Engineering

**ENGR 5375** Introduction to Robotics (3 semester hours) Fundamentals of robotics, rigid motions, homogeneous transformations, forward and inverse kinematics, velocity kinematics, motion planning, trajectory generation, sensing, vision, and control. Prerequisites: ([ENGR 2300](https://catalog.utdallas.edu/2013/graduate/courses/engr/2/1) and [EE 3302](https://catalog.utdallas.edu/2013/graduate/courses/ee/2/1)) and ([EE 4310](https://catalog.utdallas.edu/2013/graduate/courses/ee/3/1) or [MECH 4310](https://catalog.utdallas.edu/2013/graduate/courses/mech/4/1)) or equivalent. (2-3) Y

**ENGR 6331** ([MECH 6300](https://catalog.utdallas.edu/2013/graduate/courses/mech/6/1), [SYSM 6307](https://catalog.utdallas.edu/2013/graduate/courses/sysm/6/1)) Linear Systems (3 semester hours) State space methods of analysis and design for linear dynamical systems. Coordinate transformations and tools from advanced linear algebra. Controllability and observability. Lyapunov stability analysis. Pole assignment, stabilizability, detectability. State estimation for deterministic models, observers. Introduction to the optimal linear quadratic regulator problem. Prerequisites: [ENGR 2300](https://catalog.utdallas.edu/2013/graduate/courses/engr/2/1) and [EE 4310](https://catalog.utdallas.edu/2013/graduate/courses/ee/3/1) or [MECH 4310](https://catalog.utdallas.edu/2013/graduate/courses/mech/4/1) or equivalent. (3-0) Y

**ENGR 6332** ([MECH 6332](https://catalog.utdallas.edu/2013/graduate/courses/mech/6/2)) Advanced Control (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: [ENGR 6331](https://catalog.utdallas.edu/2013/graduate/courses/engr/6/1). (3-0) R

**ENGR 6336** ([BMEN 6388](https://catalog.utdallas.edu/2013/graduate/courses/bmeng/6/1), [MECH 6313](https://catalog.utdallas.edu/2013/graduate/courses/mech/6/3), [SYSE 6324](https://catalog.utdallas.edu/2013/graduate/courses/syseng/6/4)) Nonlinear Control Systems (3 semester hours) Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: [ENGR 6331](https://catalog.utdallas.edu/2013/graduate/courses/engr/6/1) or [MECH 6300](https://catalog.utdallas.edu/2013/graduate/courses/mech/6/0) or [SYSM 6307](https://catalog.utdallas.edu/2013/graduate/courses/sysm/6/0) or equivalent. (3-0) T

**ENGR 7v90** Special Topics in Control Systems (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) R