Des Moines Area Community College

Comprehensive Program Evaluation

Civil Engineering Technology AAS

For the Years

2009 - 2013

GENERAL INFORMATION
Part I

Program Name: Civil Engineering Technology

Degrees/Diplomas Awarded:Certificates Offered: Associate Degree (AAS)

Campus(es): Boone
Program Chair: Renee White
Academic Dean/Provost: Tom Lee

IOWA CAREER AND TECHNICAL PROGRAM COMPLIANCE

This Program Evaluation is intended to provide support for career and technical program compliance with 281– IAC 46.7(4) as listed below:

- Compatible with educational reform efforts.
- Capable of responding to technological change and innovation.
- Meet the educational needs of the students and employment community including students with disabilities, both male and female students, from diverse racial and ethnic groups.
- The competencies in the program are mastered by students enrolled.
- The curriculum is articulated and integrated with other educational offerings required of all students.
- The program permits students with secondary career and technical education backgrounds to pursue other educational interests in a postsecondary setting, if desired.
- The program removes barriers for both traditional and nontraditional students to access educational and employment opportunities.

In addition Program Evaluation is intended to provide support in meeting the additional expectations of the Department of Education Program Review Process noted in the Program Approval Guidelines for Iowa Community Colleges issued 11.01.2010:

- The costs of the program are proportionate to educational benefits received.
- Program standards and curricula address new and emerging technologies.
- Program standards and curricula address job seeking/job/keeping and other employment skills including self-employment, and entrepreneurship skills, entrepreneurial and labor market needs.
- Program standards and curricula address strengthening of basic academic skills.

PROGRAM OVERVIEW

Please provide a brief history and/or overview of the program: Catalog program description, when it started; Campus or campuses it is offered on; How the demands or needs of the community have influenced its evolution; what milestones have been achieved; etc.

The Civil Engineering Technology program prepares the student for a career as a technician in the areas of design, surveying, construction and materials testing. This is designed to be a two-year degree program.

This program educates future engineering technicians to help design, construct and maintain our civil engineering infrastructure: bridges, roads, dams, culverts, airports and more. It is the Civil Engineering Technician, working as the eyes and ears for the engineer, who ensures that these infrastructure projects get built to last.

Career opportunities with this degree are with construction firms; surveying firms; consulting engineering firms; federal, state and local government agencies; materials testing labs and many other areas of the private sector that support the transportation industry.

The program began in the fall of 1999. Since that time it has graduated 199 students. It is only offered on the Boone campus.

Civil Engineering Technicians continue to be an important part of the workforce. All of our infrastructure projects: roads, bridges, dams, waterways, etc. require the use of Civil Engineering Technicians. The program has nearly 100% placement rate, with starting salaries increasing to an average of $38,000 -$40,000 per year (based on 2015 graduate placement data).

INDICATORS OF EFFECTIVENESS
Part II

AQIP Category Seven, **MEASURING EFFECTIVENESS**, focuses collects, using data, information, and knowledge to manage and drive performance improvement.

Assessment at the program level focuses on how effectively students have acquired the skills and abilities to successfully enter employment after graduation.

Providing the right courses, right mix of courses and right sequence of courses is critical to quality programming and student learning. In addition programs of study have to look at the program goals, courses offered, course sequencing and indirect evidence as well as professional standards. These are some of the resources that should be used for analysis and instructional programming enhancement:

- Course level assessment
- Program level assessment
- Surveys: Student, Graduate, Employer, Advisory Board
- National & State Certification Data
- Five Year Program Assessment
- Institutional Research: course/term retention, fall-spring persistence and GPA

Responses to the questions should encompass the assessment process; how it is implemented; what data are collected; how they are used; what questions are raised; and what improvements in teaching/learning processes are or have happened as a result.

The implementation of systematic assessment leads towards professional collaboration; enhance an environment for experimental practices and programs; and focused discussion of student development and curriculum revision.

A. PROGRAM/COURSE ASSESSMENT:

1.For assessment of student learning **at the course level**, what formal assessment tools and plans are in place? What courses have been assessed over the past five years? What data have been collected? What improvements were implemented based on the data? *(Provide copies of Annual Course Assessment Summaries.)*

Survey II and Materials I have been assessed formally in the last 5 years. Annual course Assessment Summaries Attached.

2. What **external assessments** do you use to measure student occupational knowledge, and assure industry currency and professional development of your students? *(Internships, licensure exams, practicums, etc. What type of data are collected?)*

This is where we spend most of our assessment time.
A. All of our students complete an internship the summer between their 1st and 2nd year, and we utilize the feedback we receive from students and employers to improve our program. We ask questions regarding their education, is it appropriate for their job, were they prepared, etc.
B. In the materials classes, students take 9 Iowa Department of Transportation Certification exams to become certified as technicians for the State of Iowa. The results of their exams are used to ensure that the curriculum in the materials courses are in line with industry expectations.
C. The program meets with our Advisory Board once or twice each year, to discuss technology needs, software applications, new trends and employer expectations. This information is used by the faculty to modify classes, add classes, or delete classes from the curriculum.
D. All faculty attend conferences in their areas of expertise each year, to learn what's new in the industry, refine their knowledge, and ensure we are teaching relevant information.

We find all of the above to be of utmost importance to keep our program in line with the growth and advancement of our industry.

3. How have the assessment activities conducted over the past five years *(both the external assessments and the course level assessments)* been used to improve the program?

Question answered above already.

Program Competencies Iowa Code – Must be revalidated every 3 years
Iowa Code 258.4(8) *Establish a minimum set of competencies and core curriculum for approval of a vocational program sequence that addresses the following: new and emerging technologies; job-seeking, job-keeping, and other employment skills, including self-employment and entrepreneurial skills that reflect current industry standards, leadership skills, entrepreneurial, and labor-market needs; and the strengthening of basic academic skills.*

Iowa Code 281.46.7(1,2) … *Revalidation for minimum competencies will be completed and authorized for the state board at least every three years, commencing with the 1992-93 school year.*

While the direct assessment of courses is a critical component it is only one factor. In addition, assessing the program develops key inquiry-based resources to track, synthesize, and implement program modifications that are based on sound inquiry and research.

One of the first steps in initiating a program assessment is to look at the program competencies. Map the courses in your program to the appropriate program competencies. Complete the template for visualization. Expand as needed.

4. Are the program competencies and curriculum aligned with the following?: (*as relevant to your program*)
   Yes
   - *new & emerging technologies*
   - *current industry standards*
   - *job seeking, job keeping, & other employment skills*
   - *leadership skills*
   - *entrepreneurial skills*
   - *labor-market needs*
   - *strengthening basic academic skills*

5. Were the program competencies reviewed, and updated as needed within the last 3 years?
   Yes

6. List the pre-requisites for entry into your program.

   1. Complete an application for admission.
   2. Satisfy the required assessment by taking the reading and English COMPASS test or equivalent.
   3. Obtain minimum ALEKS placement score of 30 or a minimum ACT math score of 19. (Scores may not be more than three years old.) These scores reflect the suggested level of math skills necessary to be successful in the field of Civil Engineering Technology. Students who

do not currently meet the minimum scores required must meet with an advisor to develop an action plan for improving their math skills.

4. Attend any required information/registration session.

7. What are the graduation requirements for successful completion of your program?

To earn a Civil Engineering Technology AAS degree, a student must complete all coursework as prescribed and maintain a 2.0 grade point average.

8. Provide the term-term course sequence model for completion of the program.

Program Term-Term Breakout	
Term 1	**Term 4**
CET 102 Fundamentals of Civil Engineering CET 119 Survey I CET 135 Materials I MAT 773 Applied Math II CSC 110 Intro to Computers Any A.A.S. degree General Requirement Communications course Opt 1	CET 173 Highway Design I CET 192 Statics CET 219 Survey III CET 244 Materials II Any A.A.S. degree General Requirement Social & Behavioral or Humanities course Opt 2
Term 2	**Term 5**
CET 138 Construction I CET 178 Automated Design I CET 169 Survey II ADM 221 Career Development Skills Any A.A.S. degree General Requirement Communications course Opt 1 •	CET 283 Highway Design II CET 222 Soils and Foundations CET 235 Construction II CET 291 Structure Design and Construction CET 278 Automated Design II
Term 3	**Term 6**
CET 304 Field Coop Opt 3 (With Department approval, students may complete BOTH Option 4 courses OR BOTH Option 5 courses in place of Option 3.) CET 307 Field Orientation Opt 4 MGT 145 Human Relations in Business Opt 4 CET 307 Field Orientation Opt 5 PSY 102 Human and Work Relations Opt 5	•

9. How do you monitor **program competencies and student learning** at the program level?

We annually meet as a department to review program competencies based on performance of the students in each individual class. We routinely discuss effective teaching and learning strategies, and find ways to increase student learning by using more hands-on teaching, interactive strategies, group work, etc.

10. Which specific DMACC General Education Competencies does the program emphasize for student acquisition of lifelong learning skills?

DMACC Gen Ed Competency:	Applicable:	DMACC Gen Ed Competency:	Applicable:
1. Understanding & demonstrating effective communication.	**Yes**	**4.** Developing an understanding of fundamental mathematical principles & their application.	Yes
2. Understanding & demonstrating logical & critical thinking.	**Yes**	**5.** Developing an understanding of human society & cross-cultural variation & perspective.	No
3. Developing & understanding of fundamental scientific principles& their application.	**Yes**	**6.** Developing knowledge of & appreciation for the human condition as expressed in works of human imagination & thought.	No

Program: Civil Engineering Technology	**Program Course Acronyms Updated 2009**																	
Program Competencies (*List program competencies below, the program courses across and place an "X" in the column under the corresponding course acronym that applies to the program competency.)*	**CET 102**	**CET 119**	**CET 135**	**CET 138**	**CET 169**	**CET 173**	**CET 178**	**CET 192**	**CET 219**	**CET 222**	**CET 235**	**CET 244**	**CET 278**	**CET 283**	**CET 291**	**MAT 773**	**CSC 110**	**CET 305**
Demonstrate the usage of CAD software and its applicability to current state of the are road and bridge design techniques					X		X											
Demonstrate use of the GEOPAK software package													X					
Generate computerized design tech sheets							X						X					
Demonstrate the use of surveying equipment		X			X				X									
Utilize state of the art equipment for testing the usability nature of various construction sites										X								
Perform required inspections at construction sites				X														
Demonstrate the ability to measure accurately		X	X		X				X	X	X					X		
Describe the application and testing procedures of various construction materials			X							X		X						
Explain the concepts presented in contract and sub-contract documents			X							X	X	X						
Program Competencies (*List program competencies below, the program courses across and place an "X" in the column under the corresponding course acronym that applies to the program competency.)*	**CET 102**	**CET 119**	**CET 135**	**CET 138**	**CET 169**	**CET 173**	**CET 178**	**CET 192**	**CET 219**	**CET 222**	**CET 235**	**CET 244**	**CET 278**	**CET 283**	**CET 291**	**MAT 773**	**CSC 110**	**CET 305**
Integrate skills learned in the classroom and at the internship site					X						X							X
Demonstrate the personal qualities needed to succeed as a civil engineering technician	X	X	X		X					X	X	X						
Develop individual career values		X			X						X							
Explore opportunities in the civil engineering technician profession	X	X			X						X							
Assess the changing civil engineering environment		X	x		X	X				X	X	X						
Demonstrate the basic workplace skills of listening, writing, computing, problem-solving, interpersonal		X	X		X	X				X	X	X						

relationships and leadership																		
Additional Program Courses	**CET 307**	**MGT 145**	**PSY 111**	**COM 703**	**ENG 105**	**ENG 106**	**ENG 108**	**PSY 102**	**CAD119**	**SPC 101**	**MAT 130**	**SRV 215**						
Demonstrate the usage of CAD software and its applicability to current state of the are road and bridge design techniques									X									
Demonstrate use of the GEOPAK software package																		
Generate computerized design tech sheets									X									
Demonstrate the use of surveying equipment												X						
Utilize state of the art equipment for testing the usability nature of various construction sites																		
Perform required inspections at construction sites																		
Demonstrate the ability to measure accurately											X							
Describe the application and testing procedures of various construction materials																		
Explain the concepts presented in contract and sub-contract documents																		
Integrate skills learned in the classroom and at the internship site	X																	
Additional Program Courses	**CET 307**	**MGT 145**	**PSY 111**	**COM 703**	**ENG 105**	**ENG 106**	**ENG 108**	**PSY 102**	**CAD119**	**SPC 101**	**MAT 130**	**SRV 215**						
Demonstrate the personal qualities needed to succeed as a civil engineering technician	X																	
Develop individual career values	X																	
Explore opportunities in the civil engineering technician profession	X																	
Assess the changing civil engineering environment	X																	
Demonstrate the basic workplace skills of listening,				X	X	X	X	X										

writing, computing, problem-solving, interpersonal relationships and leadership																		

B. ASSURANCES

By indicating a "yes" for each of the following items you are assuring that you complete these reviews on an annual basis. For each "no" response explain and provide a plan for change.

1. Are all program specific career/technical course competencies reviewed annually, updated as needed and published in the course competency web page?
   Yes

2. Are all program specific career/technical course descriptions reviewed annually, updated as needed, and published in the catalog?
   Yes

3. Is the catalog description reviewed annually?
   Yes

4. Are all program specific career/technical course syllabi reviewed annually?
   Yes

5. Is the program curriculum current and meeting business & industry standards?
   Yes

6. Are current course competencies & syllabi for program courses on file in the Dean's office?
   Yes

5. Are course competencies & course syllabus for each course provided to students at the beginning of each course?
   Yes

6. Is the length of each program award appropriate and in compliance with the DMACC and Dept of Ed requirements as listed below?
   Yes

- **AA degree**
  - 64 credits
  - Able to be completed in 2 calendar years (4 regular terms & 2 summer terms)
  - Meets DMACC general education requirements
- **AS-CO degree**
  - 66 to 70 credits (including program pre-requisite credit courses, not remedial)
  - Able to be completed in 2 calendar years (4 regular terms & 2 summer terms)
  - Meets DMACC general education requirements
  - Articulation agreements on file with 3 baccalaureate degree programs (list Colleges below)
    1. _
    2. _
    3. _
- **AAS degree**
  - 60 to 86 credits (including program pre-requisite credit courses, not remedial)
  - 50% of program courses are career/technical Meets DMACC general education requirements
- **Diplomas**

- 30 to 48 credits (including program pre-requisite credit courses, not remedial)
- Able to be completed in 1 calendar year (52 weeks maximum)
- Meets DMACC general education requirements

- **Certificates**
  - 48 credits max (including program pre-requisite credit courses, not remedial)
  - Able to be completed in 1 calendar year (52 weeks maximum)
  - Includes only career/technical courses

C. STUDENT INFORMATION AND DEMOGRAPHICS

AQIP Category Three, **UNDERSTANDING STUDENTS' AND OTHER STAKEHOLDERS' NEEDS**, focuses on understanding student and other stakeholder needs.

DEMOGRAPHIC DISTRIBUTIONS

Number of Students by Race and Year and Student Type

Program Evaluation Data for: Civil Engineering Technology
Number of Students by Race and Year and Student Type Status
Source: DMACC, Banner Database, Annual Data, SWRR010
Note: Students who either began the year or ended the year in the selected program are included

		Total Students					Percent of Total				
		2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Career Advantage	White	.	.	.	.	1	.	.	.	.	100.00
	SUBOTAL	.	.	.	.	1	.	.	.	.	100.00
Regular Student	Am Indian	.	.	2	.	.	.	.	2.67	.	.
	Asian	.	.	2	1	.	.	.	2.67	1.79	.
	Black	2	2	6	3	5	2.90	3.70	8.00	5.36	12.20
	Hispanic	1	1	1	.	1	1.45	1.85	1.33	.	2.44
	Unknown	.	10	7	3	2	.	18.52	9.33	5.36	4.88
	White	66	41	57	48	32	95.65	75.93	76.00	85.71	78.05
	unknown	.	.	.	1	1	.	.	.	1.79	2.44
	SUBOTAL	69	54	75	56	41	100.00	100.00	100.00	100.00	100.00
TOTAL		69	54	75	56	42	100.00	100.00	100.00	100.00	100.00

Number of Students by Gender and Year and Student Type

Program Evaluation Data for: Civil Engineering Technology
Number of Students by Gender and Year and Student Type Status

		Total Students					Percent of Students				
		2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Career Advantage	Male	.	.	.	.	1	.	.	.	.	100.00
	SUBTOTAL	.	.	.	.	1	.	.	.	.	100.00
Regular Student	Female	11	8	8	6	5	15.94	14.81	10.67	10.71	12.20
	Male	58	46	67	50	36	84.06	85.19	89.33	89.29	87.80
	SUBTOTAL	69	54	75	56	41	100.00	100.00	100.00	100.00	100.00
TOTAL		69	54	75	56	42	100.00	100.00	100.00	100.00	100.00

Number of Students by Age Group and Year and Student Type

Program Evaluation Data for: Civil Engineering Technology
Number of Students by Age Group and Year and Student Type Status

		Total Students					Percent of Students				
		2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Career Advantage	>22 and <=30 years old	.	.	.	.	1	.	.	.	.	100.00
	SUBTOTAL	.	.	.	.	1	.	.	.	.	100.00
Regular Student	<= 22 years old	27	20	28	23	14	39.13	37.04	37.33	41.07	34.15
	>22 and <=30 years old	15	17	17	13	15	21.74	31.48	22.67	23.21	36.59
	>30 and <=40 years old	14	12	21	11	5	20.29	22.22	28.00	19.64	12.20
	>40 and <=50 years old	11	4	7	7	2	15.94	7.41	9.33	12.50	4.88
	>50 years old	2	1	2	2	5	2.90	1.85	2.67	3.57	12.20
	SUBTOTAL	69	54	75	56	41	100.00	100.00	100.00	100.00	100.00
TOTAL		69	54	75	56	42	100.00	100.00	100.00	100.00	100.00

Number of Students by Full-Time or Part-Time Status and Student Type

Program Evaluation Data for: Civil Engineering Technology
Number of Students by Full-time or Part-time Status and Student Type Status

		Total Students					Percent of Students				
		2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Career Advantage	Full time	.	.	.	.	1	.	.	.	.	100.00
	SUBTOTAL	.	.	.	.	1	.	.	.	.	100.00
Regular Student	Full time	31	20	35	30	14	44.93	37.04	46.67	53.57	34.15
	Part time	38	34	40	26	27	55.07	62.96	53.33	46.43	65.85
	SUBTOTAL	69	54	75	56	41	100.00	100.00	100.00	100.00	100.00
TOTAL		69	54	75	56	42	100.00	100.00	100.00	100.00	100.00

Are the numbers of students starting appropriate for the program?
We would like it to be larger, because there is much greater need in industry than we are able to fill. Our freshmen classes have dropped to 10 – 15, we are strongly marketing our program in the hopes that we can have 20 – 30 incoming freshmen.

Is there a waiting list? How long? Is this a new trend or has it been ongoing?
No

Have enrollment patterns changed over the past five years? Why?

Yes, enrollment has gone down. We are not sure why.

Does enrollment reflect balanced diversity in gender, age and ethnicity?

No, but that's not unusual in the engineering field.
Typical students are male, Caucasian, between 18 and 26 years old.

What efforts are being made to promote diversity in the program?

We participate in programs at the high schools that encourage girls to be in STEM programs, and reach out to everyone regardless of gender, age, or ethnicity.

Is the program capable of meeting the needs of all students including students with disabilities, both male and female students, and from diverse racial and ethnic groups?

Yes

Student Survey Results

Student Survey

Last Modified: 08/13/2015

Filter By: Civil Engineering Technology

1. Current Year (YYYY)

Text Response
2015

Statistic	Value
Total Responses	11

2. What program/program area are you currently enrolled in?

#	Answer		Response	%
15	Civil Engineering Technology		14	100%

3. Which of the following plan to obtain upon completion of your program studies?

#	Answer		Response	%
1	AA Degree		1	7%
2	AS Degree		1	7%
3	AAS Degree		12	86%
4	Diploma		0	0%
5	Certificate		0	0%

4. What best describes your current educational goal at DMACC?

#	Answer		Response	%
1	Prepare for a job (obtain employment)		10	71%
2	Make a career change		5	36%
3	Upgrade my skills		3	21%
4	Take courses for career exploration		1	7%
5	Obtain or maintain certification		2	14%
6	Personal interest or self improvement		2	14%
7	Transfer to a four-year college or university		2	14%
8	Other -Please Specify		0	0%

5. What is your current student classification?

#	Answer		Response	%
1	Full-Time (8 or more credits)		14	100%
2	Part-Time (7 or fewer credits)		0	0%
	Total		14	100%

6. How did you find out about the program you are enrolled in?

#	Answer		Response	%
1	Iowa State Fair		0	0%
2	TV Commercial		0	0%
3	High School Counselor		1	7%
4	Newspaper		1	7%
5	Other - Please Specify		5	36%
6	Recruitment Personnel		0	0%
7	DMACC Tabloid		1	7%
8	College Catalog		5	36%
9	Relative/Friend		4	29%

Other - Please Specify
DMACC Website
my aunt
internet
Un-employment office

7. Reason for enrolling at DMACC (Select all that apply):

#	Answer		Response	%
1	Convenience		6	43%
2	Affordability		8	57%
3	Availability of a specific program		9	64%
4	Other - Please Specify		1	7%
5	Recommended by parent, friend, etc.		2	14%
6	DMACC reputation		2	14%
7	Recruited		1	7%

Other - Please Specify
only program in the state to offer Civil Engineering Degree

8. How many credits have you completed at DMACC?

#	Answer		Response	%
1	None		0	0%
2	0-16 Credits		1	7%
3	17-32 Credits		2	14%
4	33-45 Credits		1	7%
5	46-64 Credits		3	21%
6	65+ Credits		7	50%
	Total		14	100%

9. During your enrollment are you taking classes:

#	Answer		Response	%
1	Days Only		12	86%
2	Evenings Only		1	7%
3	Weekends Only		1	7%
4	Days and Evenings		3	21%
5	Evenings and Weekends		0	0%
6	Online		0	0%

10. Where are you taking the majority of your classes?

#	Answer		Response	%
1	Ankeny Campus		0	0%
2	Boone Campus		14	100%
3	Carroll Campus		0	0%
4	Other - Please Specify		0	0%
5	Newton Campus		0	0%
6	Urban Campus		0	0%
7	West Campus		0	0%
	Total		14	100%

11. Overall, how does the instruction you are receiving compare with your expectations?

#	Answer		Response	%
1	Excellent		7	50%
2	Good		7	50%
3	Average		1	7%
4	Poor		0	0%
5	Very Poor		0	0%
6	Don't Know/No Opinion		0	0%

12. Rate the facilities on the following characteristics:

#	Question	1-Excellent	2-Good	3-Average	4-Poor	5-Very Poor	6-Don't Know/No	Total Responses	Mean
1	Availability when students need to use them	7	6	1	0	0	0	14	1.57
2	Adequacy	9	5	0	0	0	0	14	1.36
3	Maintenance	7	7	0	0	0	0	14	1.50

13. Rate the equipment on the following characteristics:

#	Question	1-Excellent	2-Good	3-Average	4-Poor	5-Very Poor	6-Don't Know/No	Total Responses	Mean
1	Availability when students need to use them	9	4	1	0	0	0	14	1.43
2	Adequacy	10	4	0	0	0	0	14	1.29
3	Maintenance	9	4	0	1	0	0	14	1.50

14. Rate the student support services:

#	Question	1-Excellent	2-Good	3-Average	4-Poor	5-Very Poor	6-Don't Know/No	Total Responses	Mean
1	Tutoring Services	7	5	1	0	0	1	14	1.86
2	Library Services	8	4	1	0	0	1	14	1.79
3	Guidance and Counseling Services	8	4	0	0	0	2	14	2.00
4	Academic Achievement Center	9	3	0	0	0	2	14	1.93
5	Computer Lab/Services	7	4	1	0	0	1	13	1.85

15. Would you recommend the program to others?

#	Answer		Response	%
1	Definitely Yes		10	71%
2	Probably		4	29%
3	Uncertain		0	0%
4	Probably Not		0	0%
5	Definitely Not		0	0%

16. Please select the time(s) you would prefer to attend class:

#	Answer		Response	%
1	6:00am - 8:00am		3	21%
2	8:00am - 11:00am		11	79%
3	Other - Please Specify		1	7%
4	11:00am - 1:00pm		6	43%
5	1:00pm - 3:00pm		2	14%
6	3:00pm - 6:00pm		0	0%
7	6:00pm - 9:00pm		0	0%

Other - Please Specify
9 am-3 pm

17. How many hours do you work per week while a student at DMACC?

#	Answer		Response	%
1	None		3	21%
2	1-10 hrs/wk		3	21%
3	11-20 hrs/wk		4	29%
4	21-30 hrs/wk		4	29%
5	31-40 hrs/wk		0	0%
6	40+ hrs/wk		0	0%
	Total		14	100%

18. What high school did you last attend?

School Name	City	State
DMACC	ANKENY	IA
Tidewater Community College	Virginia Beach	Virginia
Valley High School	West Des Moines	IA
Columbus Community High School	Columbus Junction	Iowa
East Liverpool	East Liverpool	Ohio
Roland-Story	Story City	Iowa
nevada high	nevada	Iowa
northwestern	sciota	illinois
Community Learning Center	Yakima	Wa
Boone High School	Boone	Iowa
Old Khartoum Secondary School	Khartoum	Sudan, Africa
East High School	Kansas City	Missouri
ITPL	Congo Africa	DR congo

Statistic	Value
Total Responses	13

19. After receiving your high school diploma/GED, did you attend any other educational institution before attending DMACC?

#	Answer		Response	%
1	Yes		6	46%
2	No		7	54%
	Total		13	100%

20. If you answered yes to question 17, please indicate the type of school(s) you attended:

#	Answer		Response	%
1	Technical/Business College		0	0%
2	Two Year College		6	86%
3	Four Year College/University		1	14%
	Total		7	100%

21. Did you graduate from that institution?

#	Answer		Response	%
1	Yes		3	33%
2	No		6	67%
	Total		9	100%

22. What do you like most about the program you are enrolled in?

Text Response
The variety of skills taught
helpful instructor’s
I like the small class sizes and the 8 week classes.
The material I am learning, and the hands-on style of teaching
The program is two years long.
The Hands on classes and experience by the professors
the instructors are awesome and the classes are really fast paced
I like that it's targeted towards finding a career. I am looking to transfer to a four year program but still find the idea of finding fulltime work directly out of the two year degree appealing.
The job network it offers. Also admire the ability to use the resources, such as engineering equipment.
The faculty and how everyone helps each other with class work as well as the material learned.
The faculty helps us if we need assistance and makes equipment available upon request.
What I like about this program is that it opens doors for students to obtain a new career right after graduation.
I enjoy the opportunity to learn about materials

23. What do you like least about the program you are enrolled in?

Text Response
The classes are very intense, some classes should not be done in 8weeks. Such as career development should be paired alongside a difficult class for 8 weeks if we are having 8week classes, rather than the hard classes for 8 and a almost wasted time class like career development for a full semester
learning a lot of material in short period of time
Some classes start too early in the morning for my commute.
The demand it requires in terms of studying and class work
Four or five hour classes.
The Packed semesters
sometimes you feel that you just need a bit more time to get things done or if i had just a bit more time on this subject i would of received a better grade
limited on transfer options but, I understand that not many schools offer this type of program.
The program is great.
How short it is somtimes it feels like some of the classes should be longer.
N/A
I found the computer design class to be a bit hard for me.

Provide a brief analysis of the **Student Satisfaction Survey**.
What insight have you derived from the results?

This survey is the first that's been done since we changed our curriculum from 16 week terms, to 8 week terms. Our students take 2 or 3 CET classes at one time, in a condensed manner, rather than 4 or 5. It appears that many like this better, and like the fast paced nature of the program, but also we recognize that this may make some students feel like it's too rushed. It is true that if a student falls behind, it can be very difficult for them to get caught back up. That is, however, the reality of the work that they may be doing, and we feel strongly that we can help them be better employees if we help them be successful under those time crunches as students.

We are happy to hear them reflect on their appreciation of faculty, of working with each other, and of the career opportunities that this degree offers them.

Number of Graduates by Year and Award Type

Program Evaluation Data for: Civil Engineering Technology
Number of Graduates by Year and Award Type- 200801 - 201203

Major and Degree Type		Academic Year				
		2008	2009	2010	2011	2012
Civil Engineering Technology	AAS	16	6	9	13	9
TOTAL		16	6	9	13	9

Do you project any expansion or decrease in graduation rates during the next five years?

We hope to increase them. Our goal would be to graduate 15-20 each year.

What challenges do you face in retaining students to graduation/completion?

We really don't have an issue with retention after the first 8 weeks of the program. Our retention rate is nearly 100% after that time. If we can find a way to recruit 20-30 students into the program each year, we are confident that we can retain them through graduation.

Are there specific program courses available to part-time students looking for licensure, improvement of skills, to obtain or maintain certification, or career exploration? *(list the courses)*

Yes, these types of offerings are available in our non-credit Civil Engineering Technology courses. CET-500 level courses.
We offer the following:
Iowa DOT Materials Certification Courses (12 different courses for certification in asphalt, concrete, aggregate, soils)
Surveying Fundamentals Exam Prep Course
Surveying Licensure Prep Course
AutoCAD and Microstation Design Courses
Public Lands Information System (for Surveyors)
Surveying Ethics
Boundary Law

Graduate Survey Results

Provide a brief analysis of the **Graduate Satisfaction Survey**.
What insight have you derived from the survey results?

D. PROGRAM VIABILITY

AQIP Category Seven, **MEASURING EFFECTIVENESS**, focuses collects, using data, information, and knowledge to manage and drive performance improvement.

Number of Credits by Year and Term and Student Types Status

Program Evaluation Data for: Civil Engineering Technology
Number of Students and Credits By Year, Term and Course and Student Type Status

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
ADM	221	2012	201201	.	1	.	2
			201202	.	7	.	14
			201203	.	1	.	2

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
CET	102	2008	200801	.	20	.	60
			200802	.	1	.	3
		2009	200901	.	10	.	30
		2010	201001	.	23	.	69
		2011	201101	.	12	.	36
		2012	201201	.	12	.	36
	119	2008	200801	.	18	.	54
		2009	200901	.	11	.	33
		2010	201001	.	25	.	75
		2011	201101	.	14	.	42
		2012	201201	.	11	.	33
	135	2008	200801	.	19	.	57
			200802	.	1	.	3
		2009	200901	.	11	.	33
		2010	201001	.	24	.	72
			201002	.	1	.	3
		2011	201101	.	11	.	33
		2012	201201	.	11	.	33
	138	2008	200802	.	19	.	57
		2009	200902	.	9	.	27
		2010	201002	.	21	.	63
		2011	201102	.	10	.	30
		2012	201202	.	9	.	27
	169	2008	200802	.	18	.	72
		2009	200902	.	9	.	36
		2010	201002	.	19	.	76
		2011	201102	.	10	.	40
		2012	201202	.	7	.	28
	173	2008	200801	.	11	.	44
		2009	200901	.	10	.	40
		2010	201001	.	8	.	32
		2011	201101	.	20	.	80
		2012	201201	.	7	.	28

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
	178	2008	200802	.	18	.	72
		2009	200902	.	8	.	32
		2010	201002	.	22	.	88
		2011	201102	.	8	.	32
		2012	201202	.	5	.	20
	192	2008	200801	.	15	.	60
		2009	200901	.	10	.	40
		2010	201001	.	11	.	44
		2011	201101	.	19	.	76
		2012	201201	.	7	.	28
	219	2008	200801	.	13	.	52
			200803	.	4	.	16
		2009	200901	.	11	.	44
		2010	201001	.	8	.	32
		2011	201101	.	18	.	72
			201103	.	2	.	8
		2012	201201	.	6	.	24
	222	2008	200802	.	12	.	36
			200803	.	1	.	3
		2009	200902	.	11	.	33
		2010	201002	.	10	.	30
		2011	201102	.	13	.	39
		2012	201202	.	10	.	30
	235	2008	200802	.	12	.	36
		2009	200902	.	9	.	27
		2010	201002	.	12	.	36
		2011	201102	.	15	.	45
		2012	201202	.	5	.	15
	244	2008	200801	.	13	.	39
		2009	200901	.	10	.	30
		2010	201001	.	8	.	24
		2011	201101	.	19	.	57
		2012	201201	.	9	.	27

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
	278	2008	200703	.	1	.	4
			200802	.	10	.	40
			200803	.	1	.	4
		2009	200902	.	8	.	32
		2010	201002	.	9	.	36
		2011	201102	.	18	.	72
		2012	201202	.	6	.	24
	283	2008	200802	.	12	.	48
		2009	200902	.	7	.	28
		2010	201002	.	7	.	28
		2011	201102	.	16	.	64
		2012	201202	.	8	.	32
	291	2008	200802	.	16	.	48
		2009	200902	.	8	.	24
		2010	201002	.	6	.	18
		2011	201102	.	14	.	42
		2012	201202	.	8	.	24
	304	2012	201203	.	6	.	24
	305	2008	200802	.	1	.	5
			200803	.	9	.	45
		2009	200903	.	5	.	25
		2010	201002	.	1	.	5
			201003	.	6	.	30
		2011	201102	.	1	.	5
			201103	.	8	.	40
	307	2008	200801	.	1	.	2
			200803	.	1	.	2
		2010	201003	.	4	.	8
		2011	201103	.	2	.	4
		2012	201202	.	1	.	2

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
COM	703	2008	200801	.	9	.	27
			200802	.	2	.	6
		2009	200902	.	1	.	3
			200903	.	2	.	6
		2010	201001	.	8	.	24
			201002	.	2	.	6
		2011	201101	.	6	.	18
		2012	201201	.	2	.	6
CSC	110	2008	200801	.	9	.	27
			200802	.	3	.	9
			200803	.	1	.	3
		2009	200901	.	3	.	9
			200902	.	4	.	12
			200903	.	6	.	18
		2010	201001	.	17	.	51
			201002	.	10	.	30
			201003	.	3	.	9
		2011	201101	.	6	.	18
			201102	.	2	.	6
		2012	201201	.	7	.	21
			201202	.	1	.	3
			201203	.	1	.	3

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
ENG	105	2008	200801	.	8	.	24
			200802	.	7	.	21
			200803	.	2	.	6
		2009	200901	.	2	.	6
			200902	.	5	.	15
			200903	.	1	.	3
		2010	201001	.	5	.	15
			201002	.	13	.	39
			201003	.	5	.	15
		2011	201101	.	5	.	15
			201102	.	7	.	21
			201103	.	1	.	3
		2012	201201	1	4	3	12
			201202	.	1	.	3
	108	2008	200802	.	8	.	24
			200803	.	1	.	3
		2009	200902	.	3	.	9
			200903	.	1	.	3
		2010	201001	.	2	.	6
			201002	.	3	.	9
		2011	201101	.	1	.	3
			201102	.	2	.	6
MAT	773	2008	200801	.	19	.	57
			200803	.	3	.	9
		2009	200901	.	7	.	21
		2010	201001	.	20	.	60
			201002	.	4	.	12
		2011	201101	.	8	.	24
		2012	201201	.	11	.	33
			201203	.	1	.	3

				Students		Credits	
				Career Advantage	Regular Student	Career Advantage	Regular Student
MGT	145	2008	200801	.	2	.	6
			200802	.	5	.	15
		2009	200901	.	1	.	3
			200902	.	2	.	6
		2010	201002	.	7	.	21
			201003	.	3	.	9
		2011	201102	.	1	.	3
			201103	.	2	.	6
		2012	201202	.	1	.	3
PSY	102	2008	200801	.	1	.	3
			200803	.	2	.	6
		2010	201002	.	2	.	6
	111	2008	200801	.	2	.	6
			200802	.	4	.	12
			200803	.	3	.	9
		2009	200901	.	1	.	3
			200902	.	4	.	12
			200903	.	3	.	9
		2010	201001	.	1	.	3
			201002	.	12	.	36
			201003	.	2	.	6
		2011	201101	.	4	.	12
			201102	.	6	.	18
		2012	201202	1	1	3	3
			201203	.	1	.	3
SRV	305	2008	200803	.	1	.	5
		2009	200903	.	1	.	5
		2010	201003	.	2	.	10

Average Compass Test Scores by Test and Year and Student Type

Program Evaluation Data for: Civil Engineering Technology
Average Compass Test Scores by test and Year and Student Type Status

hsstat	year	Variable	N	Mean
Career Advantage	2012	English	1	70.00
		Math	1	70.00
		Reading	1	83.00
Regular Student	2008	English	36	68.31
		Math	34	53.06
		Reading	35	84.49
	2009	English	31	69.81
		Math	28	56.86
		Reading	31	83.58
	2010	English	46	61.09
		Math	45	57.40
		Reading	46	79.37
	2011	English	37	71.27
		Math	35	57.14
		Reading	36	83.19
	2012	English	26	73.42
		Math	25	57.00
		Reading	25	84.32

Are the average COMPASS scores for students appropriate for your program? *(If not, please explain)*

Yes. Math is sometimes lower than we'd like, but we teach the math skills necessary for our curriculum within the courses themselves.

Grade Distributions by Course and Year

Program Evaluation Data for: Civil Engineering Technology
Grade Distributions by Course and Year

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
ADM 221	2012	Regular Student	9	3	3	1	.	.	.	2	33.33	33.33	11.11	.	.	.	22.22

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
CET 102	2008	Regular Student	21	9	10	1	.	1	.	.	42.86	47.62	4.76	.	4.76	.	.
	2009	Regular Student	10	3	3	1	.	.	.	3	30.00	30.00	10.00	.	.	.	30.00
	2010	Regular Student	23	2	10	5	2	3	1	.	8.70	43.48	21.74	8.70	13.04	4.35	.
	2011	Regular Student	12	1	4	3	1	2	.	1	8.33	33.33	25.00	8.33	16.67	.	8.33
	2012	Regular Student	12	2	6	1	.	.	.	3	16.67	50.00	8.33	.	.	.	25.00
CET 119	2008	Regular Student	18	4	2	7	1	2	.	2	22.22	11.11	38.89	5.56	11.11	.	11.11
	2009	Regular Student	11	5	1	2	.	1	.	2	45.45	9.09	18.18	.	9.09	.	18.18
	2010	Regular Student	25	4	7	7	1	3	1	2	16.00	28.00	28.00	4.00	12.00	4.00	8.00
	2011	Regular Student	14	3	4	2	2	.	.	3	21.43	28.57	14.29	14.29	.	.	21.43
	2012	Regular Student	11	1	3	2	1	2	.	2	9.09	27.27	18.18	9.09	18.18	.	18.18
CET 135	2008	Regular Student	20	11	7	1	.	.	1	.	55.00	35.00	5.00	.	.	5.00	.
	2009	Regular Student	11	8	.	1	.	.	.	2	72.73	.	9.09	.	.	.	18.18
	2010	Regular Student	25	13	4	2	1	5	.	.	52.00	16.00	8.00	4.00	20.00	.	.
	2011	Regular Student	11	5	2	.	1	2	.	1	45.45	18.18	.	9.09	18.18	.	9.09
	2012	Regular Student	11	7	1	1	.	.	.	2	63.64	9.09	9.09	.	.	.	18.18
CET 138	2008	Regular Student	19	4	2	6	2	2	2	1	21.05	10.53	31.58	10.53	10.53	10.53	5.26
	2009	Regular Student	9	3	.	5	.	.	1	.	33.33	.	55.56	.	.	11.11	.
	2010	Regular Student	21	11	4	4	1	1	.	.	52.38	19.05	19.05	4.76	4.76	.	.
	2011	Regular Student	10	5	.	.	.	2	.	3	50.00	.	.	.	20.00	.	30.00
	2012	Regular Student	9	1	3	2	2	1	.	.	11.11	33.33	22.22	22.22	11.11	.	.

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
CET 169	2008	Regular Student	18	4	6	5	1	.	.	2	22.22	33.33	27.78	5.56	.	.	11.11
	2009	Regular Student	9	4	2	3	.	.	.	.	44.44	22.22	33.33	.	.	.	.
	2010	Regular Student	19	4	6	5	2	.	1	1	21.05	31.58	26.32	10.53	.	5.26	5.26
	2011	Regular Student	10	3	3	1	2	.	.	1	30.00	30.00	10.00	20.00	.	.	10.00
	2012	Regular Student	7	1	3	1	.	.	.	2	14.29	42.86	14.29	.	.	.	28.57
CET 173	2008	Regular Student	11	6	3	2	.	.	.	.	54.55	27.27	18.18	.	.	.	.
	2009	Regular Student	10	3	3	2	1	.	.	1	30.00	30.00	20.00	10.00	.	.	10.00
	2010	Regular Student	8	3	3	.	1	1	.	.	37.50	37.50	.	12.50	12.50	.	.
	2011	Regular Student	20	6	5	5	2	1	.	1	30.00	25.00	25.00	10.00	5.00	.	5.00
	2012	Regular Student	7	2	3	2	.	.	.	.	28.57	42.86	28.57	.	.	.	.
CET 178	2008	Regular Student	18	3	4	5	2	3	.	1	16.67	22.22	27.78	11.11	16.67	.	5.56
	2009	Regular Student	8	1	4	2	.	.	.	1	12.50	50.00	25.00	.	.	.	12.50
	2010	Regular Student	22	4	7	5	2	2	1	1	18.18	31.82	22.73	9.09	9.09	4.55	4.55
	2011	Regular Student	8	2	3	.	.	1	.	2	25.00	37.50	.	.	12.50	.	25.00
	2012	Regular Student	5	1	1	1	.	.	.	2	20.00	20.00	20.00	.	.	.	40.00
CET 192	2008	Regular Student	15	2	7	5	.	1	.	.	13.33	46.67	33.33	.	6.67	.	.
	2009	Regular Student	10	2	1	3	.	2	1	1	20.00	10.00	30.00	.	20.00	10.00	10.00
	2010	Regular Student	11	1	2	4	1	3	.	.	9.09	18.18	36.36	9.09	27.27	.	.
	2011	Regular Student	19	5	1	5	4	2	.	2	26.32	5.26	26.32	21.05	10.53	.	10.53
	2012	Regular Student	7	1	1	5	.	.	.	.	14.29	14.29	71.43	.	.	.	.

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
CET 219	2008	Regular Student	17	7	7	1	.	1	1	.	41.18	41.18	5.88	.	5.88	5.88	.
	2009	Regular Student	11	1	5	.	.	2	1	2	9.09	45.45	.	.	18.18	9.09	18.18
	2010	Regular Student	8	2	2	3	.	1	.	.	25.00	25.00	37.50	.	12.50	.	.
	2011	Regular Student	20	4	5	8	2	.	.	1	20.00	25.00	40.00	10.00	.	.	5.00
	2012	Regular Student	6	3	1	2	.	.	.	.	50.00	16.67	33.33	.	.	.	.
CET 222	2008	Regular Student	13	1	6	4	1	.	.	1	7.69	46.15	30.77	7.69	.	.	7.69
	2009	Regular Student	11	.	7	1	1	1	.	1	.	63.64	9.09	9.09	9.09	.	9.09
	2010	Regular Student	10	1	3	5	.	.	.	1	10.00	30.00	50.00	.	.	.	10.00
	2011	Regular Student	13	.	1	8	4	.	.	.	.	7.69	61.54	30.77	.	.	.
	2012	Regular Student	10	.	6	4	.	.	.	.	.	60.00	40.00	.	.	.	.
CET 235	2008	Regular Student	12	1	5	3	1	.	.	2	8.33	41.67	25.00	8.33	.	.	16.67
	2009	Regular Student	9	4	1	3	.	1	.	.	44.44	11.11	33.33	.	11.11	.	.
	2010	Regular Student	12	3	4	3	2	.	.	.	25.00	33.33	25.00	16.67	.	.	.
	2011	Regular Student	15	2	7	5	.	.	.	1	13.33	46.67	33.33	.	.	.	6.67
	2012	Regular Student	5	.	3	2	.	.	.	.	.	60.00	40.00	.	.	.	.
CET 244	2008	Regular Student	13	10	1	2	.	.	.	.	76.92	7.69	15.38	.	.	.	.
	2009	Regular Student	10	6	2	1	.	.	.	1	60.00	20.00	10.00	.	.	.	10.00
	2010	Regular Student	8	6	2	.	.	.	.	.	75.00	25.00	.	.	.	.	.
	2011	Regular Student	19	12	4	2	.	.	.	1	63.16	21.05	10.53	.	.	.	5.26
	2012	Regular Student	9	7	1	.	.	.	.	1	77.78	11.11	.	.	.	.	11.11

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
CET 278	2008	Regular Student	12	4	5	.	.	1	1	1	33.33	41.67	.	.	8.33	8.33	8.33
	2009	Regular Student	8	1	4	1	1	1	.	.	12.50	50.00	12.50	12.50	12.50	.	.
	2010	Regular Student	9	.	6	3	.	.	.	.	.	66.67	33.33	.	.	.	.
	2011	Regular Student	18	2	9	6	1	.	.	.	11.11	50.00	33.33	5.56	.	.	.
	2012	Regular Student	6	1	3	1	1	.	.	.	16.67	50.00	16.67	16.67	.	.	.
CET 283	2008	Regular Student	12	8	2	.	.	2	.	.	66.67	16.67	.	.	16.67	.	.
	2009	Regular Student	7	2	4	1	.	.	.	.	28.57	57.14	14.29	.	.	.	.
	2010	Regular Student	7	1	4	1	1	.	.	.	14.29	57.14	14.29	14.29	.	.	.
	2011	Regular Student	16	1	7	7	1	.	.	.	6.25	43.75	43.75	6.25	.	.	.
	2012	Regular Student	8	2	2	3	1	.	.	.	25.00	25.00	37.50	12.50	.	.	.
CET 291	2008	Regular Student	16	3	9	1	.	2	.	1	18.75	56.25	6.25	.	12.50	.	6.25
	2009	Regular Student	8	3	3	2	.	.	.	.	37.50	37.50	25.00	.	.	.	.
	2010	Regular Student	6	2	3	1	.	.	.	.	33.33	50.00	16.67	.	.	.	.
	2011	Regular Student	14	5	4	5	.	.	.	.	35.71	28.57	35.71	.	.	.	.
	2012	Regular Student	8	.	4	3	1	.	.	.	.	50.00	37.50	12.50	.	.	.
CET 304	2012	Regular Student	6	6	.	.	.	.	.	.	100.00	.	.	.	.	.	.
CET 305	2008	Regular Student	10	7	.	1	.	.	2	.	70.00	.	10.00	.	.	20.00	.
	2009	Regular Student	5	5	.	.	.	.	.	.	100.00	.	.	.	.	.	.
	2010	Regular Student	7	7	.	.	.	.	.	.	100.00	.	.	.	.	.	.
	2011	Regular Student	9	9	.	.	.	.	.	.	100.00	.	.	.	.	.	.

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
CET 307	2008	Regular Student	2	1	.	1	.	.	.	.	50.00	.	50.00	.	.	.	.
	2010	Regular Student	4	2	.	.	1	1	.	.	50.00	.	.	25.00	25.00	.	.
	2011	Regular Student	2	2	.	.	.	.	.	.	100.00	.	.	.	.	.	.
	2012	Regular Student	1	1	.	.	.	.	.	.	100.00	.	.	.	.	.	.
COM 703	2008	Regular Student	11	4	1	3	1	.	.	2	36.36	9.09	27.27	9.09	.	.	18.18
	2009	Regular Student	3	.	.	.	.	1	.	2	.	.	.	.	33.33	.	66.67
	2010	Regular Student	10	6	3	.	.	.	.	1	60.00	30.00	.	.	.	.	10.00
	2011	Regular Student	6	4	1	.	1	.	.	.	66.67	16.67	.	16.67	.	.	.
	2012	Regular Student	2	.	.	.	2	.	.	.	.	.	.	100.00	.	.	.
CSC 110	2008	Regular Student	13	7	1	2	1	1	.	1	53.85	7.69	15.38	7.69	7.69	.	7.69
	2009	Regular Student	13	7	4	1	1	.	.	.	53.85	30.77	7.69	7.69	.	.	.
	2010	Regular Student	30	13	3	3	3	7	.	1	43.33	10.00	10.00	10.00	23.33	.	3.33
	2011	Regular Student	8	6	1	1	.	.	.	.	75.00	12.50	12.50	.	.	.	.
	2012	Regular Student	9	4	.	.	.	.	.	5	44.44	.	.	.	.	.	55.56
ENG 105	2008	Regular Student	17	4	3	4	3	1	.	2	23.53	17.65	23.53	17.65	5.88	.	11.76
	2009	Regular Student	8	1	1	1	.	2	.	3	12.50	12.50	12.50	.	25.00	.	37.50
	2010	Regular Student	23	2	2	4	2	3	.	10	8.70	8.70	17.39	8.70	13.04	.	43.48
	2011	Regular Student	13	3	2	4	.	.	.	4	23.08	15.38	30.77	.	.	.	30.77
	2012	Career Advantage	1	.	.	1	.	.	.	.	.	.	100.00	.	.	.	.
		Regular Student	5	.	.	2	.	.	.	3	.	.	40.00	.	.	.	60.00

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
ENG 108	2008	Regular Student	9	.	2	5	.	.	.	2	.	22.22	55.56	.	.	.	22.22
	2009	Regular Student	4	1	1	.	.	.	.	2	25.00	25.00	.	.	.	.	50.00
	2010	Regular Student	5	1	1	.	.	.	.	3	20.00	20.00	.	.	.	.	60.00
	2011	Regular Student	3	.	2	1	.	.	.	.	.	66.67	33.33	.	.	.	.
MAT 773	2008	Regular Student	22	3	7	3	4	4	.	1	13.64	31.82	13.64	18.18	18.18	.	4.55
	2009	Regular Student	7	1	2	1	.	1	.	2	14.29	28.57	14.29	.	14.29	.	28.57
	2010	Regular Student	24	2	9	5	2	4	.	2	8.33	37.50	20.83	8.33	16.67	.	8.33
	2011	Regular Student	8	1	3	2	.	1	.	1	12.50	37.50	25.00	.	12.50	.	12.50
	2012	Regular Student	12	1	2	3	1	1	1	3	8.33	16.67	25.00	8.33	8.33	8.33	25.00
MGT 145	2008	Regular Student	7	1	.	4	1	.	.	1	14.29	.	57.14	14.29	.	.	14.29
	2009	Regular Student	3	1	1	.	.	.	.	1	33.33	33.33	.	.	.	.	33.33
	2010	Regular Student	10	1	7	1	.	1	.	.	10.00	70.00	10.00	.	10.00	.	.
	2011	Regular Student	3	2	.	.	.	.	.	1	66.67	.	.	.	.	.	33.33
	2012	Regular Student	1	.	1	.	.	.	.	.	.	100.00	.	.	.	.	.
PSY 102	2008	Regular Student	3	.	2	1	.	.	.	.	.	66.67	33.33	.	.	.	.
	2010	Regular Student	2	.	.	1	.	.	.	1	.	.	50.00	.	.	.	50.00

Course and Year				Grades Given							Percent Grades Given						
			Total Students	As	Bs	Cs	Ds	Fs	Other	Ws	As	Bs	Cs	Ds	Fs	Other	Ws
PSY 111	2008	Regular Student	9	3	3	2	1	.	.	.	33.33	33.33	22.22	11.11	.	.	.
	2009	Regular Student	8	3	2	1	.	2	.	.	37.50	25.00	12.50	.	25.00	.	.
	2010	Regular Student	15	2	5	3	2	3	.	.	13.33	33.33	20.00	13.33	20.00	.	.
	2011	Regular Student	10	4	1	1	2	.	.	2	40.00	10.00	10.00	20.00	.	.	20.00
	2012	Career Advantage	1	.	.	.	.	1	.	.	.	.	.	.	100.00	.	.
		Regular Student	2	1	.	.	.	.	.	1	50.00	.	.	.	.	.	50.00
SRV 305	2008	Regular Student	1	.	.	1	.	.	.	.	.	.	100.00	.	.	.	.
	2009	Regular Student	1	1	.	.	.	.	.	.	100.00	.	.	.	.	.	.
	2010	Regular Student	2	2	.	.	.	.	.	.	100.00	.	.	.	.	.	.

7. Are students required to complete any external certification or licensure exams for industry employment?

   No

8. Provide certification/licensure data for the previous five years if it is applicable to the program. What trends are provided in the data? *(Attach documents in Appendix if appropriate.)*

   N/A

E. EMPLOYMENT OUTLOOK / ANALYSIS

Graduate Placement

Year	Grads	Employed Related	Employed Unrelated	Further Education	Job Seeking	Unknown	Working in IA
2009	12	9	1	0	0	2	9
2008	19	17	1	0	0	1	16
2007	20	17	1	1	0	17	16
2006	16	14	1	0	0	1	14

1. How have placement rates changed or have they?

For a few years when the economy was down and construction funds were unavailable, placement was more difficult. Now the CET program has more jobs available than we have graduating students.

2. What is the employment outlook for program graduates? *(Potential sources available for your analysis)* http://www.occsupplydemand.org/OSD_Main.aspx?ST=IA ; http://www.bls.gov/oco/

   We expect near 100% placement, with starting salaries near $40,000.

3. Are there other similar programs offered in the state? How do they compare? *(List programs and locations.)*
   Hawkeye Tech has a Civil Engineering Techology program. They are in Waterloo. Student numbers are lower, placement is similar.

4. Does the program use national skill standards as a resource? *(Identify standards used)*
   No

5. What has been done in the last five years to keep the program curriculum relevant to current employment needs? *(What has been done to ensure that students will be competitive in the industry?)*

   The department regularly meets with it's industry advisory board to ensure all curriculum is relevant to employer needs.

Employer Survey Results

6. Provide a brief analysis of the **Employer Satisfaction Survey** results.
   What insight have you derived from the survey results?

F. STAFF ANALYSIS

AQIP Category Four, **VALUING PEOPLE**, focuses on to the development of faculty since the efforts of all are required for organizational success.

1. List all full-time Program faculty members and their professional qualifications.

Renee White. CET Group Leader/Instructor
Teaches: Materials I, Materials II, Soils and Foundations

Education: Bachelors, Construction Engineering, ISU; Masters, Education Leadership, ISU
Experience: 13 years in industry as a site manager, project manager and field engineer

Greg Chlebicki: Instructor
Teaches: Survey I, II, III, Construction II, Highway Design II, CAD Practice Lab
Education: Western Illinois University, Bachelor of Business, St. Ambrose University, Masters of Business Administration, University of Iowa, Ph.D., Higher Education
Experience: Thirty five years of experience in the civil engineering and land surveying profession. During these years, I owned my own firm and also managed both established and startup offices for other engineering organizations. In addition, as a project manager during this period, I prepared designs, surveys, inspections, and contract administration for the construction of many municipal infrastructure improvements.
Professional Registrations: Professional Land Surveyor-State of Iowa, Professional Engineer-State of Iowa

Kerry Newbanks: Instructor
Teaches: Everything!! My list would be too long. Just say a smattering of everything related to design and careers.
Education: Associate of Applied Science, Civil Engineering Technology, DMACC; Associate of Arts, Liberal Arts, DMACC; Graduate degree, School of Hard Knocks, currently working on Bachelors' degree, American Military University
Experience: 9 years in engineering services, primarily worked in roadway design, also have experience in site development, Land Surveying, and survey plats.

2. Briefly discuss the use of adjunct faculty in the program *(number and expertise)*.

   We use 2. Once is a retired Iowa DOT Engineer, who teachers our construction inspection course. The other is an aeronautical engineer who teaches our Statics Course and our Structural Design Course.

Nick Thorp: Instructor
Teaches: Statics and Structural Design
Education: Some
Experience: Worked as a senior aeronautical engineer for General Dynamics in San Diego. Teaching and Research at Iowa State in the Engineering curriculum. Member of the CET curriculum since 2000.

Duane Smith: Adjunct Instructor
Teaches: Construction I
Education: BS and MS in Civil Engineering
Experience: 18 years Iowa DOT, 6 years City Traffic Engineer, 8 years Civil engineering consultant – Denver, CO., 20 years teaching at ISU and DMACC

3. Discuss/list any identified faculty/staff development needs *(coursework, licensure, certifications, conferences, etc.)*

   We always need to attend conferences to ensure we are staying up to date on the latest technology and industry trends. If a new topic needs to be taught, we sometimes need to attend courses to improve our technical skills.

4. What additional human resources are required to meet the needs of the program?

   None.

G. INDUSTRY WORKFORCE CONNECTIVITY

AQIP Category Nine, **BUILDING COLLABORATIVE RELATIONSHIPS**, focuses on community relationships and collaborations and how they contribute to the organization's accomplishing its mission.

PROGRAM ADVISORY COUNCIL/COMMITTEE MEMBERSHIP

	Extend form if necessary.	Gender[1]	Race[2]	Other[3]
1.	Name: Nick Kuhn Employer: Foth-Engineering Alliance, Inc Position: Engineer	Male	1	
2.	Name: Annette Thompson Employer: City of Ames Position: Engineering Technician	Female	1	
3.	Name: Dave Moermond Employer: Howard R. Green Position: Engineer	Male	1	
4.	Name: John Meyer Employer: French-Reneker Associates, Inc. Position: Engineer	Male	1	
5.	Name: Milt Dakovich Employer: Aspro, Inc. Position: President	Male	1	
6.	Name: Greg Parker Employer: Johnson County Engineer Position: Engineer	Male	1	
7.	Name: Stephen Oldfield Employer: Snyder & Associates Position: Engineer	Male	1	
8.	Name: Mike Lustig Employer: Geotechnical Services, Inc Position: Engineer	Male	1	
9.	Name: Kevin Patel Employer: Iowa Dot Position: Engineer	Male	1	
10.	Name: Chris Anderson Employer: Iowa Dot Position:Technical Training Coordinator			

[1]Gender: M = Male F = Female

[2]Race: 1=White, Not Hispanic 4=Hispanic
2=Black, Not Hispanic 5=American Indian or Alaskan Native
3=Asian or Pacific Islander 6=Does not indicate

[3]Other: L=Member of Organized Labor D=Individual with Disability

1. Does membership reflect diversity and strong community support? *(If not please document plans to address that or validate limitations.)*

   The membership reflects all facets of our industry employers: the Iowa DOT, county engineers, city engineers, consulting firms and private companies.

2. Is organized labor represented on the Advisory Committee or is it not applicable to this industry?

No, and it's not applicable to our industry.

3. Does the Advisory Committee meet a minimum of two times per academic year? *(Provide minutes for the past 5 years in the Attachments).*

   Yes

4. Are program competencies, and changes or modifications reviewed by the Advisory Committee and documented in meeting minutes?

   Yes

5. Does the Advisory Committee review enrollment and graduation rates?

   Yes

Advisory Committee Survey

6. Provide a brief analysis of the **Advisory Committee Survey**.
   What insight have you derived from the survey results?

H. FACILITY ANALYSIS

Evaluate the program in regards internal DMACC infrastructure, availability of space, resources, etc. Think about the current and projected facility needs and instructional support. Focus on classroom/equipment resources, day, time usage, class size vs. room size capacity, budget, etc:

1. Is the equipment current according to the standards of business and industry?

   Yes, we are always upgrading equipment to meet industry standards.

2. Is the equipment sufficient in quantity to meet the needs of department?
   Yes

3. Is the supply budget adequate? *(Document unmet needs.)*
   Yes

4. Are the classroom and lab facilities sufficient and conducive to learning?
   Yes

I. COMMUNICATIONS/SERVICES ANALYSIS

AQIP Category Six, **SUPPORTING ORGANIZATIONAL OPERATIONS**, addresses the variety of organizational support processes that help to provide an environment in which learning can thrive.

1. What Student Support Services provided by the college are used by your program students?

Service	Yes/No	Service	Yes/No
Counseling Services	Yes	Student Health	No
Academic Advising	Yes	Services for Students with Disabilities	Yes
Academic Achievement Center	Yes	Vocational Rehabilitation Counseling	Yes
Tutoring	Yes	Career & Transfer Resource Center	Yes
Computer Lab	Yes	Campus Recreation Programs	Yes
Library	Yes	Child Care	No

2. What additional needs have you identified that would enhance/support students' learning experience?
   We do not have any additional needs

3. How are students informed of college grievance processes and special needs services available?

   We give them college information at the CET orientation, and because our group is small and we know them well, we reach out to them when we see there might be a need.

4. List student professional groups are available to program students. Are they equitable and non-discriminatory?
   None

5. Optional: List any special accomplishments and activities of students in professional organizations.

   N/A

SUMMARY CONCERNS/COMMENTS:

1. What additional data would have been useful to have in conducting this program review?

   None, everything I need was available.

FIVE-YEAR STRATEGIC PLANNING
Part III

AQIP Category Eight, **PLANNING CONTINUOUS IMPROVEMENT**, focuses on the planning, strategies and action plans employed to help you achieve your vision. As you plan for the next five years think about your goals for the program as well as the necessary short and long term strategies needed to help achieve them.

1. Briefly list your program strengths.
   Great job opportunities with $40,000 starting salaries a real possibility.
   Students are given the best instruction by people who have done this work and know how to teach.
   We take placement very seriously, and work with employers and students to make connections.

2. Identify any significant challenges over the past five years that have impacted the program.

   Low enrollment. We have had several years in a row of low enrollment, partially due to the economy and the fact that people can find good work without an education, and partially because only a few people within the college is promoting our program. Incoming students do not know that we're here, or what we do.

3. What are your overall target objectives for the next five years?

   Recruit new students. We feel that our curriculum is solid, our instructors are excellent, and our placement program is well established. Our goal is to improve our own internal marketing, establish a "brand", and market ourselves to high school students with the hope of having a solid group of incoming freshmen each year. 21 incoming freshmen would be ideal. We know that our retention is good, we just need to get them in the door initially.

4. Define your strategies to achieve those target objectives.

   We are beginning to work with the 46 high schools in our geographic area (6 counties surround Boone).
   -Send program information to high school counselors
   -Attend high school career fairs and / or set up a booth during lunch at the high schools
   -email marketing campaign to any high school school dually enrolled in a DMACC class related to CAD, engineering, or construction trades
   -possible direct mailing campaign to families with 16-18 year old kids in their household
   -update website
   -create new video
   -Facebook ads

5. What resources are needed to reach the objectives?

   We are doing the leg work ourselves (3 faculty and one staff member). Funding would be appreciated.

PROGRAM INFORMATION BRIEF

Civil Engineering Technology 2013–2014

The Civil Engineering Technology program prepares the student for a career as a technician in the areas of design, surveying, construction and materials testing. This is designed to be a two-year degree program.

This program educates future engineering technicians to help design, construct and maintain our civil engineering infrastructure: bridges, roads, dams, culverts, airports and more.

Career opportunities with this degree are with construction fi surveying fi consulting engineering fi federal, state and local government agencies; materials testing labs and many other areas of the private sector that support the transportation industry.

For more information about the Civil Engineering program, please visit our website at

https://go.dmacc.edu/programs/civilengineering

Location: Boone

This program is designed to start in the Fall semester.

Students who desire to start other term may be accepted, but may not graduate in four semesters due to the sequencing of coursework. If starting other than Fall, please contact the Civil Engineering Technology department.

Go to **www.dmacc.edu/admissions/applyonlinefull.asp** to apply for admission.

Program Entry Requirements

1. Complete an application for admission.

2. Satisfy the required assessment by taking the reading and English COMPASS test or equivalent.

3. Obtain a minimum COMPASS algebra score of 46 or a minimum ACT math score of 19. (Scores may not be more than three years old.) These scores refl the suggested level of math skills necessary to be successful in the fi of Civil Engineering Technology. Students who do not currently meet the minimum scores required should meet with an advisor to develop an action plan for improving their math skills.

4. Attend any required information/registration session.

Graduation Requirements

To earn a Civil Engineering Technology A.A.S. degree, a student must complete all coursework as prescribed and maintain a

2.0 grade point average.

PROGRAM INFORMATION BRIEF (CONT.)

Required Courses

Term 1—Select 1 Course from Option 1

CET 102	Fundamentals of Civil Engineering		3
CET 119	Survey I		3
CET 135	Materials I		3
MAT 773	Applied Math II		3
CSC 110	Intro to Computers		3
Any A.A.S. degree General Requirement Communications course		Opt 1	3

Term 2—Select 1 Course from Option 1

CET 138	Construction I		3
CET 178	Automated Design I		4
CET 169	Survey II		4
ADM 221	Career Development Skills		2
Any A.A.S. degree General Requirement Communications course		Opt 1	3

Term 3—Select the Course in Option 3

CET 304	Field Coop	Opt 3	4

(With Department approval, students may complete BOTH Option 4 courses OR BOTH Option 5 courses in place of Option 3.)

CET 307	Field Orientation	Opt 4	2
MGT 145	Human Relations in Business	Opt 4	3
CET 307	Field Orientation	Opt 5	2
PSY 102	Human and Work Relations	Opt 5	3

Term 4—Select 1 Course from Option 2

CET 173	Highway Design I		4
CET 192	Statics		4
CET 219	Survey III		4
CET 244	Materials II		3
Any A.A.S. degree General Requirement			

Social & Behavioral or Humanities course		Opt 2	3

Term 5

CET283	Highway Design II	4
CET222	Soils and Foundations	3
CET235	Construction II	3
CET 291	Structure Design and Construction	3
CET278	Automated Design II	4

Recommended Electives (not required for the AAS degree)

CAD 119	Intro to Computer-Aided Drafting	3
SPC 101	Fund of Oral Communication	3
MAT 130	Trigonometry	3
SRV 215	Intro to Land Information Systems	2

Total credits required to complete the AAS degree **73**

For all campus information, call 515-964-6200 or 877-863-6222, extension 6200.

www.DMACC.edu

Fixed Costs

Tuition .....$136.00 per credit

Varied Costs

	Term 1	Term 2	Term 3	Term 4	Term
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The costs for each program are estimates and subject to change.

Approximate total for the program: $11,758

What Kind of Work Will You Do?

1. Perform surveying of highways, roadways.

2. Perform inspections of highway and bridge projects.

3. Design highways, roadways, bridges.

- Sample and test materials used on highway projects for quality control or quality assurance.

What Skills and Abilities Will You Need?

- Knowledge of operating surveying equipment.
- Be able to perform inspection techniques.
- Knowledge of CADD (Microstation and GEOPAK).
- Communicate with counterparts in civil engineering.
- Understanding of technical manuals and literature to upgrade existing skills and learn new skills.

What Else Should I Consider about this Program or Career Choice?

- Civil Engineering Technology is projected as a growth field into the 21st century.
- Anticipated average starting salary—$36,774 (2010–2011 Placement Report).

Civil Engineering Technology (2013–2014)

Des Moines Area Community College

Course Information – EFFECTIVE January 2010

Acronym/Number CET 102 Historical Ref CET-315

Title Fundamentals of Civil Engineering

Credit breakout 3 3 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S):

COURSE DESCRIPTION:

This course introduces concepts of the civil engineering technician field, including career opportunities, the engineering industry and basic engineering principles. The student will learn to read and understand road and bridge plans and be introduced to all the elements that make up a highway construction project.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Describe civil engineering.
1.1 Define civil engineering.
1.2 Explain the goals of the civil engineering field.

2. Examine the people and projects of the civil engineering industry.
2.1 List the different disciplines in civil engineering.
2.2 List the types of projects in civil engineering.

3. Identify the disciplines of the civil engineering technician.
3.1 Describe the surveying technician's duties and responsibilities.
3.2 Describe the material tester's duties and responsibilities.
3.3 Describe the design technician's duties and responsibilities.
3.4 Describe the inspector's duties and responsibilities.

4. Explain fundaments of engineering.
4.1 Discuss the engineering problem solving process.
4.2 Discuss precision in engineering problems.

5. Explain fundamentals of a roadway plan.
5.1 Define civil plans and specifications.
5.2 Examine stationing.
5.3 Discuss the elements of an alignment.
5.4 Discuss the elements of grading.
5.5 Define pavement structure.

CET 102

5.6 Define roadway cross section terminology.
5.7 Discuss the organization of roadway plans.

6. Examine a Construction Road Plan.

6.1 Investigate the Title Sheet.
6.2 Understand general notes and quantities.
6.3 Examine typical cross sections.
6.4 Understand estimate of quantities and general information.
6.5 Read the main line plan and profile sheets.
6.6 Read the side road plan and profile sheets.
6.7 Understand reference ties and bench marks.
6.8 Examine intersection geometric, staking and jointing details.
6.9 Understand the soil plan sheets.
6.10 Examine earthwork quantities.
6.11 Classify signing, wells and facility.
6.12 Investigate cross sections.
7. Examine a Construction Concrete Beam Bridge Plan.
7.1 Identify basic bridge components.
7.2 Investigate the Title Sheet.
7.3 Understand general notes and quantities.
7.4 Distinguish elements on a situation plan.
7.5 Utilize general plan and soundings.
7.6 Understand details: piers, abutments, superstructure, intermediate diaphragms, barrier rails, beams, pier bearings. CET 102

COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: Sept. 2009 (via email request)
FACULTY: non listed
1.
2.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: November 2008
FACULTY:
1.
2.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: October 2008
FACULTY:
1.
2.
Effective date: January 2010
Originated by: Steve Rittgers
Campus: A B C U N W OC
extension: 5055
Revision(s): 7/99; 8/04; 10/08; 11/08; 8/09;

Des Moines Area Community College

COURSE INFORMATION – EFFECTIVE FL 2011-01

Acronym/Number CET 119 Historical Ref CET 119

Title Survey I

Credit breakout 3 2 2 0 0

(credit lecture lab practicum work experience)

PREREQUISITE or COREQUISITE(S): MAT 773

COURSE DESCRIPTION: This course will develop working knowledge of surveying fundamentals. Topics will include introduction to: surveying instruments and equipment; measurement of distances and angles; determining elevation; note keeping, traversing, triangulation, mapping, researching of monuments and benchmarks.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Learn surveying basics.

1.1 List famous surveyors.

1.2 Examine the early history of surveying.

1.3 Discuss the evolution of surveying equipment.

1.4 Discuss types and classes of surveys.

1.5 Understand different surveying reference systems.

1.6 Discuss the maintenance of equipment.

2. Understand basic horizontal and vertical measurements.

2.1 Learn and illustrate basic measurement units.

2.2 Illustrate the necessity for accurate surveys.

2.3 Differentiate between accuracy and precision.

2.4 Identify sources of errors and mistakes.

2.5 Define significant figures.

2.6 Learn how to and understand the importance of survey planning.

2.7 Prepare various types of field notes.

2.8 Prepare electronically recorded notes.

2.9 Describe office work and digital computers.

3. Using surveying equipment, demonstrate knowledge of measuring and corrections.

3.1 Use electronic distance measurements.

3.2 Discuss different uses of trigonometry in surveying.

3.3 Outline the types of corrections.

3.4 Discuss incorrect tape length or standardization error.

3.5 Examine the effect of temperature variations. CET 119

3.6 Define slope corrections.
3.7 Define sag and tension corrections.
3.8 Categorize common mistakes made in taping.
3.9 Describe the magnitude of errors.
4. Learn the application of trigonometry in surveying calculations.
4.1 Use the law of sins in surveying calculations.
4.2 Use the law of cosines in surveying calculations.
4.3 Be able to calculate missing angles and lengths by using trigonometric.
5. Utilize electronic distance measuring instruments (EDMs).
5.1 Define basic terms.
5.2 List the types of EDMs.
5.3 Illustrate the set-up, leveling, and centering of EDMs.
5.4 Learn basic SMI software commands.
5.5 Locate errors in DEM measurements.
5.6 Discuss calibration of EDM equipment.
5.7 Illustrate the accuracy of EDMs.
5.8 Computer horizontal distances from slop distances.
6. Examine different types of leveling.
6.1 Discuss the theory of leveling.
6.2 Define basic definitions.
6.3 Describe differential leveling.
6.4 Discuss the earth's curvature and atmospheric refraction.
6.5 List the use of level rod targets.
6.6 Identify common leveling mistakes.
6.7 Examine leveling errors.
6.8 Show methods for good leveling.
6.9 Define the precision of differential leveling.
6.10 Show the use of hand signals.
6.11 Computer adjustments of level circuits.
6.12 Describe precise leveling.
6.13 Illustrate profile leveling.
6.14 Define profiles.
6.15 Define cross sections.
7. Examine angles and directions.
7.1 Define meridians.
7.2 Define units of measuring angles.
7.3 Describe Azimuths and Bearings
7.4 Examine uses of the Compass
7.5 Define Traverse Angle Terms
7.6 Prepare Traverse Computations
7.7 Examine Magnetic Declination CET 119

8. Compare angles and directions with Transits, Theodolites, and Total Stations.
8.1 Examine Transits and Theodolites.
8.2 Produce measures of horizontal angles.
8.3 Produce measured angles by repetition.
8.4 Produce measured vertical angles.
8.5 Illustrate how to set-up the Theodolite.
8.6 Define forced centering.
8.7 Produce measured zenith angles with a Theodolite.
8.8 Examine the total station.

9. Discuss miscellaneous angle concerns.

9.1 Identify common errors in angle measurement.
9.2 Identify common mistakes in measuring angles.
9.3 Define angle-distance relationships.
9.4 Understand resections.
9.5 Discuss older methods of traversing.
10. Review modern traversing.
10.1 Reproduce the intersection of two lines.
10.2 Demonstrate prolonging a straight line by double centering.
10.3 Discuss proper methods of cleaning surveying equipment.
10.4 Place points on a straight line between two given points. CET 119

COMPETENCIES REVIEWED/REVISED AND APPROVED BY: CR White
DATE: November 2009
FACULTY:
1. RL Stumbo
2.
3.
COMPETENCIES REVIEWED AND APPROVED BY: CR White
DATE: _____4/20/06_____
FACULTY:
1. RL Stumbo
2.
3.
4.
5.
6.
Effective date: August, 2010
Originated by: RL Stumbo
Campus: A B C U N W OC
extension: 5058
Revision(s): 3/99; 8/04; 11/09;

CET- 350

Des Moines Area Community College

Course Information – EFFECTIVE Aug. 2006

Acronym/Number CET 135 Historical Ref CET-350

Title Materials I

Credit breakout 3 3 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S):

COURSE DESCRIPTION:

To develop a working knowledge of sampling and testing basic materials used in the highway construction industry (aggregate and concrete). Iowa Department of Transportation materials certifications (AGG I, AGG II, PCC I) will be given to students upon successful completion of state certification exams given during the course.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Describe the Iowa Department of Transportation's Technician Training Certification Program.
2. Define Aggregate Types and the Use of Each.
3. Explain the principles of sampling Aggregates.
    - 3.1 Identify equipment needed for sampling.
    - 3.2 Discuss minimum frequencies for sampling.
    - 3.3 Identify size of sample needed for testing.
    - 3.4 Perform the correct procedure for sampling.
4. Examine Aggregate Properties and Characteristics.
    - 4.1 Discuss general aggregate source information.
    - 4.2 Define deleterious materials.
    - 4.3 Understand resistance to abration.
    - 4.4 Discuss absorption and surface moisture.
    - 4.5 Understand specific gravity.
    - 4.6 Define the relationship between shape and surface texture, and performance.
    - 4.7 Understand gradation and its relevant specification structure.

CET 135

5. Perform critical aggregate laboratory tests.
    5.1 Perform splitting operations to take an aggregate sample from field size to proper test sample size.
    5.2 Perform method of test to determine the amount of material finer than the #200 sieve.
    5.3 Perform sieve analysis of aggregates for fine, coarse and combined aggregate test samples.
    5.4 Perform shale test for fine and coarse aggregates.
    5.5 Understand results of a Los Angelos Abrasion Test.
    5.6 Understand results of Soundness tests by freezing and thawing.
    5.7 Perform aggregate specific gravity test.
6. Describe reporting requirements for Iowa DOT.
    6.1 Describe daily reports required to submit to districts.
    6.2 Describe daily reports required to submit to central Iowa DOT.
    6.3 Describe what makes up legal documentation for reporting.
7. Describe plant inspection and tests performed on Portland Cement Concrete.
    7.1 Property sample freshly mixed concrete.
    7.2 Properly take temperatures of freshly mixed concrete.
    7.3 Perform the slump of hydraulic concrete test.
    7.4 Perform air content of freshly mixed concrete test by the pressure method.
    7.5 Make, protect and cure concrete flexural strength field specimens.
    7.6 Perform test of flexural strength of concrete using a simple beam with center-point loading beam breaker.
    7.7 Discuss making, protecting, curing and testing concrete cylinders.
    7.8 Discuss testing the strength of Portland Cement Concrete using the maturity method.
    7.9 Discuss the method of test for flow of grout mixtures.

CET 135

COMPETENCIES REVIEWED AND APPROVED BY: CR White
DATE: __4/20/06_____
FACULTY:
1.
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3.
4.
5.
6.

Effective date: August, 2006
by: CR White
Campus: A B C U N W OC
extension: 5056
Revision(s): 3/99; 8/04; 8/05; 8/05;

Des Moines Area Community College

Course Information – EFFECTIVE Aug. 2006

Acronym/Number CET 138 Historical Ref CET-340

Title Construction I

Credit breakout 3 3 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): CET 102 or department approval

COURSE DESCRIPTION:

This course will develop a working knowledge of construction inspection fundamentals. Topics will include introduction to: construction reviews, pre-construction planning, permits process, embankment construction, drainage solutions, stabilization methods, equipment used in construction, placement work, paving procedures, estimating of time and materials.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Define reference documents needed on a construction project.
    - 1.1Define and explain hierarchy of documents.
    - 1.2Describe what documents are important.
    - 1.3Discuss what documents are available and from what sources.
2. Describe duties of an inspector.
    - 2.1Discuss inspector duties.
    - 2.2Discuss importance of inspector understanding contract documents.
    - 2.3Learn documentation and record keeping requirements.
3. Discuss work zone safety requirements.
    - 3.1Learn importance of work zone safety.
    - 3.2Define all aspects of a safe work zone.
4. Understand inspection duties necessary for grading projects.
    - 4.1Determine relevant specifications needed for grading projects.
    - 4.2Determine Division II documents needed to inspect grading projects.

CET 138

    - 4.3Determine RCE instructions needed to inspect grading projects.
    - 4.4Review grading plan sets to develop field notebook.
    - 4.5Summarize inspection duties necessary on a grading project.
5. Understand inspection duties necessary for drainage projects.
    - 5.1Determine relevant specifications needed for drainage projects.
    - 5.2Determine Division II documents needed to inspect drainage projects.
    - 5.3Determine RCE instructions needed to inspect drainage projects.
    - 5.4Review drainage plan sets to develop field notebook.
    - 5.5Summarize inspection duties necessary on a drainage project.
6. Understand inspection duties necessary for culvert projects.
    - 6.1Determine relevant specifications needed for culvert projects.
    - 6.2Determine Division II documents needed to inspect culvert projects.
    - 6.3Determine RCE instructions needed to inspect culvert projects.
    - 6.4Review culvert plan sets to develop field notebook.
    - 6.5Summarize inspection duties necessary on a culvert project.
7. Understand inspection duties necessary for bridge projects.
    - 7.1Determine relevant specifications needed for bridge projects.
    - 7.2Determine division II documents needed to inspect bridge projects.
    - 7.3Determine RCE instructions needed to inspect bridge projects.

7.4Review bridge plan sets to develop field notebook.
7.5Summarize inspection duties necessary on a bridge project.

8. Understand inspection duties necessary for Portland Cement Concrete (PCC).
   8.1 Determine relevant specifications needed for PCC paving projects.
   8.2 Determine Division II documents needed to inspect PCC paving projects.
   8.3 Determine RCE instructions needed to inspect PCC paving projects.
   8.4 Review PCC paving plan sets to develop field notebook.
   8.5 Summarize inspection duties necessary on a PCC paving project.
9. Understand inspection duties necessary for hot mix asphalt (HMT) paving.
   9.1 Determine relevant specifications needed for HMA paving projects.
   9.2 Determine Division II documents needed to inspect HMA paving projects.
   9.3 Determine RCE instructions needed to inspect HMA paving projects.
   9.4 Review HMA paving plan sets to develop field notebook.
   9.5 Summarize inspection duties necessary on a HMA paving project.

CET 138

COMPETENCIES REVIEWED AND APPROVED BY:
DATE: _____
FACULTY:
1.
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3.
4.
5.
6.

Effective date: August, 2005
by: CR White
Campus: A B C U N W OC
extension: 5056
verified by: 3/99; 8/04; 8/05;

Des Moines Area Community College Course Information – EFFECTIVE Aug. 2009

Acronym/Number CET 178 Historical Ref CET-390 Title Automated Design I

Credit breakout 4 4 0 0 0 (credit lecture lab practicum work experience) PREREQUISITE(S): CSC 110, CET 102 or department approval **COURSE DESCRIPTION:** This course will introduce the student to computer-aided drafting (CAD) utilizing Microstation software. Microstation fundamentals will be taught including drawing, formats, placing and manipulating elements, measurements, cells, patterning, dimensioning, reference files, and three-dimensional modeling. Drawings will be created and plotted.

During this course, the student will be expected to:

1. Explain the basic concepts of drafting.
1.1 Explain purposes and applications of drafting.
1.2 Explain the basic tools and practices of manual drafting.
1.3 Explain the basic tools and practices of computer-aided drafting.
2. Demonstrate a working knowledge of the Miscrostation working environment.
2.1 Explain the Microstation coordinate system and use precision inputs.
2.2 Set up project working units.
2.3 Explain mouse actions in Microstation.
3. Utilize Microstation drawing aids.
3.1 Use element attributes. 3.2 Use snaps. 3.3 Use locks.
3.4 Use element selection and the fence tool.
3.5 Use view controls.
4. Print a hard copy of a drawing in Microstation.
4.1 Set plot settings.
4.2 Plot to scale. CET 178
5. Place and manipulate geometric elements in a design file in Microstation.
5.1 Set element attributes.
5.2 Place elements.
5.3 Modify elements.
5.4 Manipulate elements.
6. Place and manipulate text in a design file in Microstation.
6.1 Set text attributes.
6.2 Place text.
6.3 Edit text.
7. Utilize Accudraw in a design file in Microstation.
7.1 Use the Accudraw compass for rectangular and polar coordinates.
7.2 Place elements of specific sizes and angles. 8. Place cells in a design file in Microstation.
8.1 Navigate a cell library.
8.2 Create a cell.
8.3 Place a cell.
9. Place patterns in a design file in Microstation.
9.1 Create a pattern.
9.2 Place a pattern.
10. Place dimensions in a design file in Microstation.
10.1 Set dimension settings.
10.2 Place dimensions.
11. Use reference files in Microstation.
11.1 Attach reference files.

11.2 Set reference file settings.
11.3 Manipulate reference files.
12. Create a basic three-dimensional file in Microstation.
12.1 Use Accudraw in a three-dimensional file.
12.2 Use multiple views to create three-dimensional drawings. CET 178

COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: October 2008 FACULTY:

1. Renee White
2. K. Newbanks
3.

Effective date: August, 2009 Originated by: SJ Rittgers Campus: A B C U N W OC extension: 5055 Revision(s): 3/99; 8/04; 8/05; 10/08

Des Moines Area Community College Course Information – EFFECTIVE August 2009

Acronym/Number CET 169 Historical Ref CET-325 Title Survey II

Credit breakout 4 3 2 0 0 (credit lecture lab practicum work experience) PREREQUISITE(S): CET-320 or department approval **COURSE DESCRIPTION:** A continuation of Survey I. Topics will include: construction control surveys; topographic surveys, construction site layout, coordinate systems (i.e. state plane); elementary horizontal curves; real property descriptions; right of way; electronic data collection and global positioning will be utilized; data downloading and editing; CAD. **COURSE COMPETENCIES:** ***During this course, the student will be expected to:***

1. Examine Topographic Surveying
1.1 Discuss Contours
1.2 Describe Methods of Obtaining Topography
1.3 Define Stadia
1.4 Identify Stadia Equipment
1.5 Illustrate Field Procedure for Stadia Mapping
1.6 Demonstrate Stadia Work
1.7 Give Contour Characteristics
1.8 Define Plane Table Surveys
1.9 Examine Topographic Details Obtained With Total Stations

1.10 List Map Symbols 1.11 Describe to Method to Complete the Map
1.12 List Specifications for Topographic Maps
1.13 Define Profiles from Contour Maps
1.14 Prepare Checklist of Items to be Included on a Topographic Map
2. Investigate Global Positioning System (GPS)
2.1 Define Global Positioning System (GPS)
2.2 Identify Monitoring Stations
2.3 Illustrate Basic Theory
2.4 Discuss how the Travel Time of a Satellite Signal is Measured
2.5 Give Uses of GPS
CET 169

2.6 List Types GPS Signals
2.7 Discuss GPS Errors
2.8 Illustrate how to Minimize Errors
2.9 Define Position Dilution of Precision(PDOP)
2.10 Show Point Positioning and Relative Positioning
2.11 Demonstrate Field Applications
2.12 Define Continuously Operating Reference Stations(CORS)
2.13 Define Kinematic Surveying

3. Investigate Geographic Information Systems (GIS)
3.1 Illustrate the Uses of Geographic Information Systems
3.2 Discuss the Historical Development of GIS
3.3 Define Objectives of GIS
3.4 Discuss the Advantages of a GIS
3.5 Define the Accuracy in a GIS
3.6 Show Coordinates and Map Projections
3.7 Define Control Surveying use in GIS
3.8 Produce Map Data for a GIS
3.9 Show Inputting Computer Data
3.10 Discuss Legal Concerns With GIS

4. Examine Construction Surveying
4.1 Define a Construction Survey
4.2 Describe the Work of the Construction Surveyor
4.3 Describe Property Survey from the Contractors Viewpoint
4.4 Define Preliminary Surveys
4.5 Discuss Grade Stakes
4.6 Examine Referencing Points for Construction
4.7 Describe Building Layouts
4.8 Describe Base Lines (Layout Performed by Surveyors)
4.9 Describe Radial Staking Methods
4.10 Place Batter Boards
4.11 Define As-Built Surveys

5. Investigate Geometric Designs
5.1 Identify Volumes and Volumes use in Construction
5.2 Discuss Slopes and Slope Stakes
5.3 Define Borrow Pits
5.4 Define Cross Sections
5.5 Illustrate Areas of Cross Sections
5.6 Compute Earthwork Volumes
CET 169

5.7 Draw a Mass Diagram
5.8 Calculate Volumes from Contour Maps
5.9 Classify Volume Formulas for Geometric Figures

6. Examine Land Surveying or Property Surveying
6.1 Define Land Surveying
6.2 Describe Title Transfer and Land Records
6.3 Discuss Common Law
6.4 Define Monuments
6.5 Illustrate Blazing Trees
6.6 Discuss Monuments, Bearings, Distances and Areas
6.7 Define Miscellaneous Terms Relating to Land Surveying
6.8 Define Resurveys
6.9 Discuss Metes and Bounds
6.10 Discuss the U.S. Public Lands Survey Systems
6.11 Discuss Early Days of the System
6.12 Identify the Outline of the System
6.13 Define Meander Lines
6.14 Define Witness Corners
6.15 Discuss Deed Descriptions of Land

7. Analyze Horizontal Curves
7.1 Define Degree of Curvature and Radius of Curvature
7.2 Discuss Curve Equations
7.3 Calculate Deflection Angles
7.4 Demonstrate Selection and Staking Out of Curves
7.5 Show Field Procedure for Staking Out Curves
7.6 Discuss Circular Curves Using the SI System
7.7 Illustrate Horizontal Curves Passing Through Certain Points
7.8 Define Spiral Curves

8. Analyze Vertical Curves
8.1 Define Vertical Curves
8.2 Calculate a Vertical Curve
8.3 Discuss Miscellaneous Items Relating to Vertical Curves
8.4 Define Unequal-Tangent Vertical Curves
8.5 Illustrate a Vertical Curve Passing Through a Certain Point
8.6 Describe Parabolic Equation
8.7 Define Crowns
8.8 Describe Superelevation

9. Examine Surveying-The Profession
CET 169

9.1 Discuss Surveying Licenses
9.2 Discuss Registration Requirements
9.3 List Penalties for Practicing Surveying Without a License
9.4 Identify Reasons for Becoming Registered
9.5 Define Surveying Code of Ethics
CET 169

COMPETENCIES REVIEWED AND
APPROVED BY: Renee White DATE: November 2008
FACULTY: 1.
2.
3.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: October 2008
FACULTY: 1.
2.
3
Effective date: August 2009 Originated by: S. Nelsen Campus: A B C U N W OC extension: Revision(s): 3/99; 10/2008; 11/08

Des Moines Area Community College

Course Information – EFFECTIVE FL 2012-01

Acronym/Number CET 304 Historical Ref CET 305

Title Field Coop

Credit breakout 4 0 0 0 16

(credit lecture lab practicum work experience)

PREREQUISITE(S):

Successful completion of 32 credit hours of CET program courses and/or departmental approval

COURSE DESCRIPTION:

Practical experience through on-the-job training in an approved civil engineering technician setting. Tasks will be consistent with student's career objectives, skills, and knowledge.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Reconstruct duties completed through internship.

1.1 Use knowledge, skills, and attitudes required for business careers.

1.2 Use effective communications skills for employment.

1.3 Develop techniques of good listening.

1.4 Identify importance of ability to carry on a conversation.

1.5 Identify awareness of aids to good communication skills.

1.6 Describe importance of retraining and learning new skills.

2. Categorize techniques and skills learned in the course work.

2.1 List the required civil engineering technician skills involved in the coop.

2.2 Develop ability to work under pressure.

2.3 Develop habits of neatness, thoroughness, a concern for accuracy techniques and the importance of good communication.

3. Develop objectives that measure directed activities and performance standards.

3.1 List goals related to coop activities.

3.2 Select six of the most appropriate listed goals.

3.3 List the activities to achieve each listed goal.

3.4 Develop performance standards to determine when goals are achieved.

4. Compose college and employer reports.

4.1 List required reports.

4.2 Identify recipients of reports.

4.3 Identify due date of each report.

4.4 Complete report forms as required.

4.5 Give reports to identified recipients.

CET 304

5. Comply to policies, procedures, and regulations.
5.1 Identify employer expectations for an intern.
5.2 List employer policies and procedures to be complied with.
5.3 Identify and observe all company regulations that are applicable to interns.

6. Display a professional appearance.
6.1 Avoid tardiness.
6.2 Develop abilities to show initiative.
6.3 Develop pride in doing a job well.
6.4 Complete tasks within acceptable standards of quantity and quality of work.
CET 304

COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: November, 2010
FACULTY:
1. Renee White
2. SJ Rittgers
3.
4.
5.
6.
Effective date: August, 2011
Originated by: SJ Rittgers
Campus: A B C U N W OC
extension: 5055
Revision(s): 4/99; 8/04; 11/10;

Des Moines Area Community College

Course Information – EFFECTIVE Aug. 2006

Acronym/Number CET 307 Historical Ref CET-407

Title Field Orientation

Credit breakout 2 2 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S):

Written permission from the CET faculty to substitute this course for 2 credits of the 5 credit CET 305 requirement.

COURSE DESCRIPTION:

This course will acquaint a student with field operations. The role of the technicians superintendent and project manager will be discussed, as well as the relationship between the contractor and owner. Visits will be made to local projects to observe construction procedures.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Accurately discuss the defined duties of the following:
    - 1.1 The superintendent
    - 1.2 The project manager
    - 1.3 The Civil Engineering Technician

2. Understand the relationship and duties of the contractor and owner.
    - 2.1 Contract Obligations
    - 2.2 Gentlemen's Agreements
    - 2.3 Liability

3. Be able to diagram a basic construction schedule.
4. Visit and report on each of the following major project categories:
    - 4.1 Grading
    - 4.2 Bridge or culvert
    - 4.3 Asphalt Cement Concrete
    - 4.4 Portland Cement Concrete

CET 307

COMPETENCIES REVIEWED AND APPROVED BY:

DATE: _____

FACULTY:

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2.
3.
4.
5.
6.

Effective date: 6/26/2002
by: Renee White
Campus: A B C U N W OC
extension: 5056
Revision(s): 6/02;

Des Moines Area Community College COURSE INFORMATION – EFFECTIVE Aug. 2009

Acronym/Number CET 173 Historical Ref CET-330 Title Highway Design I

Credit breakout 4 4 0 0 0 (credit lecture lab practicum work experience) PREREQUISITE(S): CET 102, CET 178 or department approval **COURSE DESCRIPTION:** This course will introduce the student to highway design. Topics will include an overview of the highway development process, design criteria and standards, horizontal alignments, vertical alignments, cross-sections, earthwork, construction details, specifications, and estimates of quantities. A final highway design project will be completed. **COURSE COMPETENCIES:** ***During this course, the student will be expected to:***

1. Discuss an overview of highway development process.
1.1 Discuss a brief history of highway development.
1.2 Discuss highway administration and finance.
1.3 Describe the 5 stages of the FHWA highway development process.

2. Discuss the planning stage of high way development.
2.1 Describe how traffic data is collected.
2.2 Discuss basic concepts of transportation modeling.

3. Discuss the project development (evaluation) stage of highway development.
3.1 Discuss economic analysis of projects.
3.2 Discuss basic concepts of transportation modeling.

4. Discuss an overview of the design stage of highway development.
4.1 Describe types of highway surveys.
4.2 Interpret basic plan features such as contours and stationing.
4.3 Describe the steps of preparing preliminary and final road plans.

5. Discuss the basics of the right-of-way stage of highway development.

5.1 Describe the principles of designing a right-of-way layout. 5.2 Discuss the right-of-way acquisition process.
6. Discuss the basics of the construction stage of highway development.

6.1 Describe the process of selecting contractors to build a project. 6.2 Describe the construction inspection process. CET 173

7. Discuss basic driver and vehicle characteristics.
7.1 Describe perception-reaction time and driver expectancy.
7.2 Describe vehicle types, sizes, and performances.

8. Discuss basic design standards and controls.
8.1 Identify sources for design standards.
8.2 Describe design exceptions.
8.3 Identify the most important design controls.

9. Design the horizontal alignment of a highway.
9.1 Layout tangents for a horizontal alignment.
9.2 Design curves for a horizontal alignment.
9.3 Calculate stationing on curves and alignments.
9.4 Design superelevation on curves.

10. Design the vertical alignment of a highway.
10.1 Understand the principles of sight distance.
10.2 Layout tangents for a vertical alignment.
10.3 Design curves for a vertical alignment.
10.4 Calculate elevations along a vertical alignment.

11. Plot cross-sections for a highway project.
11.1 Describe elements of highway cross-sections.
11.2 Plot existing ground cross-sections.
11.3 Plot proposed roadway cross-sections.

12. Compute earth work for a highway project.
12.1 Compute volumes of earthwork.
12.2 Plot a mass diagram.
12.3 Calculate overhaul from a mass diagram.

13. Prepare construction details, specifications, and estimates of quantities.
13.1 Create new or reference construction details for a highway project.
13.2 Create a new or reference specifications for a highway project.
13.3 Computer estimates of quantities for a highway project.
CET 173
COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: October 2008
FACULTY: 1. Renee White 2. K. Newbanks 3. 4. 5. 6.
Effective date: August, 2009 Originated by: SJ Rittgers Campus: A B C U N W OC extension: 5055 Revision(s): 3/99; 8/04; 8/05; 10/08

CET 192

Des Moines Area Community College

COURSE INFORMATION – EFFECTIVE Aug. 2006

Acronym/Number CET 192 Historical Ref CET-380

Title Statics

Credit breakout 4 4 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): MAT 773 or department approval

COURSE DESCRIPTION:

This course is designed to acquaint the student with basic structural concepts. Emphasis is placed on the use of free body diagrams in understanding the forces acting on a structural member.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Identify and analyze a planar concurrent force system.

1.1 Use vectors to represent forces.

1.2 Determine the rectangular components of a force.

1.3 Determine the resultant of 2 or more planar concurrent forces by rectangular components.

2. Apply equilibrium conditions to a planar concurrent force system.

2.1 State the equilibrium conditions.

2.2 Sketch the proper free body diagram.

2.3 Apply the equilibrium conditions to a planar concurrent force system to determine unknown forces or orientations.

3. Identify and analyze a planar nonconcurrent force system.

3.1 Demonstrate a knowledge of the principle of transmissibility and the Theorem of Moments.

3.2 Determine the magnitude and location of the resultant of a distributed load.

3.3 Determine the resultant of 2 or more planar nonconcurrent forces.

4. Apply equilibrium conditions to a planar nonconcurrent force system

4.1 Identify the proper support conditions for a structure.

4.2 Sketch a proper free body diagram for a structure.

4.3 State the equilibrium conditions.

4.4 Apply the equilibrium conditions to a structure, subjected to a planar nonconcurrent force system, to determine unknown forces, locations, or orientations.

5. Apply equilibrium conditions to simple plane trusses.

5.1 Discuss the assumptions used in the development of the model of a plane truss. CET 192

5.2 Determine the internal force within a truss member by sue of the Method of Joints.
5.3 Determine the internal force within a truss member by use of the Method of Sections.
6. Calculate the centroid location and moments of inertia for planar composite areas and simple structural cross sections.
6.1 Discuss the concept of the centroid of a plane area.
6.2 Discuss the concept of a composite area.
6.3 Calculate the location of the centroid of a composite area.
6.4 Demonstrate the use of tables in the determination of the centroid of a structural cross section.
6.5 Discuss the concept of an area moment of inertia.
6.6 Demonstrate a knowledge of the Parallel Axis Theorem by the proper calculation of the moment of inertia of a composite area or a structural cross section.
7. Identify and calculate normal and shear stresses in an axially loaded member.
7.1 Discuss the concepts of normal stress, shear stress, and bearing stress.
7.2 Calculate normal stress, shear stress, and bearing stress within an axially loaded member.
7.3 Explain the concepts of allowable stress and factor or safety.
7.4 Use allowable stress and factor of safety in the calculation of stresses within an axially loaded member.

8. Identify and calculate normal strain in an axially loaded member.
8.1 Discuss the concept of normal strain.
8.2 Explain tension tests, compression tests, and stress-strain diagrams.
8.3 Demonstrate a knowledge of Hooke's Law through proper stress, strain, or deformation calculations.
8.4 Calculate thermal deformations, strains, and stresses.
9. Construct a shear force diagram and a bending moment diagram for a beam.
9.1 Identify the various types of beams and applied loads.
9.2 Discuss internal shear force and internal bending moment in beams.
9.3 Demonstrate a knowledge of the relation between applied loads, internal shear force, and internal bending moment by the construction of a proper shear diagram and a proper bending moment diagram.
10. Identify, calculate, and locate the bending stress and the shear stress in a beam.
10.1 discuss the distribution of bending stress within a beam cross section.
10.2 Demonstrate a knowledge of the flexure formula by the determination of the bending stress at a specified point within a beam.
10.3 Determine the magnitude and location of the maximum tensile bending stress within a beam and the maximum compressive bending stress within a beam.
10.4 Discuss the distribution of shear stress within a beam cross section.
10.5 Demonstrate a knowledge of the shear stress formula by the determination of the shear stress at a specified point within a beam. CET 192

10.6 Determine the magnitude and location of the maximum shear stress within a beam.
11. Calculate the amount of deflection of a beam due to bending.
11.1 Use tabulated formulas and the concept of superposition to calculate the maximum deflection of a loaded beam.
11.2 Determine if deflection exceeds code requirements.
12. Identify and analyze lateral buckling of an axially loaded column.
12.1 Determine the Euler buckling load or critical stress for an axially loaded column.
12.2 Discuss end conditions and lateral bracing of columns. CET 192

COMPETENCIES REVIEWED AND APPROVED BY: CR White
DATE: ___4/20/06_____
FACULTY:
1. Nick Thorpe
2.
3.
4.
5.
6.
Effective date: August, 2005
by: Nick Thorpe
Campus: A B C U N W OC
extension: 5060
Revision(s): 4/99; 8/04

Des Moines Area Community College

Course Information – EFFECTIVE August 2009

Acronym/Number CET 219 Historical Ref CET-422

Title Survey III

Credit breakout 4 3 2 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): CET 169 or department approval

COURSE DESCRIPTION:

Application of survey concepts to Boundary and Route Surveying. Topics will include: Real Property descriptions; research, route surveying, horizontal curve calculation and layout, vertical curve calculations; closed and open loop survey, bench level circuit; subdivision surveying, construction surveying; electronic data collection and global positioning will be utilized.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Review Traverse Surveys.

1.1 Define Traverse Surveys.

1.2 Perform calculations to balance field angles.

1.3 Review Meridians.

1.4 Review Bearings.

1.5 Review Azimuths.

1.6 Review Latitudes and Departures.

1.7 Define Traverse Precision and Accuracy.

1.8 Calculate Compass Rule Adjustment.

1.9 Identify the Effects of Traverse Adjustments on Measured Angles and Distances.

1.10 Identify Omitted Measurement Computations.

1.11 Calculate Rectangular Coordinates of Traverse Stations.

1.12 Calculate Area of a Closed Traverse by the Coordinate Method.

2. Review Topographic Surveying and Drawing.

2.1 Review Basics of Topographic Surveys.

2.2 Define the Precision Required for Topographic Surveys.

2.3 Diagram Cross Sections and Profiles Drawings.

2.4 Use Theodolite to collect topographic data.

2.5 Download and analyze collected data.

2.6 Produce CAD Contour Drawing.

CET 219

3. Examine Construction Surveying.
3.1 Define Construction Control Survey
3.2 Define preliminary surveys.
3.3 Discuss grade stakes.
3.4 Describe building layouts.
3.5 Describe base lines (layout performed by surveyors).
3.6 Describe radial staking methods.
3.7 Place batter boards.
3.8 Define as-built surveys.

4. Review Global Positioning Systems (GPS).
4.1 Operate various Global Positioning Systems (GPS).
4.2 Discuss the CORS.
4.3 Discuss the OPUS.
4.4 Understand Satellite Geometry.
4.5 Review errors.
4.6 Illustrate current GOPS Surveying Techniques.
4.7 Discuss survey planning.
4.8 Define Initial Ambiguity Resolution.
4.9 Discuss Vertical Positioning.

5. Investigate Highway Curves.
5.1 Define Route Surveys.
5.2 Review Circular Curves.
5.3 Calculate Circular Curve Geometry and Deflections.
5.4 Produce Chord Calculations.
5.5 Produce Field Procedure.
5.6 Illustrate Moving Up on the Curve.
5.7 Create Offset and Compound Circular Curves.
5.8 Calculate Offset and Compound Circular Curves.
5.9 Define Reverse Curves.
5.10 Discuss Vertical Curves.
5.11 Calculate offset and compounded circular curves.

6. Examine Highway Construction Surveys.
6.1 Define Preliminary (Pre-Engineering) Surveys.
6.2 Illustrate Highway Design.
6.3 Produce Highway Construction Layout.
6.4 Discuss Clearing, Grubbing, and the Stripping of Topsoil.
6.5 Show Placement of Slope Stakes.
6.6 Layout Line and Grade.
6.7 Produce Grade Transfer.
6.8 Describe Ditch Construction.
CET 219

7. Investigate land surveying.
7.1 Review the public land survey system.
7.2 Understand boundary surveying
7.3 Create land descriptions.
7.4 Create land corner certificates.
7.5 Create plat of survey.
7.6 Review the code of Iowa relative to land surveying.
7.7 Review Iowa Administrative Code 193C.
7.8 Troubleshoot survey problems.
7.9 Demonstrate proficiency with survey instruments.
CET 219

COMPETENCIES
REVIEWED AND APPROVED BY: Renee White DATE:
November 2008
FACULTY:
1.
2.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: October 2008
FACULTY:
1.
2.
3.
Effective date: January 2009 Originated by: RL Stumbo Campus: A B C U N W OC extension: Revision(s): 3/99; 8/04; 10/08;

Des Moines Area Community College

Course Information – EFFECTIVE August 2009

Acronym/Number CET 244 Historical Ref CET-450

Title Materials II

Credit breakout 3 2 2 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): CET 135 or department approval

COURSE DESCRIPTION: To develop a working knowledge of hot mix asphalt and Portland cement concrete plant operations, plant control, sampling and testing. Iowa Department of Transportation materials certifications (PCC II, HMA I) will be given to students upon successful completion of state certification exams given during the course.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Discuss the basic design process for Portland Cement Concrete pavements.

2. Discuss important properties of cements.
2.1 Understand why lime is used in concrete pavements and how it reacts.
2.2 Understand why hydraulic limes are used in concrete pavements and how they react.
2.3 Explain pozzolan cements.
2.4 Explain slag, natural, Portland, aluminu, and expansive cements.

3. Describe the design procedure for making concrete.
3.1 Discuss concrete materials.
3.2 Discuss principal requirements for concrete.
3.3 Discuss influences of ingredient on properties of concrete.
3.4 Discuss proportioning concrete mixes.
3.5 Discuss proportioning materials.
3.6 Discuss mixing and depositing.
3.7 Discuss compressive, tensile, and flexural strength.

4. Examine proportioning concrete mixtures with fly ash and other pozzolans.
4.1 Summarize the procedure for proper proportioning.
4.2 Discuss applicability to lightweight concrete.
4.3 Produce sample computations for different concrete mixtures.

5. Interpret the performance characteristics of Concrete.
5.1 Investigate failure mechanism of concrete.
5.2 Point out factors that cause deterioration.
5.3 Assess admixtures.
CET 244

6. Use the above knowledge to perform a concrete design that meets specifications.

7. Discuss the basic design process for hot mix asphalt pavements.

8. Review basic components of hot mix asphalt.
8.1 Understand performance graded asphalt binder.
8.2 Understand aggregates used in hot mix asphalt and their basic source and consensus properties.
8.3 Understand mix behavior and how proper design can minimize poor behavior.
8.4 Use volumetrics to understand the relationship between mass and volume and the relevance of air as a key ingredient in asphalt mixes.

9. Explain hot mix asphalt pavement design.
9.1 Use construction documents to establish design requirements.
9.2 Understand the material selection process and the variables a mix designer faces.
9.3 Explain what materials are necessary to perform a mix design and how to obtain and sample these materials.
9.4 Summarize initial testing required on aggregate before further steps can be taken in an asphalt pavement design.
9.5 Utilize aggregate test results and design requirements to determine an aggregate blend to test.
9.6 Explain the aggregate blending process.
9.7 Determine initial trail asphalt binder content to test the mix at.
9.8 Explain the batching process and calculate batch weights.
9.9 Understand the mixing process and be able to properly mix up a batch of hot mix asphalt.
9.10 Identify tests requires of the hot mix asphalt design and properly perform all of these tests.
9.11 Analyze test results and compare to design requirements.
9.12 Explain the bracketing process for asphalt binders and how optimum asphalt binder content is extracted from this bracketing process.

10. Utilize the SHADE' program to report results of hot mix asphalt design.
10.1 Explain back up documentation, the Form 955 and the Form 956.
10.2 Describe requirements to get hot mix asphalt mix approval.

11. Discuss how an asphalt mix design will change once subjected to a hot mix asphalt plant.
11.1 Discuss importance of mix adjustability.
11.2 Discuss likely problems.
11.3 Understand the troubleshooting charts.
11.4 Discuss requirements necessary if a mix design is changed.
CET 244

COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: November 2008 FACULTY: 1. 2. 3. COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: October 2008 FACULTY: 1. 2. 3. 4. 5. 6.

Effective date: August 2009 Originated by: CR White Campus: A B C U N W OC extension: 5056 Revision(s): 3/99; 8/04; 8/05; 10/08; 11/08;

Des Moines Area Community College

Course Information – EFFECTIVE August 2009

Acronym/Number CET 283 Historical Ref CET-430

Title Highway Design II

Credit breakout 4 4 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): CET 173 or department approval

COURSE DESCRIPTION: This course will introduce the student to additional highway design topics. Topics will include hydrology and drainage design, intersection and interchange design, roadside design, jointing, pavement design, parking design, highway capacity, and traffic engineering.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Discuss the goals of drainage system design.
1.1 Describe the goals and components of surface drainage systems.
1.2 Describe the goals and components of subsurface drainage systems.

2. Discuss computation of surface runoff.
2.1 Explain return period.
2.2 Compute surface runoff using rational method.

3. Discuss design of open channels.
3.1 Compute flow depth in open channels using Manning's equation.
3.2 Design open channels for a given flow quantity.

4. Discuss design of culverts.
4.1 Design sizes of culverts for inlet control.
4.2 Design sizes of culverts for outlet control.

5. Discuss design of basic storm sewer systems.
5.1 Design locations and sizes of intakes.
5.2 Design sizes and slopes of storm sewer pipes.

6. Discuss the principles of roadside design.
6.1 Describe clear zones and recovery areas.
6.2 Identify types and criteria of longitudinal barriers.
6.3 Design a longitudinal barrier system.

CET 283

7. Discuss the principles of intersection and interchange design.
7.1 Describe the types and functions of at-grade intersections.
7.2 Describe the types and functions of grade separated interchanges.
7.3 Perform a basic parking facilities design.

7. Identify and design highway pavements. 8.1 compare the benefits of rigid pavements and flexible pavements. 8.2 Design jointing of rigid pavements. 8.3 Design the thickness of pavements. 9. Discuss the basic principles of highway capacity analysis. 9.1 Perform capacity analysis for freeway segments. 9.2 Perform capacity analysis for signalized intersections. 10. Discuss the basic principles of traffic engineering. 10.1 Describe traffic control devices and systems. 10.2 Describe traffic control in work zones. 11. Discuss the design of other transportation systems. 11.1 Describe the design of air systems. 11.2 Describe the design of rail systems. 11.3 Describe the design of bicycle systems. 12. Discuss principles of access management. 12.1 Discuss how access management can improve safety and capacity. 12.2 Discuss successful access management designs. CET 283
8.
9. **COMPETENCIES REVIEWED AND APPROVED BY: Renee White**
10. **DATE: November 2008**
11. **FACULTY:**
12. **1.**
13. **2.**
14. **3.**
15. **COMPETENCIES REVIEWED AND APPROVED BY: Renee White**
16. **DATE: October 2008**
17. **FACULTY:**
18. **1.**
19. **2.**
20. **3.** **Effective date: January 2009 Originated by: SJ Rittgers Campus: A B C U N W OC extension: 5055 Revision(s): 3/99; 8/04; 8/05; 10/08;**

Des Moines Area Community College

Course Information – EFFECTIVE January 2010

Acronym/Number CET 222 Historical Ref CET-360

Title Soils and Foundations

Credit breakout 3 2 2 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): MAT 773 or department approval

COURSE DESCRIPTION:

The student will learn to recognize soil relationships with landforms and the effect on engineered construction. Concepts of geology and engineering properties including soil type, classification, strength, and deformation will be covered. Principles of soil mechanics and construction observation techniques will be learned and applied to real world examples.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Review the concepts of geology, soil development, and landforms.
1.1 Understand the Unified and AASHTO soil classification systems.
1.2 Determine soil index properties for classification in the laboratory.
1.3 Discuss the role of subsurface exploration in foundation design.

2. Discuss and understand the concepts of density, compaction, and soil improvement.
2.1 Review the principles of mass, density, and volumetric relationships.
2.2 Discuss soil strength parameters and measurement tests/
2.3 Review the relationships between density, stiffness, and strength.
2.4 Determine the stress-strain properties of soils in the laboratory.

3. Review the principles of total and effective stress in the subsurface.
3.1 Discuss the total stress versus depth in the subsurface.
3.2 Calculate effective versus depth and the effect of ground water levels.
3.3 Review total and effective horizontal stresses with depth.
3.4 Analyze the effect of ground water levels on buoyant forces.

4. Analyze subsurface stresses, soil consolidation, and settlement.
4.1 Calculate the change in subsurface stress due to external forces.
4.2 Review methods of vertical and horizontal stress distribution.

CET 222

4.3 Discuss the concept of drainage, permeability, and soil consolidation.
4.4 Determine the effect of ground water levels on settlement.

5. Explore shallow and intermediate foundation design and construction.
5.1 Discuss shallow foundation design procedures for granular and cohesive soils.
5.2 Review the concept of intermediate foundations and principles of design.
5.3 Review methods of field observation for shallow and intermediate foundation construction.

6. Review deep foundation design and construction methods.
6.1 Discuss different types and materials of deep foundations.
6.2 Compare the side friction and end bearing parameters in deep foundation design.
6.3 Review the observational method in deep foundation construction.
6.4 Examine the role of NDT techniques in foundation quality control.

7. Examine lateral earth pressures and retaining wall design and construction.
7.1 Discuss the magnitude and distribution of lateral earth pressures.
7.2 Review the three states of lateral earth pressure and structure interaction.
7.3 Compare conventional walls with mechanically stabilized earth, soil nails, and soil anchor retention systems.
7.4 Review principles of slope stability and soil strength.
7.5 Discuss excavation safety and OSHA standards for excavations.

8. Determine soil classification.
9. Perform soils tests.
9.1 Perform sieve analysis.
9.2 Perform consistency test (Atterberg limits).
9.3 Perform Proctor & Modified Proctor moisture-density tests.
9.4 Perform test for moisture content of soil. CET 222

COMPETENCIES REVIEWED AND APPROVED BY: CR White
DATE: ___September 2009 (via email)
FACULTY: Non listed
COMPETENCIES REVIEWED AND APPROVED BY: CR White
DATE: ___4/20/06_____
FACULTY:
1. Mike Lustig
2.
3.
4.
5.
6.
Effective date: August, 2004
by: Mike Lustig
Campus: A B C U N W OC
extension:
Revision(s): 3/99; 8/04;

Des Moines Area Community College

COURSE INFORMATION – EFFECTIVE January2010

Acronym/Number CET 235 Historical Ref CET-440

Title Construction II

Credit breakout 3 3 0 0 0

(credit lecture lab practicum work experience)

PREREQUISITE(S): CET 138 or department approval

COURSE DESCRIPTION: This course will teach a student to define, interpret and utilize construction contract documents and contracting methods. Topics covered are bonds, contracts, bidding documents, construction insurance, subcontracts and subcontractors, dispute resolutions, ethics, safety and labor relations.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Description of the construction industry.

1.1 Examine the economy and construction industry.
1.2 Understand public vs private construction.
1.3 Examine manufacturing vs construction.
2. Describe construction contracting methods and nature thereof.
2.1. Be familiar with the five types of contracting methods.
2.2. Describe construction management at risk.
2.3. Understand descriptors and elements of a contract.

3. Understand issues concerning real property.

3.1 Define tax and mechanics liens.
3.2 Understand imminent domain.
3.3 Describe right-of-way and zoning.
4. Define agents and forms of organizations.
4.1. Define the principle and agent.
4.2. Understand the creation and termination of an agency.
4.3. Define contingent liability.
4.4. Understand proprietorships, partnerships and corporations.
5. Understand contract disputes and torts.
5.1. Define contract disputes.
5.2. Define torts.
CET 235

6. Describe surety bonds and the bidding process.

6.1 Define and understand the different types of bonds.
6.2 Understand bonding limits and default.
6.3 Understand bid advertisements.
6.4 Define phases of the bid process.
7. Examine construction contract documents and their legal applications.
7.1 Define contract documents and their hierarchy.
7.2 Define unit price, cost plus and lump sum contracts
7.3 Understand change orders and their implications.
7.4 Define changed conditions and the responsible party.
8. Understand matters of time and payments.
8.1 Understand construction duration and project schedule.
8.2 Understand matters of time involved in the contract.
8.3 Examine types of payment.
8.4 Examine final payment and retainage.
9. Discuss warranties and construction insurance.
9.1 Understand the difference between expressed and implied warranties.
9.2 Understand and define owners acceptance of work.
9.3 Understand and define types of insurance for construction.
9.4 Understand terms of insurance.
10. Examine subcontractors and subcontracts and international construction contracts.
10.1 Understand general contractor, subcontractor and owner relationship.
10.2 Understand what work is subcontracted and how subcontractors are selected.
10.3 Discuss insurance requirements of subcontractors.
11. Examine methods of dispute resolution and professional ethics.
11.1 Understand the difference between negotiation, litigation and ADR techniques.
11.2 Define ethics and examine ethics scenarios. CET 235

COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: Sept. 2009 (via email)
FACULTY: non listed
1.
2.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: November2008
FACULTY:
1.
2.
COMPETENCIES REVIEWED AND APPROVED BY: Renee White
DATE: October 2008
FACULTY:
1.
2.
Effective date: January 2010
Originated by: CR White
Campus: A B C U N W OC
extension: 5056
Revision(s): 3/99; 7/05; 8/05; 10/08; 1/09; 9/09

Des Moines Area Community College Course Information – EFFECTIVE Aug. 2009

Acronym/Number CET 291 Historical Ref CET-470 Title Structural Design & Construction

Credit breakout 3 3 0 0 0 (credit lecture lab practicum work experience) PREREQUISITE(S):

CET 192 **COURSE DESCRIPTION:** This course is an introduction to the understanding of load and resistance factor design (LRFD) method. Topics considered include material properties, tension, compression, bending, beam columns, simple connections, base plates, and bearing plates. **COURSE COMPETENCIES:** ***During this course, the student will be expected to:***

1. Review the mechanics of bending and analyze concrete beams.
1.1 Discuss the properties of concrete and analyze concrete beams.
1.2 Review the mechanics of bending and the use of the flexure formula.
1.3 Analyze a rectangular concrete beam by use of the internal couple method.

2. Analyze stress and strain aspects of concrete.
2.1 Discuss the assumptions in the strength design method.
2.2 Discuss and illustrate the stress distribution in rectangular, reinforced concrete beams and slabs.

3. Analyze and design rectangular, reinforced concrete beams.
3.1 Analyze rectangular, reinforced concrete beams containing only tension steel.
3.2 Design a rectangular, reinforced concrete beam containing only tension steel.

4. Analyze and design one-way slabs.
4.1 Discuss one-way slabs.
4.2 Analyze reinforced, one-way slabs containing only tension steel.
4.3 Design reinforced, one-way slabs containing only tension steel.

5. Analyze and design reinforced concrete T beams.
5.1 Identify T beams.
5.2 Analyze and design reinforced concrete T beams.

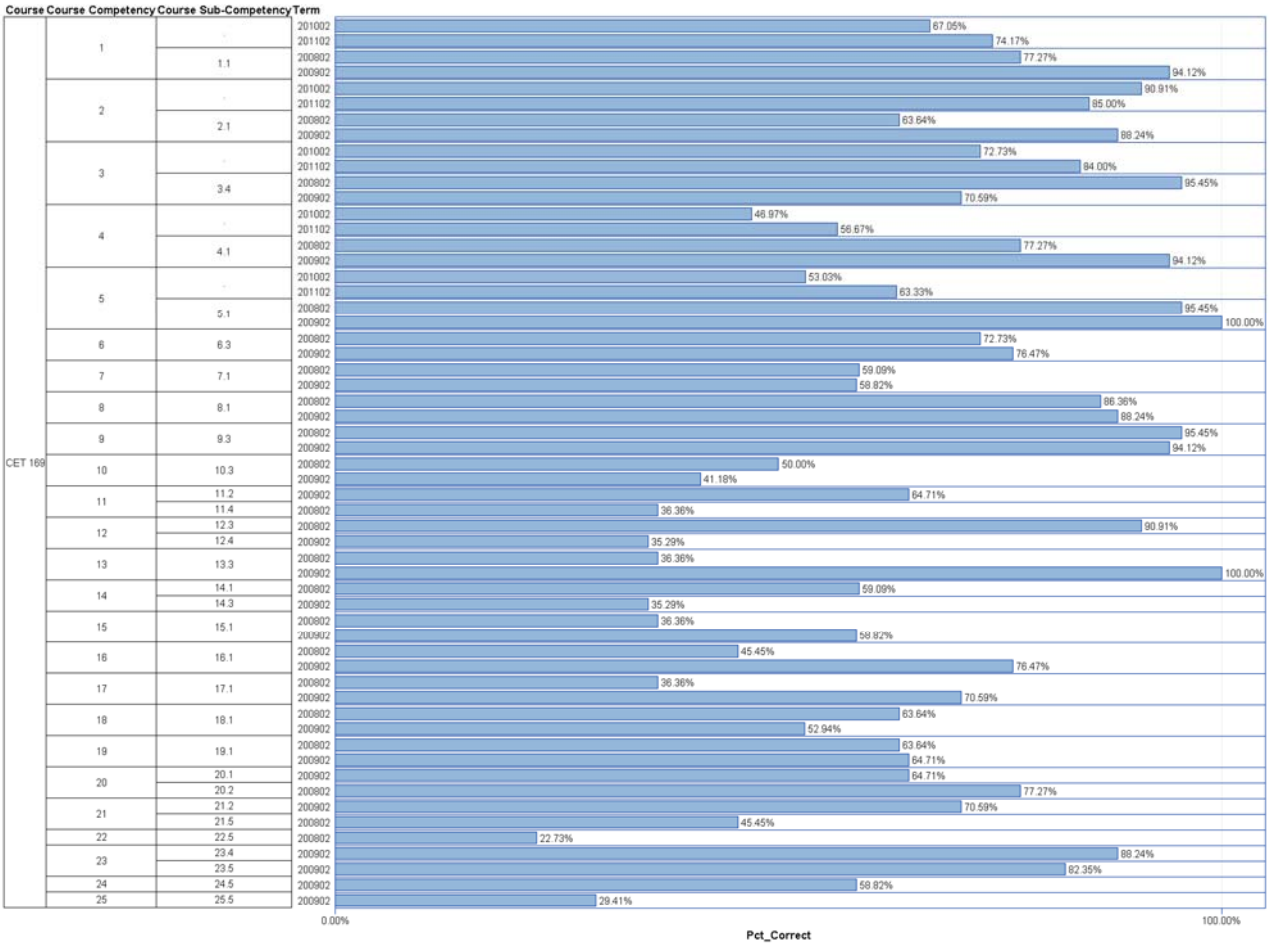
CET 291

6. Analyze and design doubly reinforced beams.
6.1 Discuss rectangular, doubly reinforced concrete beams.
6.2 Analyze and design rectangular, doubly reinforced concrete beams.

7. Analyze and design reinforced concrete beams for shear forces.
7.1 Discuss the requirements for shear reinforcement in rectangular, reinforced concrete beams.
7.2 Determine the required shear strength of a rectangular, reinforced concrete beam.
7.3 Determine the required stirrup size and spacing for a loaded, reinforced concrete beam.

7. Analyze and design continuous floor systems. 8.1 Use ACE code coefficients and equations to construct shear and moment diagrams for continuous floor systems. 8.2 Use shear and moment diagrams in the design of a continuous floor system. 9. Analyze and design short, reinforced concrete columns. 9.1 Determine the axial load strength for short, reinforced concrete columns. 9.2 Discuss the ACI code requirements for short, reinforced concrete columns. 9.3 Analyze and design short, reinforced concrete columns. CET 291
8.
9.
10. **COMPETENCIES REVIEWED AND APPROVED BY: Renee White DATE: October 2008 FACULTY: 1. Renee White 2. Nick Thorp 3. K. Newbanks 4. 5. 6. COMPETENCIES REVIEWED AND APPROVED BY: CR White DATE: ___4/20/06_____ FACULTY: 1. N Overtree 2. 3.**

Effective date: August, 2009 Originated by: N Overtree Campus: A B C U N W OC extension: 5056 Revision(s): 3/99; 8/04; 8/05; 10/08


Course
Course Competency
Course Sub-Competency
Term
CET 169
1
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36.36%
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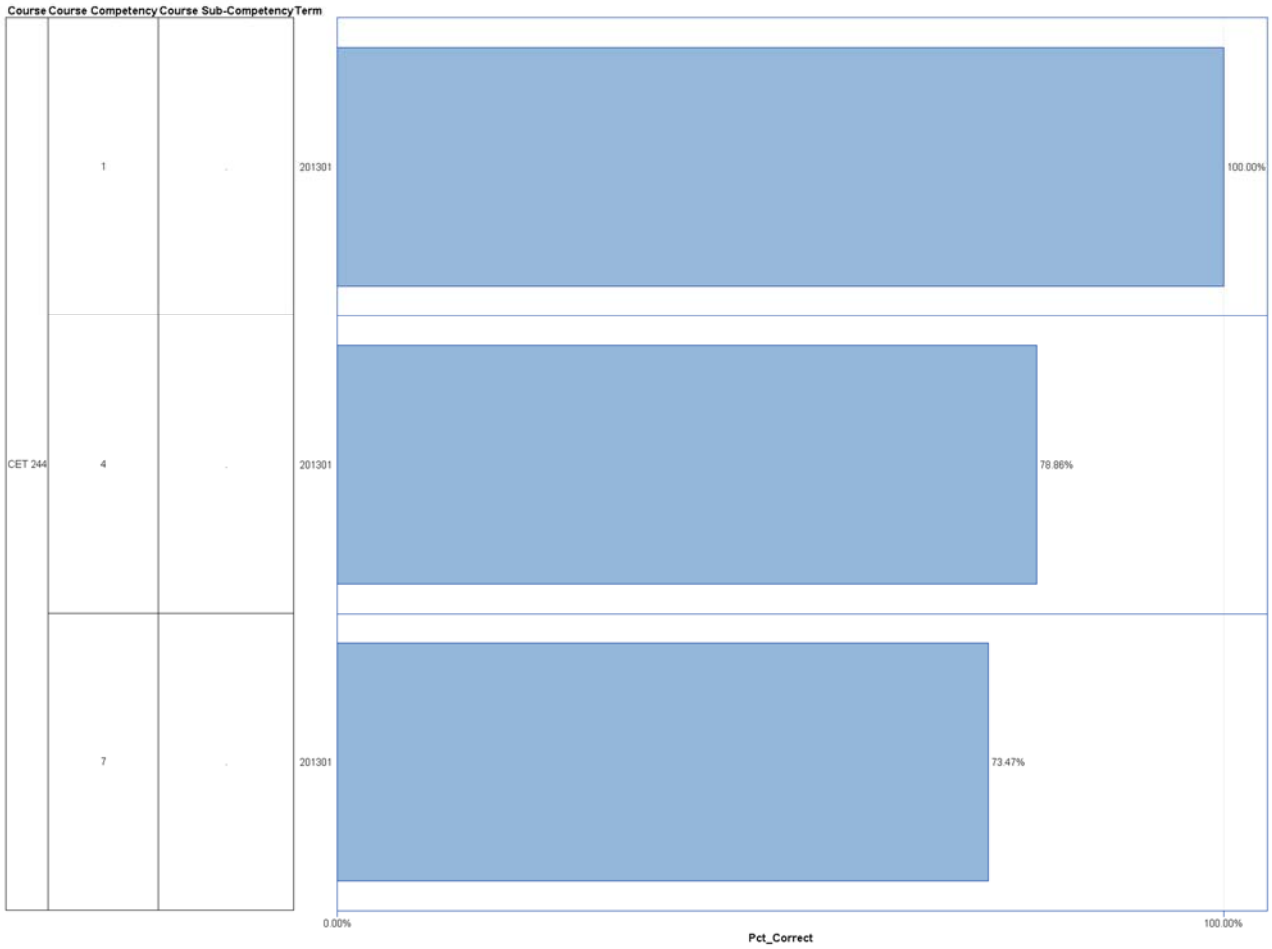
Course Competency Assessment Data for Course Listed

Course		CET 169							
		Number of Responses				Pct_Correct			
Year		2008	2009	2010	2011	2008	2009	2010	2011
Course Competency	Course Sub-Competency								
1	.	.	.	264	120	.	.	67.05%	74.17%
	1.1	22	17	.	.	77.27%	94.12%	.	.
2	.	.	.	44	20	.	.	90.91%	85.00%
	2.1	22	17	.	.	63.64%	88.24%	.	.
3	.	.	.	110	50	.	.	72.73%	84.00%
	3.4	22	17	.	.	95.45%	70.59%	.	.
4	.	.	.	66	30	.	.	46.97%	56.67%
	4.1	22	17	.	.	77.27%	94.12%	.	.
5	.	.	.	66	30	.	.	53.03%	63.33%
	5.1	22	17	.	.	95.45%	100.00%	.	.
6	6.3	22	17	.	.	72.73%	76.47%	.	.
7	7.1	22	17	.	.	59.09%	58.82%	.	.
8	8.1	22	17	.	.	86.36%	88.24%	.	.
9	9.3	22	17	.	.	95.45%	94.12%	.	.
10	10.3	22	17	.	.	50.00%	41.18%	.	.
11	11.2	.	17	.	.	.	64.71%	.	.
	11.4	22	.	.	.	36.36%	.	.	.
12	12.3	22	.	.	.	90.91%	.	.	.
	12.4	.	17	.	.	.	35.29%	.	.
13	13.3	22	17	.	.	36.36%	100.00%	.	.

Course Competency Assessment Data for Course Listed

Course		CET 169							
		Number of Responses				Pct_Correct			
Year		2008	2009	2010	2011	2008	2009	2010	2011
Course Competency	Course Sub-Competency								
14	14.1	22	.	.	.	59.09%	.	.	.
	14.3	.	17	.	.	.	35.29%	.	.
15	15.1	22	17	.	.	36.36%	58.82%	.	.
16	16.1	22	17	.	.	45.45%	76.47%	.	.
17	17.1	22	17	.	.	36.36%	70.59%	.	.
18	18.1	22	17	.	.	63.64%	52.94%	.	.
19	19.1	22	17	.	.	63.64%	64.71%	.	.
20	20.1	.	17	.	.	.	64.71%	.	.
	20.2	22	.	.	.	77.27%	.	.	.
21	21.2	.	17	.	.	.	70.59%	.	.
	21.5	22	.	.	.	45.45%	.	.	.
22	22.5	22	.	.	.	22.73%	.	.	.
23	23.4	.	17	.	.	.	88.24%	.	.
	23.5	.	17	.	.	.	82.35%	.	.
24	24.5	.	17	.	.	.	58.82%	.	.
25	25.5	.	17	.	.	.	29.41%	.	.


Course
Course Competency
Course Sub-Competency
Term
CET 244
1
201301
100.00%
4
201301
78.86%
7
201301
73.47%
0.00%
100.00%
Pct_Correct

Course Competency Assessment Data for Course Listed

Course		CET 244	
		Number of Responses	Pct_Correct
Year		2013	2013
Course Competency	Course Sub-Competency		
1	.	35	100.00%
4	.	175	78.86%
7	.	245	73.47%