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# Vibration Analysis of Formula SAE Race Cars

PHASE 1: DATA STRUCTURES AND QUARTER-CAR MODELS

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TEXAS A&M  
MEEN 357 - SECTION 50X

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**MECHANICAL ENGINEERING**  
T E X A S   A & M   U N I V E R S I T Y

**Task 1) Dynamic Analysis of the 1 DOF  $1/4$  Car Model**

**Task 2) Create Data Structures**

Task 2a) Pilot struct

Task 2b) Wheel struct

Task 2c) Suspension struct

Task 2d) Motor struct

Task 2e) Chassis struct

**Task 3) Construct FSAE Race Cars**

**Task 4) Wriet MatLab Functions**

Task 4a) Leverage Ratios

Task 4b) Assemble Mass Matrix

Task 4c) Assemble Damping Matrix

Task 4d) Assemble Stiffness Matrix

Task 4e) Static Deflection

**Task 5) Test Functions**