

Thursday, February 23, 2017

Murray State University

E-Day

“Engineering Day”
EVENTS

Architecture CAD (TSA: CAD, Architecture) (Coordinator: Kevin Perry) – IT 243

3-hour event

On-site event

Individual Event

- Brief Description: Use basic drawing principles and computer modeling skills to solve an architectural design challenge the day of the event. Students should be prepared to sketch, model, and render for full points.
- MSU will provide: AutoCAD 2016 and Revit 2016

Civil/Structural Project (TSA: N/A) (Coordinators: Jon Payne/Brian Giltner/SCA) – IT 229

1-hour event

On-site event

Teams of 2 students per team – Limit 2 teams per school

- The following materials will be provided the day of the event. The towers will be constructed onsite the day of the event.
 - Paper for sketching design
 - 1 golf ball
 - 50 plastic straws
 - 50 pipe cleaners
 - 25 metal paper clips
- Draw the concept of your tower on the provided paper. The paper can only be used for sketching.
- The golf ball must be supported near the top of the tower, with the bottom of the ball no more than 20% below the upper height of the tower. The tower must be able to support the golf ball for a minimum of 2 minutes.
- The tower height is measured from the bottom of the tower to the bottom of the golf ball.
- Evaluation - each tower will be awarded points based on the following criteria
 - Height 30 points max.
 - Creativity 30 points max.
 - Sketch 20 points max.
 - Height to weight ratio 20 points max.

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Construction (TSA: N/A) (Coordinator: Sam Hayes/AEGD/SCA) – IT 107

4-hour event

On-site event

Teams of 2 or 3 students per team – Limit 1 team per school

- Design and build a model architectural structure using nothing more than wooden matches, the boxes that contain them, and glue (types of glue to be determined)
 - Structure does not have to be a house
 - Skyscrapers, towers, bridges, dams, or other structures are allowed
 - Include detailed trim work, or other architectural features
 - Use your imagination and creative skills
- Two sizes of matches/ match boxes will be used, both large and regular size
- Using architect's scales, graph paper and straight edge, students will draw an exterior sketch of the structure they intend to construct
 - In addition to the hand drawn sketch, students may choose also to use AutoCAD 2016 and Revit 2016 provided by MSU
- Drawing must include at minimum two elevation views and a plan view
- Detail should include at minimum, scale and overall exterior dimensions
- Include doors, windows, porches, garages, etc., if features are present
- Students will build their structures using tools and materials provided by MSU:
 - AutoCAD 2016 and Revit 2016
 - Architect's scales ($\frac{3}{4}$ " = 1'-0" scale size)
 - Graph paper
 - Match sticks
 - Glue
 - Exacto knife, etc.
- Evaluation - each structure will be awarded points based on the following criteria:
 - Architectural Design (Creativity) - 30 points max
 - Correctness of Proportions - 20 points max
 - Sketch (more detail = more points) - 20 points max
 - Quality of construction (Neatness, Attention to Detail) – 20 points max
 - Number of match sticks used for construction
 - more sticks does not necessarily mean better – 10 points max

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CO² Car Design (TSA: Dragster Design) (Coordinator: Sid Martin/ISA) – IT 221

1-hour event

Bring project to event

Up to 4 students per team – No Limit on # of teams per school

- Brief Description: CO₂ Cars will compete for best design and aesthetics. Accuracy of the sketch to the actual model will also be included in the scoring. Car designs will be judged prior to the race. There will be no divisions for this event.
- Bring to event: design, sketches/drawings, production development

CO² Car Race (TSA: Dragster Design) (Coordinator: Sid Martin/ISA) – IT 221

2-hour event

Bring project to event

Up to 4 students per team – No Limit on # of teams per school

- Brief Description: Students will design, manufacture and race a model CO₂ dragster car and bring to MSU. Students will design their car to meet certain specifications and limitations so that it qualifies as a legal car on race day.
- There will be two divisions – those cars that used the exact TSA specifications (TSA division) and those that did not use the TSA specifications (Open Division). Car racing in the TSA division may also compete in the open division.

Computer Aided Design (CAD, Engineering) (Coordinator: Rudy Ottway/AEGD) – IT 241

2-hour event

On-Site Event

Individual Event

- Create 3D computer model(s) of an engineering design problem
- Full 3D CAD model (may include: part models, assemblies)
- To also include: design intent, model development, function of model
- 2D production prints as needed/required
- Available software: Autodesk Fusion, SolidWorks, Pro-E/Creo
- Software brought on high school computer will be allowed

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Engineering Design (TSA: Technology Problem Solving) (Coordinator: Emre Bahadir/Jamie Rogers) – IT 106

2 ½-hour Event

On-Site Event

Teams of 2 students per team – Limit 3 teams per school

- Brief Description: Students will be given a challenging interactive engineering problem to solve. Students will develop a solution the day of the event and present that solution to everyone at the end of the day.

Environmental Experiment (TSA: N/A) (Coordinator: Mike Kemp) IT 234

1 ½ hour event

On-site event

Teams of 2 students per team – Limit 2 teams per school

- Brief Description: Students will purify a sample of water with supplies that will be provided to the students the day of the competition. The water will contain material such as: coffee grounds, salt, vegetable oil, soil, soap, food coloring, plant residue and vinegar.

Information Technology (TSA: N/A) (Coordinator: Carlos Lopez/John Hart/ATSM) – IT 226

2-hour event

On-site event

Teams of 2 students per team – Limit 2 teams per school

- Brief Description: Students will install and configure a basic network server to meet specifications provided the day of the event

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Kayak (TSA: N/A) (Coordinator: Jon Payne/Brian Giltner/SCA) – I&T Bldg Loading Dock

2-hour event

On-site event

Teams of 4 students per team – Limit 2 teams per school

- Teams of 4 – Bring kayak to event (one kayak per school)
- Testing will take place during the event
- Guidelines:
 - CONTEST- Build, design and research kayak construction. Your job is to design and build a small lightweight kayak that can easily be carried to remote fishing lakes, the boat must be light weight but also be strong enough to carry at least 200 lbs.
 - SCOPE OF CONTEST- Research kayak design from primitive to modern day, design your own kayak using specified materials, float and paddle your kayak at Murray State University on February 23, 2017.
 - REQUIREMENTS- Notebook documenting research, design and construction of kayak Finished boat and testing of boat on day of competition at MSU pool. Quality of construction and design will be factors in overall judging. Sketches and technical drawings must be included in your notebook. Kayak design teams may have up to 4 members.
 - SIZE REQUIREMENTS- 10' maximum length, there is no height, width or weight requirements.
 - MATERIALS- Boat will be constructed of PVC pipe, zip ties, duct tape, shrink wrap, bicycle rim (if used) and shrink tape.
 - SOURCES- Bicycle rim for cockpit, ¾" PVC pipe-thin wall or thick (Lowe's, Home Depot or plumbing house.) Duct tape (anywhere), Shrink wrap (U-LINE.COM) use heavy shrink wrap used for boat storage and transport, any color.

Project Showcase / Manufacturing Prototype (Engineering Design) (Coordinator: Rudy Ottway/AEGD) – IT 241

1 ½ hour event

Bring project to event

Unrestricted students per team – Unrestricted teams per school

- Brief Description: Students will bring a prototype developed for a product design or problem or materials related to their class/senior capstone project.
- Please solve a realistic problem with a realistic/functional prototype or solution.
- Prototype may be produced from a variety of materials or a 3D printer
- Display will set up for viewing by 10:00 a.m. – Presentation time – TBA
- Students will make a 5 to 7 minute presentation (PowerPoint or similar)

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Robot Challenge (TSA: VEX) (Coordinator: Bryant Harrison/ISA) – IT 244

1 ½ - hour event

On-site event (Can bring project to event)

Teams of 4 students per team – Limit 3 teams per school

- Brief Description: The Robotics event will require teams of students to construct and program a robotic vehicle to maneuver an obstacle course. Multiple robotic construction systems may be used. (e.g., Vex, LEGO, Parallax and others). The robot can either be tethered by a power source or operate wireless. (However any robot should be capable of autonomous operation) The vehicle may be built on site or prior to the event. Most of the programming will be done on site.
- Bring to event (not required): Students may bring a robot preassembled. Those who choose not to bring a preassembled robot will be provided with one on site.

IEEE Project Showcase (Coordinator: Aleck Leedy)

- IEEE students will be setting up a showcase of projects they have been working on. This will be available for viewing at some point during the day.

TEAMS Competition (Coordinator: Ted Thiede) – Curris Center Large Ballroom

NOTE: All schools (and teams) will have several options for taking the TEAMS exams. If you have ANY questions about this, please email Dr. Ted Thiede at tthiede@murraystate.edu.

- High School – 9th and 10th Division
 - Teams of 8 will be given two exams
 - Two – 90 minute exams
 - Limit 8 teams per school
 - Team members may participate in other E-Day events during break times
 - On-site Event
- High School – 11th and 12th Division
 - Teams of 8 will be given two exams
 - Two – 90 minute exams
 - Limit 8 teams per school
 - Team members may participate in other E-Day events during break times
 - On-site Event

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