

The Hebrew University of Jerusalem

Syllabus

INTRO. TO OPERATIONS RES.-STOCHASTIC MODELS - 52531

Last update 15-09-2016

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: statistics

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> Mt. Scopus

Course/Module Coordinator: Prof. Moshe Haviv

Coordinator Email: offer.kella@huji.ac.il

Coordinator Office Hours: Monday 9:30-10:15

<u>Teaching Staff:</u> Prof Moshe Haviv

Course/Module description:

The courses teaches the basic on how probabilistic models are used in order to deal with operations research models such as queues, Markov chains and decision problem

Course/Module aims:

The pruposes of the course is to aquire the students with modeling and techniques in applied probability and demonstrate their use in operations research.

Learning outcomes - On successful completion of this module, students should be able to:

The students should be able to model themthelves basic problems in which uncertainty is involved. The will be able to utilize dome basic tools in applied probability.

<u>Attendance requirements(%):</u> 0

Teaching arrangement and method of instruction: Frontal lecture

Course/Module Content:

1. Nonnegative andom variables. Renewal theory: the distribution of the age, residual and length bias.

2. The exponential distribution, Poisson process, memoryless property, Erland distribution.

3. Single server queues. Utilization, waiting time, queue length. busy period. Little's rule and The P-K formula. Queues with priority.

4. Conitiniuous time Markov chains. Models and flow diagrams. Limit probabilities and balance equations. Cut-balancing.

5. Probabilistic dynamic programming with finite horizon. States, stages, return function and recursion.

6. Discrete event simulation. Event driven simulation and process driven simulation.

<u>Required Reading:</u> There is none.

<u>Additional Reading Material:</u> There is none.

<u>Course/Module evaluation:</u> End of year written/oral examination 100 % Presentation 0 % Participation in Tutorials 0 % Project work 0 % Assignments 0 % Reports 0 % Research project 0 % Quizzes 0 % Other 0 %

<u>Additional information:</u> There is none.