

101-1 Preliminary Syllabus, Da-Yeh Univ

| Information | | | |
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| Title | 車輛系統動態分析 | Serial No. / ID | 1808 / MUR5046 |
| Dept. | 機械與自動化工程學系碩士班 | School System / Class | 研究所碩士班1年1班 |
| Lecturer | 張一屏 | Full or Part-time | 專任 |
| Required / Credit | Optinal / 3 | Graduate Class | No |
| Time / Place | (二)56 / H466 (五)3 / H466 | Language | English |

| Introduction |
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| Establish the principles for vehicle dynamic system and combine the knowledge of control theory and dynamic simulation methodologies to reach the understanding of system performance correlation with the design and control parameters and variables. |

| Outline |
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| <ol style="list-style-type: none"> 1. Vehicle Dynamic System introduction. 2. Mathematical Model for the System from the Physical Laws and the Control Theory 3. System Dynamic Performance and the Transfer Function Response of 1st and 2nd order Systems 4. Mechanical Translation and Rotation Stiffness and Damping Elements Linear and Nonlinear Characteristics 5. Hydraulic and Pneumatic Elements and Circuit Analysis from the System Models 6. Heat Transfer and Thermal Resistance and Capacitor in Thermal System Dynamics 7. Combine the Electrical and Hydraulic or Mechanical System Analogy Model Analysis. 8. Electical Motor Drive Load and the Performance Evaluation from the Dynamic Analysis. 9. Nonlinear System Approximation in State Space and Jacobin Transfer Matrix in Engine Application 10. Matlab-Simulink Introduction for the Linear Control System Model and Implment. 11. Establish of Mechanicla Mass, Stiffness, Damper and Inertia Elements under the Simulink Environment 12. Cascade Conection and Mask the System Parameter for Vehicle Powertrain Elements 13. Manual and Automatic Transmission Model, Clutch and CVT Model, and Differential Model. 14. Vehicle Road Load and Tire Model 15. Vehicle Powertrain Cascade Model Requirements and Analysis. 16. Combined Translation and Rotational Dynamic in Vehicle Modular Suspension Models and Interaction. 17. Vehicle Brake System Hydraulic and Mechanical System interaction. 18. Vehicle Collision Model and Impact Dynamic Response. |

| Prerequisite |
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| Automatic Control Engineering Mathematics Vehicle Dynamics |