<table>
<thead>
<tr>
<th>TDC</th>
<th>Topic</th>
<th>NASA Mentor</th>
<th>Majors</th>
<th>Levels</th>
<th>Duration</th>
<th>Status</th>
<th>Current Teams</th>
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<tbody>
<tr>
<td>TDC-01</td>
<td>CREW FORCE LOADING ON PRIMARY AND SECONDARY STRUCTURE</td>
<td>NASA JSC, Engineering Directorate, Structural Engineering Division</td>
<td>AE, BME, Eng Phys, ME</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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<td>TDC-02</td>
<td>HYPERVELOCITY IMPACT MODELING ON WINDOWS</td>
<td>NASA JSC, Engineering Directorate, Structural Engineering Division</td>
<td>AE, Eng Phys, MME, ME, Phys, Math</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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<td>TDC-03</td>
<td>MODEL TO PREDICT OPTICAL PROPERTIES IN SPACE</td>
<td>NASA JSC, Engineering Directorate, Structural Engineering Division</td>
<td>AE, Eng Phys, MME, ME, Optics, Phys, Math, AM</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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<td>TDC-10</td>
<td>PROTOTYPE OF A SPACE WIFI MOBILE, DISRUPTION-TOLERANT, AD-HOC MESH NETWORK</td>
<td>NASA JSC, Engineering Directorate</td>
<td>AE, AAE, EE, CE, Eng Phys, Physics, Math/AM, CS</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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<td>TDC-11</td>
<td>ALTERNATE CLOTHING WASHING OR SANITIZING SYSTEM FOR LONG DURATION SPACE MISSIONS</td>
<td>NASA JSC, Engineering Directorate</td>
<td>AE, BME, Eng Phys, ME</td>
<td>ANY LEVELS</td>
<td>Any Major Levels</td>
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<td>TDC-23</td>
<td>OLFACTORY DELIVERY SYSTEM (ODS) DEVELOPMENT</td>
<td>NASA JSC, Human Interface Branch Office</td>
<td>EE, IE, CE, CHE, CS</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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<td>TDC-24</td>
<td>MARS HABITAT &amp; INITIAL SETTLEMENT VILLAGE</td>
<td>UT Center for Space Research / NASA JSC</td>
<td>AE, BME, Eng Phys, ME</td>
<td>ALL MAJORS</td>
<td>ALL LEVELS</td>
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<td>TDC-25</td>
<td>INTELLIGENT LIGHTING CONTROL SYSTEM</td>
<td>NASA JSC, Avionics Systems Division</td>
<td>EE, CE</td>
<td>UPPER DIVISION [JR/SR]</td>
<td>Two-Semester</td>
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| TDC-32 | DUAL-USE WIDEBAND MICROPHONE ARRAY SYSTEM CHALLENGE  
NASA MENTOR: George Salazar | NASA JSC, Engineering Directorate, Avionics Systems Division | - Duration: Two-Semester  
- Status: RESERVED  
- Current Teams: 1 |
| TDC-33 | USE OF SONIFICATION FOR SPACECRAFT SITUATIONAL AWARENESS APPLICATIONS  
NASA MENTOR: George Salazar | NASA JSC, Engineering Directorate, EV/Human Interface Branch | - Majors: EE, CE, ME, Physics  
- Levels: UPPER DIVISION [JR/SR]  
- Duration: Two-Semester  
- Status: CLOSED  
- Current Teams: 0 |
| TDC-35 | MARS SAMPLE RETURN SYSTEM (MSRS)  
NASA MENTOR: John Alred | NASA JSC, Engineering Directorate, Structural Engineering Division | - Majors: ALL MAJORS  
- Levels: UPPER DIVISION [JR/SR]  
- Duration: Two-Semester  
- Status: CLOSED  
- Current Teams: 0 |
| TDC-36 | MARS FIELD LAB  
NASA MENTOR: John Alred | NASA JSC, Engineering Directorate, Structural Engineering Division | - Majors: ALL MAJORS  
- Levels: UPPER DIVISION [JR/SR]  
- Duration: Two-Semester  
- Status: CLOSED  
- Current Teams: 0 |
| TDC-37 | A LOW POWER, SOLID STATE, METHOD OF OXYGEN OF SUPPLY  
- Levels: UPPER DIVISION [JR/SR]  
- Duration: Two-Semester  
- Status: CLOSED  
- Current Teams: 0 |
| TDC-38 | DESIGN/BUILD/TEST A COMPACT, HIGH SPECIFIC AREA LIQUID CONTACTOR  
NASA MENTOR: John Graf | NASA JSC, Engineering Directorate, Crew and Thermal Systems Division | - Majors: EE, CS, Software ENG  
- Levels: All Levels  
- Duration: One or Two Semester  
- Status: CLOSED  
- Current Teams: 0 |
| TDC-40 | MICRO-G NEUTRAL BUOYANCY EXPERIMENT: SPACETWALK TOOLS (3 CHALLENGE OPTIONS)  
NASA MENTOR: To be assigned upon acceptance | NASA JSC Office of Education | - Majors: Interdisciplinary teams  
- Levels: All Levels  
- Duration: One or Two Semester  
- Status: RESERVED  
- Current Teams: 2  
- SPECIAL NOTICE: Download topic PDF for information |
| TDC-41 | ICE 3D PRINTER  
**NASA MENTOR**: Brian Banker | NASA JSC, Human Interface Branch | • **Majors**: All Majors  
• **Levels**: All Levels  
• **Duration**: Two-Semester  
• **Status**: RESERVED  
• **Current Teams**: 1 |
| TDC-43 | ANTENNA PERFORMANCE OF STANDARD-BASED CONSUMER COMMUNICATION COMMERCIAL OFF-THE-SHELF (COTS) HARDWARE  
**NASA MENTOR**: Chatwin Lansdowne | NASA JSC, Crew and Thermal Systems Division - EC | • **Majors**: EE, CE  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: CLOSED  
• **Current Teams**: 0 |
| TDC-44 | DESIGN OF A THERMAL/CAPILLARY FLIGHT EXPERIMENT  
**NASA MENTOR**: John Graf | NASA JSC, EV/Communications System Branch | • **Majors**: CHE, ME  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: CLOSED  
• **Current Teams**: 0 |
| TDC-45 | VEHICLE INTERCHANGEABLE ELECTRONIC CONTROLLER (VIEC) NETWORK SYSTEM  
**NASA MENTOR**: George Salazar | NASA JSC, EV/Communications System Branch | • **Majors**: EE, CE  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: RESERVED  
• **Current Teams**: 1 |
| TDC-46 | SPACECRAFT LIGHTING NETWORK SYSTEM (SLNS)  
**NASA MENTOR**: George Salazar | NASA JSC, EV/Communications System Branch | • **Majors**: EE/CE, CS, AE, Eng.  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: RESERVED  
• **Current Teams**: 1 |
| TDC-47 | HUMAN-TENDED INFLATABLE LUNAR OUTPOST  
**NASA MENTOR**: John Alred | NASA JSC, EV/Communications System Branch | • **Majors**: AE, ME or Materials Eng  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: RESERVED  
• **Current Teams**: 2 |
| TDC-48 | HIGH EFFICIENCY THERMAL CONTROL GARMENTS  
**NASA MENTOR**: Christopher Massina | NASA JSC, Crew and Thermal Systems Division, Thermal Systems Branch | • **Majors**: All Majors  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: Two-Semester  
• **Status**: RESERVED  
• **Current Teams**: 1 |
| TDC-49 | ANTENNA MOUNTING STRUCTURE FOR LANDER OR ZERO GRAVITY CREWED ENVIRONMENT  
**NASA MENTOR**: Chatwin Lansdowne | NASA JSC, EV8 Branch | • **Majors**: ME, AE  
• **Levels**: UPPER DIVISION [JR/SR]  
• **Duration**: One or Two-Semester  
• **Status**: CLOSED  
• **Current Teams**: 0 |
| TDC-50 | BLUETOOTH TRACKING VIA BEACONS AND ANGLE OF ARRIVAL  
NASA MENTOR: Justin Bautista | NASA JSC, EV3 Branch | • Majors: EE, CE, CS  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: Two-Semester  
• Status: RESERVED  
• Current Teams: 1 |
| TDC-51 | 3D PRINTED FERROUS EMI-EME SHIELDING  
NASA MENTOR: Chatwin Lansdowne | NASA JSC, EV8 Branch | • Majors: EE  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-52 | 3D PRINTED CONDUCTIVE EMI-EME SHIELDING  
NASA MENTOR: Chatwin Lansdowne | NASA JSC, EV8 Branch | • Majors: EE  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-53 | ALTERNATE TREADMILL FOR EXPLORATION MISSIONS  
NASA MENTOR: Phillip Callen | NASA JSC, Flight Systems Branch/ER3; Software, Robotics, and Simulation Division; Engineering Directorate | • Majors: Multidiscipline (ME, EE, CS, BioMed etc.)  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One or Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-54 | MULTI-MOTOR EXERCISE DEVICE FOR SPACE EXPLORATION  
NASA MENTOR: Phillip Callen | NASA JSC, Flight Systems Branch/ER3; Software, Robotics, and Simulation Division; Engineering Directorate | • Majors: Multidiscipline (ME, EE, CS, BioMed etc.)  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One or Two-Semester  
• Status: RESERVED  
• Current Teams: 1 |
| TDC-55 | TACTILE DISPLAY FOR SPACEWALKS  
NASA MENTOR: Ricco Aceves | NASA JSC, EV3 Branch | • Majors: EE/CE, CS, AE, ME  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-56 | DEVELOPMENT OF VARIABLE EMISSIVITY COATINGS/STRUCTURES FOR SPACECRAFT THERMAL MANAGEMENT SYSTEMS  
NASA MENTORS: Angel Alvarez-Hernandez, Ron Lewis | NASA JSC, ES3 Thermal Design Branch | • Majors: All Majors  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One to Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-57 | NOVEL HUMAN RATED SPACECRAFT THERMAL MANAGEMENT SYSTEMS  
NASA MENTORS: Angel Alvarez-Hernandez, Ron Lewis | NASA JSC, ES3 Thermal Design Branch | • Majors: All Majors  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One to Two-Semester  
• Status: CLOSED |
| TDC-58 | NEW DEPLOYABLE RADIATOR DESIGN FOR INFLATABLE STRUCTURES  
**NASA MENTORS:** Angel Alvarez-Hernandez, Laurie Carrillo | NASA JSC, ES3 Thermal Design Branch | • Current Teams: 0  
• Majors: All Majors  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One to Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-59 | DEVELOPMENT OF DAMAGE TOLERANT/SELF-HEALING HEATER SYSTEMS FOR SPACECRAFT THERMAL MANAGEMENT  
**NASA MENTOR:** Angel Alvarez-Hernandez | NASA JSC, ES3 Thermal Design Branch | • Majors: All Majors  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One to Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-60 | HUMAN RATED SPACECRAFT THERMAL MATH MODEL RUNTIME OPTIMIZATION MATH  
**NASA MENTORS:** Angel Alvarez-Hernandez, Mark Cavanaugh | NASA JSC, ES3 Thermal Design Branch | • Majors: All Majors  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: One to Two-Semester  
• Status: CLOSED  
• Current Teams: 0 |
| TDC-61 | MACHINE-LEARNING HUMAN-COMPUTER INTERFACE SYSTEM (MHIS)  
**NASA MENTOR:** George Salazar | NASA JSC, Human Interface Branch | • Majors: EE, CE  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: Two-Semester  
• Status: RESERVED  
• Current Teams: 1 |
| TDC-62 | PREVENTION, MITIGATION, OR TREATMENT OF CHRONIC LOW BACK PAIN  
**NASA MENTORS:** Bara Reyna, George Salazar | NASA JSC, Exploration Medical Capability Branch | • Majors: Kinesiology  
• Levels: UPPER DIVISION [JR/SR]  
• Duration: Two-Semester  
• Status: RESERVED  
• Current Teams: 1 |