



**NEW MEXICO MESA USA  
NATIONAL ENGINEERING DESIGN COMPETITION  
PROSTHETIC ARM CHALLENGE  
2012-2013**

**Overview**

In order to maximize each team's experience during this event, it is important to properly execute all aspects of the testing process and event administration. Although each MESA state may elect to present this event in different format(s), the MESA USA host site and the corresponding National Event Planning Committee will be required to adhere to the following processes in the MESA USA National Competition Handbook. Please note that the processes not only outline the event but also the roles, expectations and responsibilities of student team members and advisors.

**MESA USA Code of Sportsmanship**

During the course of this event, MESA students, staff, advisors and supporting family members will be expected to act in a professional and courteous manner at all times. All judges' decisions are final. Staff, advisors and parents shall not engage judges during the event.

**New Mexico Specificity**

This document is state specific to the New Mexico Competition. For the full and stand-alone National Requirements and logistical information, please review the National Handbook, <http://nmmesa.org/pdf%20Files/2013%20MESA%20USA%20Prosthetic%20Arm.pdf> . As a guideline, any rule changes or omissions mentioned in this addendum supersede the National Handbook for the New Mexico State Competition only.

**New Mexico General Information**

**TEAMS:** Each school is allowed to bring 1 event team per program only. A team consists of 2-4 students. All students on a team must be on the program roster (A-2 entered in MIMS and have their A-1 submitted to Regional Coordinator) by the registration deadline, December 7, 2012. Final students need to be determined by the Project Proposal submittal deadline, February 28, 2013. An alternate will be allowed to be named but only a maximum of 4 students will be allowed to attend the State Competition.

**AWARDS:** At the MESA USA National Engineering Design Competition 1<sup>st</sup>-3<sup>rd</sup> place trophies and individual awards will be presented for both middle and high school levels. Awards will be presented to winners in each component area of this competition. The middle and high school 1<sup>st</sup> place teams will compete in the National MESA USA competition as the NM MESA representatives. The national competition will be held in Oregon on June 20-23, 2013.

**DISQUALIFICATION:** A team will be disqualified for not following event parameters or for not participating in a required portion of the event.

**QUALIFICATION:** There will be multiple levels of qualification as summarized below and described in this document in detail.

1.) Round 1-Team Pre-Registration

- a. All teams will be required to pre-register with NM MESA as outlined no later than 5:00PM on December 7, 2012. The MESA registration software will automatically prevent any late entries.

- b. Teams will then be given access to all MESA USA preparation materials.
- 2.) Round 2-Project Proposal Submittal
  - a. All teams will be required to submit a project proposal as outlined in the state information, no later than 5:00PM on February 28, 2013.
  - b. Teams will be notified of acceptance to Final State Competition no later than March 8, 2013 via email.
  - c. Accepted teams will register to attend according to instructions received in the acceptance information.
  - d. Up to the top 15 middle school teams and the top 15 high school teams will advance to the final state competition.
  - e. All advancing teams must meet all device requirements and performance minimum as outlined.
- 3.) Round 3-Final State Competition
  - a. This is the final round of competition and qualifiers will be required to participate in all aspects of the competitions as outlined.
  - b. Testing and requirements will mimic the National MESA USA event as closely as possible.
  - c. The final technical paper must be submitted no later than 5:00PM on April 11, 2013 for all teams that have qualified for the final round of competition. If the required technical paper is not submitted, the team is automatically disqualified.

STATE COMPETITION LOGISTICS: The New Mexico State Competition will take place on April 26, 2013 in Roswell, New Mexico at the New Mexico Military Institute. Transportation will be provided to all participating teams. Regional consolidation will be required as able. Lodging will be provided at a lodging fee of \$10/student and (1) advisor shared room will be provided at no cost per team. Additional information will be provided to all qualifiers regarding logistics and state competition registration.

#### PRE-REGISTRATION PROCESS AND ONLINE EVENT SITE:

- Please visit the NM MESA Website: <http://nmmesa.org>; Advisor Section, Events & Registration Link. This is the link to the event website and the registration area.
- Pre-Registration will be open as of November 26, 2012.
- Pre-Registration will need to be completed by the program advisor creating one (1) registration per team/school.
- Online Registration will collect all needed information as follows:
  - Student Information: Student names (as listed on school roster and may be changed until Project Proposal Deadline)
  - Advisor and School Information
  - Estimated cost of attendance to Roswell (for budgetary purposes) if team was to be selected.
- All correspondence will be sent via email. Make sure that all email accounts allow nmmesa.org emails, specifically the email of the Program Coordinator.
- Once registered, each registrant will receive a confirmation email and number which will allow access to the event website. Do not cancel a registration unless the program is withdrawing from the competition in entirety. A school that is unsure about participating SHOULD NOT register unless they are ENTIRELY SURE about participating.
- As mentioned, this email will also re-direct you to the event summary website which will contain all preparation and attendance including deadline reminders, current agendas, and more as they are available. The event summary website will be a closed site so only those that have registered for the event will have access to this location. This event website will become increasingly more important as EVERYTHING related to MESA USA will be posted here and registration will need to be modified as teams advance to the state competition rounds.
- Teams who are not selected will have their access to event website blocked.
- All pre-registrants will be given a user name and password which will give them access to national MESA USA materials including the MESA USA curriculum, forums, and guidebooks. Expect an email with detailed log in information to come from “webmaster@mesausa.org”.

**WEBINARS:** All pre-registrants will receive invitations to monthly webinars and are expected to attend to help prepare for the State Competition. Content prior to project proposal deadline will include prosthetic arm information, MESA USA project completion suggestions, and technical paper support. Content after project proposal deadline will include academic display support and oral presentation support.

**MENTORS:** All teams that are selected to advance to the State Competition will be assigned a team mentor to assist with final project completion. Mentors are to aid teams, but teams are expected to assume ownership of project. It is the responsibility of the team advisors to schedule meetings with the mentors.

**MESA USA NATIONAL CURRICULUM:** A National Curriculum has been created to assist with MESA USA preparation. Only pre-registrants will have access to this curriculum. Information contained within is copyrighted and is to be used for MESA use only, including pre-registrants for the MESA USA Project. Pre-Registrants will be assigned a log in ID to a National Site for access to all curriculum components.

**MISCELLANEOUS:** There will be a MESA USA FAQ (frequently asked questions) document as needed on the NM MESA Website: <http://nmmesa.org>; Advisor Section, Events & Registration, MESA USA area.

**Tentative Agenda**  
 April 26, 2013-Roswell-NMMI  
 Godfrey Athletic Center

<b>TIME</b>	<b>EVENT</b>	<b>LOCATION</b>
<i>All schools must arrive at the Event Location no later than 7:30 a.m.</i>		
7:00 a.m.	Staff and Judges Report	TBA
7:30 – 8:15 a.m.	School Registration and Check In – Advisors	TBA
7:30 – 8:30 a.m.	Device Impound and Inspection Academic Display Set Up	TBA
8:30 a.m.	Welcome/Instructions	TBA
8:45 a.m.	Dismissed by Event to Event Sites	TBA
9:00 – 11:00 a.m. <b>SHIFT 1</b>	HS Device Performance Testing HS Display Judging MS Oral Presentation MS Displays-Open to Public	TBA
11:00 a.m.	Student Lunch-On Own Staff/Volunteer Lunch	TBA
12:00 – 2:00 p.m. <b>SHIFT 2</b>	MS Device Performance Testing MS Display Judging HS Oral Presentation HS Displays-Open to Public	TBA
2:00 – 3:00 p.m.	Academic Display Take Down Final Scoring	TBA
3:00 - 3:45 p.m.	Downtime Presentation	TBA
3:45 p.m.	Awards Ceremony	TBA
4:15 p.m.	Depart for Home	
<b>Detailed Agenda is Subject to Change</b>		

## **QUESTIONS: The New Mexico 2012-2013 Event Coordinator is:**

Anita Gonzales  
NM MESA Program Coordinator  
Teacher Education Center #113  
New Mexico Highlands University  
Las Vegas, NM 87701  
O: (505) 454-3027 or (866) 614-2487  
F: (877) 464-6642  
[anita@nmmesa.org](mailto:anita@nmmesa.org)  
NM MESA Website: <http://nmmesa.org>

### **Round 2 Detailed Information**

**TEAMS:** Each team will be required to submit a project proposal for feedback. Judges will be providing feedback and final team selection will be based on project proposals. Complete information is not expected. But effort, start of project, and some research is expected. This is intended to be the start of the final project. However, information provided in proposal does not have to be the final submitted information if team is selected to advance.

Project Proposal is intended to give reviewers a snapshot of your project and team commitment. This is a good requirement to ensure a start of all aspects of project. All project proposals are to be submitted to the Program Coordinator in person, hard copy (mail), email, or fax. Email or fax is preferred. All teams that submit a project proposal will receive an academic competition credit in MIMS regardless of acceptance to the State Competition.

**COMPONENTS:** Project Proposal will have the required elements-

- 1.) Draft Technical Paper
- 2.) Detailed Project Timeline
- 3.) Start of (1) Physical Model

#### **Draft Technical Paper Guidelines**

##### **Objective**

To show the start of the project, initial understanding of the prototype, and the current progress in the engineering design process.

##### **Length**

The paper should be no longer than five pages in length (excluding the title page). Thorough but concise papers are encouraged.

##### **Electronic Format**

Teams are required to save the document in Portable Document Format (pdf) or Microsoft Word format prior to submission.

##### **Authorship**

The authors must be members of the student team participating in the competition. The paper must be the original work of the authors. All research shall be referenced including personal interviews.

##### **Written Presentation**

The paper should be typed, double-spaced, and have a cover sheet. Graphics should be computer generated. The font used should be Times New Roman and the font size should be 12. A one-inch margin is required on all sides.

The paper should include the following:

- A. Title Page - not included in the page count
- B. Introduction
- C. Partial Discussion and Current Progress
- D. Recommendations for Completion
- E. References or bibliography

### Title Page

Title, Authors, School and Date need to be included

### Introduction

This is the narrative that prepares readers for the discussion that follows. It provides background for the reader before introducing any technical data. It is broken down into three sections that average one to two paragraphs each:

- Purpose: why the project was initiated and why the report was compiled (e.g., to solve a problem, to evaluate or introduce a new concept, etc.)
- Scope: defines the parameters of your report; outlines methods of investigation and any limiting factors
- Background Information: presents facts the reader should know, conditions or events prior to the project, details of previous reports

### Partial Discussion

This is the longest section of the paper. It presents and discusses all evidence.

1. Summarize the teams' device development, including a general description of design research, design selection and modifications made to satisfy event rules and task objectives thus far.
2. Discuss physical phenomena related to the device that you have discovered thus far.
3. Use of advanced concepts, techniques, algorithms or other materials that would not normally be included in middle or high school subjects must be explained. The paper must show how the team's research and work led to their selection and use.
4. Current progress on work. Because the project is in the beginning phases of operation, conclusions and recommendation will be unable to be reached, but describe your current progress through use of the Engineering Process.
5. Sample designs and ideas are to be included and can be in the form of a "blog" format, pictures, and/or drawings. Teams are expected to submit the equivalent of (5) submissions from an Engineering Design Notebook.

### Recommendations for Completion

This section is used to indicate further work to be done or to indicate the best solution when several solutions have been presented. Write recommendations, in strong definitive terms using first person and active verbs.

### References

All sources that are consulted should be properly cited according to the APA format. See Resource Materials section of the MESA USA Handbook for example references and additional information.

### Criteria for Evaluation and Scoring

Shown below are the main areas that will be considered in the evaluation of the technical paper.

- Discussion
  - Has thought been put into the start of the project?
  - Are students researching phenomena and concepts related to the project?
  - Have students started the Engineering Process and have at least one model started?
- Introduction
- Recommendations
- Written Presentation

## **Project Timeline Guidelines**

### Objective

To outline planned project completion

### Electronic Format

Teams are required to save the document in Portable Document Format (pdf) or Microsoft Word format prior to submission and submit according to registration instructions. If timeline is hand drawn, it can be scanned and attached as a .JPG image.

The Project Timeline should include the following:

- A. Expected work time and completion dates for all parts of project: Technical Paper, Academic Display, Oral Presentation, and Physical Project.
- B. Summary for each part of project about what needs to be completed and what team members will complete.

## **Physical Model Guidelines**

### Objective

To ensure the start of building on at least one prototype model

The Physical Model Requirement should include the following:

- A. Picture of prototype (if not already included in draft technical paper)
- B. Sample drawing of prototype (if not already included in draft technical paper)
- C. Discussion of how prototype works or is expected to work (if not already included in draft technical paper)

## **New Mexico Changes and/or Omissions to National Handbook**

<b><i>Topic</i></b>	<b><i>Page</i></b>	<b><i>Summary of Change/Omission</i></b>
Device Construction	10	Teams are encouraged to build their device to be able to be transported to Nationals. Advancing teams will be expected to transport device, impound and repair materials, and smaller display materials with them as part of their baggage allowance. NM MESA will only ship display and approved other items to the National Competition.
Technical Paper	13	New Mexico Deadline will be April 11, 2013 at 5:00PM. Paper should be submitted via fax or email to Event Coordinator. Final Technical paper is only required of teams being accepted to the State Competition.
Academic Display	16	The dimensions for the table may be different dependent on availability at facility. If the correct size of table cannot be found, displays may be placed on the floor if too large to fit on a smaller table.
Oral Presentation	18	There is no official state MESA USA Shirt. For the purpose of the competition, teams are expected to be dressed professionally and/or be in matching school or MESA shirts.