TO: The Faculty of the College of Engineering

FROM: School of Electrical and Computer Engineering of the College of Engineering

RE: ECE 64100 Changes in Title, Description, and Content

The faculty of the School of Electrical and Computer Engineering has approved the following changes in ECE 64100. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From: **ECE64100 – Model-Based Image and Signal Processing**
Sem. 1. Class 3, cr. 3.

An advanced treatment of selected topics in digital image processing. Image models, color, digital video, synthetic aperture radar, magnetic resonance imaging, stack filters, morphological filters, in-verse problems in computational vision, multiscale techniques.

To: **ECE 64100 – Advanced Compilation and Automatic Programming**
Sem. 1. Class 3, cr. 3.

An advanced treatment of the methods in model based signal and image processing including stochastic modeling of multidimensional signals, Bayesian estimation, inverse methods, doubly stochastic models, regularized inversion, the EM algorithm, Bayesian networks, Markov chains, optimization, convexity, majorization techniques, and stochastic simulation. The underlying theory is presented in the context of applications including image restoration, tomographic reconstruction, clustering, classification, and segmentation.

Reason: The course description has been updated to reflect the updated content of the course and to include 15 weeks of lectures in the outline. Also the coure title has been updated to a more precise description of the scope of the course.

Lectures	Principle Topics
4	Probability, estimation, and random processes
3	Causal Gaussian models
4	Non-causal Gaussian models
4	Image restoration using MAP estimate
4	Continuous non-Gaussian MRF models
5	MAP estimation with non-Gaussian Priors
5	The expectation-maximization (EM) algorithm
4	Markov chains and hidden Markov models
3	Discrete valued Markov random fields (MRF)
3	Stochastic simulation methods
3	Segmentation and MAP estimation with discrete priors

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