



# Steps in Implementing Career Clusters

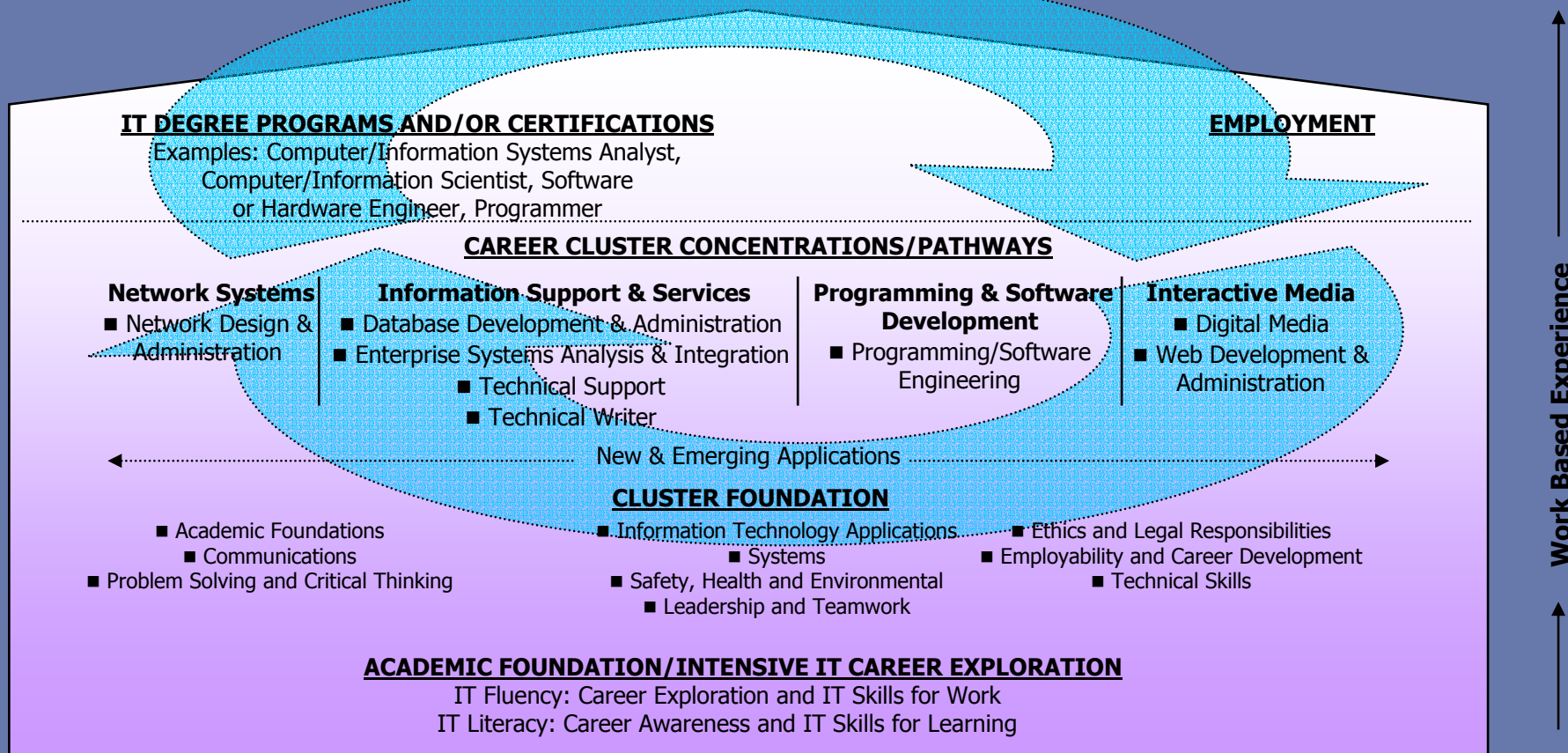


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Education Development Center, Inc.  
September 13, 2002  
States' Career Cluster Initiative Debut, Charleston S.C.*

- IT careers involve the design, development, support and management of hardware, software, multimedia, and systems integration services. In addition to career opportunities in the IT industry, IT careers are available in every sector of the economy, from Financial Services to Manufacturing; Transportation to Education.

# The IT Career Cluster Model

## CAREER DEVELOPMENT/LIFELONG LEARNING



### SOURCES

- IT Pathway Pipeline Model
- NWCET Skill Standards for Information Technology
- The Ohio Information Technology Competency Profile

Model revised 10-19-01 - Version 9 © 2001, EDC

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## Build a community with a common vision

- Raise awareness of need and value of clusters
- Develop partnerships involving the right people from key stakeholder groups who become champions, involve them continuously in all relevant aspects of the project
- Identify pilot sites that are willing and ready to implement the cluster

## Conduct a planning process

- Assess infrastructure, existing partnerships and status of curriculum and skills available at pilot site(s) relating to the cluster
- In depth orientation to cluster model, curriculum framework and standards
- Conduct a planning institute with pilot team members, set local goals, develop implementation plan, identify staff development resources needed to implement plan

## Build capacity to implement and replicate

- Gap Analysis/Program and Curriculum, Align program to model, conduct curriculum analysis on foundation skills and pathways, use cluster resources to fill gaps
- Provide targeted and just-in-time technical assistance and support to build capacity of implementation teams (12 to 18 months), link to networks
- Transition to dissemination centers through hand-in-hand support, consistent materials, network
- Provide leadership and support removing institutional and organizational barriers to growth



# Guilford County Schools IT Career Cluster Implementation

*Sylvia Anderson*

*Guilford County Schools, N.C.*

*September 13, 2002*

*States' Career Cluster Initiative Debut, Charleston S.C.*



## Guilford County Schools Greensboro, North Carolina

- 64,575 students
- 102 Schools K – 12
  - 17 High Schools
  - Weaver Education Center
  - 19 Middle Schools
- 51% Minority – 49% Non-Minority
- 41.9% Low Income Students
- 82 Languages
- Both Rural & Urban Schools

1/3 of Budget Comes From Local Funds

# College Tech Prep Information Technology Multiple Options

## College Tech Prep Information Technology Course of Study

**English – 4 credits**  
**Science – 3 credits**  
**Math – 3 credits**  
 Alg. I, Geometry, Alg. II\*  
 or  
 Alg. I, Tech Math I, Tech Math II  
**Social Studies – 3 credits**  
**PE/Health – 1 credit**  
**Career/Technical-4 credits in one of the following pathways.**  
 Business Computer Programming  
 Electronics  
 Network Administration I/II  
 Network Engineering I/II  
 Scientific Visualization

\*Students planning to pursue a four year degree should select these math courses, an additional **advanced math**, and two credits in the same **second language**.

**Youth Apprenticeship**  
 Scholarships are available

## Bachelors Degree in an Information Technology Field

## Associate Degree Certificate or Diploma in an Information Technology Field

## Information Technology Apprenticeship Journeyman's Certification

Scholarships are available

## Careers in Information Technology

**Network Engineer**  
**Systems Engineer**  
**Network Administrator**  
**Network Technician**  
**Workstation Technician**  
**Project Manager**  
**Lead Test Analyst**  
**Control Systems Technician**  
**LAN Manager**  
**e-Commerce**  
**Webmaster**  
**Help Desk**

For information on continuing education, scholarships, and careers contact these websites

[www.soicc.state.ncus/soicc/](http://www.soicc.state.ncus/soicc/)   
 [www.ncmentor.org](http://www.ncmentor.org)   
 [www.nccareers.org](http://www.nccareers.org)   
 [www.collegeboard.com](http://www.collegeboard.com)  
[www.technet.gtcc.cc.nc.us/services/jobplmt](http://www.technet.gtcc.cc.nc.us/services/jobplmt)   
 GTCC curriculum link   
[www.petersons.com](http://www.petersons.com)   
[www.gettech.org](http://www.gettech.org)

- IT careers involve the design, development, support and management of hardware, software, multimedia, and systems integration services. In addition to career opportunities in the IT industry, IT careers are available in every sector of the economy, from Financial Services to Manufacturing; Transportation to Education.

## The IT Career Cluster Model Guilford County Schools

### CAREER DEVELOPMENT/LIFELONG LEARNING

#### CAREER CLUSTER CONCENTRATIONS/PATHWAYS

	<b>Network Systems Career Pathways</b>	<b>Programming &amp; Software Development Career Pathway</b>	<b>Interactive Media Career Pathway</b>
Grade 12	Software/Administration Network Administration II (Microsoft Certification)	Hardware/Network Systems Network Engineering Technology II (Cisco Certification)	Business Programming in C++
Grade 11	Network Administration I (Novell Certification)	Network Engineering Technology I (Nortel NetKnowledge Certification)	Programming Essentials
Grade 10	IT Essentials <i>or</i> Computer Applications I	Computer Engineering Technology (A+ Certification) <i>or</i> Electronics I	Programming Essentials <i>or</i> IT Essentials
Grade 9, 10	IT Essentials <i>or</i> Computer Applications I <i>or</i> Keyboarding	IT Essentials <i>or</i> Electronics I	Computer Applications I <i>or</i> Keyboarding

↑ Grades 9 - 20

↑ Work Based Experience

#### CLUSTER FOUNDATION

- |   |  |  |   |
|---|--|--|---|
| <ul style="list-style-type: none"> <li>■ Academic Foundation</li> <li>■ Communications</li> </ul> | <ul style="list-style-type: none"> <li>■ Employability Skills &amp; Teamwork                             <ul style="list-style-type: none"> <li>▸ <i>Management &amp; Supervision</i></li> </ul> </li> <li>■ Ethics &amp; Legal Responsibilities                             <ul style="list-style-type: none"> <li>▸ <i>Business Law, Ethics, Legal Issues</i></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ IT Applications                             <ul style="list-style-type: none"> <li>▸ <i>Computer Applications</i></li> </ul> </li> <li>■ Safety Practices                             <ul style="list-style-type: none"> <li>▸ <i>Management &amp; Supervision</i></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ Systems                             <ul style="list-style-type: none"> <li>▸ <i>Economic &amp; Business Concepts</i></li> </ul> </li> <li>■ Technical Skills                             <ul style="list-style-type: none"> <li>▸ <i>Data Communications</i></li> <li>▸ <i>Internet</i></li> <li>▸ <i>IT Technology Basics</i></li> <li>▸ <i>IT Technical Foundation*</i></li> </ul> </li> </ul> |
|---|--|--|---|

#### ACADEMIC FOUNDATION/INTENSIVE IT CAREER EXPLORATION

IT Fluency: Career Exploration and IT Skills for Work  
IT Literacy: Career Awareness and IT Skills for Learning

#### SOURCES

- IT Pathway Pipeline Model
- NWCET Skill Standards for Information Technology
- The Ohio Information Technology Competency Profile

# GUILFORD COUNTY SCHOOLS COLLEGE TECH PREP COURSE OF STUDY INFORMATION TECHNOLOGY NETWORK ADMINISTRATION

Grade	9	10	11	12
<b>English</b>	English I	English II	English III	English IV
<b>*Math Sequence A (For CUP &amp; CTP)</b>	Algebra I or Geometry	Geometry or Algebra II	Algebra II or Algebra III	****An Advanced Math
<b>Sequence B (For CTP only)</b>	Algebra I	Technical Math I	Technical Math II	
<b>Social Studies</b>	ELPSA	World Studies	US History	
<b>Science</b>	Earth or Environmental Science	Biology	Chemistry or Principles of Technology I	Physics or Principles of Technology II
<b>Foreign Language</b>			**Elective: Spanish is suggested	**Elective: Spanish is suggested
<b>PE/Health</b>	Health/PE			
<b>+Career/ Technical Courses for CTP Completer Status</b>	Keyboarding or IT Essentials	Computer Applications I	Network Administration I	Network Administration II (Novell & Microsoft Certification)
<b>***CTP Business Council Suggested Electives</b>	Fundamentals of Technology	Programming Essentials or Computer Engineering Technology I	Business Programming in C++, Computer Engineering Technology II, Network Engineering I	Apprenticeship, Small Business/Entrepreneurship or Business & Electronic Communications, or Business Management & Applications

Students enrolled in this College Tech Prep Course of Study may apply for a youth apprenticeship directly related to this career area.

\*Sequence A is recommended so students can qualify as both College University Prep and College Tech Prep completers.

\*\*Students may meet College/University Prep requirements by selecting these courses.

\*\*\*Recommended courses to enhance skills for better preparation to enter this field.

+Students must have 4 units in the career course sequence, one of which, must be a level II course.

# GUILFORD COUNTY SCHOOLS COLLEGE TECH PREP COURSE OF STUDY

## INFORMATION TECHNOLOGY NETWORK

### ENGINEERING/TELECOMMUNICATIONS

Grade	9	10	11	12
<b>English</b>	English I	English II	English III	English IV
<b>*Math Sequence A (For CUP &amp; CTP)</b>	Algebra I or Geometry	Geometry or Algebra II	Algebra II or Algebra III	****An Advanced Math
<b>Sequence B (For CTP only)</b>	Algebra I	Technical Math I	Technical Math II	
<b>Social Studies</b>	ELPSA	World Studies	US History	
<b>Science</b>	Earth or Environmental Science	Biology	Chemistry or Principles of Technology I	Physics or Principles of Technology II
<b>Foreign Language</b>			**Elective: Spanish is suggested	**Elective: Spanish is suggested
<b>PE/Health</b>	Health/PE			
<b>+Career/Technical Courses for CTP Completer Status</b>	IT Essentials or Electronics	Computer Engineering Technology I	Network Engineering Technology I (Nortel NetKnowledge Certification)	Network Engineering Technology II (Cisco Systems Certification)
<b>***CTP Business Council Suggested Electives</b>	Fundamentals of Technology or Keyboarding	Manufacturing Systems or Computer Applications I	Business Computer Programming, Computer Engineering Technology II, Network Admin I, or Small Business/Entrepreneurship	Apprenticeship, Business & Electronic Communications, Network Admin II, Business Management & Applications

Students enrolled in this College Tech Prep Course of Study may apply for a youth apprenticeship directly related to this career area.

\*Sequence A is recommended so students can qualify as both College University Prep and College Tech Prep completers.

\*\*Students may meet College/University Prep requirements by selecting these courses.

\*\*\*Recommended courses to enhance skills for better preparation to enter this field.

+Students must have 4 units in the career course sequence, one of which, must be a level II course.

# GUILFORD COUNTY SCHOOLS COLLEGE TECH PREP COURSE OF STUDY INFORMATION TECHNOLOGY BUSINESS COMPUTER PROGRAMMING IN C++

<b>Grade</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>English</b>	English I	English II	English III	English IV
<b>*Math Sequence A (For CUP &amp; CTP)</b>	Algebra I or Geometry	Geometry or Algebra II	Algebra II or Algebra III	An Advanced Math
<b>Sequence B (For CTP only)</b>	Algebra I	Technical Math I	Technical Math II	
<b>Social Studies</b>	ELPSA	World Studies	US History	
<b>Science</b>	Earth or Environmental Science	Biology	Chemistry or Principles of Technology I	Physics or Principles of Technology II
<b>Foreign Language</b>	Two units of the same foreign language are suggested for CTP completion But required for CUP completion.			
<b>PE/Health</b>	Health/PE			
<b>+Career/ Technical Courses</b>	Computer Applications I or Keyboarding	IT Essentials or Computer Applications II	Programming Essentials	Business Computer Programming in C++
<b>*Industry Suggested Electives</b>	Fundamentals of Technology	Programming Essentials or Computer Engineering Technology I	Computer Engineering Technology II or Network Engineering I	Apprenticeship, Small Business/Entrepreneurship or Business & Electronic Communications, Business Management & Applications, or E-Commerce

Students enrolled in this College Tech Prep Course of Study may apply for a youth apprenticeship directly related to this career area.

- \*Sequence A is recommended so students can qualify as both College University Prep and College Tech Prep completers.
- +Students must have 4 units in the career course sequence, one of which, must be a level II course.

# GUILFORD COUNTY SCHOOLS COLLEGE TECH PREP COURSE OF STUDY INFORMATION TECHNOLOGY SCIENTIFIC VISUALIZATION

<b>Grade</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>English</b>	English I	English II	English III	English IV
<b>*Math Sequence A (For CUP &amp; CTP)</b>	Algebra I or Geometry	Geometry or Algebra II	Algebra II or Algebra III	An Advanced Math
<b>Sequence B (For CTP only)</b>	Algebra	Technical Math I	Technical Math II	
<b>Social Studies</b>	ELPSA	World Studies	US History	
<b>Science</b>	Earth or Environmental Science	Biology	Chemistry or Principles of Technology I	Physics or Principles of Technology II
<b>Foreign Language</b>	Two units of the same foreign language are suggested for CTP completion But required for CUP completion			
<b>PE/Health</b>	Health/PE			
<b>+Career/ Technical Courses</b>	Drafting I or Computer Applications I or Keyboarding	Drafting II Or Drafting I	Scientific Visualization I	Scientific Visualization II
<b>*Industry Suggested Electives</b>	Fundamentals of Technology	Computer Applications I, or Computer ET I, or Scientific & Technical Visualization I	Drafting-Engineering II, Network Engineering I, or Communications Systems	Apprenticeship, Drafting-Engineering III, or Small Business/Entrepreneurship

Students enrolled in this College Tech Prep Course of Study may apply for a youth apprenticeship directly related to this career area.

Sequence A is recommended so students can qualify as both College University Prep and College Tech Prep completers.

+Students must have 4 units in the career course sequence, one of which, must be a level II course.

## Existing Courses Aligned to the ITCC Model

- Network Administration I
  - Novell
- Network Engineering I
  - Nortel NetKnowledge
- Scientific Visualization I
  - Computer Graphics and Visualization
- Computer Engineering Technology I
- Computer Programming I - Visual Basic

## Expanded Courses and Programs

### ADDED

- Network Administration II - Microsoft
- Network Engineering II - CISCO Academy
- Computer Engineering II
- Computer Programming II - C++
- IT Essentials course for 9th and 10th graders
  - Computer Architecture
  - Network Systems
  - Web Development
  - Software Development and Application

## Expanded Courses and Programs *(continued)*

- Developed/Expanded IT CTP Business Council
- Expanded program from 3 high school sites to 11 sites
- Paid for students National Certification Tests

## Future Expansion of Courses and Programs

- Network Administration III
  - Linux
  - Red Hat
- IT Essentials Assessments
  - Considering using CompTIA and Certiport Internet and Computing Core Certification (IC3)



## Northwest Technical College IT Career Cluster Implementation

*Teri Bradel*

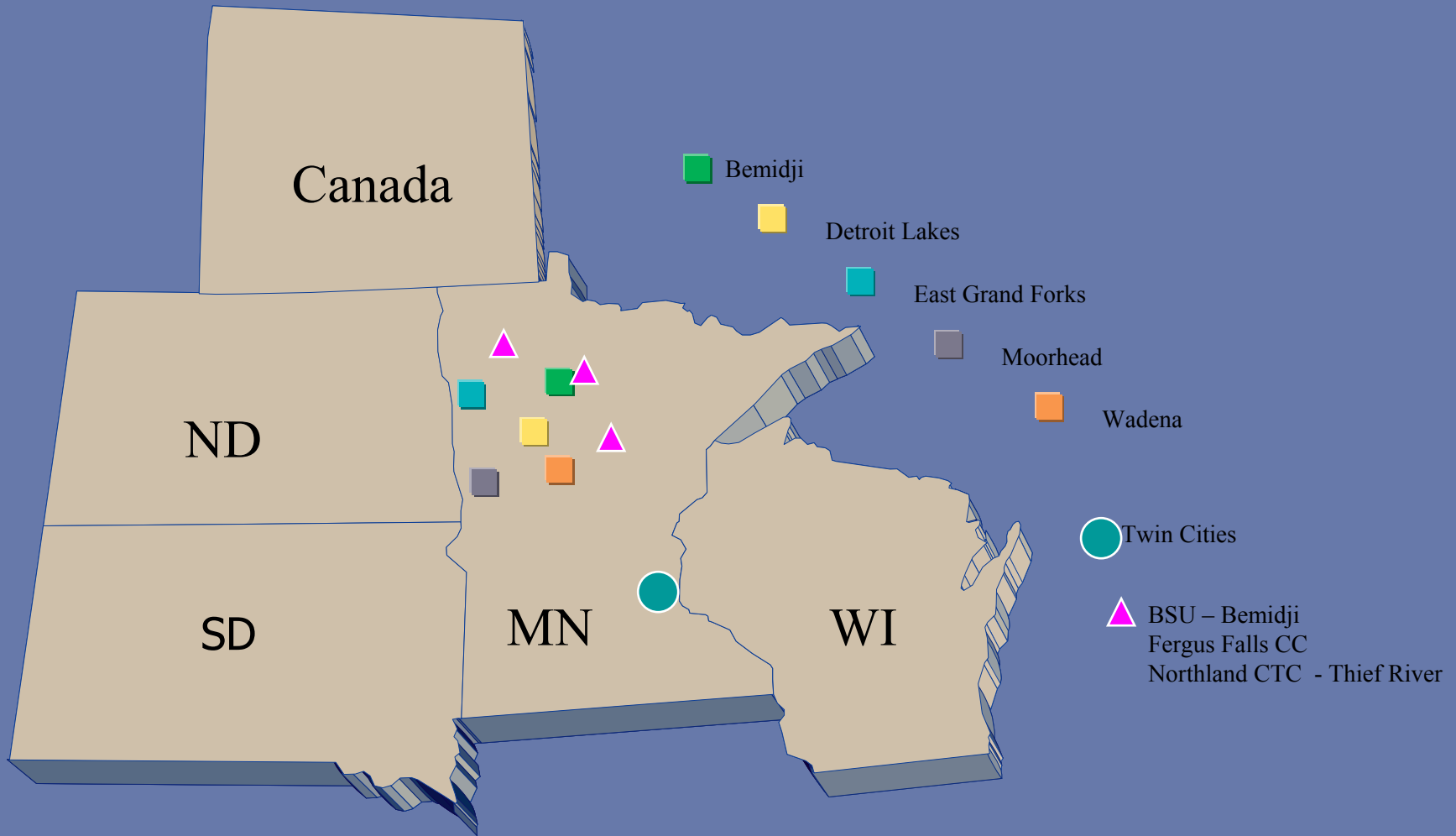
*Northwest Technical College, MN*

*September 13, 2002*

*States' Career Cluster Initiative Debut, Charleston S.C.*



# Northwest Technical College



# Custom Training Services/Economic Development

- ❖ R & D arm of the college
- ❖ Working with businesses
  - Consulting
  - Workforce training

# The NTC Model...

## CAREER DEVELOPMENT/LIFELONG LEARNING

### IT DEGREE PROGRAMS AND/OR CERTIFICATIONS

Programs:

Computer Programming

Computer Systems Electronics

Computer Technical Support Specialist

Microcomputer & Network Technology

Admin Support – Cptr Emphasis

Library & Information Technology

Accounting Clerk – Microcomputer Applications

Emphasis

Database Specialist Certificate 15 cr certificate – CTS\*

Database Administration Certificate 16 cr certificate – CTS\*

Certifications: (College is certified to do testing)

▶ MOUS

▶ A+

▶ Cisco

▶ MCSE

▶ CIW

▶ IC3

▶ “Grow Your Own IT” (test ready)

### EMPLOYMENT

We work with business partners in maintaining workforce skills by customizing courses to meet industry needs.

### CAREER CLUSTER CONCENTRATIONS/PATHWAYS

#### **Network Systems**

Microcomputer & Network Technology

#### **Information Support & Services**

Database  
Computer Tech Support

#### **Programming & Software Development**

Programming

#### **Interactive Media**

Internet Design

# Partnerships

## Business Link

- Degree programs
- Hour-based options
- Certification testing

## Secondary Link

- Teacher training
- Course offerings w/high schools
- Certification testing
- Credit transfer

## Internal Link

- Curriculum development
- Certification testing at remote sites

## NTC Resources

- Teri Bradel, Assessment Specialist
  - [teri.bradel@ntcmn.edu](mailto:teri.bradel@ntcmn.edu)
  
- Pat Wilber, Corporate Academic Dean
  - [Pat.wilber@ntcmn.edu](mailto:Pat.wilber@ntcmn.edu)
  
- <http://www.ntcmn.edu>

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