NTID
Automation Technologies Program Outcomes Assessment
Plan and Report for AY 2005-06*

Program Goal: To provide students the job entry skills needed to acquire positions in a wide array of automated environments, who will have as their primary responsibilities, to install, maintain, upgrade, troubleshoot and repair automated systems and their components.

Critical Outcomes for all Students		Assessment of Outcomes		Timeline		Results	
Domain/Task/ Capability	**Performance Criteria/ Benchmarks**	**Instrument/ Opportunity**	**Assessment of Performance**	**Develop**	**Collect**	**Summarization of Results**	**Use of Results**
Subsystem Capability	A. Use of Tools: Students will be able to identify and demonstrate correct use of tools. B. Safety Awareness: Students will be able to describe and demonstrate correct safety protocols. C. Reading and interpreting drawings, schematics and technical specs: Students will demonstrate the ability to read and correctly interpret electrical and mechanical drawings, schematics and technical specifications sheets. D. Programming: Students will demonstrate an understanding of programming concepts relating to the control of a system or process. E.	*Benchmarks A-F* Assessment to occur as a written and hands-on project exam at the end of the Automated Systems I course, (0891-220) Fall quarter of the second year.	A. Given an assembly or disassembly project, the all students will be able to identify and correctly use 90% of the tools needed. B. Given a scenario of an automated environment, all students will be able to describe the correct safety protocol and demonstrate adherence to the safety protocol on a given project 100% of the time. C. Given an assembly or troubleshooting project, all students will be able to correctly read and interpret electrical and mechanical drawings, schematics and other technical specification sheets needed to correctly assemble or troubleshoot the equipment 80% of the time. D. Given written program segments, all of the students	A-F 20033	A-F 20041		

	Instrumentation: Students will demonstrate the ability to correctly select, use and interpret instrumentation measurement devices. F. Problem Solving: Students will demonstrate a logical approach to problem solving and document solutions.		will be able to determine the function or purpose of the program segment 80% of the time. E. Given a project requiring electrical or mechanical gauges, all students will be able to correctly select, connect, and accurately read gauges information or electrical measurement information 80% of the time. F. Given a series of subsystems having one or more problems, all students will be able to demonstrate a logical approach to solving the problem(s), and will document the solution 80% of the time.				
System Level Capability							
Robotics Option *Subsystem Integration*	A. *Assembling:* Students will correctly assemble a basic automated system using mechanical and electrical drawings and manuals. Such system(s) may include subsystems such as motion controllers, HMI's, Robotic Controllers, Pneumatic and Hydraulic modules and various electromechanical sensing/signaling	*Benchmarks A-G* Assessment to occur as a written and hands-on project exam at the end of the Automated Systems Troubleshooting II course, (0891-330) Fall quarter of the third year.	A. Given a basic system, all students will mechanically and electrically assemble additional subsystems onto the system using mechanical and electrical drawings and manuals with minimal supervision. B. Given the assembled system, all students will be able to identify interface types, select appropriate interface connectors and connect and configure the	A-G 20033	A-G 20041		

	devices. B. *Interfacing:* Students will identify different electrical and mechanical interfaces and understand supporting documentation. C. *Programming:* Students will correctly install and debug simple controller programs. D. *Safety Awareness:* Students will be able to demonstrate correct safety protocols and procedures. E. *Troubleshooting:* Students will demonstrate a logical approach to troubleshooting and repairing system faults. F. *Data Collection and Process Verification:* Students will be able to demonstrate correct use and interpretation of basic quality control and statistical analysis tools and techniques. G. *System Maintenance:* Students will be able to identify and describe system	interface with 80% accuracy. C. Given a connected/interfaced controller all students will be able to install controller program(s) and will be able to debug 80% of the a simple controller program errors. D. Given a operating automated system senerio or actual system set-up, all students will be able to describe the correct safety protocol/procedures and demonstrate adherence to them on a given project 100% of the time. E. Given an automated system with operating faults, all students will be able to demonstrate a logical approach to troubleshooting and be able to identify and repair 80% of the faults. F. Given an operating automated system, all students will be able to collect process data and demonstrate use of control charts or other statistical analysis tools and techniques to verify process control compliance (or lack of it) with 80% accuracy. G. Given an automated system, all students will be able to identify and			

	maintenance requirements and perform basic maintenance tasks.		describe 80% of the maintenance tasks required for the system and correctly perform those maintenance tasks.				
Semiconductor Option *Subsystem Integration*	A. *Interfacing:* Students will identify different electrical and mechanical interfaces and understand supporting documentation. B. *Programming:* Students will correctly install and debug simple controller programs. C. *Safety Awareness:* Students will be able to describe and demonstrate correct safety protocols and procedures related to chemical and equipment safety using the Material Safety Data Sheets (MSDS). D. *Troubleshooting:* Students will demonstrate a logical approach to troubleshooting and repairing system faults using supporting documentation. E. *Data Collection and Process Verification:* Students will be able to demonstrate correct use and interpretation of	*Benchmarks A-H* Assessment to occur as a written and hands-on project exam at the end of the Semiconductor Tooling course, (0891-350) Fall quarter of the third year.	A. Given the assembled system, all students will be able to identify interface types, and configure the interface with 80% accuracy. B. Given a connected/interfaced controller all students will be able to install controller program(s) and will be able to debug 80% of the simple controller program errors. C. Given an operating automated system scenario or actual system set-up, all students will be able to describe the correct safety protocol/procedures and demonstrate adherence to them on a given project 100% of the time. D. Given an automated system with operating faults, all students will be able to demonstrate a logical approach to troubleshooting and be able to identify and repair 80% of the faults using the supporting documentation. E. Given an operating automated system, all students will be able to	A-H 20033	A-H 20041		

	basic quality control and statistical analysis tools and techniques. F. *System Maintenance:* Students will be able to identify and describe system maintenance requirements and perform basic maintenance tasks. G. *Wafer Fabrication Process:* Students will be able to flowchart and describe the process for fabricating wafers. H. *Clean Room Protocol:* Students will correctly describe and demonstrate clean room protocol.		collect process data and demonstrate use of control charts or other statistical analysis tools and techniques to verify process control compliance (or lack of it) with 80% accuracy. F. Given an automated system, all students will be able to identify and describe 80% of the maintenance tasks required for the system and correctly perform those maintenance tasks. G. All students will be able to flowchart and describe the process for fabricating wafers with 100% accuracy. H. Given a clean room environment or scenario, all students will be able to correctly describe and demonstrate appropriate clean room protocol 100 % of the time.				

Comments:
*The curriculum for this program of study was modified during AY 2005-06 and a new Outcomes Assessment Plan was written. Data for the new plan will be collected and reported for students who enter the modified program beginning AY 2006-07.

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Rev: 02/16/2006

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