

**IRHEC
HIGHER EDUCATION INITIATIVE**

**ESTABLISHING THE
ARROWHEAD INSTITUTE OF
TECHNOLOGY**

2011

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Consultant's Report

**IRHEC
HIGHER EDUCATION INITIATIVE:
ESTABLISHING THE
ARROWHEAD INSTITUTE OF
TECHNOLOGY
CONTRACT DELIVERABLE 2.3.3.3**

2011

PREPARED FOR THE
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EXECUTIVE SUMMARY

“The Iron Range Higher Education Committee (IRHEC) was created to provide higher education programs in the taconite assistance area of Northeast Minnesota.

Concern for the provision of higher education, especially that related to technical learning and training, in northeast Minnesota is being driven by the over \$6 billion of potential new investment in mines, steel production and energy generation and the unfolding turnover of the workforce due to large scale retirements. The region correctly perceives a need for re-engineering the higher educational infrastructure to anticipate the needs of employers and workers, and to foster a level of creativity and entrepreneurship that will energize the regional economy.”¹

That quote was from the IRHEC funded 2009 document that defined and initiated the Arrowhead Institute of Technology program through the Northeast Higher Education District (NHED). Building upon that momentum, the IRHEC supported a second year of activity that implemented the first program – the internationally recognized Iron Range Engineering Program. This document outlines the ready-to-implement design of the next four programs.

As this second phase of the IRHEC planning and implementation effort was underway, the newly designated Iron Range Resources & Rehabilitation Board Commissioner (IRRRB), Tony Sertich, reaffirmed the initiative. In an IRRRB industry profile brochure, he stated “Businesses want to relocate or expand new centers of excellence or talent development. We are a region where companies can expand and find the talent and training they need.”

The IRRRB has committed itself to “education-based economic development” whereby the agency “provides funding to strengthen high school technical education programs, expand college programs, and increase customized training opportunities for businesses.” The Arrowhead Institute of Technology (AIT) is clearly a part of this strategy.

2010/11 ACTIONS

This report presents the results of the past year’s efforts to further the scope and effectiveness of the AIT.

The AIT is grounded in the understanding that higher education must be mission-centered on meeting the needs of two sets of customers: “Higher education faces many challenges and opportunities. An increasingly diverse student population is seeking a wider variety of educational experiences . . . that provide practical skills. Employers demand graduates who have the knowledge and skills to be productive from their first day of work. In this dynamic landscape, institutions must identify their comparative advantage over their peers and be able to adapt and readily respond to a changing environment.”²

A wide ranging set of activities were undertaken in the 2010/11 project. The most critical of them were:

- Iron Range Engineering Program, both at the upper division and graduate level, was successfully initiated.

¹ *The Arrowhead Institute of Technology, A Comprehensive Plan for Providing Post Secondary, Upper Division, and Graduate Technical Education in Northeastern Minnesota*, prepared for the Iron Range Higher Education Committee, Sertich Consulting, October 2009.

² *Academic Design* (2004) Society for College and University Planning

- Four new programs were designed and prepared for implementation – Chemical Technology, Industrial Systems Technology, Process Automation Systems, and Executive Office Management.

A series of working papers were prepared during the year reporting on each activity. This document focuses on the four new AIT programs. The following summarizes all of the documents.

Deliverable	Description
AIT Development Plan	This paper outlines a proposal to initiate the process of implementing the AIT concept as a strategic enterprise. It restates AIT’s mission and approach to learning. It offers an institutional structure and function that had been reviewed by NHED’s General Program Advisory Committee. And it lists a sequence of actions to implement AIT.
Work Plan Framework Updated Program Design Specifications (AIT) Program Academic & Financial Plans NHED and Area School Agreements Final Program Work Plans	These are the suite of components that comprise the design of the four new AIT programs – chemical technology, industrial systems technology, process automation systems, and executive office management. They are summarized in this final report.
Iron Range Engineering Report Update MOAs for IR Engineering	This document updated the status on the Bachelors of Engineering and Masters of Engineering components of the Iron Range Engineering Program. It included updates of the memoranda of understanding that support these efforts.
Knowledge Park Concept Paper	This paper presents the findings of that examination and proposes the creation of an Iron Range “knowledge park-like” entity designed to generate innovative, globally competitive businesses within the region. While the term <i>knowledge park</i> was specified in the contract, it may not be the appropriate term for the concept presented in this report. As used globally, a knowledge park embraces activity at a scale much larger than that possible for the Iron Range. However, as illustrated in this paper the core concept of a knowledge park is transferable and implementable. For the purposes of this paper the term knowledge park is being replaced with Innovation Business Generator , which more closely describes the proposed action.
Regional K-14 Strategies	This paper encapsulates the results of a series of meetings convened under the leadership of Dr. Sue Collins, President of the Northeast Higher Education District in which the participants were the leadership of the entities involved in creating the Applied Learning Institute – superintendents of 16 public school districts and provosts of five community colleges. She urged them to leverage the strength of the existing partnerships between their respective K-12 and post-secondary institutions to drive necessary change in education. What emerged from these sessions was a urgent call to action from the participants asserting that an essentially broken system needs not fixing but total rethinking so that the vital task of providing 21 st Century learning opportunities can be realized for all the youth and workers of the region.

Deliverable	Description
Education/Industry User Groups (Learning Academies) Report	Identifies possible mechanism for fostering the sharing of learning and best practices between practitioners in regional industries and higher education instructors.
Final Project Report	Provides overview of the AIT implementation plan, describes the next four programs to be undertaken, and summarizes the entire project.

The IRHEC has defined these next steps as the means to continue with AIT's development:

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

CHAPTER 1: AIT MISSION.

1.1 MISSION STATEMENT

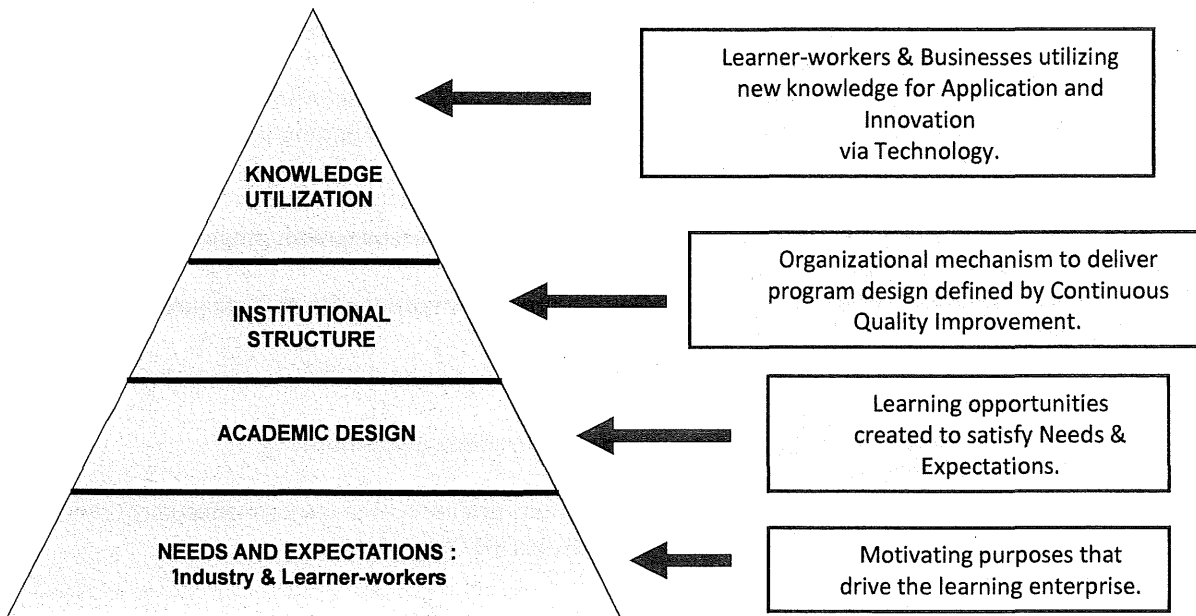
The mission of the AIT is as follows.

The Arrowhead Institute of Technology is a nationally recognized innovative mechanism by which regional learner-workers access baccalaureate degrees, graduate degrees, and customized training tied to regional economic activity so learner-workers are prepared for employment and advancement in their fields of learning-working by gaining transferable education and skill, occupational proficiency, and personal enrichment.

1.2 THE AIT APPROACH TO LEARNING

As shown in Figure 1 AIT is an approach to learning driven by knowing and satisfying customers' needs. It is this customer focused approach that will distinguish AIT giving it national recognition.

Fig. 1. The AIT Approach to Learning



CHAPTER 2: A MISSION-CENTERED ENTERPRISE

2.1 AIT STRUCTURE³

AIT is a mission-centered strategic enterprise of NHED intended to create and deliver world-class, innovative education in technology oriented programs. The structure described herein represents the intentions of the President of NHED and has been reviewed with NHED's General Program Advisory Committee.

STRUCTURE

AIT will be a distinct structural unit within NHED led by a provost-level administrator who will sit on the President's Cabinet.

A major component of NHED's overall analysis of need and appropriate program response is the General Program Advisory Committee (GPAC). Consisting of representatives from regional business and industry, GPAC reports directly to the NHED President.

FUNCTIONS

AIT has four core functions:

1. **New Technology Programming & Integration Research & Development:**
 - On behalf of NHED President, coordinate the General Program Advisory Committee, which is NHED's primary means of ongoing exploration and evaluation of needs and expectations of industry and learner-workers.
 - Oversee Continuous Quality Improvement for all technology related programs as integral aspect of needs assessment and academic design.
 - Integrate programming to ensure seamless career laddering (Applied Learning Institute/K-14, two-year, upper division, graduate level programming, customized training).
2. **Center for Workforce Development Administration:**
 - Direct a regional, strategic enterprise of customized training with programs provided on NHED campuses.
 - Coordinate efforts of Workforce Development with other external stakeholders.
3. **Upper Division/Graduate Program Administration:⁴**
 - Administer all upper division and graduate degree programming accessed by students on NHED campuses.
 - Manage memoranda of agreement with partnering institutions.
4. **Entrepreneurial Initiatives:**
 - Initiate and deliver entrepreneurial activities related to new and enhanced programs.
 - Promote entrepreneurial curriculum across NHED institutions.

³ This section comes from *Arrowhead Institute of Technology: A Proposed Plan for Development*, prepared for the IRHEC, Sertich Consulting, December 10, 2010.

⁴ This function is currently being undertaken by Arrowhead University, which under this concept will be folded into the AIT.

2.2 MISSION-CENTERED

While it is tempting to “fix” AIT to some physical place, the very nature of AIT means that it is a ‘mission-centered’ component of NHED that cannot be contained in a specific geographic location or be limited to any one specific college or building. Instead, AIT is the institutional mechanism by which NHED *offers relevant technical programming to students and employers in a timely, cost-effective manner.*

Essential facets of the AIT strategic enterprise are:

- Mission-Centered: **Focus on mission drives integration** of all aspects of technical education within NEHED regardless of where that education occurs.
- Institutional Framework: AIT is more than an internal structure of NHED. AIT works through NHED’s colleges to **engage a broad set of stakeholders** that include area employers, national technical providers and an extended student population.
- Programming vs. Physical Space: **AIT is an approach to education** whose focus is on providing the programming that meets the needs and expectations of industry and learner-workers. That programming is not bound to a single physical setting nor should the bricks and mortar where that programming occurs be perceived as “being” AIT.

CHAPTER 3: ANCHORING THE DESIGN

AIT intends that its programming is nationally recognized, innovative, and market responsive. To achieve that goal AIT's programming has to be firmly anchored in solid design. That anchor comes from benchmarking, which is defined as: "A measurement of the quality of an organization's policies, products, programs, strategies, etc., and their comparison with standard measurements, or similar measurements of its peers. The objectives of benchmarking are (1) to determine what and where improvements are called for, (2) to analyze how other organizations achieve their high performance levels, and (3) to use this information to improve performance."⁵

Benchmarking could be a one-off event undertaken during initial design, but AIT considers it part of its Continuous Quality Improvement process through which it continually seeks to improve its practices. The following outline used for the AIT benchmark visits indicates the type of information being sought:

BENCHMARK VISIT INFORMATION

Target Program

- History
- Goals and Objectives
- Development: funding, timeline, design (group/leadership).

Business/Industry Relationships

- Business/Industry Profiles
- Advisory Involvement
- Instructional Involvement
- Contributions

Program Configuration

- Courses and Syllabi
- Delivery System(s)
- Degrees/Certificates

Operations

- Budget and Cash Flow
- Enrollment Management
- Continuous Improvement Practices
- Graduate Employment

Strategic Direction

- Planned Development
- Emerging Opportunities
- Partnerships

⁵ Source: BusinessDictionary.com.

BENCHMARK VISITS

At this point, though, it is the initial round of benchmarking visits that are important. NHED college teams visited three renowned programs to gain insights into program design and implementation. The resulting program work plans built upon these visits and helped craft programs that break free from traditional models of higher education institutions and programs. The visits particularly focused on automation and industrial systems.

NORTHERN ALBERTA INSTITUTE OF TECHNOLOGY (NAIT)

Visit: May 2010.

Located in Edmonton, Alberta NAIT is regarded as being the best in the world in the area of instrumentation. It can be considered a prime example of what might result from a mission-centered approach to design. Its singular focus on instrumentation has engendered an international reputation.

This benchmark visit assisted in the development of the Process Automation Systems program.

GEORGIA NORTHWESTERN TECHNICAL COLLEGE (GNTC)

Visit: October 2010.

Situated in Rock Spring, Georgia, GNTC shows how an institution can lead technical industry training while responding to contemporary needs. Close integration between industry practice and program content ensures a high level of student readiness for employment.

Among the many findings from this visit are:

- Philosophy: proactive to industry needs and concerns, not reactive; long term thinking (10-year vision).
- Program curriculum: certificates are embedded and advanced; industry involvement and input in programming.
- Program features: alternative delivery times/flexible schedule; simulators for training troubleshooting skills; entry exam to set basis for learning; integrated industry involvement; industry "trains the trainer" providing development skills for the people they want as instructors; graduates are triple qualified – mechanical, electrical, and operational.
- Industry relationships: highly symbiotic relationship between industry and college; industry involvement is integrated into programming and is not merely advisory in nature; industry specific equipment plan.

EASTERN IOWA COMMUNITY COLLEGE (EICC)

Visit: April 2011.

The Eastern Iowa Community College District is comprised of Clinton, Muscatine and Scott Community Colleges, the Business and Industry Center, and a Continuing Education Division. This institution is probably the most useful example for the next steps in AIT development. Size, funding, location and programming at EICC have a productive match to current and planned AIT initiatives. The team visited two separate facilities.

MUSCATINE INDUSTRIAL TECHNOLOGY CENTER (MITC)

Opened in 2005 on the Muscatine Community College campus the MITC is a \$1.2 million, state-of-the-art, 8,000-square-foot facility specifically designed to train the manufacturing workers of today and tomorrow. It is located in a refurbished campus building; \$500,000 of development cost came from local businesses, \$500,000 from EICC and the balance from the State of Iowa.

- Features: MITC focuses on basic manufacturing technology (welding, CNC machining, hydraulics). It features HAAS computer-controlled equipment. No foundational equipment is employed.
- Support: MITC has strong support from local manufacturers. These are 'light manufacturers' who provide consultation and employment for MITC graduates.
- Custom Training: This facility is used for custom training. MITC has determined that training at employer sites is ineffective. Custom training is founded on long-standing connections between industry and MITC staff.

BLONG TECHNOLOGY CENTER

Operated by the Scott Community College the John T. Blong Technology Center (BTC) in its own words presents "the future of manufacturing technology" in a \$1.7 million facility located in a business/industrial park some distance from the college campus. The facility's mission is to support the economic future and vitality of area manufacturers through human resource, technology and industrial development.

- Development: BTC most closely corresponds to the Industrial Systems Technology program at Hibbing Community College.
- Features: BTC is truly a 'comprehensive' industrial systems training facility. Programs ranging from logistics to automated manufacturing are supported by state of the art technology; a good example is an entry-level welding program that meets John Deere standards.
- Program features: Program format is expressly designed to meet student needs. Programs are geared for self-paced education and training with so-called "planned-entry" and "open-exit" options. Programs are self-paced and modular. Students may register for individual modules or entire programs at any time during a typical academic term.
- Support: The Quad Cities are home to several large manufacturing operations (John Deere, Case-IH), and supporting industries providing BTC a base for exchange of new ideas and practices as well as a resource for faculty and student employment. It is important to note that BTC operations have a 'break-even' balance sheet.
- Custom Training: The 'industry-driven' nature of BTC programming provides the connections and content that strengthens its custom training offerings.

ADDITIONS TO BENCHMARK VISITS

Benchmarking research done in addition to the visits contributed to AIT program design as follows.

MADISON AREA TECHNICAL COLLEGE (MATC) (WISCONSIN)

MATC provided the model for the Executive Office Management program. Their Administrative Professional AAS Degree closely matches the EOM design specifications: "The Administrative Professional Program prepares individuals in the software/hardware, administrative, and interpersonal skills needed to perform the duties of administrative support personnel. With additional education and/or work experience, there is opportunity for advancement into supervisory or managerial positions."

Elements of the MATC model that inform the EOM program are:

- Focus on the AAS Degree for students who aspire to a professional level office role.
- Availability of the program on-line.
- Course content.

CAPE FEAR COMMUNITY COLLEGE (CFCC) (NORTH CAROLINA)

CFCC offers a Chemical Laboratory Technology that closely corresponds to AIT's Chemical Technology design specifications. The CFCC program is described as follows: "The Chemical Technology curriculum prepares individuals for work as analytical technicians in chemical laboratories associated with chemical production, environmental concerns, pharmaceuticals, or general analysis. Students can also use the degree to propel themselves into a four-year college or university where they will enter as juniors in a B.S. Chemistry program. Many students will choose this alternative in comparison to traditional transfer chemistry courses. A two year CHEM TECH degree qualifies an individual to work in a laboratory setting whereas two years of courses in a traditional B.S. curriculum do not provide this opportunity."

BENCHMARK SUMMARY FINDINGS

Essential findings from these three benchmark visits include:

- **Mission:** Site missions parallel NHED technology directions. In particular, the mission of the Blong Technology Center states that the Center "supports the economic future and vitality of area manufacturers through human resource, technology and industrial development." The EICC visit especially provides a working model that NHED can follow as the AIT endeavor unfolds.
- **Strategy:** Every benchmarking site affirmed the strategic importance of industry partnerships. Advisory committees were continually engaged in enhancing supportive relationships as well as setting directions for program development.
- **Custom Training:** On-going engagement with industry through custom training was the catalyst for program leaders and faculty to tailor their work to emerging industry standards and practices.
- **Structure:** Sites tended to cut across traditional organizational boundaries so that resources from colleges and industries were deployed in support of shared missions. Eastern Iowa Community College (three institutions) operates two technology centers – Blong Technology Center and Muscatine Industrial Technology Center.

These "lessons learned" strongly support the concept articulated in the October 2009 Arrowhead Institute of Technology report. Of them the most important is the example offered by the Blong Technology Center, which should serve as the prototype for "Organizational mechanism to deliver program design defined by Continuous Quality Improvement." [see Figure 1]

General findings from the benchmarking process that support benchmarking as a critical tool to be applied on an ongoing basis include:

- A benchmark model for program organization and delivery was identified for each of the four AIT programs.
- Faculty and program leadership at benchmarking sites can serve in advisory roles to assist in AIT program development.
- This process should assist NHED in determining how benchmarked models can inform a wide range of new technical program initiatives.
- The connections to business and industry are essential to the on-going relevancy and program design of technical programming, practices, equipment, and staffing.
- There is no "right" model that works for technical programming.

CHAPTER 4: AIT PROGRAMMING

AIT began in 2010 with the initiation of the Iron Range Engineering program and an understanding of the next round of programs. This past year has been spent preparing this next set of programs for launch. At the heart of AIT's mission-centered focus is the drive to insure that:

Programs within the Arrowhead Institute of Technology are nationally recognized, innovative, market responsive and sustainable whereby learner-workers gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

YEAR 1: THE FIRST PROGRAM

The Iron Range Engineering program launched the AIT initiative. The launch was exciting, aggressively scheduled, and supremely successful.⁶

The best assessment of the value of IRE to date is the statement from a United Taconite Area Manager who said about an IRE project at his plant: "[I] just attended the closeout presentation on the Filter Bag Wash system that was designed by six of your students. They did an outstanding job. The design, experiment, and validation were of higher quality than many efforts I've seen from paid engineering consultants."

The following provides a quick overview of the substantial progress made by this program in one short year:

- 14 first-year students will graduate in December 2011; the next 10 will graduate in May 2012.
- 22 new students have applied, have been interviewed, and accepted for Fall 2011 junior class.
- ABET accreditation is a high priority. Guidance is provided by the program's advisory board members, one of whom wrote the ABET process for BSE. There are currently 65 ABET accredited BSE programs in US. An ABET visit is anticipated for Fall 2012 (after first graduates enter workforce).
- To date, students have: (1) Placed 2nd in national *General Electric Lean Engineering Challenge*, (2) placed three teams in top 10 in Minnesota Cup business plan competition, (3) completed 10 projects for area industries with 4 more currently in process.
- An extensive evaluation and assessment program has been developed and implemented. Using 12 different assessment tools, faculty is tracking cognitive development of higher-order skills, acquisition of technical and professional competencies, and student motivation.
- The student ownership of the acquisition of their technical and professional competencies is attracting national attention by engineering educators and National Science Foundation staff as it is seen as a breakthrough in effective learning.

In addition, a new memorandum of agreement has been negotiated between the Northeast Higher Education District/Arrowhead University and the Minnesota State University, Mankato to govern the Iron Range Engineering program. The purpose of this agreement is "to set forth terms and

⁶ Summary is from *IRHEC: Higher Education Initiative: 2010 Iron Range Engineering Status Report*, Sertich Consulting for IRHEC, February 4, 2011.

conditions to facilitate the design and delivery of the Iron Range Engineering (IRE) Program, a Bachelor of Science (B.S.) Degree in Engineering or equivalent, which should minimize administrative and system level barriers in order to maximize the sustainability of the program.”

Another memorandum of understanding was executed between MnSCU and UMD in 2010 by which UMD would offer a new Masters of Engineering program to expand graduate opportunities for unemployed and employed engineers on the Iron Range. Notable features of this program include:

- Scheduling of courses to allow access by employed engineers.
- Credit for project work performed in work settings.
- Direct connections with undergraduate internships on the Iron Range.
- Courses to be offered at Mesabi Range Community & Technical College.

At this point it appears that the UMD Masters of Engineering program on the Iron Range is on course and proceeding in the right direction. However, high costs per student and lack of adequate enrollment are challenges that need continuous attention and new strategies.

In Fall 2010 the program offered courses in: Management of Engineers and Technology; Process Optimization; Technical Forecasting; Sustainable Design and Construction; Structural Dynamics; and Innovation Management. The courses offered in Spring 2011 include: Operations Modeling and Analysis; Finite Element Analysis; Power Electronics; Advanced Process Control; and Nondestructive Evaluation of Engineering Materials.

YEAR 2: THE NEXT FOUR PROGRAMS

Over the course of the past year four new AIT programs were developed for implementation. The program development process is detailed, arduous and time consuming. Key components in this effort as directed by Sertich Consulting included:

- **Process Expeditor**

The value of this role cannot be understated. Undertaking a task of this magnitude and duration can get caught up in the churn of day-to-day activities and demands. As project “ram rod” the consulting team convened dozens of meetings with staff and faculty to work through issues and details, supported program advisory committees, coordinated the wants and needs of the design teams, monitored development of workplans, and generally sustained the momentum needed to complete the tasks in a timely manner.
- **Program Framework**

A detailed Program WorkPlan, or framework, was created to guide development of each program and to assure that all necessary components were considered and addressed. This tool was critical in conveying and tracking information for the large number of stakeholders involved in each program.
- **Attention to the Details**

In a process of this complexity vital details can become stumbling blocks or get lost in the shuffle. The range of issues covered included assessing facilities, ensuring there is no unnecessary duplication, advise and edits on marketing materials, keeping all stakeholders engaged and informed, and ensuring that all components such as learning structures are incorporated into the program design. Resolving conflict among partners

and bringing new voices to the table was also required to overcome real and perceived hurdles.

- **Benchmark Visits**

The essential element in creating innovative AIT programs was undertaking visits to cutting edge institutions to establish benchmarks by which to gauge AIT's efforts. This process involved identifying and evaluating programs and institutions to visit, conducting preliminary site visits, and arranging for visits by the various program design teams.

- **"Conscience of the AIT"**

The NHED President is the "holder of the vision" for state (MnSCU) and regional perspectives. As such, the consulting team became the "conscience of the AIT." The team strove to keep the broader perspective in the forefront of all considerations, even when the work groups delved into minute details. This included ensuring that the essence of customer-driven design was front and center and that two-way career laddering was kept in mind. A critical aspect was assuring that the resulting programs were truly ground-breaking and not minor tweakings of existing programs.

The four new AIT programs are:

- Chemical Technology (originally Industrial Lab Technician in the 2009 AIT report)
- Process Automation Systems (originally Process Automation)
- Executive Office Management (originally Information Management), and
- Industrial Systems Technology (originally Industrial Technology).

The following sections overview these programs; more detailed information on each is provided in the Addendum.

CHEMICAL TECHNOLOGY

This program prepares students for employment in entry-level laboratory positions in a wide variety of industries including natural resources, mining and ores, construction, plastics, pharmaceuticals, foods and environmental compliance. Students will spend the majority of their time in the field of science learning principles and theories to help with problem solving, evaluation, development, inventing, and improvement of products and processes.

Graduating students will be fully prepared to enter a laboratory and perform all required analyses. They will learn by experiencing real-world lab time: working with a variety of laboratory equipment, setting up, maintaining, and monitoring experiments; they will make observations, record results, and develop conclusions.

Careers for graduates span both governmental and private employers. The career outlook for these jobs is very promising. As new products are put into market and as industry regulations continue to increase, there is no shortage of positions for students with laboratory skills and backgrounds. These students can fill a range of job titles including: Industrial Lab Technician, Geological Analysis Technician, Mining Lab Technician, Materials Testing Technician, Quality Control Analyst, Biological Analysis Technician, Chemical Analysis Technician, Petroleum Analyst, Food Science Technician, Agricultural Analysis Technician, and Environmental Compliance Officer.

Quantitative Goals

Goal	Date	Target
Program enrollment in year 1	Sep – 2011	1 st year: 10
Program enrollment in year 2	Sep – 2012	1 st year: 10 2 nd year: 7
Program enrollment in year 3	Sep – 2013	1 st year: 12 2 nd year: 7
Retention rate	Fall to Fall	70%
Graduation rate		60%
Related employment rate		75%

Learning Approach & Structure

Instruction Approach	Learning Structure				
	Class	Team	Cohort	Community	Network
Lecture	X				
Laboratory		X	X		
On the Job		X	X	X	
Mentor		X	X	X	
Self Directed					

Program Information

Lead College	Vermillion Community College
Potential 4-year Partners	Bemidji State University St. Cloud State University

PROCESS AUTOMATION SYSTEMS

This program provides training in the areas of industrial electronics, process control, instrumentation, fluid power, electrical-mechanical systems and computer control integration. It is well suited for students with mechanical and analytical aptitude with math and science background is desirable, as well as an interest in working with computers, machines, and electronic devices in a hands-on environment. Previous electronic/electrical classes or work experience is helpful, but not required.

Graduates will be well positioned for careers in highly competitive industries that are reducing costs while improving productivity. This requires adaptation to modern technology. Automation of equipment and processes is increasingly used to accomplish this goal. A need exists for personnel trained in servicing and maintaining high-technology equipment. The job outlook for service and technical personnel is expanding.

Graduates will find opportunities exist in paper/pulp, manufacturing, mining, transportation, warehousing/distribution, utilities, graphics/publishing, chemical processing, petroleum refining, and many other industries.

Goal	Quantitative Goals	
	Date	Target
Equipment	May – 2011	Process labs updated
Hire instructor/program coordinator	Sep – 2011	On staff full time
Equipment	Oct – 2011	Advanced controls/equip. ready to order
Market 3 rd year option	Dec – 2011	6-8 students
3 rd year curriculum development	Feb – 2011	Course outlines approved
Equipment	May – 2012	Installed
Market 3 rd year option	Jul – 2012	12-15 students
3 rd year curriculum development	Aug – 2012	Syllabi completed
Retention	May - 2013	Graduate 11-13 students

Learning Approach & Structure					
Instruction Approach	Learning Structure				
	Class	Team	Cohort	Community	Network
Lecture	39%				
Laboratory	49%				
On the Job				10%	
Mentor				2%	
Self Directed					

Program Information	
Lead College	Mesabi Range Community & Technical College
Potential 4-year Partners	University of Minnesota, Duluth Bemidji State University Iron Range Engineering Program

EXECUTIVE OFFICE MANAGEMENT

Graduates of this program will have the skills to be executive level administrative assistants to top level managers. They will be fully prepared to manage the full range of functions in various office environments. They will have expert office skills, in-depth integrated software knowledge, and basic accounting. Program coursework is designed to develop training in office information systems, oral and written communication, work process and organizational performance improvement, human relations, healthcare, business communications, business decision-making, and project management.

This program is also an ideal pathway for people in the workforce looking for a challenge or ways to advance their careers. Graduates find employment in administrative support in a wide variety of businesses, including corporate headquarters, insurance companies, banks, manufacturing firms, government agencies and schools/colleges/ universities. Further, the program offers students who have completed the two-year A.A.S degree to continue studies towards a Bachelor's degree (Bachelor of Business Administration – Management or a Bachelor of Science in Management).

Goal	Quantitative Goals	
	Date	Target
Program enrollment in year 1	Sep – 2011	12 – 20 students
Program enrollment in year 2	Sep – 2012	1 st year: 15 2 nd year: 10
Program enrollment in year 3	Sep – 2013	1 st year: 20 2 nd year: 12
Retention rate	Fall to Fall	75%
Graduation rate		60%
Related employment rate		75%

Learning Approach & Structure					
Instruction Approach	Learning Structure				
	Class	Team	Cohort	Community	Network
Lecture	22%				
Laboratory	40%				
On the Job				16%	
Mentor					
Self Directed					22%

Program Information	
Lead College	Mesabi Range Community & Technical College
Potential 4-year Partners	Bemidji State University University of Wisconsin - Stout

INDUSTRIAL SYSTEMS TECHNOLOGY

This program prepares students for entry-level employment in today's technologically advanced industrial and manufacturing environment. Through lab-based training, students learn multi-craft skills such as mobile equipment operating, blueprint reading, mechanical systems, electricity fundamentals, welding, machining, fluid power, gear and belt-drive systems, and various diagnostic and repair procedures. Students will learn and understand the economic and environmental impact of industry. Class visits will be taken to industries such as mining, pulp and paper, power generation, industrial construction, and light manufacturing. These visits will allow students a first-hand look at the industry environment as well as allow graduates the opportunity to network. Students are trained to safely and efficiently operate mobile and plant equipment and are required to incorporate teamwork, effective communication skills, and critical thinking throughout the program.

Students will earn certificates in: forklift operations, skidsteer operations, carry deck crane operations, scissor manlift operations, boiler operator-special, and OSHA-10.

Graduates can work in the operations portion of the industry and with post-employment training move into maintenance departments. Industries are looking to fill new and replacement positions with well trained and educated employees possessing two years of technical training.

Goal	Quantitative Goals	
	Date	Target
Program enrollment in year 1	Sep – 2011	1 st year: 24 2 nd year: 18
Program enrollment in year 2	Sep – 2012	1 st year: 40 2 nd year: 20
Program enrollment in year 3	Sep – 2013	1 st year: 48 2 nd year: 32
Retention rate	Fall to Fall	75%
Graduation rate		60%
Related employment rate		75%

Learning Approach & Structure					
Instruction Approach	Learning Structure				
	Class	Team	Cohort	Community	Network
Lecture	40%				
Laboratory		40%			
On the Job		10%			
Mentor					
Self Directed					10%

Program Information	
Lead College	Hibbing Community College
Potential 4-year Partners	Bemidji State University Iron Range BAS in IT (3 or 4 year)

CHAPTER 5: NEXT STEPS

The next set of actions to be taken to continue and enhance AIT and its programming are:

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

ADDENDUM: PROGRAM WORKPLANS

A detailed Program WorkPlan was prepared for each of the four new AIT offerings. These WorkPlans are analytical tools devised to facilitate design, implementation, monitoring, assessment and improvement.

A Program Workplan is a matrix in which for each of the topics listed below there is to be Description, Measurement Item and/or Goal, Responsible Party, and Status Report.

- Measurable Program Outcomes
- Industry Inputs
- Benchmark Outcomes
- Career Laddering
- Learning Outcomes
- Learning Structure/Delivery System
- Existing Aligned NHED Programs
- Implementation Strategies
- Marketing Plan
- Program Sustainability
- Conclusion

The four WorkPlans are contained in a separate report.

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ARROWHEAD INSTITUTE OF TECHNOLOGY
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2011

ADDENDUM: PROGRAM WORKPLANS

**PREPARED FOR THE
IRON RANGE HIGHER EDUCATION COMMITTEE
BY
SERTICH CONSULTING**

This Addendum contains the detailed Program WorkPlans prepared for each of the four new AIT offerings. These WorkPlans are analytical tools devised to facilitate design, implementation, monitoring, assessment and improvement.

Contents:

Chemical Technology WorkPlan
Process Automation Systems WorkPlan
Executive Office Management WorkPlan
Industrial Systems Technology WorkPlan

PROGRAM WORKPLAN

COLLEGE: Vermilion Community College
 PROGRAM: Chemical Technology
 PRINCIPAL DESIGN MANAGER: Teresa Neufelder

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
A	MEASUREABLE PROGRAM OUTCOMES:			
	Have quantitative indicators been set to assess the effectiveness and efficiency of candidate colleges/programs?	Yes, quantitative goals have been set.	Neufelder	See details on quantitative goals sheet.
	What qualitative indicators can be used to judge the utility of candidate program delivery systems, relevance of program content and acceptance by employers?	1. Follow up of students in jobs in chemical technology a. Student readiness survey after one year on the job? b. Hiring of more students by same employer	Neufelder	
	How are the indicators (above) to be used for program development & improvement?	The qualitative indicators above will be used to evaluate the delivery methods and adjustments can/will be made based on the feedback from students, industry and employers.	Neufelder	
B	INDUSTRY INPUTS			
	How will industry be involved in designing the curriculum? (Retain documentation of industry feedback—minutes, surveys, etc.)	A survey of area industries on the course content and skills necessary for a technician in the chemical technology was completed in May 2010 and documentation of the survey results was retained. Secondly, the formation of an Advisory Committee was completed and the first meeting was held in March 2010 to discuss the survey results. These Advisory Committee meetings will be ongoing.	Neufelder	Ongoing Advisory meetings to be held at least semi-annually

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Profile the ideal program advisory committee: Identify the industry representative & what their relationship to the program would be.	<p>The actual Advisory Committee Members</p> <ol style="list-style-type: none"> 1. Representatives from the mining industry: <ol style="list-style-type: none"> a. Doug Johnson, lab manager of US Steel: provides taconite mining processing and sampling and testing techniques of iron ore and environmental compliance sampling as well as input on use of safety, statistics, lab management and other curriculum support b. Kevin Pylka of PolyMet Mining: provides mining of semi-precious metals processing and sampling techniques and environmental compliance sampling as well as input on use of safety, statistics, lab management and other curriculum support 2. Representative from the power industry: <ol style="list-style-type: none"> a. Tom Hendrickson, Head Chemist of Minnesota Power: provides input of curriculum support and sampling and testing of fuels 3. Representatives of independent laboratories: <ol style="list-style-type: none"> a. Brandi Baker-Muhich, lab manager of Northeast Technical Services: Lab procedures, management, accreditation as well as input on all curriculum b. Chris Wiberg, lab manager Twin Ports Testing: Lab procedures, management, accreditation as well as input on all curriculum 4. Representative Liaison between VCC and area industry: <ol style="list-style-type: none"> a. Roy Smith Iron Range Resources: provides connections between area industry and VCC 5. Representatives of VCC program development team: <ol style="list-style-type: none"> a. Wade Klingsporn, VCC Water Resources/Quality program director: support in program development of curriculum, and instructor of Water Analysis I course for program 6. Representative of benchmark program: <ol style="list-style-type: none"> a. Terry Holbrook, lead technical instructor of Chemical Technology program at Cape Fear Community College, NC: curriculum input, input on instrument technology and lab management 	Neufelder	Formation of Advisory Committee is complete, Program Director will add members as deemed necessary

C	BENCHMARK OUTCOMES (Other institutions/programs):			
	What research or program around the state, country, and world informs the design process and aligns this program with best practices? Identify the college, the program & lessons learned. Retain documentation of lessons learned document.	April of 2010, VCC provost Mary DuBois, Teresa Neufelder and Wade Klingsporn met with Terry Holbrook of Cape Fear Community College (CFCC) of North Carolina since CFCC has had a successful Chemical Technology program for over 30 years. We discussed all aspects of the Chemical Technology program, and reviewed the facility. Mr. Holbrook has also sent outlines and calendars of courses by which to guide the VCC program. Mr. Holbrook is also available for any future questions. Mr. Holbrook provides input on Advisory Committee meeting notes. Notes on CFCC visit are in Appendix B	Neufelder	CFCC was a role model for partnering with industry. However, the CFCC program has a more direct focus in chemistry. The CT program at VCC is tailored to educate a student not only in analysis and testing, but industrial processes & sampling.

D	CAREER LADDERING:			
	What programs/design elements will build career ladder opportunities from K-12?	High school students need strong science, math and communication background. VCC has PSEO students in the first year courses of this program. These students are potential candidates for the CT program.	Program Director or ALI Coordinator	These students will have access to the program when it launches in Fall 2011.
	Outline program relationships with area secondary schools and/or the Applied Learning Institute (ALI).	To be determined.	Program Director or ALI Coordinator	

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Which colleges, programs, or universities are potential partners for purposes of articulation? Designate who will pursue each identified partner.	Bemidji State University (Environmental Studies major) and/or St. Cloud State University (Chemistry BS, Chemical Physics, BS)	AUC Director and Program Director	
	Define what will be included in the MOA along with an overview of the courses, faculty and delivery options.	Standard Articulation Agreement	AUC Director and Program Director	
E	LEARNING OUTCOMES:			
	Courses and other learning experiences should be defined by syllabi and Learning Outcomes that guide both students and teachers. Describe the current status of the course syllabi.	The program checklist and new chemical technology course outlines have been approved by the Faculty Association at VCC as well as the Academic Affairs and Standards Committee as of June 2010. Course syllabi are under construction based on these approved course outlines.	Neufelder	Completed.
F	LEARNING STRUCTURE/DELIVERY SYSTEM:			
	Complete the attached worksheet, "Delivery System," giving percentages (& other details) regarding Instruction Approach and Learning Structure	See completed worksheet, Delivery System.	Neufelder	Details will be updated based upon final curriculum development.
G	EXISTING ALIGNED NHED PROGRAMS:			
	Specify shared courses, faculty and related learning experiences from institutions across NHED.	Due to the nature of technology courses, which are dependent on instrumentation and trips to local industry, there are no shared courses with other institutions across NHED.		
H	IMPLEMENTATION STRATEGIES:			
	Describe the steps to be taken to develop the program and secure necessary approvals/certification.	1. Course checklist and new chemical technology course outlines have been created by Teresa Neufelder and approved by Faculty Association and AASC at VCC in December, 2010.	Neufelder	Completed.
		2. Chris Hegenbarth is completing the Notice of Intent Application for Chemical Technology A.A.S. for approval of program at the MNSCU level. Estimated time of application is by end of December, 2010.	Hegenbarth	Estimated completion is February 2011.
		3. Teresa Neufelder is following guidelines of the American Chemical Society's (ACS) Chemical Technology Accreditation for 2-Year Programs. When VCC has run the program for sufficient years following these ACS guidelines, we may apply for accreditation.	Neufelder	Estimated for September 2016.
	Describe the steps to be taken to identify program faculty and staff.	1. Based on her analytical chemistry experience and master's degree in chemistry as well as chemistry teaching experience at VCC, Teresa Neufelder will be developing the chemical technology courses for the program. She will also teach these courses.	Bina	Done
		2. Wade Klingsporn will teach the Water and Wastewater Analysis I course for the program which is part of the Water Program as well.		
		3. Other supporting courses will continue to be taught by the appropriate faculty members of VCC.		
	Describe the steps to be taken to secure industry participation.	1. The industry members of the Advisory Committee will continue to participate in course development as well as being available for internship participation.	Neufelder	Completed and ongoing
		2. Advisory Committee members are supplying contacts to other members of industry not yet represented such as the petroleum and wood products industry.	Neufelder	Completed and ongoing
		3. Teresa Neufelder continues to contact area industry to ask about internship and employment opportunities for program participants.	Neufelder	Completed and ongoing

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Identify program infrastructure needs.	Renovation of an instrumentation room will need to include moving equipment and cabinetry as well as installing an exhaust system and compressed-gas tank wall mounts.	Bina	Pre-design is done and VCC is in the bidding process. This work will provide a space to accommodate the programs up to approximately 14 students. Should the program reach FY2013 enrollment goals of 17 students, expenditures for larger lab space will be necessary.
I	MARKETING PLAN:			
	Describe the steps to be taken in marketing the program to students.	1. Teresa Neufelder provided information to Tommy Bennett and Jeff Nelson so a brochure and program card are available for mailings and high school visits.	Bennett/Nelson	Completed.
		2. CT program was listed on the VCC website in January 2011.	Neufelder	Completed.
		3. Teresa Neufelder will be visiting area high schools during Spring semester 2011 to demonstrate aspects of the CT program.	Neufelder	March 2011
	Describe the steps to be taken in placement of graduates (ie. Marketing of students to employers).	1. Teresa Neufelder is working with Advisory Committee members on ways to promote placement of graduates in area industries. 2. Teresa Neufelder continues to contact area industry to ask about internship and employment opportunities for program	Neufelder	Ongoing.
J	PROGRAM SUSTAINABILITY:			
	What re-deployment of resources are necessary to make it likely this program will succeed?	Additional funds for marketing, industry outreach and instrumentation purchase would aid in the success of the CT program.	Bina	
	What is the projected cost per student for each of the next 5 years?	Program projection details to be maintained by the principal design manager.	Bina	
	Detail/describe the projected revenue for each of the next 5 years.	Program projection details to be maintained by the principal design manager.	Bina	
K	CONCLUSION:			
	Describe what makes this program innovative.	The Chemical Technology (CT) program is innovative in its real-world application. Students will be using state-of-the-art instrumentation, equipment and computer software found in laboratory careers. Students will experience a broad spectrum of the responsibilities of an actual chemical technician in order to prepare them to set-up and maintain an accredited lab as well as troubleshoot industrial processes of material synthesis, quality control and/or quality control. Because of an encompassing curriculum, students will have the flexibility to work in numerous settings doing a variety of tasks from analyses to record keeping.	Neufelder	
	Describe the integrated approach that involves committed partners.	The Advisory Committee for Chemical Technology provides partners in numerous industries of the Northeastern Minnesota with connections being made to new partners. A continued effort is being made to find partners in other areas of Minnesota such as the Twin Cities. Partners have direct input and feedback into the development of this program in all its phases. Partners will be providing opportunities for on-site visits, guest speakers and summer internships.	Neufelder	

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Describe how this program assures it is responding to market demand.	Good communication with industry partners assures that the graduates of the Chemical Technology program are ready to step into careers with minimal acclimation time on the job. The vast variety of laboratory settings ensures the availability of careers in analyses and process and lab management for the graduates of this program. Based on the U.S. Department of Labor research, chemical technician career opportunities are holding steady in this bleak economic time. "Employment of environmental science and protection technicians is expected to grow much faster than average, at a rate of 29 percent." Need for replacement of retirement age workers will only continue due to the demographic of skilled labor population growing older.	Neufelder	
	Describe what approaches contribute to program sustainability.	Responsiveness to students and employers and aggressive marketing of the program.	Neufelder	

QUANTITATIVE GOALS

COLLEGE: Vermilion Community College

PROGRAM: Chemical Technology

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

<u>#</u>	<u>QUANTITATIVE GOAL</u>	<u>MEASUREMENT DATE</u>	<u>TARGET</u>	<u>ACTUAL</u>	<u>EXPLANATION</u>
1	Program enrollment in year 1	Sep-11	1st yr - 10		10 is the target number to start approaching covering program direct costs with a goal to get to approximately 14 students in the initial lab space.
2	Program enrollment in year 2	Sep-12	1st yr - 10 2nd yr - 7		
3	Program enrollment in year 3	Sep-13	1st yr - 12 2nd yr - 7		
4	Retention rate	Fall to Fall	70%		
5	Graduation rate		60%		
6	Related employment rate		75%		

DELIVERY SYSTEM

COLLEGE: Vermilion Community College
PROGRAM: Chemical Technology

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This is a technical course which provides numerous opportunities for self-directed learning. This is greatly utilized in the Instrumental Analysis I & II courses where students will be instructed on an instrument, and then are responsible to analyze known and unknown substances independently. Courses integrate a hands-on approach to all technical courses doing actual work as done in laboratory and industrial work sites such as sampling techniques, maintenance of Material Safety Data Sheets, statistical analysis of lab results collected in a database, etc. Visits to actual labs and industries will provide students with an accurate account of the responsibilities and practices of jobs in the chemical technology field. A breakdown of the course content into percentages will be completed at a later date.

LEARNING STRUCTURE/DELIVERY SYSTEM

<i>INSTRUCTION APPROACH</i>	<i>LEARNING STRUCTURE</i>				
	<i>Class</i>	<i>Team</i>	<i>Cohort</i>	<i>Community</i>	<i>Network</i>
Lecture	X				
Laboratory		X	X		
On-the-job		X	X	X	
Mentor		X	X	X	
Self-directed					

PROGRAM EQUIPMENT NEEDS

COLLEGE: Vermilion Community College
PROGRAM: Chemical Technology

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

<u>#</u>	<u>EQUIPMENT DESCRIPTION</u>	<u>DATE NEEDED</u>	<u>ESTIMATED COST</u>
1	Industrial Lab Tech equipment	Jun-11	\$ 75,000
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

PROGRAM WORKPLAN

COLLEGE: Mesabi Range Community & Technical College
 PROGRAM: Process Automation Systems
 PRINCIPAL DESIGN MANAGER: Scott Norcia

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
A	MEASUREABLE PROGRAM OUTCOMES:			
	Have quantitative indicators been set to assess the effectiveness and efficiency of candidate colleges/programs?	Yes, quantitative goals have been set.	Norcia	See details on quantitative goals sheet.
	What qualitative indicators can be used to judge the utility of candidate program delivery systems, relevance of program content and acceptance by employers?	A needs analysis designed to survey local industries' need for advanced automation technicians or process engineering technicians. Performance of a task analysis designed to identify program content that is relevant to skills and knowledge needed by such technicians. The resulting curriculum plan will be reviewed by experts within the field for relevancy.	Norcia	Estimated to be complete by May 2012.
	How are the indicators (above) to be used for program development & improvement?	Active participation of industrial based partners will provide criteria for the program's curriculum and goals. The task analysis will serve as the framework for the course content design.	Norcia and advisory committee	Will be determined at a later date based on the outcomes of the quantitative goals and the results of the needs analysis discussed above.
B	INDUSTRY INPUTS			
	How will industry be involved in designing the curriculum? (Retain documentation of industry feedback--minutes, surveys, etc.)	Program content and tasks collected and evaluated by means of surveys, interviews, and advisory committee meetings.	Norcia	Industry surveys have been sent and feedback is being incorporated into course development, along with other feedback from advisory committee meetings. Survey detail and minutes of advisory meetings are retained by the principal design manager.
	Profile the ideal program advisory committee: Identify the industry representative & what their relationship to the program would be.	Advisory committee members should represent mining, pulp & paper, power generation/distribution, manufacturing and system integrator design and consulting firms. The diversity of members within those industries needs to represent technicians, engineers, and supervisors/managers in the automated process control field.	Norcia	Initial advisory committee has been established and additions will be contemplated at the March 31, 2011 meeting.
C	BENCHMARK OUTCOMES (Other institutions/programs):			
	What research or program around the state, country, and world informs the design process and aligns this program with best practices? Identify the college, the program & lessons learned. Retain documentation of lessons learned document.	Review of world class programs such as Northern Alberta Institute of Technology's Industrial Instrumentation program. An additional avenue for comparing and sharing ideas and thoughts is through the International Automation Society's (ISA) District 6 Council meetings and student competitions. ISA also provides curriculum guidelines and certification for different levels of technical experience and skills.	Norcia	The initial benchmarking visit was completed at the Northern Alberta Institute of Technology as discussed. Norcia will accumulate additional feedback from the ISA meetings as discussed; as well as considering future benchmarking opportunities (which in the near term includes the team coordinating a visit to Eastern Iowa Community College, along with an Advisory Committee member).
D	CAREER LADDERING:			
	What programs/design elements will build career laddering opportunities from K-12?	Participation in the ALI initiative. Participation in STEM camp activities.	Norcia	As discussed, input will be obtained from participation in ALI and STEM camp. Feedback to be monitored and adjustments made after introduction in these programs.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Outline program relationships with area secondary schools and/or the Applied Learning Institute (ALI).	Through the ALI initiative we presently have an articulation agreement with the Mesabi East school district covering 3 total credits in two of our program's courses, Basic Soldering and Computer Aided Design. We also work with representatives of industry in a coordinated effort to educate secondary school students on the career and employment opportunities that exist locally in this field.	Norcia	See inventory of current courses provided by Roy Smith.
	Which colleges, programs, or universities are potential partners for purposes of articulation? Designate who will pursue each identified partner.	University of Minnesota Duluth, Electrical and Computer Engineering Bemidji State University, Applied Engineering and Technology Management, and Iron Range Engineering program.	Norcia	Norcia plans to have a conversation with Jim McCracken.
	Define what will be included in the MOA along with an overview of the courses, faculty and delivery options.	MOAs will identify programs at other institutions and craft articulation agreements for the transferability of Process Automation courses into those programs.	Norcia	Nothing additional to add at this time.
E	LEARNING OUTCOMES:			
	Courses and other learning experiences should be defined by syllabi and Learning Outcomes that guide both students and teachers. Describe the current status of the course syllabi.	Curriculum is currently a collection of course topic areas with general ideas on the content. The course syllabi will be built from content identified by task analysis.	Norcia	Nothing additional to add at this time.
F	LEARNING STRUCTURE/DELIVERY SYSTEM:			
	Complete the attached worksheet, "Delivery System," giving percentages (& other details) regarding Instruction Approach and Learning Structure	See completed worksheet, Delivery System.	Norcia	Details will be updated based upon final curriculum development.
G	EXISTING ALIGNED NHED PROGRAMS:			
	Specify shared courses, faculty and related learning experiences from institutions across NHED.	Electrical & Industrial Automation Technology (EIAT) currently has an articulation arrangement for graduates of the Electrical Construction Program at Hibbing Community College. The third year Process Automation Program could add to that articulation arrangement.	Norcia	Additional consideration to be given to this area as the program is developed and launched.
H	IMPLEMENTATION STRATEGIES:			
	Describe the steps to be taken to develop the program and secure necessary approvals/certification.	Two steps must take place simultaneously. The necessary modifications/additions need to be made to our current facilities and equipment inventory and, simultaneously, curriculum development and course design work needs to be started. Both are dependent on each other as curriculum drives the selection of equipment, and lab facilities and infrastructure dictate the ability to produce learning outcomes.	Norcia	Nothing additional to add at this time.
	Describe the steps to be taken to identify program faculty and staff.	General criteria requires faculty with process control experience with additional experience working on projects involving process improvement and integration of automation components.	Helland	Nothing additional to add at this time.
	Describe the steps to be taken to secure industry participation.	Contacts with local industry; a key component is to enroll a diverse advisory committee membership. Beyond the advisory committee, other personnel within industry need to be made aware of our efforts and the focus of the program; those people include operations and maintenance managers, human resource people, and upper management. Participation by both instructors and students within professional organizations such as ISA and IEEE must be maintained. In addition, the establishment of internships will help maintain those ties.	Norcia	Nothing additional to add at this time.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Identify program infrastructure needs.	As mentioned above, infrastructure needs will be driven by curriculum/course development that drives specific learning outcomes.	Norcia	\$500k of funds have been secured to have a major renovation of the identified existing space.
I	MARKETING PLAN:			
	Describe the steps to be taken in marketing the program to students.	Introduce program to new and current students of the EIAT program. Customized Training department marketing to local industry as staff development for their incumbent work force.	Norcia	Change name of program to Electrical Process Automation for the major modification to the existing 2 year EIAT program to align with the 3 year option.
	Describe the steps to be taken in placement of graduates (ie. Marketing of students to employers).	Meet with local human resource departments of companies to inform them of the program and focus of the graduates. Graduates are tracked through a MnSCU system survey and monitored through the Mesabi Range Placement Office. Postings for employment are located in respective program areas, our website and on the Learning Center employment board	Norcia	Nothing additional to add at this time.
J	PROGRAM SUSTAINABILITY:			
	What re-deployment of resources are necessary to make it likely this program will succeed?	Funds will be required in three general categories: Facilities will need to be expanded. Equipment will need to be procured. Additional faculty will need to be hired.	Norcia	Nothing additional to add at this time.
	What is the projected cost per FYE for each of the next 5 years?	Current average cost is \$4,500.00/yr/FYE. It is estimated that this cost will increase by about 5% per year.	Norcia	Nothing additional to add at this time.
	Detail/describe the projected revenue for each of the next 5 years.	Program projection details to be maintained by the principal design manager.	Norcia	Nothing additional to add at this time.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
K	CONCLUSION:			
	Describe what makes this program innovative.	Focus is on automation and process improvement utilizing computerized state of the art control and data acquisition systems.	Norcia	Nothing additional to add at this time.
	Describe the integrated approach that involves committed partners.	Program development is tied strictly to criteria derived from industry through advisory committees. The task and needs analysis provides the stake holders an opportunity for ownership in the outcome.	Norcia	Nothing additional to add at this time.
	Describe how this program assures it is responding to market demand.	Market demand has demonstrated a need for efficiency improvement through the integration of computerized industrial control and data acquisition.	Norcia	Nothing additional to add at this time.
	Describe what approaches contribute to program sustainability.	The program can serve to provide a higher level of training and certification to current students and offer additional training to incumbent work force through customized training.	Norcia	Nothing additional to add at this time.

QUANTITATIVE GOALS

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Process Automation Systems

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

#	QUANTITATIVE GOAL	MEASUREMENT DATE	TARGET	ACTUAL	EXPLANATION
1	Equipment	May-11	Process labs updated		Upgrade current water stations to biodiesel processors (5 ea.)
2	Hire instructor/program coordinator	Sep-11	On staff full time.		
3	Equipment	Oct-11	Advanced controls and equip specified and ready to order		To be used in conjunction with process lab biodiesel processors.
4	Actively market third year option	Dec-11	6-8 students (app only)		
5	Curriculum development for third year	Feb-12	Course outlines complete and approved		
6	Equipment	May-12	Procured and installed		
7	Actively market third year option	Jul-12	12-15 students		
8	Curriculum development for third year	Aug-12	Syllabi complete		
9	Retention	May-13	Graduate 11-13 students		

DELIVERY SYSTEM

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Process Automation Systems

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LEARNING STRUCTURE/DELIVERY SYSTEM

<i>INSTRUCTION APPROACH</i>	<i>LEARNING STRUCTURE</i>				
	<i>Class</i>	<i>Team</i>	<i>Cohort</i>	<i>Community</i>	<i>Network</i>
Lecture	39%				
Laboratory	49%				
On-the-job				10%	
Mentor				2%	
Self-directed					

PROGRAM EQUIPMENT NEEDS

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Process Automation Systems

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

<u>#</u>	<u>EQUIPMENT DESCRIPTION</u>	<u>DATE NEEDED</u>	<u>ESTIMATED COST</u>
1	Two year program option	Jun-11	\$ 309,000
2	Three year program option	Jun-12	\$ 416,300
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

PROGRAM WORKPLAN

COLLEGE: Mesabi Range Community & Technical College
 PROGRAM: Executive Office Management
 PRINCIPAL DESIGN MANAGER: Carol Helland

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
A	MEASUREABLE PROGRAM OUTCOMES:			
	Have quantitative indicators been set to assess the effectiveness and efficiency of candidate colleges/programs?	Yes, quantitative goals have been set.	Helland & Program Director	See details on quantitative goals sheet.
	What qualitative indicators can be used to judge the utility of candidate program delivery systems, relevance of program content and acceptance by employers?	Employer satisfaction surveys, advisory council program reviews, graduate followup surveys.	Helland & Program Director	The results of these quantitative goals will be evaluated after the new program has been launched (Fall 2011).
	How are the indicators (above) to be used for program development & improvement?	Quarterly meetings with advisory council, Capstone or field placement experiences.	Helland & Program Director	Q1 Calendar 2011 advisory committee meeting was held on January 21, 2011. Good input was received on the potential for employer internships and/or field placement experience. The program title of EOM was discussed and upon review of program description, it was approved by the advisory council as the most appropriate title.
B	INDUSTRY INPUTS			
	How will industry be involved in designing the curriculum? (Retain documentation of industry feedback—minutes, surveys, etc.)	Industry summit in Sept. 2010 to recommend program content and program name. Proposed bi-annual industry partner meetings.	Helland & Program Director	The advisory council reviewed the results of the industry summit during the January 21, 2011 advisory council meeting. See discussion above.
	Profile the ideal program advisory committee: Identify the industry representative & what their relationship to the program would be.	<u>Education:</u> NHED/Colleges. <u>Pulp & Paper:</u> Blandin; <u>Power Generation:</u> Allete/MN Power; <u>Mining:</u> Polymet, US Steel. Proposed added members from <u>small business</u> and <u>healthcare</u> .	Helland & Program Director	As the program evolves and advisory members are added or as others resigned, the profile will be evaluated. The current advisory committee has a balance of representatives from the profiled industries.
C	BENCHMARK OUTCOMES (Other institutions/programs):			
What research or program around the state, country, and world informs the design process and aligns this program with best practices? Identify the college, the program & lessons learned. Retain documentation of lessons learned document.	Team has reviewed websites at the following colleges: Dakota County Technical College; Washington State Community College; Sheridan College Institute; Zane State College and Sanford-Brown College to identify best practices and leading ideas on course content and delivery.	Helland & Program Director	As a Program Director is secured for the program, additional work will be completed in this area.	
D	CAREER LADDERING:			
	What programs/design elements will build career laddering opportunities from K-12?	Through ALI principal meetings, introductory courses will be presented to high schools for consideration.	Program Director and/or ALI Coordinator	As a Program Director is secured for the program, additional work will be completed in this area.
	Outline program relationships with area secondary schools and/or the Applied Learning Institute (ALI).	Working with the Perkins District Coordinator, career laddering opportunities will be designed.	Program Director and/or ALI Coordinator	As a Program Director is secured for the program, additional work will be completed in this area.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
	Which colleges, programs, or universities are potential partners for purposes of articulation? Designate who will pursue each identified partner.	Bemidji State University and University of Wisconsin - Stout	Program Director and AUC Director	May-12
	Define what will be included in the MOA along with an overview of the courses, faculty and delivery options.	Standard Articulation Agreement	Program Director and AUC Director	May-12
E	LEARNING OUTCOMES: Courses and other learning experiences should be defined by syllabi and Learning Outcomes that guide both students and teachers. Describe the current status of the course syllabi.	Learning outcomes will be developed for each new course as required by the Mesabi Range AASC curriculum development process.	Program Director	Mar-11
F	LEARNING STRUCTURE/DELIVERY SYSTEM: Complete the attached worksheet, "Delivery System," giving percentages (& other details) regarding Instruction Approach and Learning Structure	See completed worksheet, Delivery System.	Helland & Program Director	Details will be updated based upon final curriculum development.
G	EXISTING ALIGNED NHED PROGRAMS: Specify shared courses, faculty and related learning experiences from institutions across NHED.	To be determined.	Helland & Program Director	As a Program Director is secured for the program, additional work will be completed in this area.
H	IMPLEMENTATION STRATEGIES: Describe the steps to be taken to develop the program and secure necessary approvals/certification.	Present program planner to AASC in 2010. Hire faculty member to present new curriculum to AASC in Jan/Feb. 2011. Work with MNSCU for program approval.	SAO	Feb-11
	Describe the steps to be taken to identify program faculty and staff.	Advertise and hire (thru MnSCU) program faculty coordinator and instructor (Program Director).	SAO	The position has been advertised and applications received. The application process closes February 25, 2011 and a hire should be made in the next few weeks.
	Describe the steps to be taken to secure industry participation.	Through advisory council input, Capstone & field placement/student learning experiences.	Program Director	See discussion above under January 21, 2011 Advisory Council meeting.
	Identify program infrastructure needs.	Update/maintain computer lab as determined & new lab space designed to meet new program requirements.	Program Director	Helland has been reviewing (with an architectural firm) the possibility of housing the new program in a section of the Virginia campus library by designing a state of the art "office lab" in an underutilized section of the library.
I	MARKETING PLAN: Describe the steps to be taken in marketing the program to students.	Develop marketing plan including target audience analysis, key messages, strategies and tactics, and measurement. Plan will be aligned with enrollment management practices and strategies.	Enrollment Management Team	A meeting will be held February 28, 2011 to meet with Mesabi marketing to develop program marketing materials.
	Describe the steps to be taken in placement of graduates (ie. Marketing of students to employers).	Host employer technology fair; ongoing integrated industry relationships will ensure employment exposure to all program graduates.	Career Placement & Program Champion	Mar-12
J	PROGRAM SUSTAINABILITY: What re-deployment of resources are necessary to make it likely this program will succeed?	Convert existing class room space into "Office Lab"	Helland & Program Director	Helland has been reviewing (with an architectural firm) the possibility of housing the new program in a section of the Virginia campus library by designing a state of the art "office lab" in an underutilized section of the library.
	What is the projected cost per student for each of the next 5 years?	Program projection details to be maintained by the principal design manager.	Helland & Program Director	To be reviewed and updated with the addition of the Program Director.
	Detail/describe the projected revenue for each of the next 5 years.	Program projection details to be maintained by the principal design manager.	Helland & Program Director	To be reviewed and updated with the addition of the Program Director.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
K	CONCLUSION:			
	Describe what makes this program innovative.	The combination of course content, the unique delivery structure and the appeal of the program to existing employees to hone their skills for advancement. The program also will have a wide appeal to a variety of industries.	Helland	To be reviewed and updated with the addition of the Program Director.
	Describe the integrated approach that involves committed partners.	Project based learning brings students to business and industry through Capstone projects and field placement internships.	Helland	To be reviewed and updated with the addition of the Program Director.
	Describe how this program assures it is responding to market demand.	Through feedback of industry summits and advisory committee.	Helland	To be reviewed and updated with the addition of the Program Director.
	Describe what approaches contribute to program sustainability.	Aggressive marketing, customized training and certificate options.	Helland	To be reviewed and updated with the addition of the Program Director.

QUANTITATIVE GOALS

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Executive Office Management

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

#	QUANTITATIVE GOAL	MEASUREMENT DATE	TARGET	ACTUAL	EXPLANATION
1	Program enrollment in year 1	Sep-11	12 to 20 students		Enrollment estimates
2	Program enrollment in year 2	Sep-12	1st yr - 15 2nd yr - 10		
3	Program enrollment in year 3	Sep-13	1st yr - 20 2nd yr - 12		
4	Retention rate	Fall to Fall	75%		
5	Graduation rate		60%		
6	Related employment rate		75%		

DELIVERY SYSTEM

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Executive Office Management

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

LEARNING STRUCTURE/DELIVERY SYSTEM

<i>INSTRUCTION APPROACH</i>	<i>LEARNING STRUCTURE</i>				
	<i>Class</i>	<i>Team</i>	<i>Cohort</i>	<i>Community</i>	<i>Network</i>
Lecture	22%				
Laboratory	40%				
On-the-job				16%	
Mentor					
Self-directed					22%

PROGRAM EQUIPMENT NEEDS

COLLEGE: Mesabi Range Community & Technical College
PROGRAM: Executive Office Management

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

<u>#</u>	<u>EQUIPMENT DESCRIPTION</u>	<u>DATE NEEDED</u>	<u>ESTIMATED COST</u>
1	Executive Office Management Equipment	Jun-11	\$ 100,000
2			
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PROGRAM WORKPLAN

COLLEGE: Hibbing Community College
 PROGRAM: Industrial Systems Technology
 PRINCIPAL DESIGN MANAGER: Mike Raich

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
A	MEASUREABLE PROGRAM OUTCOMES:			
	Have quantitative indicators been set to assess the effectiveness and efficiency of candidate colleges/programs?	Yes, quantitative goals have been set.	Raich	See details on quantitative goals sheet.
	What qualitative indicators can be used to judge the utility of candidate program delivery systems, relevance of program content and acceptance by employers?	Employer satisfaction surveys; ongoing advisory board input; national standards benchmarking. Student Satisfaction Surveys. Student course evaluations and program evaluation. Graduate followup survey.	Raich	The design team will be moving ahead with designating a name of the program & obtaining approval from MnScu of a new program. The evaluation of the qualitative indicators noted to the left will be ongoing.
	How are the indicators (above) to be used for program development & improvement?	Program learning outcomes, delivery methods, lab and field experiences will be created, monitored and adjusted according to industry, student and employer feedback.	Raich & Program leader	1/30/11 Advisory Board asked by IST Faculty for real world MSHA citations and hazards & integrated projects ideas.
B	INDUSTRY INPUTS			
	How will industry be involved in designing the curriculum? (Retain documentation of industry feedback--minutes, surveys, etc.)	General Program Advisory Committee has provided the broad-based industry perspective on program learning outcomes. Industrial Technology Summit attendees further defined the core curriculum and skill sets. Program advisory board will provide support & guidance on all curriculum development decisions and delivery.	Program leader	At the 1/30/11 IST Advisory Board meeting, the Board reviewed and approved the IST program plan and courses. Additional actions are noted in the minutes from 1/30/11 IST Advisory Board Meeting. Next steps will involve Raich recruiting a member of the IST Advisory Committee to be the Chair of the committee and working with the assigned Chair to accompany him on a site visit to Eastern Iowa Community College.
	Profile the ideal program advisory committee: Identify the industry representative & what their relationship to the program would be.	Ferrous and non-ferrous mining: Cliffs Natural Resources; U.S. Steel; Arcelor Mittal Steel; Polymet; Essar Steel; Mesabi Nugget. Power Generation: Allele/Minnesota Power; Hibbing Public Utilities; Lake Country Power. Pulp and Paper: UPM; Boise. Industrial Vendors: P&H Minepro. Manufacturing: L&M Radiator.	Program leader	Completed February 2011
C	BENCHMARK OUTCOMES (Other institutions/programs):			
	What research or program around the state, country, and world informs the design process and aligns this program with best practices? Identify the college, the program & lessons learned. Retain documentation of lessons learned document.	Georgia Northwestern Technical College, Rome Georgia: Industrial Systems Technology and Industrial Mechanical Systems and numerous industrial certificate programs. SEE LESSONS LEARNED DOCUMENT.	Raich & faculty	Completed October 2010. As noted above, a site visit to Eastern Iowa Community College is being planned for Raich and the designated IST Advisory Committee Chair.
		Staples Technical College, Staples, Minnesota: Heavy Equipment Operations program. Key learning: operations simulator options.	Raich & Roy Smith	Completed September 2010.
	Itasca Community College, Grand Rapids, Minnesota: Engineering program. Key learning: project based learning	Raich & faculty	Completed February 2011	

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
		Staples Technical College, Staples, Minnesota: Heavy Equipment Operations program. Key learning: operations simulator options.	Faculty	Completed February 2011

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
D	CAREER LADDERING: What programs/design elements will build career laddering opportunities from K-12?	Possible articulations: Introduction to Industrial Technology; Technical Report Writing; Physics; Welding	Faculty or ALI Coordinator	To be completed by September 2011.
	Outline program relationships with area secondary schools and/or the Applied Learning Institute (ALI).	Pilot at Hibbing High School; future expansion to other high schools where feasible.	Faculty or ALI Coordinator	To be completed by September 2011. See inventory of current courses provided by Roy Smith.
	Which colleges, programs, or universities are potential partners for purposes of articulation? Designate who will pursue each identified partner.	Bemidji State University: Industrial Technology Program and/or Iron Range BAS in IT (3 or 4 year)	AUC Director and Faculty	To be completed by September 2012.
	Define what will be included in the MOA along with an overview of the courses, faculty and delivery options.	Standard Articulation Agreement	AUC Director and Four Year University Program Director	To be completed by September 2012.
E	LEARNING OUTCOMES: Courses and other learning experiences should be defined by syllabi and Learning Outcomes that guide both students and teachers. Describe the current status of the course syllabi.	Learning outcomes and syllabi will be developed for each new course as required by Hibbing Community College's curriculum development process. These outlines will drive the curriculum delivery in each course.	Faculty	To be completed by March 2011.
F	LEARNING STRUCTURE/DELIVERY SYSTEM: Complete the attached worksheet, "Delivery System," giving percentages (& other details) regarding Instruction Approach and Learning Structure	See completed worksheet, Delivery System.	Faculty	To be finalized by February 2011.
G	EXISTING ALIGNED NHED PROGRAMS: Specify shared courses, faculty and related learning experiences from institutions across NHED.	Pilot model industrial technology program expandable to other NHED colleges as dictated by industry demand.	Raich	
H	IMPLEMENTATION STRATEGIES: Describe the steps to be taken to develop the program and secure necessary approvals/certification.	Program Development: see below.		
		Internal Academic Affairs and Standards Council approval MNSCU new program approval process	Raich & faculty Raich & faculty	Completed February 2011. To be completed by March 2011.
	Describe the steps to be taken to identify program faculty and staff.	Credentialed instructors in place. Seek additional instructor/Program Champion.	Raich	To be completed by February 2011.
	Describe the steps to be taken to secure industry participation.	GPAC; Industrial Summits; Program Advisory Board; Faculty Development Academy; Liason between program and industry		Program Advisory Board Meeting 1/31/11
	Identify program infrastructure needs.	Equipment needs matched to learning outcomes. Lab space designed to meet learning outcomes.		As noted above, the IST Advisory Committee has approved the course outline, which is tied to equipment purchases.
I	MARKETING PLAN: Describe the steps to be taken in marketing the program to students.	Develop marketing plan including target audience analysis, key messages, strategies and tactics, and measurement. Plan will be aligned with enrollment management practices and strategies.	Enrollment Management Team	2/10/11 - Retained a marketing firm to develop a targeted marketing plan for the new program.
	Describe the steps to be taken in placement of graduates (ie. Marketing of students to employers).	Host employer technology fair; ongoing integrated industry relationships will ensure employment exposure to all program graduates.	Career Placement & Program Champion	To be completed by March 2012.

STEP	DATA REQUESTED DESCRIPTION	MEASUREMENT ITEM AND/OR GOAL	PARTY RESPONSIBLE	STATUS
J	PROGRAM SUSTAINABILITY:			
	What re-deployment of resources are necessary to make it likely this program will succeed?	Redeploy 2 existing faculty that met credentials. Convert existing lab space and equipment.	Raich	Summer, 2011
	What is the projected cost per student for each of the next 5 years?	Program projection details to be maintained by the principal design manager.	Raich	Ongoing
	Detail/describe the projected revenue for each of the next 5 years.	Program projection details to be maintained by the principal design manager.	Raich	Ongoing
K	CONCLUSION:			
	Describe what makes this program innovative.	Lead by broad based regional industry partners and true industry integration in the whole program curriculum and delivery. Benchmarked nationally. Program design incorporates an integrated/systematic approach to course delivery. Skill set developed from this program is designed to function across industry sectors. Theoretical content is applied in project based learning labs.	Raich	Ongoing
	Describe the integrated approach that involves committed partners.	See above.	Raich	Ongoing
	Describe how this program assures it is responding to market demand.	Bi-annual Industry Summits, semi-annual advisory board meetings and program champion research. Ongoing Benchmark visits	Raich	Ongoing
	Describe what approaches contribute to program sustainability.	Continued benchmarking, faculty/professional development, ongoing industry involvement and aggressive marketing.	Raich	Marketing to students outside of region to ensure regional diversity of student body (to help counteract regional employment cycles and correlated student numbers).

QUANTITATIVE GOALS

COLLEGE: Hibbing Community College
PROGRAM: Industrial Systems Technology

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

#	QUANTITATIVE GOAL	MEASUREMENT DATE	TARGET	ACTUAL	EXPLANATION
1	Program enrollment in year 1	Sep-11	1st yr - 24		
		Sep-11	2nd yr - 18		
	Program enrollment in year 2	Sep-12	1st yr - 40		
		Sep-12	2nd yr - 20		
	Program enrollment in year 3	Sep-13	1st yr - 48		
		Sep-13	2nd yr - 32		
2	Retention rate	Fall to Fall	75%		
3	Graduation rate		60%		
4	Related employment rate		75%		

DELIVERY SYSTEM

COLLEGE: Hibbing Community College
PROGRAM: Industrial Systems Technology

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

LEARNING STRUCTURE/DELIVERY SYSTEM

<i>INSTRUCTION APPROACH</i>	<i>LEARNING STRUCTURE</i>				
	<i>Class</i>	<i>Team</i>	<i>Cohort</i>	<i>Community</i>	<i>Network</i>
Lecture	40				
Laboratory		40			
On-the-job		10			
Mentor					
Self-directed					10

PROGRAM EQUIPMENT NEEDS

COLLEGE: Hibbing Community College
PROGRAM: Industrial Systems Technology

MISSION STATEMENT: Programs within the Arrowhead Institute of Technology (AIT) should be nationally recognized, innovative, market responsive and sustainable whereby learner-workers can gain transferrable education and skill, occupational proficiency, and personal enrichment in an integrated model with committed partners.

<u>#</u>	<u>EQUIPMENT DESCRIPTION</u>	<u>DATE NEEDED</u>	<u>ESTIMATED COST</u>
1	To be determined by advisory committee recommendations and learning outcomes.	June 2011	
2			
3	Equipment list will be updated as equipment is purchased.		
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