**UNLV ME 425/625 – Robotics 1 – Spring 2021 (last updated 01/18/21)**

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| Week | Topic |
| Week 101/25/21 |

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| Lecture | Introduction |
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| Week 202/01/21 |

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| Lecture | Simple Machines I: Levers, Shafts and Cranks |
| Lab | LEGO levers, shafts and cranks |
| Programming | LEGO NXC: hello world, motors and touch sensor |
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| Week 302/08/21 |

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| Lecture | Simple Machines II: Cams, Springs and Linkages |
| Lab | LEGO cams, springs and linkages |
| Programming | LEGO NXC: ultrasonic and infrared sensors |
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| Week 402/15/21 | **President’s Day – UNLV Holiday**  |
| Week 502/22/21 |

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| Lecture  | Simple Machines III: Ratchets, Drives and Gearing |
| Lab | LEGO ratchets, drives and gearing |
|  | ML-CAD (or Solidworks) |
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| Week 603/01/21 |

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| Lecture/Lab | Putting it all together: Automata Examples (The Gymnast)  |
|  | Email: Team’s proposed Project |
| ProgrammingProject | LEGO NXC: File handlingTeams Work on Automata Project |
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| Week 703/08/21 |

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| Due:  | Automata Presentation; Hardcopy Report Due |
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| Week 803/15/21 | **Spring Break** |
| Week 903/22/21 | **Midterm**

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|  | Part 1 Closed-book (60-min): Fill-in-the-blanks, essays, etc |
|  | Part 2 Open-book (90-min): Hands-on LEGO construction |
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| Week 1003/29/21 |

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| Lecture | Motor Theory |
| Programming | LEGO NXC: File handling Timers; Data Acquisition (Motor OL Step Response) |

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| Week 1104/05/21 |

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| Lecture | **Robot Sensing**: ADC: binary, voltage dividers |
| Lab | LEGO touch sensor; ohmmeter; potentiometer, voltmeter |
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| Week 1204/12/21 |

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| Lecture | **Robot Actuation**: ADC: operational amplifiers |
| Lab | LEGO temperature sensing; DAC power supply; aliasing |
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| Week 1304/19/21 |

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| Lecture | **Robot Communications**: I2C |
| Lab | LEGO PCF8574 LEDs, DIPs |
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| Week 1404/26/21 |

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| Lecture  | **Robot Interfacing**: H-Bridges |
| Lab | Relays and Transistors |
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| Week 1505/03/21 |

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| Project: | **Teams Work on NXT H-Bridge Project****Project Due****Study Week Begins** |

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| Week 1605/10/21 | **Finals Begin** |