

Project Status Letter Week 14
 Covering Period from 11/25/2018 to 12/2/2018
 Prepared by Alex Kmetz and Katie Lee

DYNO Integration Action Tracking

| | | | | |
|--|---------|---------|-----|---|
| Motor Spinning in Dyno Room | 50.00% | 50.00% | No | Motor Purchased Motor Controller Purchased Pulley / Shaft Fabricated Motor Installed in Motor Mount MCS Installed in Fixture Pulley / Shaft Connected to Motor |
| Motor Purchased | 100% | 100% | Yes | |
| Motor Controller Purchased | 100% | 100% | Yes | |
| Motor Controller Connected to TSI, Cooling, and Motor in Dyno Room | 83.33% | 33.33% | No | Motor Controller Purchased MCS / TSI / Cooling Fixture Fabricated TSI Board Complete TSI Mounting Plate Complete |
| Motor Mount Fabricated | 67% | 33% | No | |
| Motor Installed in Motor Mount in Dyno Room | 66.67% | 50.00% | No | Motor Purchased Motor Mount Fabricated |
| Pulley / Shaft Fabricated | 80% | 60% | No | |
| Pulley / Shaft Connected to Motor and Mounted in Dyno Room | 72.73% | 45.45% | No | Motor Purchased Pulley / Shaft Fabricated |
| MCS / TSI / Cooling Fixture Fabricated | 100% | 100% | Yes | |
| Dyno Room Testing Plan Complete | 100% | 100% | Yes | |
| Dyno Room Wiring Diagram Complete | 100% | 100% | Yes | |
| GLV Board Manufactured | 100.00% | 100.00% | Yes | |
| GLV Mounting Plate Manufactured | 100.00% | 100.00% | Yes | |
| Safety Loop Testing Panel Mounted in Dyno Room Rack | 100% | 100% | Yes | |
| Safety Loop Functional In Dyno Room | 100% | 100% | Yes | GLV Board Manufactured |
| TSI Board Manufactured | 100.00% | 69.23% | No | |
| TSI Mounting Plate Manufactured | 100.00% | 67% | No | |
| TSI Throttle / Brake Control Panel Manufactured | 100.00% | 85.71% | No | TSI Board Manufactured TSI Mounting Plate Manufactured |
| Cooling Loop Filled with Water and Tested For | 100.00% | 100.00% | Yes | |

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| Leaks | | | | |
| Cooling System Mounted on Fixture in Dyno Room | 100% | 100% | Yes | MCS / TSI / Cooling Fixture Fabricated |
| Cooling System Connected to MCS and Motor in Dyno Room | 88% | 63% | No | MCS / TSI / Cooling Fixture Fabricated |
| Cooling System Connected to TSI in Dyno Room | 100.00% | 80% | No | |
| SCADA Recording Data and Writing to a File | 85.71% | 71% | No | |
| SCADA Displaying Data to Rack Monitor in Dyno Room | 75% | 75% | No | |
| SCADA Communicating with GLV in Dyno Room | 100% | 100% | Yes | GLV Board and Mounting Plate Integrated |
| SCADA Communicating with TSI in Dyno Room | 50% | 25% | No | TSI Board and Mounting Plate Integrated |
| SCADA Communicating with Motor Controller in Dyno Room | 100% | 75% | No | |
| All Connecting Wires Produced with Correct Connector Types | 100% | 90% | No | |
| All Subsystems fully wired in Dyno Room | 100% | 73% | No | |
| All Tests According to Test Plan Run in Dyno Room | 100% | 0% | No | |

Projected and Actual Dyno Integration



For more data, visit website using link below:

https://sites.lafayette.edu/motorsports/files/2018/12/Week_14_DYNO_Progress-1-1.pdf

Project Item Completion Chart:

| Team | Tasks Completed | Tasks Planned for Next Week | Proposed Changes | Overdue WBS Items |
|--------|---|--|------------------|--|
| VSCADA | <p>Sam: SCADA.3.1 - VSCADA and GLV Connected via CAN and GPIO</p> <p>SCADA.3.2 - VSCADA Receiving Data from GLV Sensors</p> <p>SCADA.3.3 - VSCADA Sends Warnings for Error Sensor Data</p> <p>SCADA.4.1 - VSCADA and MCS Connected via CAN</p> <p>SCADA.4.2 - VSCADA Receiving Data from MCS Sensors</p> <p>SCADA.7.2 - RTC Integrated with SCADA</p> <p>SCADA.7.3 - SCADA Logging Data with Timestamps</p> <p>Zian: SCADA.7.3 - SCADA Logging Data with Timestamps</p> <p>SCADA 8.12 - Demo of calibrated data written to a file</p> | <p>Sam: SCADA.4.3 - SCADA Outputs a Throttle Control to the Motor Controller</p> <p>Zian: SCADA.2.1 - VSCADA and TSI connected via CAN</p> | none | none |
| TEST | <p>Hayden: ATP Rev. 2</p> | <p>Hayden: TEST.1.1 - Motor Testing Plan</p> | none | <p>Hayden: TEST.1.1 - Motor Testing Plan</p> |

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| | | <p>TEST.2.1 - GLV Testing Plan</p> <p>TEST.3.1 - TSI Testing Plan</p> <p>TEST.4.1 - TSV Testing Plan</p> <p>TEST.5.1 - SCADA Testing Plan</p> <p>TEST.6.1 - DYNO Integration Testing Plan</p> <p>Katie: TEST.6.2 - Full DYNO Risk Assessment</p> | | <p>TEST.2.1 - GLV Testing Plan</p> <p>TEST.3.1 - TSI Testing Plan</p> <p>TEST.4.1 - TSV Testing Plan</p> <p>TEST.5.1 - SCADA Testing Plan</p> <p>TEST.6.1 - DYNO Integration Testing Plan</p> <p>Katie: TEST.6.2 - Full DYNO Risk Assessment</p> |
| GLV | <p>Max: GLV.1.7 - GLV BoB Installed on Mount in Rack in Dyno Room</p> <p>GLV.2.4 - Left Side Panel Fabricated and Wired with Needed Buttons / Switches</p> <p>GLV.2.8 - Right Side Panel Fabricated and Wired with Needed Buttons / Switches</p> <p>GLV.2.9 - Left Side Panel Installed in Dyno Room</p> <p>GLV.2.10 - Right Side Panel Installed in Dyno Room</p> <p>GLV.3.2 - Dyno Power Supply Safety Loop On/Off Mechanism Delivered</p> <p>GLV.3.3 - Left Side Panel</p> | <p>Max: GLV.3.6 - Demo of Left Side Panel Closing / Opening Safety Loop</p> <p>GLV.3.7 - Demo of Right Side Panel Closing / Opening Safety Loop</p> <p>GLV.3.8 - Demo of Safety Loop shutting off the Dyno Power Supply from Safe Distance</p> <p>GLV.3.9 - Demo of Dashboard Panel Closing / Opening Safety Loop</p> <p>GLV.3.10 - Demo of Dashboard Panel Putting Car / Dyno into Drive Mode</p> <p>Robson: GLV.3.6 - Demo of Left Side Panel Closing /</p> | none | none |

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| | <p>Components Connected to GLV In Dyno Room</p> <p>GLV.4.3 - GLV External Wiring Delivered and Accepted</p> <p>GLV.4.8 - GLV and Safety Loop Connected</p> <p>GLV.6.4 - Dashboard Panel Fabricated and Wired with Needed Buttons / Switches</p> <p>Robson: GLV.3.2 - Dyno Power Supply Safety Loop On/Off Mechanism Delivered</p> <p>GLV.3.3 - Left Side Panel Components Connected to GLV In Dyno Room</p> <p>GLV.3.4 - Right Side Panel Components Connected to GLV In Dyno Room</p> <p>GLV.3.5 - Dyno Power Supply Connected to GLV Safety Loop</p> | <p>Opening Safety Loop</p> <p>GLV.3.7 - Demo of Right Side Panel Closing / Opening Safety Loop</p> <p>GLV.3.8 - Demo of Safety Loop shutting off the Dyno Power Supply from Safe Distance</p> <p>GLV.3.9 - Demo of Dashboard Panel Closing / Opening Safety Loop</p> <p>GLV.3.10 - Demo of Dashboard Panel Putting Car / Dyno into Drive Mode</p> | | |
| TSI | <p>Tianyu: TSI 1.11 - TSI Mounting Plate Mechanical Drawing Submitted</p> <p>TSI 1.5 - TSI Mounting Plate Mechanical Drawing Submitted</p> <p>TSI.4.4 - TSI Base Plate Block Diagram Delivered</p> | <p>Katie: TSI.1.6 - TSI PCB Populated and Verified</p> <p>Tianyu: TSI 1.10 - TSI PCB Debugged and Complete</p> <p>TSI.1.13 - TSI Installed on Mount in Dyno Room</p> <p>Antonio:</p> | none | <p>Tianyu: TSI.6.1 - Mechanical Drawing of TSI Enclosure Delivered and Approved</p> <p>Antonio: TSI.5.8 - TSI ICD Delivered</p> <p>TSI.5.9 - TSI Wiring Diagram Delivered</p> |

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| | <p>TSI.4.5 - TSI Base Plate BoM Purchase Order Approved and Purchased</p> <p>TSI.4.6 - TSI Base Plate Mechanical Drawing Submitted to Machine Shop</p> <p>TSI.4.7 - TSI Base Plate Fabricated, Wired, and Populated</p> <p>Hongbo: TSI.2.5 - State Machine Delivered</p> <p>Yuqiu: TSI.1.5 - TSI PCB Purchased and Delivered</p> | <p>TSI.5.8 - TSI ICD Delivered</p> <p>TSI.5.9 - TSI Wiring Diagram Delivered</p> <p>Hongbo: TSI.2.4 - UART for firmware completed</p> <p>TSI.2.6 - TSI Firmware state machine completed</p> <p>Yuqiu: TSI.1.6 - TSI PCB Populated and Verified</p> <p>TSI 1.10 - TSI PCB Debugged and Complete</p> <p>TSI.2.9 - VSCADA I2C Communication Complete</p> <p>TSI.2.11 - CANBus / TSI Integration Complete</p> <p>Yishak: TSI.3.1 - Verify and correct 2018 Block and Wiring Diagram</p> <p>Xiaonan: TSI.1.6 - TSI PCB Populated and Verified</p> <p>TSI 1.10 - TSI PCB Debugged and Complete</p> <p>TSI.1.13 - TSI Installed on Mount in Dyno Room</p> | | <p>Yuqiu: TSI.2.5 - Firmware Logic / State Machine Delivered and Approved</p> <p>TSI.2.9 - VSCADA I2C Communication Complete</p> <p>TSI.2.11 - CANBus / TSI Integration Complete</p> |
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| <p>TSV</p> | | <p>Hayden: TSV.1.2 - Pack Mechanical Drawing Submitted and Accepted</p> <p>TSV.3.1 - PackMan Block Diagram Delivered and Approved</p> <p>TSV.3.2 - PackMan Circuit Schematic Delivered and Approved</p> <p>Yishak: TSV.1.1 - Pack High Level Electrical Block Diagram Delivered and Accepted</p> <p>TSV.1.3 - Pack BoM Purchase Order Approved and Purchased</p> <p>TSV.4.1 - SegMan Block Diagram Delivered and Approved</p> <p>TSV.3.1 - PackMan Block Diagram Delivered and Approved</p> <p>Weston: TSV.3.1 - PackMan Block Diagram Submitted and Approved</p> <p>Alex: TSV.3.1 - PackMan Block Diagram Delivered</p> | <p>none</p> | <p>Alex: TSV.3.1 - PackMan Block Diagram Delivered</p> <p>Hayden: TSV.4.1 - PackMan Block Diagram Delivered and Approved</p> <p>TSV.4.2 - PackMan Circuit Schematic Submitted and Accepted</p> <p>Yishak: TSV.1.1 - Pack High Level Electrical Block Diagram Delivered and Accepted</p> <p>TSV.1.3 - Pack BoM Purchase Order Approved and Purchased</p> <p>TSV.2.1 - CellMan Block Diagram Delivered and Approved</p> <p>TSV.2.4 - CellMen BoM Purchase Order Approved and Purchased</p> <p>TSV.4.1 - SegMan Block Diagram Delivered and Approved</p> <p>Weston: TSV.1.2 - Pack BoM Purchase Order Approved and Purchased</p> <p>TSV.1.6 - Pack Testing Plan Submitted and</p> |
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| | | | | Approved TSV.3.1 - PackMan Block Diagram Delivered |
| Cooling | <p>Hongbo: COOL.1.5 - Cooling Mechanical System Assembled</p> <p>Weston: COOL.4.4 - Cooling - TSI Connected</p> | <p>Hongbo: COOL.2.3 - Cooling System mounted in Dyno Room</p> | none | <p>Hongbo: COOL.1.4 - Controller Algorithm Delivered and Approved</p> <p>COOL.4.2 - Cooling Wiring Diagram Delivered</p> |
| Interconnect | <p>Drew: WIRE.2 - Dyno Room Wiring Materials Purchased and/or Produced</p> <p>WIRE.1.1 3 - Dyno Room Wiring Diagram Complete</p> <p>WIRE.1.2 3 - Dyno Room Wiring Diagram Printed and Posted in AEC 400</p> <p>WIRE.1.3 3 - Dyno Room Wiring Diagram Printed and Posted in AEC 134</p> <p>WIRE.2.1 3 - Full Wiring BoM Submitted and Approved</p> <p>WIRE.2.2.3 - Full Wiring BoM Purchase Order Submitted and Approved</p> <p>WIRE.2.5 3 - Pedal Throttle Fixture Wires Complete</p> <p>WIRE.2.6 3 - TSI-Test Panel Wires Complete</p> <p>WIRE.2.7 3 -</p> | <p>Drew: WIRE.3.1 - TSI - MCS Connected</p> <p>WIRE.3.2 - TSI - Cooling Connected</p> <p>WIRE.3.3 - TSI - Pedal Throttle Fixture Connected</p> <p>Hayden: WIRE.2.3 - TSI-MCS Wires Complete</p> <p>WIRE 3.12 - Safety Loop Panels - Dyno Supply Wires Complete</p> | none | <p>Drew: WIRE.2.3 - TSI-MCS Wires Complete</p> <p>WIRE.2.4 - TSI-Cooling Wires Complete</p> |

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| | <p>TSI – TSV Wires Complete</p> <p>WIRE.2.8 3 - GLV - Safety Loop Wires Complete</p> <p>WIRE.2.9 3 - GLV - TSI Wires Complete</p> <p>WIRE.2.10 3 - GLV - Cooling Wires Complete</p> <p>WIRE.2.11 3 - GLV - TSV Wires Complete</p> <p>WIRE.2.12 - Safety Loop Panels - Dyno Supply Wires Complete</p> <p>WIRE.3.4 - TSI - Test Panel Connected</p> <p>WIRE.3.6 - GLV - Safety Loop Connected</p> <p>WIRE.3.7 - GLV - TSI Connected</p> <p>WIRE.3.8 - GLV - Cooling Connected</p> <p>WIRE.3.9 - GLV - TSV Connected</p> <p>WIRE.3.10 - Safety Loop Panels - Dyno Supply Connected</p> <p>Alex: WIRE.2 – Dyno Room Wiring Materials Purchased and/or Produced</p> <p>WIRE.3 – All Subsystems connected together according to Wiring</p> | | | |
|--|---|--|--|--|

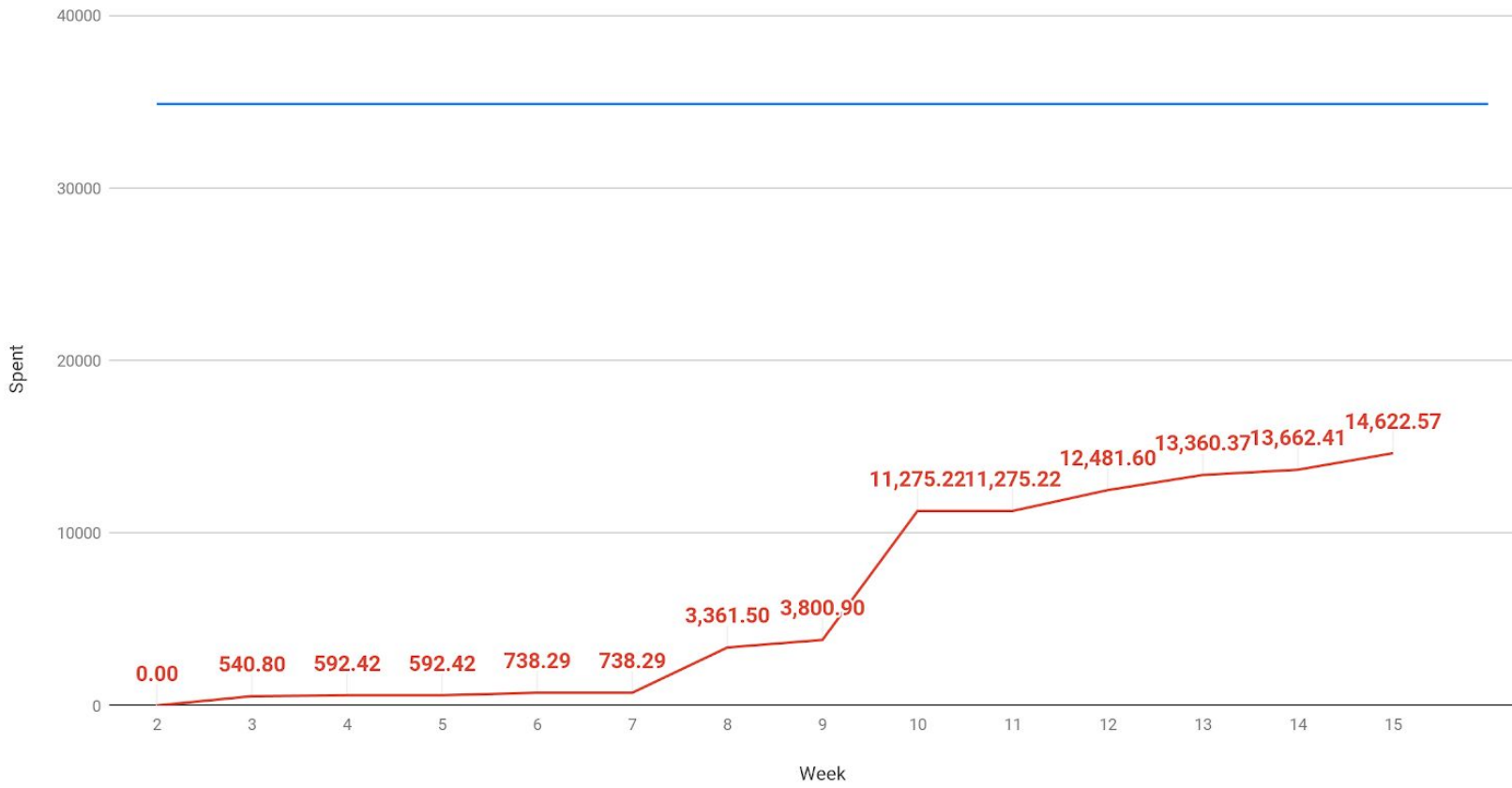
| | | | | |
|------------|--|--|------|---|
| | <p>Diagram</p> <p>Katie: WIRE.2 – Dyno Room Wiring Materials Purchased and/or Produced</p> <p>WIRE.3 – All Subsystems connected together according to Wiring Diagram</p> | | | |
| Mech | <p>Adam: Remanufactured Dyno mounting plates</p> <p>Developed steering design and had design review</p> <p>Nick: Motor mount shop drawings submitted and approved</p> <p>TSI mounting plate updated for bigger TSI PCB</p> | none | none | none |
| Management | <p>Katie: M1.5 - Team Photo</p> | <p>Alex: M.1.4 - Program Submission</p> <p>M.4.4 - Posters Delivered</p> <p>Update WBS to better reflect SMART goals</p> <p>Katie: M.4.9 - Final Report Delivered</p> <p>All: Update WBS to better reflect SMART goals</p> | none | <p>Alex: M.1.4 - Program Submission</p> <p>M.4.4 - Posters Delivered</p> <p>Update WBS to better reflect SMART goals</p> |

Purchasing Summary from Previous Week:

| Sub-system | Allocated Budget | Total Spent | Budget Remaining | Percentage Spent |
|----------------|------------------|-------------|------------------|------------------|
| Brakes | 3,500.00 | 0.00 | 3,500.00 | 0.00% |
| Chassis/Body | 5,000.00 | 0.00 | 5,000.00 | 0.00% |
| Cooling | 620.00 | 37.64 | 582.36 | 6.07% |
| GLV | 780.00 | 967.48 | -187.48 | 124.04% |
| Interconnect | 1,500.00 | 1,440.87 | 59.13 | 96.06% |
| Motor | 4,000.00 | 3,823.43 | 176.57 | 95.59% |
| Pedal/Controls | 2,000.00 | 0.00 | 2,000.00 | 0.00% |
| Steering | 2,500.00 | 0.00 | 2,500.00 | 0.00% |
| Suspension | 2,200.00 | 0.00 | 2,200.00 | 0.00% |
| TSI/MCS | 1,500.00 | 4,354.11 | -2,854.11 | 290.27% |
| TSV | 4,187.00 | 1,112.84 | 3,074.16 | 26.58% |
| VSCADA / DYNO | 525.00 | 87.67 | 437.33 | 16.70% |
| Shipping/Tax | 4,246.80 | 498.53 | 3,748.27 | 11.74% |
| Registration | 2,300.00 | 2,300.00 | 0.00 | 100.00% |
| Overall | 34,858.80 | 14,622.57 | 20,236.23 | 41.95% |

Total Spent vs. Week

Max Budget Total Spent



Purchase Orders:

| 11/27/2018 | | ECE Department Material Request | | | | |
|--|----------|--|--|---------------|-------------|------|
| Course: ECE 491 Professor: Nadovich | | Req Number: 32 | | | | |
| Requested By Name: Robson Adem Email: ademr@lafayette.edu Phone: 4845919265 | | Vendor: www.mcmaster.com Web Site: www.mcmaster.com Phone: (609) 689-3000 Ship By: Ground | | | | |
| # | Quantity | Vendor Part | Description | Unit Price | Total Price | Rcvd |
| 1 | 1 | 6452T45 | 100 feet 18awg 9 wire | \$145.00 | \$145.00 | |
| 2 | 1 | 6452T65 | 100 feet 16 awg 12 wire | \$225.00 | \$225.00 | |
| 3 | 5 | 7130K12 | zip tie 100 packs | \$2.41 | \$12.05 | |
| 4 | 2 | 7565K46 | cable tie (25 a pack) | \$7.49 | \$14.98 | |
| 5 | 5 | 7566K73 | Cable tie mount (25 a pack) | \$3.82 | \$19.10 | |
| 6 | 2 | 5945T83 | lables 1-45 (10 of each) | \$19.83 | \$39.66 | |
| 7 | 4 | 96144A120 | Fine-Thread Alloy Steel Socket Head Screw M6 x 0.75 mm Thread, 20 mm Long 96144A120 | \$3.38 | \$13.52 | |
| | | | | Shipping Fees | \$7.00 | |
| | | | | Grand Total: | \$476.31 | |
| Instructor Approval: | | | | | | |
| Department Approval: (Over \$500) | | | | | | |

| DATE:11/27/2018 | | ECE Department Material Request | | | | |
|--|----------|---|---------------------------------|---------------|-------------|------|
| Course: ECE 491 Professor: Nadovich | | Req Number: 33 | | | | |
| Requested By Name: Robson Adem Email: ademr@lafayette.edu Phone: 4845919265 | | Vendor: Dig-Key Web Site: digikey.com Phone: 1 (800) 858-3616 Ship By: | | | | |
| All items added to shopping cart : | | https://www.digikey.com/short/jlc33m | | | | |
| # | Quantity | Vendor Part | Description | Unit Price | Total Price | Rcvd |
| 1 | 1 | Z1032-ND | RELAY GEN PURPOSE 4PST 25A 24V | 46.9 | \$46.90 | |
| 2 | 1 | Z1238-ND | W-BRACKET FOR OMRON RELAY | 2.1 | \$2.10 | |
| 3 | 6 | WM2906-ND | CONN HOUSING 8POS .100 W/LATCH | 0.43 | \$2.58 | |
| 4 | 3 | WM3704-ND | CONN RECEPT 10POS DUAL | 0.48 | \$1.44 | |
| 5 | 4 | WM3701-ND | CONN RECEPT 4POS DUAL | 0.31 | \$1.24 | |
| 6 | 6 | WM3703-ND | CONN RECEPT 8POS DUAL | 0.43 | \$2.58 | |
| 7 | 3 | WM3705-ND | CONN RECEPT 12POS DUAL | 0.64 | \$1.92 | |
| 8 | 10 | WM3700-ND | CONN RECEPT 2POS DUAL | 0.256 | \$2.56 | |
| 9 | 6 | WM3802-ND | CONN HEADER 6POS 4.2MM VERT TIN | 1.06 | \$6.36 | |
| 10 | 100 | RHM1.00KAECT-ND | RES SMD 1K OHM 1% 04W 0805 | 0.0572 | \$5.72 | |
| 11 | 25 | WM2512-ND | CONN TERM FEMALE 22-24AWG GOLD | 0.1416 | \$3.54 | |
| 12 | 100 | WM2501CT-ND | CONN TERM FEMALE 18-24AWG TIN | 0.0555 | \$5.55 | |
| | | | | Shipping Fees | | |
| | | | | Grand Total: | \$82.49 | |
| Instructor Approval: | | | | | | |
| Department Approval: (Over \$500) | | | | | | |

| DATE:11/30/2018 | | ECE Department Material Request | | | | |
|--|----------|---|----------------------------------|---------------|-------------|------|
| Course: ECE 491 Professor: Nadovich | | Req Number: 34 | | | | |
| Requested By Name: Robson Adem Email: ademr@lafayette.edu Phone: 4845919265 | | Vendor: Dig-Key Web Site: digkey.com Phone: 1 (800) 858-3616 Ship By: | | | | |
| All items added to shopping cart : | | https://www.digikey.com/short/j188dc | | | | |
| # | Quantity | Vendor Part | Description | Unit Price | Total Price | Rcvd |
| 1 | 250 | WM11981CT3ND | CRIMP TERM TIN 14/16AWG | 0.15908 | \$38.27 | |
| 2 | 250 | WM2512-ND | CONN TERM FEMALE 22-24AWG GOLD | 0.10169 | \$25.42 | |
| 3 | 250 | WM2501CT3ND | CONN TERM FEMALE 18-24AWG TIN | 0.04784 | \$11.96 | |
| 4 | 250 | 1734-1143-1-ND | CONTACT PIN 16-20AWG CRIMP NICKL | 0.17184 | \$42.96 | |
| 5 | 250 | 1734-1161-1-ND | CONTACT SKT 16-20AWG CRIMP NICKL | 0.3442 | \$86.05 | |
| 6 | 5 | 296-29034-1-ND | IC MONITOR,PWR,CURR,BIDIR,10MSOP | 2.88 | \$14.40 | |
| | | | | Shipping Fees | | |
| | | | | Grand Total: | \$219.06 | |
| Instructor Approval: | | | | | | |
| Department Approval: | | | | | | |
| (Over \$500) | | | | | | |

| 11/30/2018 | | ECE Department Material Request | | | | |
|--|----------|---|---|---------------|-------------|------|
| Course: ECE 491 Professor: Nadovich | | Req Number: 35 | | | | |
| Requested By Name: Robson Adem Email: ademr@lafayette.edu Phone: 4845919265 | | Vendor: www.mcmaster.com Web Site: www.mcmaster.com Phone: (609) 689-3000 Ship By: | | | | |
| # | Quantity | Vendor Part | Description | Unit Price | Total Price | Rcvd |
| 1 | 1 | 8010K31 | Elongated Ring Terminals Nylon Insulated, 22-18 Gauge, for Number 2, 4, 6 Screw Size Pack of 25 each | \$6.10 | \$6.10 | |
| 2 | 1 | 91841A007 | 18-8 Stainless Steel Hex Nut Pack of 100 each | \$3.40 | \$3.40 | |
| 3 | 1 | 9388K57 | Heavy Duty Ring Terminals Vinyl Insulated, for 16-14 Gauge and 7/16" Screw Size Pack of 10 each | \$4.90 | \$4.90 | |
| 4 | 1 | 9910T66 | Garolite Sheet 6" Wide x 6" Long, 3/8" Thick | \$27.89 | \$27.89 | |
| 5 | 1 | 9246K562 | 6061 Aluminum 3/4" Thick, 4" x 48" | \$104.94 | \$104.94 | |
| 6 | 1 | 92395A112 | Screw-to-Expand Inserts for Plastics, Brass, 4-40 Thread Size Pack of 50 each | \$11.00 | \$11.00 | |
| 7 | 1 | 8010K33 | Elongated Ring Terminals Nylon Insulated, 16-14 Gauge, for Number 2, 4, 6 Screw Size Pack of 25 each | \$8.56 | \$8.56 | |
| | | | | Shipping Fees | \$7.00 | |
| | | | | Grand Total: | \$173.79 | |
| Instructor Approval: | | | | | | |
| Department Approval: | | | | | | |
| (Over \$500) | | | | | | |

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| | | 11/30/2018 | | | | |
| | | ECE Department Material Request | | | | |
| | Course: ECE 491 Professor: Pro. Nadovich | | | Req Number:36 | | |
| Requested By Name Robson Adem Email ademr@lafayette.edu Phone 4845919265 | | | | Vendor: Web Site Phone Ship By: | Amazon amazon.com 5105252328 | |
| # | Quantity | Vendor Part | Description | Unit Price | Total Price | Rcvd |
| | 1 | https://amzn.to/2KIB90w | pipe coupling | \$6.49 | 6.49 | |
| | 2 | https://amzn.to/2PbQXcS | pipe fitting adapter | \$6.99 | 13.98 | |
| | | | | Shipping Fees | \$0.00 | |
| | | | | Grand Total: | \$20.47 | |
| | Instructor Approval: | | | | | |
| | Department Approval: (Over \$500) | | | | | |