MICHIGAN ENGINEERING

ZONE

HANDBOOK

A Guide to Teachers, Students, Mentors & Administrators

November 7, 2017

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What is "The Michigan Engineering Zone (MEZ)"?

Mission

The Michigan Engineering Zone (MEZ), is housed in the University of Michigan Detroit Center, located in downtown Detroit, is an innovation/creation space, which In collaboration with Detroit Publics Schools, the Educational Achievement Authority and US FIRST (For Inspiration and Recognition of Science and Technology), aims to encourage Detroit youth to pursue careers in engineering and technology by,

- Exposing middle and high school students to science, engineering, and technology through challenging and exciting hands-on experiences;
- Providing training and mentoring to the high school students offered by U-M College of Engineering students, alumni, as well as local professional engineers and interested others
- Encouraging camaraderie and teamwork among students with similar educational goals and aspirations;
- Creating tailored information workshops for students and their parents addressing college opportunities (emphasizing the availability of science and engineering degrees), financial aid and scholarships, and the college application process.

History

In January 2010, working with corporate partners and donors, the University of Michigan leased additional space within in its Detroit Center and transformed it to create a shared home for DPS FIRST teams. Nearly 240 high school students from 18 Detroit schools signed up for the robotics program at the beginning of 2015. Over the course of six weeks, professional engineers, University of Michigan engineering students, and other volunteers taught the students how to use computer-aided design, programming software, and machine tools to create robots capable of playing three-on-three games of soccer. The coaches and mentors stressed teamwork, planning, leadership, decision-making, and problem solving. After extensive practice testing, the teams' finished robots—some standing more than five feet high and weighing up to 125 pounds—were entered into a series of competitions sponsored by FIRST Robotics. One Detroit team made it to the international finals held in Atlanta in mid-April. By engaging Detroit students in challenging hands-on robotics projects, the MEZ exposed high school students to science, engineering and technology, piqued their interest in engineering careers, and helped them build with the knowledge, skills, and character to press onward toward higher education and careers in STEM fields.

Facility

The Michigan Engineering Zone is a 5200 square foot innovation/creation space, with computer labs, and a full service machine shop. Each high school team working at the MEZ is provided a

dedicated workstation and equipment and part storage. This dedicated space allows teams to develop and implement their activity plans in pursuit of their FIRST game strategy and robot build requirements.

The innovation space currently accommodates 19 teams. The team's activities are supplemented by access to a fully equipped machine shop. A certified machinist serves as supervisor and the primary trainer for all MEZ participants. This allows all students, teachers and other to be appropriately trained in the use of all the shops machines, (e.g. lathe, band saw, 3 axis mill and grinders.) A machine familiarization and use signoff is required of all who wish to use the machine shop equipment.

MEZ Staff

CONTACT US

- Email: MEZDETROIT@UMICH.EDU
- MEZ Calendar can be seen on the MEZ Web Site: http://mez.engin.umich.edu
- Please make sure you have signed in with your contact information.
- Web Site: http://mez.engin.umich.edu
- You can also follow the MEZ on Facebook at www.facebook.com/mezdetroit.

Jeanne P. Murabito

Executive Director,
Office of Student Affairs,
College of Engineering

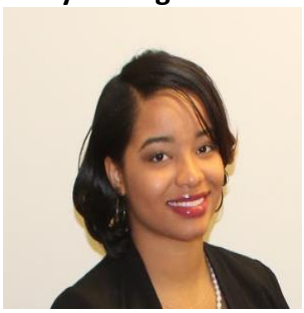
Julian E. Pate, III

MEZ Director

Robert Koehl

MEZ Senior Mentor

Jordyn Morgan



Program Assistant

Kenneth Snodgrass

MEZ Senior Mentor

George Perdue

Machine Shop Supervisor

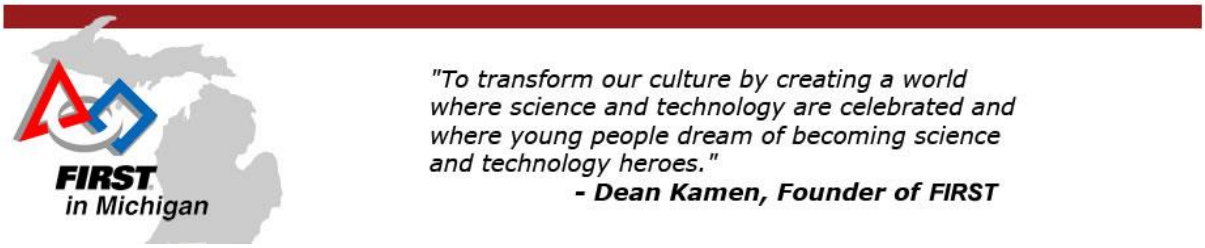
Gracious Professionalism – First Principal of US FIRST

Gracious Professionalism is part of the ethos of *FIRST*. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

In the long run, Gracious Professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

Coopertition®

Coopertition® produces innovation. At *FIRST*, Coopertition is displaying unqualified kindness and respect in the face of fierce competition. Coopertition is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete. Coopertition involves learning from teammates. It is teaching teammates. It is learning from Mentors. And it is managing and being managed. Coopertition means competing always, but assisting and enabling others when you can.



Each year the US FIRST organization devises a game to be played by robots conceived and built by high school teams. The Michigan Engineering Zone (MEZ) uses this platform as the basis for exposing students to the product development process, the dictates of the game provide the basis upon which the innovative ideas of the students are transformed into the physical remote control machines, which play the game. Teams compete in a variety of regional events to demonstrate the capability of the robot and the control acumen of the student teams. Success in the regional events can lead a team to qualify for the state and national championships. Past MEZ teams have competed at both post-season levels.

Above and beyond the activities associated with the robots, the hand-on activities under score he development of critical thinking skills, teamwork and an enhanced understanding of the value of post secondary education. The Office of Student Affairs provides workshops in college admissions, family preparation for college, insights into the financial aide process and a general overview into access to college.

Michigan Engineering Zone and FIRST Program Calendar

- Annual FIRST Game Reveal - First Saturday in January
- Robot Design and Construction - Six weeks commencing with the reveal
- Robot Bag Day – Tuesday Midnight of Week Seven of the year
- Michigan Engineering Zone Open House – Mid February
- Competition Season - Week Eight through Thirteen of the year
    - State Championship – Week Fifteen of the year
    - National Championship – Week Seventeen of the year
- Michigan Engineering Zone Post Season Banquet – Mid- May

MEZ Supported Activities

- Pre-Season Workshops
- Award Writing Workshops
- College Admissions Processes
- FIRST season kickoff
- Game Strategy Development
- Mid Season Open House
- Robot build planning
    - Mechanical and Electrical Systems
    - Materials and spare parts
- Timeline management
- Programming Development
- Construction support
- Competition planning and participation support
    - MEZ Pride Fridays
    - Competitions Practices
    - Robot and miscellaneous materials transportation
    - Team lunches at competitions
- Post Season Clean Up
- Post Season Banquet

MEZ Safety Training

All teams, teachers and mentors must complete the Michigan Engineering Zone Safety Training Module. If can be found online at: http://mez.engin.umich.edu/. Upon competition of the Training Module, the individual, teacher or team will submit the completion certificate the MEZ Program Assistant Renee Schenkman, at the MEZ. The team will not be allowed to conduct any robot construction activity until this certificate has been submitted.

Participants Responsibility

The primary participants in the MEZ activities and programming are, teachers, students and mentors and school administrators; their role and responsibilities are outlined here.

MEZ Registration

All participants, teachers, mentors and students must register with the MEZ; this is in addition to any registration made with your school organization or TIMMS registration with FIRST Robotics. This registration must be completed before any teams; teacher or student can participate in any robot construction activities in the MEZ. The registration access will be provided via Internet at the MEZ Website.

Principals /Administrators

The MEZ interacts with several school systems (Detroit Publics Schools, Education Achievement Authority and various charter and private schools). Processes and approaches vary among the participating systems; as such it is imperative that all participating schools' principal recognize the rigor and dedication required of their teachers and teams during the extremely constrained period, which is the MEZ/FIRST Season. Each principal is required to countersign a letter of commitment with the designated primary teacher/coach(es) (An sample letter is included in the appendix of this handbook). Execution of this document is required on an annual basis, when the school is invited to participate in the activities of the Michigan Engineering Zone

Teacher/Coaches

- **MEZ Safety Training**
  - All teams must complete the Michigan Engineering Zone Safety Training Module. If can be found online at: https:/12345678.edu. Upon competition of the Training Module, the teacher coach will submit the completion certificate for the team to the MEZ Program Assistant Renee Schenkman, at the MEZ. The team will not be allowed to conduct any robot construction activity until this certificate has been submitted.
- **Teachers/Mentors**
  - **As teams identify potential mentors, please share their contact information with the MEZ Director.**
  - **Refer potential mentors to the registration process link on the MEZ website.**

- **MEZ Schedule**
  - The hours of the MEZ are Mon through Thursday 3:30 PM – 7:00PM
  - Saturday 11:00 AM – 4:00 PM (Includes lunch)
  - The teams will clean up and be prepared to depart the MEZ at the designated session ending time, shown above.
  - Special hours may be developed in support of the program needs, "bag and tag day" and in support of competitions. These schedules will be distributed via email, as they occur.

- **MEZ Related Grants/Awards/Scholarships**
  - On occasion grants/awards/scholarships are offered to MEZ teams, the individual teams must complete the requirements specified in the grant to receive any specified funds. All grant expenditures are the responsibility of the granted school/team. If the requirements are not met the funds will not be awarded, or if awarded in advance will be required to be refunded to the grantor

- **Bus schedule management**
  - The bus schedule will be managed between the MEZ, and the transportation company, in accordance with an agreement between the transportation company, Detroit Public Schools and the University of Michigan, College of Engineering.
  - All schedules will be transmitted to the affected teams' teacher coach via email. Special needs of the team must have provided to the MEZ at least one week before required, and email confirmation will be provided whether or not the need can be satisfied.
  - The team should not contact the transportation company independently. The teachers should establish a phone link to the driver who transports them to the MEZ and competition sites.

- **Team goals and commitment**
  - To be successful teams must attend the MEZ as often as possible during the build period.
  - Each team is responsible for the progress on their robot
  - Teams are responsible for the cleanliness of their work area each visit to the MEZ
  - Students must sign-in on the designated computers in the MEZ lobby every day they enter the facility.
  - Teams are expected to make a contribution to the MEZ each season that will be a benefit to all. {Snacks, organize lunches, tools, materials, etc.)
  -

- **Innovation Space Use**
  - Safety glasses must be worn at all time in the MEZ.
  - Inform MEZ management if you observe unacceptable behavior.
  - Safety glasses are not required in the Break Room or the Computer Labs
  - Cell phone. Ear bud and MP3 usage is prohibited in the MEZ
  - No food or beverages are allowed in the MEZ outside of the Break Room or other designated meal space(s)
  - No painting is allowed anywhere in the MEZ or Detroit Center
  - All teams must be accompanied by a teacher/coach in order to do any work in the MEZ
  - No horse play is permitted in the MEZ
  - Teams and student members will not loiter anywhere in the Detroit Center building, or parking lots

- **Family Members**
  - Family members are encouraged to visit the MEZ during the build season, to see firsthand the activities that their children are involved in.
  - Family members are encouraged to attend all competition events.
  - Family members will be invited to the annual season open house and awards banquet.

- **Mentors**
  - Mentors provide technical insight to the teams and for some previous FRC team and competition experience.
  - Professional and college student mentors will be invited to assist the teams with the development and execution of the robot designs.
  - Teams are encouraged to identify and invite mentors to assist their teams, though this is not required for participation at the MEZ
  - Identified potential mentors must be referred to the MEZ Director; all potential mentors must complete a University of Michigan background check. Candidate mentors are not allowed to interact with student team members in the MEZ until this background check is completed, and they have completed the required Safety and Child Protection Training. It is important to refer candidates to the MEZ Director as soon as possible, to facilitate the intake process.

- **Sponsors**
  - Teams are encouraged to seek individual sponsors to supplement the teams' resources.
    - All MEZ Sponsors must be recognized by all teams on their robot

- Team Sponsors are not required to participate at the MEZ.

- **Coordination of Field trips**
  - The teacher/coach is responsible for acquiring all necessary parental and district approvals for student travel and participation in program competitions or other activities that do not occur at the MEZ.
  - Teams will not be permitted to participate without the appropriate parental/district approvals.

- **Student Discipline**
  - Teacher/coaches are responsible for maintaining appropriate conduct of their teams.
  - Inappropriate behavior will be brought to the attention of the teacher/coach by MEZ staff or mentors as required.
  - The MEZ director will coordinate with the teacher /coach if sanctions are required
  - Students are expected to maintain the Detroit Public Schools code of conduct.

- **Student Code of Conduct**
  - All students are expected to respect all participants and visitors to the MEZ. And adhere to the DPS Code of Conduct as described at: (**detroit**k12.org/resources/.../**codeOfConduct**/Student_**Code_of_Conduct**.p...)
  - The Detroit Public School dress code is the standard for the MEZ, No caps or hats or hoodies will be worn in the MEZ, or the Detroit Center at anytime. No ear buds or MP3 players or cell phones allowed.
  - Detroit Public School Dress Code can be found at: (**detroit**k12.org/resources/students/**dresscode**/)

- **Team Oversight**
  - Teams will not be permitted to work in the MEZ if not accompanied by a teacher/coach.
  - Mentors, or parents are not substitutes for teacher/coaches

- **Consequences of non-compliance**
  - Individual students or entire teams, who do not abide by the operational guidelines of the MEZ or the Detroit Center, may be excluded from participating in the FRC program activities at the MEZ.

University of Michigan Engineering Student Mentors

- The University of Michigan may select students from the College of Engineering to serve as mentors in the MEZ. The Student Mentors serve the same role as the Professional mentors shown below.

Professional Mentors

A MEZ Mentor is:

- A Motivator
- A Technical Resource
- A Sounding Board
- A Team Builder
- At the MEZ to inspire and support the teams, not drive a specific design concept or problem solution.
- A person who encourages sharing, e.g. ideas, knowledge, experience, to all the MEZ teams

<u>MEZ Mentor Commitment</u>

- MEZ Mentors commit to the team(s) when they will be here to assist at them at MEZ
- MEZ Mentors recognize that the students will do all the work
- Mentors will identify opportunities for the team(s) to learn from mistakes
- MEZ Mentors believe that a failure is an opportunity to learn
- MEZ Mentors will encourage questions and exploration
- MEZ Mentors share the following philosophy:
- "If you think you can't do something, try it anyway."**
- "If you think someone else can't do something, let them try it anyway"**
- "If you think your idea is not valuable, share it anyway" ***

- **Dr. Katherine Avery ***Ken Snodgrass
  - http://www.usfirst.org/roboticsprograms/frc/mentoring

    - University of Michigan Background Check
      - All prospective professional mentors must undergo a background check conducted by an agent of the University of Michigan.
      - The background check process will be conducted via email with information provided by the candidate, it will start when the candidate makes his or her initial expression of interest to be a mentor at the MEZ, please see the Director to begin the process.
      - Any issue identified from this review will result in the individual being dis-allowed as a mentor at the MEZ

  - These individuals will be informed of issues identified, by the MEZ Director and will only be shared with that individual.
  - Information and intake initiation access is shown on the MEZ Website.

- Boy Scout Youth Interaction Training
  - Mandatory completion of the Boy Scout Youth Protection Training is required, in addition to the background check.
  - All prospective mentors must complete online Boy Scout Youth Protection training at the following website: https://myscouting.scouting.org/_layouts/MyScouting/login.aspx?ReturnUrl=%2f_layouts%2fAuthenticate.aspx%3fSource%3d%252f&Source=%2f
  - The certificate of completion must be turned into MEZ Management, prior to being considered a Mentor or being allowed to work with students in the MEZ. This is an annual process for all mentors.
  - This certificate is required to perform any activities in the MEZ.

- MEZ Safety Training
  - All mentors must complete the Michigan Engineering Zone Safety Training Module. If can be found online at: https:/12345678.edu. Upon competition of the Training Module, the teacher coach will submit the completion certificate for the team to the MEZ Program Assistant Jordyn Morgan, at the MEZ. The team will not be allowed to conduct any robot construction activity until this certificate has been submitted

- Mentor Standard of Conduct
  - By accepting to volunteer with the MEZ, you have a responsibility to *the MEZ* and to your fellow volunteers to adhere to certain guidelines for conduct. Generally speaking, we expect every volunteer to act in a mature and responsible way at all times. When each person is aware that he or she can fully depend upon fellow volunteers to follow these Standards of Conduct, then our organization will be a better place to volunteer for everyone.
  - Treat everyone fairly, regardless of gender, ethnic background, religion, political belief or economic status
  - Conduct yourself in a manner that demonstrates a positive role model and a responsible representative of *FIRST and the MEZ.*
  - Consistently display high personal standards and project a favorable image of *the MEZ* and of volunteering
  - Whenever possible, ensure the safety of participants and volunteers
  - Respect the dignity of the participants and all other volunteers

  - Refrain from public criticism of participants or other volunteers
  - Refrain from the use of profane, insulting, harassing or otherwise offensive language while volunteering
  - Abstain from and discourage the use of drugs, alcohol and tobacco products in conjunction with the *FIRST* events
  - Report, to the MEZ Director, any incident that might be contrary to this Standard of Conduct
  - If you have any questions concerning any volunteer conduct or safety rule, or any unacceptable activity at the *MEZ*, please contact the MEZ Director.

- Consequences of non-compliance
  - Any mentor found to violate any element of the Standard of Conduct will be excluded from activities at the MEZ.

APPENDIX

Sample Commitment Letter

Each year teams are invited to participate in the FIRST season, by building and interacting with other teams at the Michigan Engineering Zone facility located in Suite 100 at the University of Michigan Detroit Center. Participating teams must agree to the requirements of the commitment letter. An example is shown here:

Dear :

The Michigan Engineering Zone (MEZ) is preparing to begin it activities in support of the 2017 FIRST Robotics season. We are seeking to build upon the successes that all of the teams experienced this past season.

We will be holding a number of workshops which we believe will beneficial to the teacher coaches, team members, and mentors. This year these workshops will include hands-on activities in computer/robot programming, construction of mini-robots, biomechanical systems, design and others. The schedule will include multiple sessions of the workshops in order to accommodate teams' participation in school activities, as well as to prepare the teams for the work schedule that will be involved when the robotics build season begins in January.

Your school's team is invited to join the 18 other teams to build in the MEZ. To confirm their spot in the MEZ, I need for you to identify the teacher coach(es) and for you to jointly review the attached school commitment document. If you agree to the team requirements listed in the commitment, you and the coach(es) are requested to sign and return it to the MEZ no later than Monday, September _____. Please email the signed commitment to The Michigan Engineering Zone at mezdetroit@umich.edu.

We will begin activities in October, so you response is vital to the involvement of your students/robotics team in these workshops. We look forward to working with your students to establish another successful season.

Sincerely,

Julian E. Pate, III

Jeanne P. Murabito

MEZ Web Site

- The MEZ web site is located at Web Site: http://mez.engin.umich.edu
- This handbook and related program information can be accessed through the website.
- Participate registration can be accomplished through the website.

Team and Teacher References

- Team Equipment Requirements
- The FRC Handbook: http://www.usfirst.org/sites/default/files/uploadedFiles/Community/FRC/Team_Resources/2013%20FRC%20team%20handbook.pdf
- Your team will need a computer and printer with Internet and e-mail access to download documents and communicate with *FIRST*. You will also need a toolbox and at least the following tools.
- **Hand Tools:** Ball Peen Hammer, Screwdrivers, Allen wrench set, Open Ended Wrench Set, Socket set, Hacksaw, Pliers, Calipers, Tape measure, C – Clamp Assortment, Files, Wire Crimpers, Wire Strippers, Multi-meter
- **Power Tools:** Portable Hand Drill, Assorted Drill Bits, Dremel hand drill system, Soldering iron
- MEZ Machine Shop has some hand tools and power drills for use in the MEZ, in addition to band saws, drill presses, grinders and a 3-axis mill (Safety signoff required to use this equipment.)
- The FIRST Mentoring Guide located in the FRC Mentor Guide Library - http://www.usfirst.org/roboticsprograms/frc/mentoring
- The team role definitions sections 3.2 - 3.4 of the annual Administrative Manual located at http://frc-manual.usfirst.org/viewItem/2
- First in Michigan (FIM) has good resources for pre-season and season steps and timing: http://www.firstinmichigan.com/
- FIRST Calendar of Events: http://www.usfirst.org/roboticsprograms/frc/calendar/