

## **AU engineering team's robot heads to national competition**

10/24/03

"Grimace," a middle-weight fighting robot designed and built last spring by a team of Alfred University engineering students as their senior project, will enter "MECH WAR 7 Full Throttle Competition" at the St. Paul National Guard Armory in St. Paul, MN, this weekend. Dustin Broderick of Hornell and Bryan Crandall of Andover will take "Grimace" to this weekend's competition. Broderick and Crandall, both graduates with degrees in mechanical engineering, were members of a five-man interdisciplinary team that designed and built the robot; they received an Alfred Research Grant for Undergraduate Students (ARGUS) to help defray the cost of building "Grimace." Broderick was responsible for the body and frame of the robot, and Crandall was in charge of designing and building weapons. Other team members and their areas of responsibility were: Patrick Mancini, mechanical engineering, power train; Chad Lewis, electrical engineering, electronics and control; and Peter Gaydon, mechanical engineering, system integration. Advisors were Dr. Jason Tang, professor of electrical engineering, and Dr. J. Steven Mayes, assistant professor of mechanical engineering. In order to qualify for national competition, the team had to build a robot that met the weight limit and the requirements for the amount of energy that could be stored "on board." As they began their design work, students had to derive relevant equations from physics and encode the information into software programs that enabled them to evaluate alternative designs. Overall system control was achieved by three-dimensional modeling of a virtual robot. Once they finalized the design, they did a prototype of each component, bench-tested it to verify its predicted performance, and then built the subsystem to be incorporated into the actual robot. The Alfred team's "Grimace," as a middle-weight robot, meaning the students worked with a maximum weight of 120 pounds. The robot also had to be capable of competing within on an 8 x 8-foot square platform. As its weapon, "Grimace" is equipped with a spinning saw blade that is required to stop within 45 seconds of cutting the power. There were also specifications for controls: the remote control has to operate within a certain frequency band and the robot must have a fail-safe kill switch. Broderick, a graduate of Hornell High School, is the son of David and Peggy Broderick of Hornell. Crandall, son of Richard and Marcia Crandall of Andover, is a graduate of Canisteo Central School. Gaydon, son of Lewis and Marie Gaydon of Muncy, PA, is a graduate of Muncy High School. Lewis, a Whitesville Central School graduate, is the son of Jeffrey and Cheryl Ann Lewis of Whitesville. Mancini, a graduate of Maine-Endwell Senior High School, is the son of Nick and Susan Mancini of Endwell.