**UNLV ME 425/625 – Robotics 1 – Fall 2017 (last updated 08/21/17)**

|  |  |
| --- | --- |
| Week | Topic |
| Week 108/28/17 |

|  |  |
| --- | --- |
| Lecture | No Class; Please view course web site |
|  |  |

 |
| Week 209/04/17 | **UNLV Holiday – Labor Day** |
| Week 309/11/17 |

|  |  |
| --- | --- |
| Lecture | Simple Machines I: Levers, Shafts and Cranks |
| Lab | LEGO levers, shafts and cranks |
| Programming | LEGO NXC: hello world, motors and touch sensor |
|  |  |

 |
| Week 409/18/17 |

|  |  |
| --- | --- |
| Lecture | Simple Machines II: Cams, Springs and Linkages |
| Lab | LEGO cams, springs and linkages |
| Programming | LEGO NXC: ultrasonic and infrared sensors |

 |
| Week 509/25/17 | **(Travel tentative: IROS 2017 Conference)**

|  |  |
| --- | --- |
| Lecture  | Simple Machines III: Ratchets, Drives and Gearing |
| Lab | LEGO ratchets, drives and gearing |
|  | ML-CAD (or Solidworks) |
|  |  |

 |
| Week 610/02/17 |

|  |  |
| --- | --- |
| Lecture/Lab | Putting it all together: Automata Examples (The Gymnast)  |
|  | Email: Team’s proposed Project |
| ProgrammingProject | LEGO NXC: File handlingTeams Work on Automata Project |
|  |  |

 |
| Week 710/09/17 |

|  |  |
| --- | --- |
| Due:  | Automata Presentation; Hardcopy Report Due |
| Lecture | Motor Theory |
| Programming | LEGO NXC: Timers; Data Acquisition (Motor OL Step Response) |
|  |  |

 |
| Week 810/16/17 | **Mid-Term (Travel World Knowledge Forum)**

|  |  |
| --- | --- |
|  | Part 1 Closed-book (60-min): Fill-in-the-blanks, essays, etc |
|  | Part 2 Open-book (90-min): Hands-on LEGO construction |
|  |  |

 |
| Week 910/23/17 |

|  |  |
| --- | --- |
| Lecture | **Robot Sensing**: ADC: binary, voltage dividers |
| Lab | LEGO touch sensor; ohmmeter; potentiometer, voltmeter |
|  |  |

 |
| Week 1010/30/17 |

|  |  |
| --- | --- |
| Lecture | **Robot Actuation**: ADC: operational amplifiers |
| Lab | LEGO temperature sensing; DAC power supply; aliasing |
|  |  |

 |
| Week 1111/06/17 |

|  |  |
| --- | --- |
| Lecture  | **Robot Communications**: I2C |
| Lab | LEGO PCF8574 LEDs, DIPs |
|  |  |

 |
| Week 1211/13/17 |

|  |  |
| --- | --- |
| Lecture  | **Robot Interfacing**: H-Bridges |
| Lab | Relays and Transistors |

 |
| Week 1311/20/17 |

|  |  |
| --- | --- |
| Project: | **Teams Work on NXT H-Bridge Project** |

 |
| Week 1411/27/17 | To be Determined |
| Week 1512/04/17 | **Study Week Begins** |
| Week 1612/11/17 | **Finals Begin** |