Northeast Alabama Community College  
Industrial Systems Technology AAS, Certificate, and Short Term Certificate  
Program Review  
March 2011

Program Purpose

The primary objective of the Industrial Systems Technology program is to provide learning experiences that enable graduates to obtain the skills necessary for gainful employment in a variety of industrial settings. This program supports goals three, four, and seven of the college mission.

Program Learning Outcomes

Graduates of the Industrial Systems Technology (INT) program are able to:

- Perform tasks in a safe manner (all courses)
- Read and interpret technical drawings (INT 117, 119)
- Use precision measurement instruments (INT 117, 119)
- Apply mathematical operations (INT 117)
- Use proper tools for the task (INT 117)
- Disassemble machinery and equipment to remove parts and make repairs (INT 117, 119)
- Install machinery and equipment (INT 129)
- Use tools to perform maintenance tasks (INT 129)
- Clean, inspect, and lubricate parts, equipment, and machinery (INT 117)
- Exhibit a positive work ethic (WKO 106)

Assessed Needs and Assumptions

Graduates of the Industrial Systems Technology program typically work in manufacturing facilities. While the current state of the economy has resulted in decreased employment opportunities in most fields, welders and CNC machinists are still in demand locally, regionally, and nationwide.

According to the Alabama Department of Industrial Relations, openings for welders are expected to grow by 1.54% annually in Alabama between 2004 and 2014, and openings for machinists are expected to grow by 1.13% during the same period. The median hourly wages for these jobs in Alabama are $14.49 and $15.93, respectively. Locally, job prospects are promising as Volkswagen has opened an assembly facility in Chattanooga and the Tennessee Valley Authority (TVA) prepares to introduce plans for the future of its Bellefonte Nuclear Power Plant.

TVA requires an Associate in Applied Science in Industrial Electronics or Industrial Maintenance for many of their jobs and training programs. The college
is working with the Nuclear Energy Institute (NEI) and TVA to assure that the INT program meets their specific needs.

**Structure**
The Industrial Systems program consists of the following:
- **Associate in Applied Science degree (63 hours)** with options in
  - Electrical and Instrumentation
  - Maintenance Mechanic
  - Multi-Skilled Technician
  - Welding
  - Machining
- Certificate – General (48 hours)
- Certificate – Machine Tool Technology (48 hours)
- Certificate – Welding (48 hours)
- Short-Term Certificate – Electrical and Instrumentation (28 hours)
- Short-Term Certificate – Maintenance Mechanic (27 hours)
- Short-Term Certificate – Machine Tool Technology (12-24 hours)
- Short-Term Certificate – Welding Technology (12-24 hours)

**Accreditation**
The Industrial Systems Technology Program is within the institutional accreditation by the SACS Commission on Colleges, reaffirmed in 2005.

**Instructors**
Northeast employs one full-time and several part-time Industrial Systems instructors. Some instructors are qualified to teach both Industrial Maintenance and Industrial Electronics courses.

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Education</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will Roberts</td>
<td>AS – Northeast Alabama Community College</td>
<td>American Welding Society (AWS) Certified Welding Inspector (CWI) Full-time instructor for 1.5 years Adjunct instructor for 1.5 years 15 years experience in Industrial Maintenance 14 years experience as a Machinist 14 years experience as a Welder</td>
</tr>
<tr>
<td>Full-time instructor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bruce Bachelor</td>
<td>AA – Northeast Alabama Community College</td>
<td>BS – Covenant College Adjunct Instructor for 1 year 22+ years at Siemens, currently a quality engineer</td>
</tr>
<tr>
<td>Adjunct Instructor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tim Barksdale</td>
<td>AAS in ILT – Northeast Alabama Community College</td>
<td>20+ years experience in electronics</td>
</tr>
<tr>
<td>Adjunct Instructor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marty Bishop</td>
<td>46 semester hours at Northeast Alabama Community College</td>
<td>American Welding Society (AWS) Certified Welding Inspector (CWI)</td>
</tr>
<tr>
<td>Adjunct Instructor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Future needs include the hiring of adjunct instructors specializing in specific technological areas, including robotics and nuclear components.

Ongoing Costs of the Program
The Industrial Systems Technology Program operates within the college’s institutional budget. Expenditures for FY2011 (through February 2011) provided by the Business Office are listed below:

<table>
<thead>
<tr>
<th></th>
<th>INT</th>
<th>MTT</th>
<th>WDT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries FT</td>
<td>$64,531</td>
<td></td>
<td></td>
<td>$64,531</td>
</tr>
<tr>
<td>Salaries PT</td>
<td>$90,060</td>
<td>$15,000</td>
<td>$25,000</td>
<td>$130,060</td>
</tr>
<tr>
<td>FICA</td>
<td>$11,826</td>
<td>$1,148</td>
<td>$1,912</td>
<td>$14,886</td>
</tr>
<tr>
<td>Retirement</td>
<td>$8,073</td>
<td></td>
<td></td>
<td>$8,073</td>
</tr>
<tr>
<td>Health Ins</td>
<td>$9,024</td>
<td></td>
<td></td>
<td>$9,024</td>
</tr>
<tr>
<td>Travel</td>
<td>$500</td>
<td>$500</td>
<td>$1,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>$4,000</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$44,000</td>
</tr>
<tr>
<td>Lease</td>
<td></td>
<td>$12,000</td>
<td>$12,000</td>
<td>$24,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$188,014</strong></td>
<td><strong>$48,648</strong></td>
<td><strong>$59,912</strong></td>
<td><strong>$296,574</strong></td>
</tr>
</tbody>
</table>

*Source: Business Office.*
**Instructional Quality and Enhancements/Curriculum Design**

**Inclusion of general education core in course of study:** The Industrial Systems AAS degree curriculum consists of 63 semester hours, with 21 hours of these being general education classes: English 101, SPH 107, Humanities and Fine Arts Elective, Math 100 or higher, CIS elective, Math, Science or CIS elective, and a History, Social and Behavioral Science elective. The remaining 42 hours meet the curriculum requirements for the AAS in Industrial Systems Technology in the College Catalog.

The Certificate in Industrial Maintenance, Machine Tool Technology, and Welding includes 12 hours of general education (ENG 101, SPH 107 and 6 hours of MTH, Science, or CIS electives). The remaining hours are in courses tied to the chosen option.

**Inclusion of course and program learning outcomes, with evaluation of outcomes and use of results for improvement:** All INT courses are tied to the INT Program Learning Outcomes, as noted above. Course syllabi incorporate appropriate course objectives and program outcomes and have been approved by both the Student Learning Outcomes – Technical Committee and the Student Learning Outcomes Committee. Course reviews are accomplished on a five-year rotating schedule. These reviews all are current as of this time.

**Syllabi:** All active syllabi are posted on the College website and are used to develop course handouts given to students at the beginning of each course.

**Course scheduling to appropriately accommodate students, addressing accessibility in relation to the Mission of the College:** INT courses are scheduled to meet the needs of the students, whether they attend during the day or at night. Many INT students work during the day and attend classes at night.

**Physical facilities, including laboratories-current status as well as needs or plans for expansion or update, equipment replacement or expansion, etc.:**

**NACC Campus**
The Industrial Systems Technology program is housed in the following areas on campus:

IS 101 – Adjunct Office  
IS 102 – ILT Instructor Office  
IS 103 – IST Instructor Office  
IS 104 – Empty Office  
IS 105 – Classroom  
IS 106 – Classroom  
IS 107 – Computer Lab/CNC Classroom
IS 108 – Industrial Maintenance Lab  
IS 109 – Welding Technology Lab  
IS 110 – Machine Tool Technology Lab  
IC 102 – Hydraulic/Pneumatics Classroom/Lab  
GY 102 – Industrial Wiring Classroom/Lab  

Off-Campus Sites  
- DeKalb County Technology Center  
  o NACC leases a shop, classroom, and offices in the DeKalb County Technology Center for the primary purpose of teaching dual enrollment courses. This facility is equipped to teach Industrial Maintenance courses as well as electrical fundamentals and wiring.  

- Earnest Pruett Center of Technology  
  o NACC leases a shop, classroom, and offices in the Earnest Pruett Center of Technology for the purpose of teaching off campus and dual enrollment courses. This facility is equipped to teach Welding and Machine Tool Technology Courses  

Future Plans: To meet increased demands and to assure a quality learning environment for our students, the following action has been made:  
- IC 101 – We are about to have our new Hydraulics/Pneumatics equipment installed here, which will increase the capacity of INT 118.  

Additional changes and modernization will take place as the full-time instructor continues to assess the needs of the program.  

Library Resources: Program-specific resources and computers for students and faculty are available at the off-campus site. Off-campus students and faculty are granted the same library privileges as other NACC students and faculty.  

Online learning resources provided by the NACC Learning Resources Center include the following: online catalog, Reader’s Guide, Humanities Index, Alabama Virtual Library (providing access to full-text newspaper, magazine, and journal articles), and eBooks (full-text books). Online tutorials provide instruction in the use of these resources, and library staff are available to assist students and faculty.  

Industrial Systems Technology faculty make recommendations for additions to the library collection and, when appropriate, purchase audiovisual programs and software for use in INT classrooms.  

Technological Resources: Industrial Systems labs are equipped with equipment and instructional technology appropriate to the courses taught, including the following:  
- GMAW welders
- GTAW welders
- SMAW welders
- FCAW welders
- Robotic Welding Cell
- Torches
- Band saws
- Hydraulic trainers
- Lathes
- Mills
- CNC Lathes
- CNC Mills
- Computers
- Smart Classrooms
- Hand and power tools

Projected costs for equipment or other needs: Currently planned purchases fit within the INT department’s budget for the current fiscal year. Additional needs will be budgeted in future budget years.

Advisory Committee
Program advisory committees are in place for INT, MTT, and WDT and consist of industry representatives with an interest in the success of the program. The purpose of each advisory committee is to assure the relevance of the program and curriculum to local needs, assure the quality of the educational programs through external review, and to establish relationships with local business and industry that will result in advantages to students. Current committee membership is listed below:

INDUSTRIAL SYSTEMS TECHNOLOGY
Dr. David Campbell (ex officio)  President
Dr. Mike Kennamer (ex officio)  Director of Workforce Development
Will Roberts (convener)  INT Instructor
Barry Wigley (convener)  ILT Instructor
Danny Johnston  Lozier Corp.
Howard Norton  PlayCore
Jake Biddle  Wayne Farms
Rick Morgan  Shaw Industries Group Inc.
Jerry Dunn  ATI Firth Sterling
John Anderson  United States Gypsum
Rocky Franklin  Great Western, LLC
Jeff Rogers  Smurfit-Stone Corp.
Randy Dorsett  Alatrade Foods
Brad Scott  GH Metal Solutions
Cecile Gray  Varco Pruden Buildings, Inc.
MACHINE TOOL TECHNOLOGY
Dr. David Campbell (ex officio)  President
Dr. Mike Kennamer (ex officio)  Director of Workforce Development
Will Roberts (convener)  INT Instructor
Steve Avans  Avans Machine and Tool
Derek Johnson  GH Metal Solutions
Charles Stephens  Dixie Machine Shop
Ron Kruckenberg  GH Metal Solutions
Teresa Wilson  Lozier
Owsley Cheek  GH Metal Solutions
Jonathon Andrews  R & M Machine Shop
Robert Dean  Retired Instructor
James Johnson  Siemens
Mike Murphy  Lozier
Ronny Kisor  Alabama Technology Network
Randi McClung  JSA Machinery

WELDING
Dr. David Campbell (ex officio)  President
Dr. Mike Kennamer (ex officio)  Director of Workforce Development
Will Roberts (convener)  INT Instructor
Michael Love  PlayCore
McRae Benefield  GSM Steel and Mechanical Contractors
Kerry Lovvorn  Telko Enterprises
Teresa Wilson  Lozier Corporation
Karl Laws  GH Metal Solutions
Danny Murray  Southern Metal Fabricators

Source: Office of Workforce Development 2010-2011 Advisory Committee Membership.

Enrollment and Completions

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Number of declared INT majors</th>
<th>Number of Short Term Certificates</th>
<th>Number of Certificates</th>
<th>Number of AAS Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-2009</td>
<td>60</td>
<td>10</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2009-2010</td>
<td>164</td>
<td>23</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>130</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: AS400 data query performed by Registrar’s Office.

Job Placement Rates and Employer Satisfaction
Because of the lag in data submission, the college has not yet received employment data from the Alabama Department of Industrial Relations (DIR). This data is expected to be reported for the first time in September 2011.
Anecdotal data gathered by instructors reveal that many students, especially those in welding, are earning American Welding Society (AWS) certifications and getting jobs while continuing their education. Survey data from 2008-2009 (one respondent) and 2009-2010 (nine respondents) revealed that seven (70%) were employed at the time of graduation or certificate completion. Future DIR reports will reveal the number employed one quarter and three quarters after program completion.

**Student Follow-Up Reports**

Data is limited by the number of alumni data and graduated student surveys returned. For 2008-2009, one survey was returned. For 2009-2010, nine surveys were returned. Of these ten, six were “very satisfied” and four were “satisfied” with the quality of instruction.

**Findings of Review**

The Industrial Systems Technology program is a relatively new program, having been implemented primarily at off-campus sites in fall 2008 and on campus in spring 2010. It has been well received and supported by local industry and promises to be relevant for many years. Strengths include the following:

1. Even in a difficult economy, employers indicate a demand for graduates
2. A quality state-developed curriculum taught by qualified instructors
3. Growing enrollments
4. Adequate financial resources to support program growth and development
5. Two off-campus sites (DeKalb County Technology Center and Earnest Pruett Center of Technology) which provide enhanced opportunities to recruit high school students.

The following opportunities for improvement will be addressed in the plan for improvement:

1. Establish and disseminate a clear course rotation that will allow students to adequately plan their programs of study
2. Ascertain that students understand which courses are applicable to each of the program options.
3. Enhance the availability of mechanical maintenance courses.
4. Continue to connect with industry to assure program relevance.
5. Periodically evaluate the curriculum to assure that it is current, relevant, and meets the needs of local employers.
6. Assure that student and employer feedback is received and used for improvement of the program.
7. Encourage students to apply for each certificate for which they qualify. It should be noted that each of the 17 students who have earned a degree should also have earned a certificate. However, only three have applied.
Plans for improvement:

1. Establish and disseminate a clear course rotation that will allow students to adequately plan their programs of study.
   - The full-time instructor will develop and provide to students a rotation of courses for advising and planning purposes.
   - This rotation will be developed based on student need and the best utilization of college resources.

2. Ascertain that students understand which courses are applicable to each of the program options.
   - Publish a list of program options and which courses fit within each.
   - Keep this list updated in the AS/400 system so that students may access via NOAH.

3. Enhance the availability of mechanical maintenance courses.
   - Add additional mechanical maintenance courses to meet the needs of local industry.
   - Cease teaching electrical and electronics courses under INT prefixes, which will free INT instructors to teach mechanical courses.

4. Continue to connect with industry to assure program relevance.
   - Fully utilize the Advisory Committee to assure that the program remains relevant.
   - Become involved in local, state and national professional organizations.

5. Periodically evaluate the curriculum to assure that it is current, relevant, and meets the needs of local employers.
   - Purge the academic inventory of unused and extraneous courses.
   - Discontinue teaching electrical courses that can be taught under ILT.

6. Assure that student and employer feedback is received and used for improvement of the program.
   - Increase the number of employer and graduated student surveys received by emphasizing the importance of these surveys and demonstrating that survey data is utilized.
   - Through connections with industry, assist students in obtaining employment in the field.

7. Encourage students to apply for each certificate for which they qualify. It should be noted that each of the 17 students who have earned a degree should have also earned a certificate. However, only three have applied.
• Instructors should encourage students to apply for certificates as soon as they qualify.
• Career Pathways Guides will be used to show students the natural progression from short term certificate (STC) to certificate (CER) and degree (AAS).

Report Affirmed by:

Will Roberts
Industrial Systems Technology Instructor

Dr. Mike Kennamer
Director of Workforce Development

Date Reviewed by Curriculum Committee: August 3, 2011

Curriculum Committee Chair: Bradley Fricks, Spanish Instructor