**UNLV ME 729 – Robotics 2 – Spring 2022 (last updated 01/07/22)**

|  |  |
| --- | --- |
| Week | Topic |
| Week 1  01/24/22 | |  |  | | --- | --- | | Lecture | Lesson A: Introduction | | Lab | Computer to Computer Communications (RS-485) | | Homework | ASCII Communications | |  |  | |
| Week 2  01/31/22 | |  |  | | --- | --- | | Lecture | Lesson B | | Lab | Smart Servos (XL-320) – Dynamixel Wizard | | Homework | XL-320 position and velocity characteristics | |  |  | |
| Week 3  02/07/22 | |  |  | | --- | --- | |  |  | | Lecture | Lesson C | | Lab | Smart Servo (XL-320) – Firmware Programming (LED) | | Homework | LED related exercises | |  |  | |
| Week 4  02/14/22 | |  |  | | --- | --- | | Lecture | Denavit-Hartenberg Notation | | Lab | Smart Servo (XL-320) – Write: Wheel and Joint Modes - | | Homework | DH derivations and related Write exercises | |
| Week 5  02/21/22 | |  |  | | --- | --- | |  | **UNLV Holiday – Presidents Day** | |  |  | |
| Week 6  02/28/22 | |  |  | | --- | --- | |  |  | | Lecture | Forward Kinematics | | Lab | 2-DOF Planar Manipulator: Forward Kinematics | | Homework | Forward kinematics and related Position exercises | |  |  | |
| Week 7  03/07/22 | |  |  | | --- | --- | |  |  | | Lecture | Inverse Kinematics | | Lab | 2-DOF Planar Manipulator: Inverse Kinematics | | Homework | IK derivations and FK related exercises | |  |  | |
| Week 8  03/14/22 | **UNLV Holiday – Spring Break begins** |
| Week 9  03/21/22 | **Mid-Term (Practical and Hands-On)** |
| Week 10  03/28/22 | |  |  | | --- | --- | | Lecture | Trajectory Planning | | Lab | 2-DOF Planar Manipulator: Line Trajectories | | Homework | Trajectory Planning | | **Project Part 1** | Design 3-DOF robot or 2-DOF pan-tilt | |  |  | |
|  |  |
| Week 11  04/04/22 | |  |  | | --- | --- | | Lecture | Jacobians | | Lab | Smart Servo (XL-320) Read Position | | Homework | Jacobians and Read Position exercises | |  |  | |
| Week 12  04/11/22 | **Project 1 Demo and Report Due**   |  |  | | --- | --- | | Lecture | Computer Vision 1 | | Lab | Image Processing | | Homework | Image processing exercises |  |  |  | | --- | --- | |  |  | |
| Week 13  04/18/22 | |  |  | | --- | --- | | Lecture | Computer Vision 2 | | Lab | Tracking | | Homework | Visual servoing exercises | | **Project Part 2** | Visually servoed Tracking | |
| Week 14  04/25/22 | **Project Work Day** |
| Week 15  05/02/22 | **Study Week Begins**  **Project 2 Demo and Report Due** |
| Week 16  05/09/22 | **Finals Begin** |