Course Name: Decision Support Tools and Techniques
Course Code: DS331

I. Basic Course Information

Major or minor element of program: Both Major Minor
Department offering the course: Operations Research and Decision Support Department

Academic level: 300 Level
Semester in which course is offered: First (fall) Semester
Course pre-requisite(s): Modeling and Simulation (DS241)

Credit Hours: 3
Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	0.0	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: September 2014

II. Overall Aims of Course

A Computers and Information Student Equipped with Basic Knowledge, competences and Practical Experience in Computer-aided Decision Support Systems, either Model, Data and Knowledge based Decision support systems

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
K17,K19,K20	I3,I4,I7,I11	P4,P13,P15	G2,G5,G6

IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Recognize basic components, types and methods of computer-based Decision support Systems (DSS).
- K.2 Underline the differences between DSS and other computer support systems.
- K.3 Recognize appropriate context and applications of DSS tools and techniques.
- K.4 Locate and classify different computer-aided data management and modeling tools for DSS.
- K.5 Undeline basic features and applications of two DSS model Building Languages

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Apply DSS tools and methods to different decision problems.
- I.2 Analyse and test the impact of using computer-based DSS.
- I.3 Assemble DSS tools for application in specific situation.
- I.4 Evaluate Decision problems and select appropriate analytical tools.
- I.5 Assess the productivity and efficiency of alternative DSS modeling Languages.

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Retrieve data using different packages.
- P.2 Understandand applythe visual decision support (VDSS) computer language to alternative decision situations.
- P.3 Apply the general algebraic modeling system (GAMS) to implement mathematical models within the data centerd DSS.

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Enhance OralCommunication Skills.
- G.2 Enhance team Working skills
- G.3 Describe, formulate and analyzethe Decision Problems

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Decision Making, Systems, Modeling and Computer Support.	[1]	[K1,K3]	[I1]	[]	[]
2-	Decision Support Systems (DSS) - An Overview	[1]	[]	[I2,I5]	[P2]	[]
3-	Application, experience and Impact of DSS	[1]	[K2]	[]	[P1]	[G1,G2,G3]
4-	Data-centered Decision Support Systems	[1]	[]	[]	[P3]	[G1,G2,G3]
5-	Data preprocessing and Extraction	[1]	[]	[I2,I4,I5]	[P1,P3]	[]

No.	Topic					
6-	Data Analysis and Visualization	[1]	[ ]	[I2,I4,I5]	[P2,P3]	[ ]
7-	Model-centered Decision Support Systems	[1]	[ ]	[ ]	[P2,P3]	[G1,G2,G3
8-	Optimization Models	[1]	[K4,K5]	[I2,I4,I5]	[P2,P3]	[ ]
9-	Predictive Models	[1	[K4,K5	[I2,I4,I5	[P2,P3	[
10-	Descriptive Models	[1]	[K4,K5]	[I2,I4,I5]	[P2,P3]	[ ]
11-	Computational Models	[1]	[K4,K5]	[I2,I4,I5]	[P2,P3]	[G1,G2,G3
12-	Developing DSS using visual Decision Support Language (VDSS) and General Algebraic Modeling System (GAMS)	[2]	[K4,K5]	[I3,I4]	[All]	[ ]
	Net Teaching Weeks	**13**				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	Decision Making, Systems, Modeling and Computer Support	[2.5]	[2.5]	
2	Decision Support Systems (DSS) - An Overview	[4]	[2.5]	[1.5]
3	Application, experience and Impact of DSS	[4]	[2.5]	[1.5]
4	Data-centered Decision Support Systems	[4]	[2.5]	[1.5]
5	Data preprocessing and Extraction	[4]	[2.5]	[1.5]
6	Data Analysis and Visualization	[4]	[2.5]	[1.5]
7	**Midterm Exam**			
8	Model-centered Decision Support Systems	[4]	[2.5]	[1.5]
9	Optimization Models	[4]	[2.5]	[1.5]
10	Predictive Models	[4]	[2.5]	[1.5]
11	Descriptive Models	[4]	[2.5]	[1.5]
12	Computational Models	[4]	[2.5]	[1.5]
13	Developing DSS using visual Decision Support Language (VDSS)	4	2.5	1.5
14	Developing DSS using General Algebraic Modeling System (GAMS)	4	2.5	1.5
15	**Final Exam**			
	Total Teaching Hours	**51**	**33**	**18**

* **No Practical/Tutorial during the first week of the semester**

VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	**Intellectual Skills**	**Professional Skills**	**General Skills**
Lectures & Seminars	[√]	[K1,K2,K3,K5]	[ ]	[ ]	[ ]
Tutorials	[ ]	[ ]	[ ]	[ ]	[ ]
Computer lab Sessions	[√]	[K4]	[I5]	[P1,P2,P3]	[ ]
Practical lab Work	[ ]	[ ]	[ ]	[ ]	[ ]
Reading Materials	[√]	[ ]	[I2,I4]	[ ]	[ ]
Web-site Searches	[ ]	[ ]	[ ]	[ ]	[ ]
Research & Reporting	[ ]	[ ]	[ ]	[ ]	[ ]
Problem Solving / Problem-based Learning	[√]	[ ]	[ ]	[P1,P2,P3]	[ ]
Projects	[√]	[ ]	[I3]	[P1,P2,P3]	[ ]
Independent Work	[√]	[ ]	[I3]	[P1,P2,P3]	[ ]
Group Work	[√]	[ ]	[I3]	[ ]	[G1,G2]
Case Studies	[√]	[ ]	[ ]	[ ]	[G3]
Presentations	[√]	[ ]	[I1]	[ ]	[G1]
Simulation Analysis	[ ]	[ ]	[ ]	[ ]	[ ]
Others (Specify):	[ ]	[ ]	[ ]	[ ]	[ ]

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	**I.S.**	**P.S.**	**G.S.**		
Midterm Exam	[√]	[K1,K2,K3,K4,K5]	[ ]	[ ]	[G3]	[10%]	7
Final Exam	[√]	[K1,K2,K3,K4,K5]	[ ]	[ ]	[G3]	60%	15
Quizzes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Course Work	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Report Writing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Case Study Analysis	[√]	[ ]	[I1,I2,I4]	[P1,P2,P3]	[ ]	[15%]	[7]
Oral Presentations	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Practical	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Group Project	[√]	[ ]	[I3,I5]	[ ]	[G1,G2]	[15%]	[12]
Individual Project	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Others (Specify):	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

IX. List of References

Essential Text Books	• Turban, E. and J. E. Aronson, " Decision Support systems and Intelligent Systems", Seventh Edition, Printice Hall, 2005. • Koutsoukis, N. S. and G. Mitra, "Decision Modeling and Information systems", Kluwer Academic Publishers, London, 2003.
Course notes	• PowerPoint Slides
Recommended books	• Kallarath, J.(ed) "Modeling Languages in Mathematical Otimization", Kluwer Academic Publishers, London, 2004. • "Visual DSS- Reference Manual", Trueblue Systems, Australia, 2004. • Brooke, A., D. Kendrick and A. Meeraus" GAMS: A user's Guide", Scientific Press, U.S.A (1992).
Periodicals, Web sites, etc.…	• Decision Support System Journal (www.elsevier.com/locate/dsw • www.idsc.gov.eg, www.thinktools.com, www.gams.com, • www.banxia.com, www.decisivetools.com, • www.man.ac.uk/idmp, www.dsseesources.com, • www.dssresources.com, www.visualt.com, http://trueblue.com.au

X. Facilities required for teaching and learning

- Teaching Accommodation
- Data Show Facility
- Computer
- Computer Labs

Course coordinator: Prof. Omar Soliman

Head of Department: Prof. Mohamed Mostafa Saleh

Date: September 2014