# Module 3 Deliverables

**3.3.1.a SNR and DR in Sensor Circuits (Pre-Lab)**

| | |
|---|---|
| SNR estimated for Figure 1ab | |
| Phototransistor / LED Circuit Diagram | |

**3.3.1.b SNR and DR in Sensor Circuits (Lab Activity)**

| | |
|---|---|
| Test data with notes on the test procedures | |

**3.3.2.a Analysis and Design of Simple Filters (Pre-Lab)**

| | |
|---|---|
| Low-pass filter (500 Hz cutoff) | |
| High-pass filter (500 Hz cutoff) | |

**3.3.2.b Analysis and Design of Simple Filters (Lab)**

| | |
|---|---|
| O-scope capture of 1 kHz sine through both filters. DC offset comments. | |
| Filter implemented for the transceiver system (60 Hz 120 Hz rejection). | |
| Filtered and unfiltered transceiver comparison documentation. | |

**3.3.3.a Analysis and Design of Op-amp Circuits (Pre-Lab)**

| | |
|---|---|
| Inverting amp analysis and comments | |
| Buffer analysis and comments | |
| Differential amp analysis and comments | |
| Hysteresis Comparator analysis and comments | |

**3.3.2.b Analysis and Design of Op-amp Circuits (Lab)**

| | |
|---|---|
| Inverting amplifier | |
| 4 oscilloscope captures with comments | |

**3.3.3.c Comparator with Hysteresis (Pre-Lab + Lab)**

| | |
|---|---|
| Design a hysteresis comparator (pre-lab) | |
| Implement a hysteresis comparator | |
| Use comparator for one circuit | |

**3.3.4 Proximity Sensor Design (Lab)**

| | |
|---|---|
| Proximity sensor schematic (clearly show what filters are used) | |
| Built and documented proximity sensor | |

**3.3.4.a 4-Digit 7-Segment Display Design (Lab)**

| | |
|---|---|
| Display circuit diagram. | |
| Built and documented 7-segment block | |

**3.3.5 Optical Detector and Scoring Feedback (Lab)**

| | |
|---|---|
| Optical detector and scoring subsystem design specs, design itself and block diagram | |
| Circuit design for the scoring subsystem | |
| CAD of the subsystem | |
| Verification testing plan | |
| Documented tests with the appropriate data | |
| Potential redesign notes | |