

## 98-2 Preliminary Syllabus, Da-Yeh Univ

Information			
Title	智慧型汽車之控制設計:TWN	Serial No. / ID	1449 / EGR5352
Dept.	電機工程學系碩士班	School System / Class	研究所碩士班1年1班
Lecturer	吳幸珍	Full or Part-time	專任
Required / Credit	Optinal / 3	Graduate Class	No
Time / Place	(三)234 / H371	Language	Chinese

Introduction
<p>This course is to provide graduate student the systematic design of the automatic driving system embedded in the smart car Taiwan iTS-1. Taiwan iTS-1 is a heterogeneous system including various sensors, core controller, interfacing and mechanisms to carry out automatic driving. A hierarchical-control autonomy structure to achieve integrated longitudinal and lateral control on highway and urban-road environments. Upper-level control analyzes the traffic situation, determines a driving mode and reference signals. Vehicle-body control e x e c u t e s real-time control-signals tracking. Both human intelligence and behaviors are integrated into vehicle-body control. Collision warning and avoidance maneuvers are embedded in this car. Furthermore, passengers ' comfort is also considered in design.</p>

Outline
<p>I. Introduction</p> <ol style="list-style-type: none"> <li>1. Mastering Simulink</li> <li>2. Introduction to CarSim</li> <li>3. Vehicle Dynamics Simulation using CarSim               <ul style="list-style-type: none"> <li>Scene Setup</li> <li>Scene Setup</li> </ul> </li> <li>4. Introduction to Automatic Driving System</li> </ol> <p>II. Autonomous Driving System</p> <ol style="list-style-type: none"> <li>5. Vehicle Overview</li> <li>6. Lane-keeping Design               <ul style="list-style-type: none"> <li>? Vision-based system</li> <li>? DSP-based system</li> </ul> </li> <li>7. Lane-changing Design</li> <li>8. Car-following Design               <ul style="list-style-type: none"> <li>? ICC mode</li> <li>? ACC mode</li> <li>? Platoon mode</li> <li>? Stop-and-Go                   <ul style="list-style-type: none"> <li>. Driving Assistance System</li> </ul> </li> </ul> </li> <li>9. Collision Warning/Avoidance Maneuver</li> </ol>

10. Comfort Estimation  
11. Integrated Lateral and Longitudinal Controller  
Final Examination (CarSim Demo)

Prerequisite

no