OPERATIONS MANAGEMENT (OPNS)

OPNS 499-0 Independent Study (1 Unit)
Students who have established superior records and who wish to study
more in depth than what is provided in regular courses may register for
independent study with a selected instructor. Permission of the instructor
and the department is required.

OPNS 510-0 Stochastic Calculus and Control (1 Unit)
Ito Calculus, HJB equations, SDEs and their applications to performance
evaluation, dynamic control of manufacturing and service operations, and
telecommunications systems, heavy traffic approximations.

OPNS 516-0 Stochastic Foundations (1-4 Units)
The first part of the course covers basic concepts in probability; the
second part renewal and regenerative processes including Markov
chains; and the last part Martingales and Brownian motion. Throughout,
theoretic results are applied to the analysis of queues. Students are
expected to have some background in probability (e.g., IEMS 202-0) and
stochastic processes; no measure theory background is required.

OPNS 521-0 Foundations of Operations Management (1 Unit)
This course will introduce PhD students to the basic models used in
academic research of operations management. As such, we will survey
a broad array of "research content" (basic models and approaches in the
literature) as well as discuss the "process of conducting research" (how
to write a paper and deliver a talk).

OPNS 522-0 Queueing Networks: Models, Algorithms and Emerging
Applications (1 Unit)
This course aims to expose students to advanced methods in stochastic
analysis and develop a toolbox of probabilistic analytical techniques.
To focus the discussion, the course will be centered around queueing
networks, which serve as building blocks in many modeling applications.
Topics covered include fundamental queueing models, fluid and diffusion
processes, limit theorems and approximations, and stochastic control. To
discuss the algorithmic/computational elements of stochastic control,
we will touch on approximate dynamic programming and explore how it is
used in the control of queueing networks.

OPNS 523-0 Estimation of Dynamic Programs (1 Unit)
This seminar will cover methods for estimating empirical dynamic
discrete choice models. We will put the econometric theory to
practice with weekly computer lab sessions and several rigorous
programming assignments. We will study applications from the
operations management area, including inventory control, supply chain
coordination, service operations, and facility positioning.

OPNS 524-0 Empirical Methods in Operations Management (1 Unit)
This course examines: (1) how to critically read empirical studies, (2) how
to ask questions that are interesting and worthwhile studying empirically,
(3) what each method of causal inference (e.g. instrumental variables,
panel data methods, regression discontinuity, etc.) does and why, when,
and how to use each method, and (4) how an empirical researcher goes
from an idea to a finished paper.

OPNS 525-0 Emerging Areas in Operations Management (1 Unit)
This course studies novel, emerging topics and methods used in
academic research of operations management. Content will depend
on the expertise and interests of the instructor. Past content included
statistical (machine) learning and sequential decision-making, such as
bandit learning, balancing exploration/exploitation, and reinforcement
learning, including methods for value function approximation and
algorithms for efficient exploration.

OPNS 590-0 Research (3 Units)
Independent investigation of selected problems pertaining to thesis or
dissertation. May be repeated for credit.