directions during the first week of class regarding how to choose your desired course code.

SECTION II: Instructor & Course Details

INSTRUCTOR DETAILS

Name:	TBA
Contact Information:	TBA
Term:	SEMESTER

ATTENDANCE POLICY

This class will meet once a week for 60 minutes each session. All students are expected to arrive on time and be prepared for the day's class session.

CEA enforces a mandatory attendance policy. You are therefore expected to attend all regularly scheduled class sessions, including any field trips, site visits, guest lectures, etc. that are assigned by the instructor. The table below shows the number of class sessions you may miss before receiving a grade penalty.

ALLOWED ABSENCES – SEMESTERS		
Courses Meeting X day(s) Per Week	**Allowed Absence(s)**	**Automatic Failing Grade at Xth Absence**
Courses meeting **1** day(s) per week	**1** Absence	**4th** Absence

For every additional absence beyond the allowed number, your final course grade will drop down to the subsequent letter grade (ex: A+ to A). As a student, you should understand that the grade penalties will apply if you are marked absent due to tardiness or leaving class early. In the table below, you will find the grade penalty associated with each excessive absence up to and including automatic course failure.

ATTENDANCE DOCKING PENALTIES				
Absence	**1st**	**2nd**	**3rd**	**4th**
Penalty	**No Penalty**	**0.5 Grade Docked**	**1 Grade Docked**	**Automatic Failure**
HIGHEST POSSIBLE GRADE AFTER ATTENDANCE PENALTIES				
Grade	**A+**	**A**	**A-**	**F**

CEA does not distinguish between excused and unexcused absences. As such, no documentation is required for missing class. Similarly, excessive absences, and the grade penalty associated with each, will not be excused even if you are able to provide documentation that shows the absence was beyond your control. You should therefore only miss class when truly needed as illness or other unavoidable factors may force you to miss a class session later on in the term.

GRADING & ASSESSMENT

The instructor will assess your progress towards the above-listed learning objectives by using the forms of assessment below. Each of these assessments is weighted and will count towards your final grade. The following section (Assessment Overview) will provide further details for each.

Class Participation	**10%**
Take-away Reports	**30%**
Final Exam	**30%**
Group Presentations	**30%**

The instructor will calculate your course grades using the CEA Grading Scale shown below. As a CEA student, you should understand that credit transfer decisions–including earned grades for courses taken abroad–are ultimately made by your home institution.

CEA GRADING SCALE			
Letter Grade	**Numerical Grade**	**Percentage Range**	**Quality Points**
A+	9.70 – 10.0	97.0 – 100%	4.00
A	9.40 – 9.69	94.0 – 96.9%	4.00
A-	9.00 – 9.39	90.0 – 93.9%	3.70
B+	8.70 – 8.99	87.0 – 89.9%	3.30
B	8.40 – 8.69	84.0 – 86.9%	3.00
B-	8.00 – 8.39	80.0 – 83.9%	2.70
C+	7.70 – 7.99	77.0 – 79.9%	2.30
C	7.40 – 7.69	74.0 – 76.9%	2.00
C-	7.00 – 7.39	70.0 – 73.9%	1.70
D	6.00 – 6.99	60.0 – 69.9%	1.00
F	0.00 – 5.99	0.00 – 59.9%	0.00
W	Withdrawal	N/A	0.00
INC	Incomplete	N/A	0.00

ASSESSMENT OVERVIEW

This section provides a brief description of each form of assessment listed above. Your course instructor will provide further details and instructions during class time.

Class Participation (10%): Student participation is mandatory for all courses taken at a CEA Study Center. The instructor will use the rubric below when determining your participation grade. All students should understand that attendance and punctuality are expected and will not count positively toward the participation grade.

CLASS PARTICIPATION GRADING RUBRIC	
Student Participation Level	**Grade**
You make major & original contributions that spark discussion, offering critical comments clearly based on readings, research, & theoretical course topics.	**A+** (10.0 – 9.70)

You make significant contributions that demonstrate insight as well as knowledge of required readings & independent research.	**A/A-** (9.69 – 9.00)
You participate voluntarily and make useful contributions that are usually based upon some reflection and familiarity with required readings.	**B+/B** (8.99 – 8.40)
You make voluntary but infrequent comments that generally reiterate the basic points of the required readings.	**B-/C+** (8.39 – 7.70)
You make limited comments only when prompted and do not initiate debate or show a clear awareness of the importance of the readings.	**C/C-** (7.69 – 7.00)
You very rarely make comments and resist engagement with the subject. You are not prepared for class and/or discussion of course readings.	**D** (6.99 – 6.00)
You make irrelevant and tangential comments disruptive to class discussion. You are consistently unprepared for class and/or discussion of the course readings.	**F** (5.99 – 0.00)

Take-away Reports (30%): Prior to each class, students will prepare a one page take-away report describing the techniques outlined in previously issued videos illustrating the use of Excel with regards to the subject of the lesson.

Group Presentations (30%): Two students will team up for Group Presentation assignments. Each group will prepare a PowerPoint presentation illustrating the contents of the videos and readings assigned for that class. At the start of each lesson two groups will be chosen at random to present their PowerPoint to the assembled class. Those groups that are not selected will submit their presentations in printed format (three slides on individual A4 sheets, with explanatory side notes).

The assigned grade will depend on the ability of the student to present (33%), to illustrate the contents of the assigned videos and required readings (33%) and to address any problem of misunderstanding of the audience (33%). All work must be ready by the beginning of the class on the date assigned and any late work will result in a zero (0), not just an F. In cases of issues the instructor must be contacted at least 24 hours in advance.

Final Exam (30%): The End of Course exam will be in the form of an invigilated written exam involving the resolution of a selection of O.M. problems using Excel. Students will undertake the exam individually in the classroom.

REQUIRED READINGS

Reading assignments for this course will come from the required texts listed below. All required readings–whether assigned from the text or assigned as a selected reading–must be completed according to the due date assigned by the course instructor.

I. **REQUIRED TEXT(S)**: You may purchase the required text(s) prior to departure or upon program arrival. Some texts may be provided by the instructor. The required text(s) are listed below:

   Brase, *Understanding Basic Statistics, 6th Edition,* Cengage, 2013 (Labeled as US6 in syllabus) – readings provided by instructor

   Anderson, Sweeney, Williams, *Quantitative Methods for Business, 12th Edition,* Cengage, 2012 (Labeled as QM12 in syllabus) – readings provided by instructor

II. **OPTIONAL TEXTS:** The optional readings for this course are listed below. You will not need to purchase these readings, but may find them helpful.

   Heizer, Jay and Barry Render, *Operations Management*, Prentice Hall: Pearson, 2011, 10th Edition. ISBN-13: 978-0136119418.

The instructor reserves the right to make changes or modifications to this syllabus as needed

Barlow, John. F., *Excel Models for Business and Operations*, Hoboken, NJ: John Wiley & Sons, 2005, ISBN-13 978-0-470-01509-4

RECOMMENDED READINGS

Balakrishnan, Nagraj, Barry Render, and Ralph M. Stair, *Managerial Decision Modeling with Spreadsheets*, Prentice Hall: Pearson, 2012, 3d edition, ISBN-13: 978-0136115830.

Collier, David and James Evans, *Operations Management*, Upper Saddle River, NJ: Cengage Learning, 2010/2011, 2nd Edition. ISBN-13: 978-0538745567

Nahmias, Steven, *Production and Operations Analysis*, New York, NY: Irwin/McGraw Hill, 2013, ISBN13:978-0073377858

Parsons, J. J., Oja, D., Ageloff, R., Carey, P., and Des Jardins, C., *New Perspectives on Microsoft Office Excel 2013, Brief*, Upper Saddle River, NJ: Cengage Learning, 2013, ISBN: 9781285169392

Powell, Stephen G. and Kenneth R. Baker, *Management Science: The Art of Modeling with Spreadsheets*, Hoboken, NJ: John Wiley & Sons, 2013, 4th edition.

Stevenson, William J., *Operations Management*, New York, NY: Irwin/McGraw Hill, 2015, 12th Edition ISBN 978-0-07-802410-8.

ADDITIONAL RESOURCES

In order to ensure you success abroad, CEA has provided the academic resources listed below. In addition to these resources, each CEA Study Center provides students with a physical library and study areas for group work. The Academic Affairs Office at each CEA Study Center also compiles a bank of detailed information regarding libraries, documentation centers, research institutes, and archival materials located in the host city.

- **UNH Online Library**: As a CEA student, you will be given access to the online library of CEA's School of Record, the University of New Haven (UNH). You can use this online library to access databases and additional resources while performing research abroad. You may access the UNH online library here or through your MyCEA Account. You must comply with UNH Policies regarding library usage.

- **CEAClassroom – Moodle**: CEA instructors use Moodle, an interactive virtual learning environment. This web-based platform provides you with constant and direct access to the course syllabus, daily schedule of class lectures and assignments, non-textbook required readings, and additional resources. Moodle includes the normal array of forums, up-loadable and downloadable databases, wikis, and related academic support designed for helping you achieve the learning objectives listed in this syllabus.

  During the first week of class, CEA academic staff and/or faculty will help you navigate through the many functions and resources Moodle provides. While you may print a hard copy version of the syllabus, you should always check Moodle for the most up-to-date information regarding this course. The instructor will use Moodle to make announcements and updates to the course and/or syllabus. It is your responsibility to ensure that you have access to all Moodle materials and that you monitor Moodle on a daily basis in case there are any changes made to course assignments or scheduling.

  To access Moodle: Please log-in to your MyCEA account using your normal username and password. Click on the "While You're Abroad Tab" and make sure you are under the "Academics" sub-menu. There you will see a link above your schedule that says "View Online Courses" select this link to be taken to your Moodle environment.

SESSION	TOPICS	ACTIVITY	READINGS & ASSIGNMENTS
			COURSE CALENDAR *Basic Operations Research Laboratory*
1	**Introduction to Course Review of syllabus Classroom Policies**	Informal dialogue with students to explain how the course will proceed and how it fits in with the BOM course	**Assignment** Excel basics – read Excel part 1 and 2 posted online. **Optional videos for next session*:** • Descriptive Statistics using Data Analysis (6:00 mins) • Vlookup (15:49 mins) • Improve your efficiency in Excel (26:57 mins) • Excel Pivot Table Tutorial for beginners (6:53 mins) • How to use the Goal function in Excel (4:08 mins) • ANOVA (24:53 mins)
2	**Review of Basic Excel Functions**	Presentation & Discussion of homework In class exercises involving use of Excel	**Assignment** Basic spreadsheet functionality xls files distributed by instructor. **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 63-84 Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 258 - 263 **Optional videos for next session*:** • Linear Regression (6:30 mins) • Multiple Regression (6:30 mins) • Using Multiple Regression for Predictive Analysis (9:16 mins) • James Flynn, '*Change of IQ with different generations*', (page equivalent: 3)

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3	**Regression Analysis**	Presentation & Discussion of homework In class exercises involving use of Excel	**Readings** **(see reading list above for US6 acronym information)** US6: 4.2 to p156 (mid), p159 (mid) – p160; 11.4 to p538 (mid) **Optional readings** Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 170 - 174 **Optional videos for next session*:** • Forecasting using Moving Averages, MAD, MSE & MAPE (4,26 mins) • Moving averages (9:11 mins) • Forecasting using Exponential smoothing (6:00 mins)
4	**Moving Average & Exponential Smoothing Forecasting**	Presentation & Discussion of homework In class exercises involving use of Excel	**Assignment** Forecasting xls files distributed by instructor **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 140 – 170 Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 174 - 186 **Optional videos for next session*:** • Decision Trees (3:00 mins) • Decision Trees (13:41 mins)
5	**Decision Trees** ——————— **Midterm Exam**	Presentation & Discussion of homework In class exercises involving use of Excel	**Readings** US6: 5.3 to p208 (mid) **Optional readings** Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 37-41, 68 - 69 **Optional videos for next session*:** • LP with Excel Solver
6	**Linear Programming**	Presentation & Discussion of homework In class exercises involving use of Excel	**Readings** **(see reading list above for QM12 acronym information)** QM12: Section 10.1 to p426 (mid) **Optional readings**

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			Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 20 – 26
			Optional videos for next session*:
			• Location Strategy (18:00 mins)
			• Location Factor Rating Analysis (2:44 mins)
7	**Location Planning**	Presentation & Discussion of homework In class exercises involving use of Excel	**Assignment** Location planning xls files distributed by instructor. **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 93 - 136
8	**Project Management**	Presentation & Discussion of homework In class exercises involving use of Excel	MS Project program lecture **Optional readings** Barlow, John. F., *Excel Models for Business and Operations*, 2005. Pages 353 – 358 **Optional videos for next session*:** • Inventory Management – an introduction (6:20 mins) • EOQ Calculation, graphs, tables and limits (11:20 mins) • Inventory Management Economic Order Quantity (36:31 mins) • Inventory Management under Uncertainty (37:00 mins) • Inventory Control (35:00 mins)
9	**Inventory Control**	Presentation & Discussion of homework In class exercises involving use of Excel	**Reading & Assignment** QM12: Section 14.1 Inventory control xls file distributed by instructor. **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 509 -540 **Optional videos for next session*:** • How to draw a Control Chart (8:20 mins) • SPC – Control Charts Explained (7:20 mins)

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10	**SPC / Quality**	Presentation & Discussion of homework In class exercises involving use of Excel	**Assignment** SPC xls file distributed by instructor **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 271 - 293 **Optional videos for next session*:** • Introduction to Lean 6 Sigma and Process Capability Index (1,20,00 hours) • Format your data for charting in Excel (7:00 mins) • Six Sigma complete project example (20:45 mins)
11	**6 Sigma**	Presentation & Discussion of homework In class exercises involving use of Excel	**Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 244-263 **Optional videos for next session*:** • Capacity Analysis (24:20 mins) • Excel Operations Management Tutorial (17:30 mins)
12	**Capacity Planning**	Presentation & Discussion of homework In class exercises involving use of Excel	**Assignment** Capacity planning xls file distributed by instructor **Optional readings** Heizer, Jay and Barry Render, *Operations Management*, 2011. Pages 333 - 351
13	**Presentation of Group Projects**	In Class Group Presentations	--
14	**Review Session**	In Class Review	Review all relevant readings
15	**FINAL EXAM**		

* all videos can be found online

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SECTION III: CEA Academic Policies

The policies listed in this section outline general expectations for CEA students. You should carefully review these policies to ensure success in your courses and during your time abroad. Furthermore, as a participant in the CEA program, you are expected to review and understand all CEA Student Policies, including the academic policies outlined on our website. CEA reserves the right to change, update, revise, or amend existing policies and/or procedures at any time. For the most up to date policies, please review the policies on our website.

Class & Instructor Policies can be found here
General Academic Policies can be found here