



AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF ENGINEERING
Department of Mechanical Engineering

| Course Information | |
|---------------------------|----------------------------|
| Course Code and Name: | ME 435- Automotive Control |
| Credit Hours: | 3 (3 Lecture + 1 Tutorial) |
| Prerequisites: | ME 334 Automatic Control |

| Course Description |
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| Basic engine operation; lambda control, speed control, knock control, fuel injection timing control, ignition control of SI engines; driveline modeling, automatic transmission control, clutch phasing control; wheel model, complete vehicle model; observers, friction coefficient estimators, tire contact patch force estimators; anti-lock brake control, traction control, yaw stability control; drive-by-wire systems. |

| Textbook | | | |
|-----------------|---|------------------|----------------------|
| Title | Automotive Control Systems | | |
| Authors | A. Galip Ulsoy, Huei Peng, Melih Cakmakci | | |
| Publisher | Cambridge University Press | Year and Edition | 2012, Latest Edition |

| Course Contents |
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| Overview of automotive control systems |
| Automotive control system design process |
| Review of engine modeling, engine operations, engine control loops |
| Review of Vehicle dynamics, longitudinal, lateral and vertical vehicle motion |
| Human factors and driver modeling |
| Air-fuel rate control (lambda control) |
| Control of spark-timings, idle speed control |
| Transmission control |
| Cruise and Headway Control |
| Antilock Brake and Traction control systems |
| Vehicle stability control |

| Academic Coordinator | Signature |
|-----------------------------|------------------|
| Dr. Khalil Hajlaoui | |



Official Stamp