**💸 Estimated Project Cost (2025 USD)**

**🧱 Structural Components**

| **Item** | **Qty** | **Unit Price** | **Total** | **Notes** |
| --- | --- | --- | --- | --- |
| **3D Printed Chamber (PETG)** | **1** | **$30** | **$30** | **High-dielectric, oblate spheroid** |
| **Viton Gasket/O-ring Seal Kit** | **1** | **$15** | **$15** | **Chemically resistant sealing** |
| **Compression Clamps** | **4** | **$2.50** | **$10** | **For securing ports/lid** |
| **Threaded Fill/Sensor Ports** | **2** | **$6** | **$12** | **Machinable PTFE or Nylon** |

**Subtotal: $67**

**⚗️ Fluid**

| **Item** | **Qty** | **Unit Price** | **Total** | **Notes** |
| --- | --- | --- | --- | --- |
| **Mercury (ACS grade, 500g)** | **1** | **~$170** | **~$170** | **Enough to fill ~35–40 mm thick spheroid** |
| **OR: Galinstan (if subbed)** | **1** | **$80** | **$80** | **Safer, but reduced performance** |

**Subtotal (w/ mercury): $170**

**🔌 Electromagnetic System**

| **Item** | **Qty** | **Unit Price** | **Total** | **Notes** |
| --- | --- | --- | --- | --- |
| **Copper Wire (AWG 18)** | **20ft** | **$0.60/ft** | **$12** | **For induction coils** |
| **Coil Formers (3D print)** | **2** | **$5** | **$10** | **To wrap symmetrical coils** |
| **Function Generator (AC)** | **1** | **$60–120** | **~$100** | **Basic waveform gen w/ freq sweep** |
| **Current Amplifier** | **1** | **$80–150** | **~$120** | **Required for driving 1–5A** |

**Subtotal: $242**

**📟 Sensors & Control**

| **Item** | **Qty** | **Unit Price** | **Total** | **Notes** |
| --- | --- | --- | --- | --- |
| **Pressure Sensor (MPX5010)** | **1** | **$15** | **$15** | **Analog output** |
| **Hall Effect Sensor (SS49E)** | **2** | **$5** | **$10** | **Field probes** |
| **TMP36 (temperature sensor)** | **1** | **$3** | **$3** | **Optional** |
| **Arduino Nano or Uno** | **1** | **$10–25** | **$15** | **Core logger** |
| **Jumper Wires + Breadboard Kit** | **1** | **$10** | **$10** | **Generic kit** |
| **USB Serial Cable** | **1** | **$6** | **$6** | **For logging to PC** |

**Subtotal: $59**

**💻 Data Logging + Misc**

| **Item** | **Qty** | **Unit Price** | **Total** | **Notes** |
| --- | --- | --- | --- | --- |
| **Enclosure / Mount Plate** | **1** | **$10** | **$10** | **Optional base panel** |
| **Thermal Paste / Epoxy** | **1** | **$6** | **$6** | **Sealant around probes** |
| **Protective Shielding** | **1** | **$20** | **$20** | **For containment / safety** |
| **USB Power Supply** | **1** | **$12** | **$12** | **For Arduino/board** |

**Subtotal: $48**

**🧾 Total Estimated Cost**

| **Tier** | **With Mercury** | **With Galinstan** |
| --- | --- | --- |
| **Total** | **~$586** | **~$496** |