

## **NRC and University of Indianapolis: Design and Fabrication of Beetleweight Combat Robot with Hubless Equator Blade**

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A team of undergraduate engineers from the University of Indianapolis R.B. Annis School of Engineering has designed and fabricated a combat robot for a national competition in the Beetleweight division, which is less than 3 lbs. In the combat robot event, student teams designed and created a single custom-built machine that employs one or more methods of destroying or disabling their robot competitor. This robot is remotely controlled with an RF device and has been designed to meet all of the specifications and requirements of the combat robot event, as outlined in the competition manual. For Phase I of the design project, the team has researched past events and the contest manual to come up with the most important constraints and design decisions for the project. For Phase II, the team has proposed three preliminary conceptual designs and has chosen which design to develop further, analyzing the strengths and weaknesses of design alternatives. The next phase, Phase III included fabrication, testing, and optimization of multiple subsystems, like the communication, weapon, and drivetrain. Phase IV has finalized the design and prepared it for final roll-out, which includes the fabrication of two identical robots for competition and part replacement. This work will highlight the design tools used including a morphological chart and Fusion 360, and strategies used in the design process to lead and manage a team of engineers, including a Gantt chart.