



Bachelor of Technology in Construction Management

2015 Program Review

WNC Bachelor of Technology Construction Management Program Review

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1. Program Description

A. College and Program Mission

College Mission	Program Mission
Western Nevada College inspires success in our community through opportunities that cultivate creativity, intellectual growth and technological excellence, in an environment that nurtures individual potential and respects differences.	The mission of the Bachelor of Technology degree in Construction Management is to prepare students for entry level and mid-level positions within the various construction industry disciplines, and to meet the goals of the Technology Division.

B. College and Program Goals

College Goals	Program Goals and Outcomes
<ul style="list-style-type: none"> • Improve student success in program completion and graduation rates • Ensure institutional excellence in teaching, programs, and services • Embrace our college’s many communities and respond to their diverse needs 	<ul style="list-style-type: none"> • Knowledge in basic economic principals, business principals and construction accounting, finances, and law • Exposure to the design theory and analysis of construction practices and systems • Understanding of the utilization of available resources for construction planning, methods and materials • Understanding, skill and knowledge of construction documents, communications, graphics, and surveying • Skill and knowledge in construction estimating and bidding practices • Ability for planning and scheduling a construction project • Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to construction management

C. Short Description

The Bachelor of Technology in Construction offers associate degree students, new students and skilled workers an educational route toward a career as a construction manager or supervisor. The 120-credit program combines knowledge in construction methods, planning and project management with business and supervisory skills. This program allows those who have completed an associate degree in construction technology to progress academically and earn a bachelor's degree. It also allows those already working in the construction field to enroll in an applicable baccalaureate degree program and expand career advancement possibilities.

This 120-credit program includes:

- 12-credits in Business and Management course requirements
- 60-credits in Construction course requirements
- 48-credits in General Education requirements

i. Unique Characteristics

The BT program at WNC holds several unique characteristics which include:

- It is the only four year construction management program offered in Northern Nevada.
- It is one of only two offered in the state, the other being at UNLV.
- The majority of the courses are scheduled late in the day to accommodate non-traditional students that work full time.
- It provides job placement to its graduates.
- Provides service opportunities to students both on and off campus.

ii. Concerns or Trends

Concerns: According to campus documents this program has never been reviewed or evaluated. Records indicate that there have been frequent turn overs in faculty and administrative leadership throughout the life of the program. Combined with the down turn in the construction industry starting in 2006 concerns have been generated about the sustainability of the program. Records indicate that scheduling semester courses varied from year to year and there was no guarantee that a student could progress through the program without delays or other obstacles that hindered their progress in a timely manner. Fortunately, the program has a new Director that has prior assessment experience that will help us address these concerns for the future of the program.

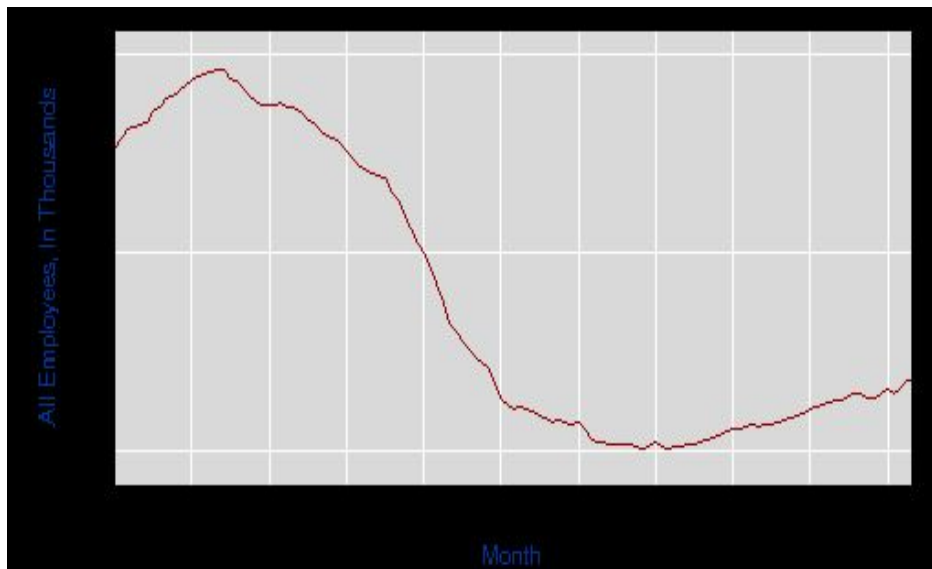
Employment Trends: CTE program areas, such as BTECH Construction Management, serve a specific employer and occupational need in the region. As such, enrollment fluxuations are expected to be consistent with the regional economy. This factor creates the need to take steps to maintain enrollment and deliver the program as efficiently as possible.

The chart below shows the State and Area Construction Employment trends over the past ten years. In 2006, the construction industry began a sharp decline and many construction companies were forced to release workers due to lack of contracts. Many workers were then retrained or worked in other industries. This generated a negative impact on enrollment and retention rates. The construction industry in Northern Nevada began a slow recovery in 2012, which accelerated in 2014 and continues upward. According to a study conducted by the Builders Alliance of Western Nevada (BAWN) there will be a potential shortage of competent construction workers in the future.

State and Area Employment, Hours, and Earnings: 2005 - 2015

Source: U.S. Bureau of Labor Statistics

Seasonally Adjusted	
State:	Nevada
Area:	Statewide
Industry:	Construction
Data Type:	All Employees, In Thousands



iii. Significant Changes or Needs

There are significant changes that need to be made to the current BT program to fit the needs of the construction industry:

- Developing the AAS curriculum to fit the fundamental needs of students enrolling into the four year program.
- Increasing the number of relevant business and management courses required for the degree.
- The lack of relevant business courses required for the program.
- Eliminating duplicate courses and structuring the program requirements more towards management than engineering.
- Providing competent adjunct instructors in courses that previously were filled by individuals filling voids in the schedule without the necessary knowledge or skill sets to cover the subject matter in the correct way.
- Student learning outcomes need to be expanded to include leadership and team building and management requirements associated with construction management.
- Student learning outcomes need to address college goals.

D. Program Student Learning Outcomes 2010-2015

The following tables show the SLO by academic years from 2010 through 2015

Bachelor of Technology - CM		2010-2011									
Student Learning Outcomes Matrix											
Upon completing the Construction Management program, students will be able to:											
Outcomes*											
1	Knowledge in basic economic principles, business principles and construction accounting, finances, and law										
2	Exposure to the design theory and analysis of construction practices and systems										
3	Understanding of the utilization of available resources for construction planning, methods and materials										
4	Understanding, skill and knowledge of construction documents, communications, graphics, and surveys										
5	Skill and knowledge in construction accounting, estimating and bidding practices										
6	Ability for planning and scheduling a construction project										
7	Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to CM										
Required Courses		Outcomes									
Course #	Name	1	2	3	4	5	6	7			
ACC 201	Financial Accounting	3									
ECON 102	Microeconomics	3									
ECON 103	Macroeconomics	3									
ECON 261	Statistics I	3									
MGT 323	Organizational Behavior							3			
MGT 367	HR Management							3			
AC 198B	HVAC		3				3				
BI 101B	Building Codes			3							
CADD 100	Computer Aided Drafting		3								
CEE 411	Environmental Law	1									
CEE 462	Construction Cost Estimating	3				3					
CEE 463	Project Scheduling			3	3	3	3				
CEE 464	Construction Law	3			3			2			
CEE 465	Construction Cost Accounting	3				3					
CEE 466	Construction Management	3	3	3	3	3	3	3			
CEE 495	Special Topics										
CONS 108B	Methods and Materials		2	3			3				
CONS 114B	Soils, sitework, concrete testing		2								
CONS 116B	Plumbing		2				3				
CONS 118B	Construction Contract Documents				3	2					
CONS 120B	Blueprint reading		3	2		3	3				
CONS 121B	Estimating	2		2	2	3	3				
CONS 205B	Site Safety		2	2	3			3			
CONS 216B	Structural Layout Assembly		3	3			2				
CONS 230B	Electrical Distribution		3	2			3				
CONS 281B	Planning and Scheduling		2	3	2	2	3				
CONS 351	Project Supervision	2	3	3	3	2	3	3			
CONS 451	Advanced Internship	3	3	3	3	3	3	3			
SUR 161	Surveying		2		3						

Assign a value to which each outcome is represented in each required class: 1 = slightly, 2 = moderately, 3 = significantly

* **Outcomes must be measurable**

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Bachelor of Technology - CM **2011-2012**

Student Learning Outcomes Matrix

Upon completing the Construction Management program, students will be able to:

Outcomes*	
1	Knowledge in basic economic principles, business principles and construction accounting, finances, and law
2	Exposure to the design theory and analysis of construction practices and systems
3	Understanding of the utilization of available resources for construction planning, methods and materials
4	Understanding, skill and knowledge of construction documents, communications, graphics, and surveys
5	Skill and knowledge in construction accounting, estimating and bidding practices
6	Ability for planning and scheduling a construction project
7	Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to CM

Required Courses		Outcomes									
Course #	Name	1	2	3	4	5	6	7	8	9	10
ACC 201	Financial Accounting	3									
ECON 102	Microeconomics	3									
ECON 103	Macroeconomics	3									
ECON 261	Statistics I	3									
MGT 323	Organizational Behavior							3			
MGT 367	HR Management							3			
AC 198	HVAC		3				3				
BI 101	Building Codes			3							
CADD 100	Computer Aided Drafting		3								
CEE 411	Environmental Law	1									
CEE 462	Construction Cost Estimating	3				3					
CEE 463	Project Scheduling			3	3	3	3				
CEE 464	Construction Law	3			3			2			
CEE 465	Construction Cost Accounting	3				3					
CEE 466	Construction Management	3	3	3	3	3	3	3			
CEE 495	Special Topics										
CONS 108	Methods and Materials		2	3			3				
CONS 114	Soils,sitework,concrete testing		2								
CONS 116	Plumbing		2				3				
CONS 118	Construction Contract Documents				3	2					
CONS 120	Blueprint reading		3	2		3	3				
CONS 121	Estimating	2		2	2	3	3				
CONS 205	Site Safety		2	2	3			3			
CONS 216	Structural Layout Assembly		3	3			2				
CONS 230	Electrical Distribution		3	2			3				
CONS 281	Planning and Scheduling		2	3	2	2	3				
CONS 351	Project Supervision	2	3	3	3	2	3	3			
CONS 451	Advanced Internship	3	3	3	3	3	3	3			
SUR 161	Surveying		2		3						

Assign a value to which each outcome is represented in each required class: 1 = slightly, 2 = moderately, 3 = significantly

* Outcomes must be measurable

Bachelor of Technology - CM **2012-2013**

Student Learning Outcomes Matrix

Upon completing the Construction Management program, students will be able to:

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Outcomes*	
1	Knowledge in basic economic principles, business principles and construction accounting, finances, and law
2	Exposure to the design theory and analysis of construction practices and systems
3	Understanding of the utilization of available resources for construction planning, methods and materials
4	Understanding, skill and knowledge of construction documents, communications, graphics, and surveys
5	Skill and knowledge in construction accounting, estimating and bidding practices
6	Ability for planning and scheduling a construction project
7	Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to CM

Required Courses		Outcomes									
Course #	Name	1	2	3	4	5	6	7	8	9	10
ACC 201	Financial Accounting	3									
ECON 102	Microeconomics	3									
ECON 103	Macroeconomics	3									
ECON 261	Statistics I	3									
MGT 323	Organizational Behavior							3			
MGT 367	HR Management							3			
AC 198	HVAC		3				3				
BI 101	Building Codes			3							
CADD 100	Computer Aided Drafting		3								
CEE 411	Environmental Law	1									
CEE 462	Construction Cost Estimating	3				3					
CEE 463	Project Scheduling			3	3	3	3				
CEE 464	Construction Law	3			3			2			
CEE 465	Construction Cost Accounting	3				3					
CEE 466	Construction Management	3	3	3	3	3	3	3			
CEE 495	Special Topics										
CONS 108	Methods and Materials		2	3			3				
CONS 114	Soils, sitework, concrete testing		2								
CONS 116	Plumbing		2				3				
CONS 118	Construction Contract Documents				3	2					
CONS 120	Blueprint reading		3	2		3	3				
CONS 121	Estimating	2		2	2	3	3				
CONS 205	Site Safety		2	2	3			3			
CONS 216	Structural Layout Assembly		3	3			2				
CONS 230	Electrical Distribution		3	2			3				
CONS 281	Planning and Scheduling		2	3	2	2	3				
CONS 351	Project Supervision	2	3	3	3	2	3	3			
CONS 451	Advanced Internship	3	3	3	3	3	3	3			
SUR 161	Surveying		2		3						

Assign a value to which each outcome is represented in each required class: 1 = slightly, 2 = moderately, 3 = significantly

* Outcomes must be measurable

2013-2014	
Bachelor of Technology - CM	
Student Learning Outcomes Matrix	
Upon completing the Construction Management program, students will be able to:	
Outcomes*	
1	Knowledge in basic economic principles, business principles and construction accounting, finances, and

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	law
2	Exposure to the design theory and analysis of construction practices and systems
3	Understanding of the utilization of available resources for construction planning, methods and materials
4	Understanding, skill and knowledge of construction documents, communications, graphics, and surveys
5	Skill and knowledge in construction accounting, estimating and bidding practices
6	Ability for planning and scheduling a construction project
7	Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to CM

Required Courses		Outcomes									
Course #	Name	1	2	3	4	5	6	7	8	9	10
BUS 101	Intro to Business	3						2			
ACC 201	Financial Accounting	3									
ECON 102	Microeconomics	3									
ECON 103	Macroeconomics	3									
ECON 261	Statistics I	3									
MGT 323	Organizational Behavior							3			
MGT 367	HR Management							3			
BI 101	Building Codes			3							
CADD 100	Computer Aided Drafting		3								
CEE 411	Environmental Law	1									
CEE 462	Construction Cost Estimating	3				3					
CEE 463	Project Scheduling			3	3	3	3				
CEE 464	Construction Law	3			3			2			
CEE 465	Construction Cost Accounting	3				3					
CEE 466	Construction Management	3	3	3	3	3	3	3			
CEE 495	Special Topics										
CEM 330	Soils and Foundations										
CONS 108	Methods and Materials		2	3			3				
CONS 114	Soils, sitework, concrete testing		2								
CONS 118	Construction Contract Documents				3	2					
CONS 121	Estimating	2		2	2	3	3				
CONS 205	Site Safety		2	2	3			3			
CONS 216	Structural Layout Assembly		3	3			2				
CONS 281	Planning and Scheduling		2	3	2	2	3				
CONS 351	Project Supervision	2	3	3	3	2	3	3			
CONS 451	Advanced Internship	3	3	3	3	3	3	3			
SUR 161	Surveying		2		3						
IS 101	Information Systems		2		2						
IS 201	Computer Applications			2	2						

Assign a value to which each outcome is represented in each required class: 1 = slightly, 2 = moderately, 3 = significantly

* Outcomes must be measurable

2014-2015	
Bachelor of Technology - CM	
Student Learning Outcomes Matrix	
Upon completing the Construction Management program, students will be able to:	
Outcomes*	
1	Knowledge in basic economic principles, business principles and construction accounting, finances, and law Exposure to the design theory and analysis of construction practices and systems

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2	
3	Understanding of the utilization of available resources for construction planning, methods and materials
4	Understanding, skill and knowledge of construction documents, communications, graphics, and surveys
5	Skill and knowledge in construction accounting, estimating and bidding practices
6	Ability for planning and scheduling a construction project
7	Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to CM

Required Courses		Outcomes									
Course #	Name	1	2	3	4	5	6	7	8	9	10
BUS 101	Intro to Business	3						2			
ACC 201	Financial Accounting	3									
ECON 102	Microeconomics	3									
ECON 103	Macroeconomics	3									
ECON 261	Statistics I	3									
MGT 323	Organizational Behavior							3			
MGT 367	HR Management							3			
BI 101	Building Codes			3							
CADD 100	Computer Aided Drafting		3								
CEE 411	Environmental Law	1									
CEE 462	Construction Cost Estimating	3				3					
CEE 463	Project Scheduling			3	3	3	3				
CEE 464	Construction Law	3			3			2			
CEE 465	Construction Cost Accounting	3				3					
CEE 466	Construction Management	3	3	3	3	3	3	3			
CEE 495	Special Topics										
CEM 330	Soils and Foundations										
CONS 108	Methods and Materials		2	3			3				
CONS 114	Soils, sitework, concrete testing		2								
CONS 118	Construction Contract Documents				3	2					
CONS 121	Estimating	2		2	2	3	3				
CONS 205	Site Safety		2	2	3			3			
CONS 216	Structural Layout Assembly		3	3			2				
CONS 281	Planning and Scheduling		2	3	2	2	3				
CONS 351	Project Supervision	2	3	3	3	2	3	3			
CONS 451	Advanced Internship	3	3	3	3	3	3	3			
SUR 161	Surveying		2		3						
IS 101	Information Systems		2		2						
IS 201	Computer Applications			2	2						

Assign a value to which each outcome is represented in each required class: 1 = slightly, 2 = moderately, 3 = significantly

* Outcomes must be measurable

E. Degrees or Certificates Offered:

- Bachelor of Technology – Construction Management
- 30 hour OSHA Safety card

F. Niches Served:

- Community and campus service projects

- Play set design and construction for the Western Nevada Theatre Company
- Active involvement in area High School CTE programs
- Engagement with professional construction organizations

2. Quality of Program

The Bachelor of Technology – Construction Management programs has produced approximately 40 graduates that are currently employed in construction related careers across the country (based on informal follow up data). In the past the curriculum was saturated with fundamental trade skill curriculum that only allowed students to learn the specifics related to the trade not how to manage that trade. Since the fall 2014 semester steps have been taken to re-develop the current two year AAS – Construction Technology program towards becoming a strong foundation for the four year degree. Students will learn the work breakdown structures of each milestone activity of a commercial construction project plus problem solving and critical thinking processes associated with the uniqueness of each site. Additional changes are expected in the current four year curriculum that will enhance the total learning experience towards construction management. These changes will match or exceed what are offered at other schools that offer two and four year construction related degrees and certificates.

Currently, the faculty involved in the construction program are developing online course work that will offer students the flexibility to either complete course work on line or in class. Providing a 21st Century approach to learning should benefit the students that are seeking an education but live in rural areas of the state. Unlike most four year programs at major universities WNC wants to target non-traditional students that are currently working in the construction industry and want to enhance their advancement opportunities or those that have found themselves in a career that has grown stagnant or obsolete and want to enter into a new career.

A. Evidence of Effectiveness

i. Course Scheduling/Enrollment History Report:

The 4 year course history for the BTECH Construction Management is summarized in the table below. An analysis of the table shows:

- Selected courses offered twice per academic year, as opposed to once, ran with low enrollment.
- Spring 2015 semester total student count averages 73% higher than each of the three previous semesters.
- Spring 2015 total student count in CONS 451: Internship in Construction is 40% higher than the three previous semesters combined.

The full Course Scheduling Matrix is shown in Attachment A.

BTECH Course History										
Prefix	Title	Fall 2011	Spr 2012	Fall 2012	Spr 2013	Fall 2013	Spr 2014	Fall 2014	SP 2015 prelim	Total student per course (over 4 academic years)
CONS 451	Adv Internship in Const		7	4	4	2	2	1	7	27
CEE 463	Project Scheduling		5		9	2	4	4	2	26
CEE 466	Construction Mgmt.		2	6		3	7		4	22
CEE 465	Const Cost Accounting	7		7	2	3		8		27
CEM 456	Cons Mgt Capstone		4		9		2		3	18
CEE 462	Const Cost Estimating		9		4		5	7	3	28
CEM 330	Soils and Found. for Cons					8			5	13
CEE 464	Construction Law		12			3	6		6	27
CONS 351	Adv Project Supervision	8		7		8		5		28
CEE 495	Special Topics		6		9				10	25
CEE 411	Environmental Law	16	5	8					6	35
Total student count per semester		31	50	32	37	29	26	25	46	

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ii. Summary Data -

Summary Data Worksheets generated by IR are no longer available.

Enrolled by Major and Semester: The chart below represents the summary numbers for students in the declared BTECH major by semester.

Description	Fall 2011	Spr 2012	Fall 2012	Spr 2013	Fall 2013	Spr 2014	Fall 2014
Number Students declared BTECH major	49	49	33	39	42	32	32

WNC Awards: The BTECH Construction Management program represents a small percentage (1.5%) of the total graduates (2010-2014). Per the chart below, this percent is comparable to the awards granted in Associate level CTE programs. It is currently the only Bachelor level program offered by WNC.

DEGREE	DESCRIPTION	CIP_CODE	2010	2011	2012	2013	2014	Totals	Percent of Total
	Total Awards (all programs)		474	494	495	522	564	2,549	
AAS	Construction Project Mgt.	46.0499	13	5	3	5	3	29	
AAS	Technology - Construction	46.0415	0	0	0	0	1	1	
Subtotal AAS level Construction								30	1.2%
BT	BTECH Construction Mgmt.	46.0412	6	11	5	4	11	37	1.5%
AAS	Machine Tool Technology	48.0501	5	3	4	5	5	22	
AAS	Technology - Machine Tool	48.0501	0	0	0	0	1	1	
CT	Machine Tool Technology Cert	48.0501	1	3	2	0	1	7	
Subtotal AAS level Machine Tool Programs								30	1.2%
AAS	Technology - Welding	48.0508	0	0	0	0	1	1	
AAS	Welding Technology	48.0508	3	0	1	2	1	7	
Subtotal AAS level Welding Programs								8	0.3%

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Course Completion: The chart below shows the success rate for BTECH courses for a five year period from 2001-2014. An analysis of this chart shows:

- Course completion rates average 93% across five years
- Course completion rates dipped below the five year institutional average of 82% in only 3 of 45 sections
- 64% of sections across the five years had 100% completion

WNC Course Success Rates by Academic Year								
<small>(Total students with C- and above, P, or S grades/total enrolled after removing audits, incompletes and missing grades. Must have at least a total of 10 students enrolled.)</small>								
Subject	Catalog No	Title	2009-10	2010-11	2011-12	2012-13	2013-14	Total_Enrolled
CEE	411	Environmental Law	62.5		85.7	75.0		45
CEE	462	Const Cost Estimating	92.9	91.7	66.7	100.0	100.0	44
CEE	463	Project Scheduling	100.0	100.0	80.0	100.0	100.0	37
CEE	464	Construction Law	100.0		100.0		100.0	33
CEE	465	Const Cost Accounting	100.0	83.3	100.0	88.9	100.0	38
CEE	466	Construction Management	100.0	100.0	100.0	100.0	80.0	38
CEE	495	Special Topics	100.0	57.1	83.3	100.0		29
CEM	456	Cons Mgt Capstone	100.0	87.5	100.0	100.0	100.0	35
CONS	351	Adv Project Supervision	100.0	100.0	100.0	85.7	87.5	37
CONS	451	Adv Internship in Const	100.0	100.0	71.4	100.0	100.0	34

iii. Systematic Assessment

There is no current history available concerning assessment associated with this program. The Institutional Research department provided data relating to enrollment and completion in a limited capacity. Some minor changes to required courses have been made prior to the fall 2014 semester but no effort was placed in developing a specific review and assessment process. Student Learning Outcomes, course requirements, and course sequencing are being addressed and will be updated by the fall 2016 semester with a yearly assessment process in place.

B. Evidence of Satisfaction

Currently, the Institutional Research department has not been able to provide hard data that provides evidence of student satisfaction. Course evaluations cannot be easily tabulated due to the process in which they are prepared and filed. It should be noted that the writer of this review was told by both students and industry partners that the program is currently implementing the necessary changes that should be competitive to other programs across the country. Course evaluation data is now being retained for future reports.

C. Certifications/Licenses

Currently there are two certifications offered through this program OSHA Safety and Residential Inspection training is available with the OSHA training being mandatory in the core requirements of the degree, The construction industry requires the 10 hr training for the skills trade workers and the 30 hr training is required for supervisory or management workers.

In the future the program may offer Basic Crew Leader and Supervisory certifications through the National Center for Construction Education and Research (NCCER) a process that will enhance the employability skills for our graduates.

D. Enrollment Trends

- a. What student demographic and enrollment trends are most notable? *See Attachment B – Course Completion Rates 2010-2014.* According to the data provided by Institutional Research in the years 2011-2012, 2012-2013 female enrollment increased by 11% and increased another 16% between years 2012-2013, 2013-2014.
- b. What groups constitute the program's main demographic? *See Attachment B – Course Completion Rates 2010-2014.* According to the data white students make up 71% of the program enrollment with 85-90% total enrollment being male.
- c. What efforts have been made by the program to recruit students? The following procedures have been implemented starting fall 2014:
 - Established an active construction industry advisory board that provides guidance and internship opportunities
 - Conducted community service projects that were promoted in local news papers
 - Developed a construction academy for area high school students interested in construction careers using the NCCER process
 - Developed a structured course schedule that is constant and does not conflict with other required courses
 - Established relationships with local workforce development organizations
 - Participate in area career fairs
 - Engage construction industry organizations and participate in their workforce development opportunities
 - Established relationships with other two year colleges through strong articulation agreements
- d. What initiatives have been undertaken to increase FTE?

The program is currently developing online courses in both the two year and four year programs for student convenience. The majority of courses are scheduled late in the afternoon or evening to allow students working full time to participate. Adjunct instructors must hold specific qualifications and experience before being allowed to instruct courses and office hours are required to provide struggling students an opportunity to address their concerns or problems with the course. To expand program opportunities courses are now being offered through the ITV technology to the Fallon campus.

The initiatives described above should generate more FTEs in the future. The trend to increased enrollment coincides with industry demand. According to the Bureau of Labor Statistics the state of Nevada is currently experiencing a rise in demand for competent and qualified construction workers. According to past data, enrollment increases with an improved economy.

e. What initiatives have been undertaken to improve student retention?

The following initiatives have been undertaken to improve student retention:

- Established a set course schedule
- Established a direct link to internship opportunities through the program's advisory board
- Provide competent and qualified instructors
- Provide updated technology that is currently used in the industry
- Introduced project based learning into all curriculum

The initiatives listed below should improve student retention in the BT program. According to the enrollment data provided by Institutional Research there were semesters where only a few required courses were offered. This extends the time it takes to complete the degree plan thus creating a loss of interest. The added convenience of having internship opportunities in house removes barriers that are present when applying for work off the street. In the past adjunct positions were filled with anyone interested in helping even if their qualifications did not match the content of the course which generates a lack of interest in students. Finally, with the introduction of project based learning the students get to experience real world applications and processes that take the lessons learned through lecture and apply them to real world scenarios.

E. Need for the Program

According to the Bureau of Labor Statistics Data (graphic pg. 6) the demand for construction workers in Northern Nevada has been slowly increasing each year since January, 2012. The Bachelor's Degree here at WNC provides the necessary qualifications to satisfy the base or fundamental criteria for any entry level construction management position across the nation. Once the curriculum is completely developed online it will fill an additional need for those that currently work in the construction industry but live in rural areas of the state.

Currently there are only two four year programs in construction management offered in the state. Here at WNC and the other being UNLV. With the increased demand from the industry the need for this particular program increases with every building permit awarded for new

WNC Bachelor of Technology Construction Management Program Review

construction projects. The program receives requests from the industry for interns every week. Fortunately at the time of this report the majority of the students enrolled in the program are working and receiving on-the-job training from our industry partners.

The detailed analysis of the data indicates the primary areas for improvement are increasing course enrollment and efficiency of delivery (scheduling). Several initiatives towards those goals have been explored since the new program instructor started in fall 2014. Some efforts have not launched and it will be one to three years before the BTECH program can expect to see impact. Efforts include:

1. BTECH was designed to be a continuation of the AAS Construction Management program. Efforts made to increase enrollment and completion at the Associate level should cultivate growth in the Bachelors program. For the Fall 2015 semester, a Construction Management Academy and concentrated K-12 recruiting is underway.
2. Agreements with TMCC for a 2+2 program with AAS graduates are being developed
3. A partnership with UNLV is being explored to accommodate some of the needs for both programs.
4. Credit for Prior Learning is being considered with CLEP testing opportunities.
5. Experiential Credit up to 15 credits with verifiable related work history.
6. Outreach to construction employers for internships, placements and recruitment of incumbent workers.
7. Conversion of instructor led courses to on-line delivery should expand the pool of potential students by reaching working adults and students in rural areas.
8. Construction focused marketing efforts which include local career fairs, industry events, and high school campus visits.

F. Curriculum Review Report:

See Attachment C

G. Findings and Recommendations

Attachment A – BTECH Course History Report

LOCATION	CLASS	CLASS TITLE	Fall 2011	Spr 2012	Sum 2012	Fall 2012	Spr 2013	Sum 2013	Fall 2013	Spr 2014	Sum 2014	Fall 2014	Spr 2015 preli m	GRAND TOTAL ENROLL
CARSON	CEE 411	Environmental Law	16	0	0	0	0	0	0	0	0	0	0	16
CARSON	CEE 411	Environmental Law	0	5	0	0	0	0	0	0	0	0	6	11
CARSON	CEE 411	Environmental Law	0	0	0	8	0	0	0	0	0	0	0	8
CARSON	CEE 411	Environmental Law	0	0	0	0	0	0	0	0	0	0	0	0
CARSON	CEE 462	Const Cost Estimating	0	0	0	0	0	0	0	0	0	7	3	10
CARSON	CEE 462	Const Cost Estimating	0	0	0	0	0	0	0	5	0	0	0	5
CARSON	CEE 462	Const Cost Estimating	0	9	0	0	0	0	0	0	0	0	0	9
CARSON	CEE 462	Const Cost Estimating	0	0	0	0	4	0	0	0	0	0	0	4
CARSON	CEE 463	Project Scheduling	0	0	0	0	0	0	0	0	0	0	2	2
CARSON	CEE 463	Project Scheduling	0	0	0	0	9	0	0	0	0	0	0	9
CARSON	CEE 463	Project Scheduling	0	5	0	0	0	0	0	0	0	0	0	5
CARSON	CEE 463	Project Scheduling	0	0	0	0	0	0	0	4	0	0	0	4
CARSON	CEE 463	Project Scheduling	0	0	0	0	0	0	0	0	0	4	0	4
CARSON	CEE 463	Project Scheduling	0	0	0	0	0	0	2	0	0	0	0	2
CARSON	CEE 464	Construction Law	0	12	0	0	0	0	0	0	0	0	6	18
CARSON	CEE 464	Construction Law	0	0	0	0	0	0	0	6	0	0	0	6
CARSON	CEE 464	Construction Law	0	0	0	0	0	0	3	0	0	0	0	3
CARSON	CEE 465	Const Cost Accounting	0	0	0	0	0	0	0	0	0	6	0	6
CARSON	CEE 465	Const Cost Accounting	0	0	0	0	0	0	3	0	0	0	0	3
CARSON	CEE 465	Const Cost Accounting	0	0	0	0	0	0	0	0	0	2	0	2

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CARSON	CEE 465	Const Cost Accounting	7	0	0	0	0	0	0	0	0	0	0	7
CARSON	CEE 465	Const Cost Accounting	0	0	0	7	0	0	0	0	0	0	0	7
CARSON	CEE 465	Const Cost Accounting	0	0	0	0	2	0	0	0	0	0	0	2
CARSON	CEE 466	Construction Management	0	0	0	0	0	0	0	0	0	0	4	4
CARSON	CEE 466	Construction Management	0	0	0	0	0	0	0	7	0	0	0	7
CARSON	CEE 466	Construction Management	0	2	0	0	0	0	0	0	0	0	0	2
CARSON	CEE 466	Construction Management	0	0	0	6	0	0	3	0	0	0	0	9
CARSON	CEE 495	Special Topics	0	0	0	0	9	0	0	0	0	0	0	9
CARSON	CEE 495	Special Topics	0	6	0	0	0	0	0	0	0	0	0	6
WEB	CEE 495	Special Topics	0	0	0	0	0	0	0	0	0	0	10	10
CARSON	CEM 330	Soils and Foundations for Cons	0	0	0	0	0	0	8	0	0	0	0	8
CARSON	CEM 330	Soils and Foundations for Cons	0	0	0	0	0	0	0	0	0	0	5	5
CARSON	CEM 456	Cons Mgt Capstone	0	4	0	0	0	0	0	0	0	0	0	4
CARSON	CEM 456	Cons Mgt Capstone	0	0	0	0	9	0	0	0	0	0	0	9
CARSON	CEM 456	Cons Mgt Capstone	0	0	0	0	0	0	0	2	0	0	0	2
CARSON	CEM 456	Cons Mgt Capstone	0	0	0	0	0	0	0	0	0	0	3	3
CARSON	CONS 351	Adv Project Supervision	0	0	0	7	0	0	0	0	0	0	0	7
CARSON	CONS 351	Adv Project Supervision	0	0	0	0	0	0	0	0	0	5	0	5
CARSON	CONS 351	Adv Project Supervision	8	0	0	0	0	0	0	0	0	0	0	8
CARSON	CONS 351	Adv Project Supervision	0	0	0	0	0	0	8	0	0	0	0	8
CARSON	CONS 451	Adv Internship in Const	0	7	0	4	4	0	2	2	0	1	7	27

Attachment B – Course Completion Rates 2010-2014

WNC Course Success Rates - Five Years for Women, Men, Minority, and Non-minority Students							
<small>(Total students with C- and above, P, or S grades/total enrolled after removing audits, incompletes and missing grades. Must have at least a total of 10 students enrolled.)</small>							
Subject	Catalog No	Title	Women	Men	Minority	Non-minority	Total_Enrolled
CEE	411	Environmental Law	71.4	76.3	60.0	77.5	45
CEE	462	Const Cost Estimating	80.0	89.7	80.0	89.7	44
CEE	463	Project Scheduling	100.0	97.1	100.0	96.9	37
CEE	464	Construction Law	100.0	100.0	100.0	100.0	33
CEE	465	Const Cost Accounting	100.0	93.9	80.0	97.0	38
CEE	466	Construction Management	100.0	93.9	83.3	96.9	38
CEE	495	Special Topics	100.0	84.6	100.0	84.6	29
CEM	456	Cons Mgt Capstone	100.0	96.9	100.0	96.7	35
CONS	351	Adv Project Supervision	100.0	94.1	80.0	96.9	37
CONS	451	Adv Internship in Const	100.0	93.5	75.0	96.7	34

Attachment C – Curriculum Review Report

Curriculum Review Report

Bachelor of Technology

Fall 2015

- 1) **Mission Statement** - The mission of the Bachelor of Technology degree in Construction Management is to prepare students for entry level and mid-level positions within the various construction industry disciplines, and to meet the goals of the Technology Division.

Student Learning Outcomes:

- Knowledge in basic economic principals, business principals and construction accounting, finances, and law
 - Exposure to the design theory and analysis of construction practices and systems
 - Understanding of the utilization of available resources for construction planning, methods and materials
 - Understanding, skill and knowledge of construction documents, communications, graphics, and surveying
 - Skill and knowledge in construction estimating and bidding practices
 - Ability for planning and scheduling a construction project
 - Application of relevant administrative skills, ethics, safety practices, and problem solving techniques to construction management
- 2) Since the fall 2010 semester there were limited changes made to the original curriculum developed when the program was implemented. The majority of the lower level 100 and 200 courses were focused on trade skills that did not provide the necessary management instruction to prepare those students interested in continuing into the four year degree. The four year degree curriculum was a combination of civil engineering and construction management courses that when combined did not provide the necessary management instruction to provide the students the necessary fundamental knowledge to excel in a construction management career. Since the turn of the century the construction industry has changed drastically becoming more technology focused and management based. Compared to programs across the country it is apparent changes are necessary before this curriculum will satisfy the current management needs of the industry.
 - 3) According to the data received from Institutional Research a clear sequence of course offerings has not been maintained. Students have been allowed to enroll in any course that fit their schedules even if pre-requisites were not met. Low enrollment numbers could be to blame but one apparent problem is the lack of planning by past faculty or administrators. It is very important to provide students a structured sequence of course offerings so they can develop a path through the curriculum that allows them to complete the requirements in a timely manner. The faculty are in the process of developing a set of sequenced course offerings that will allow the students to follow prerequisite requirements. This should build cohesion between course offerings and allow completion of the degree on time.
 - 4) There is no evidence that courses have been scheduled in a manner that allows students to complete the program in a timely manner. According to the data provided by Institutional Research courses were offered in a

WNC Bachelor of Technology Construction Management Program Review

random fashion. The faculty related to the program are in the process of developing an eight semester schedule that will be locked into place in fall 2016. Currently, the course requirements are being changed to meet the needs of the accreditation process and after the changes are adopted the program will follow a set schedule that will benefit students and hopefully enhance retention rates.

- 5) There is no history available concerning any formal review process for required or recommended courses related to this program.
- 6) There is no history available concerning any formal review of the general requirements associated with this program.
- 7) The catalog information associated with this program has only changed when new courses were added to the requirements. The current 2015-2016 catalog includes the lower level 100-200 course changes approved fall 2014. The faculty associated with this program is in the process of completing the necessary course changes to meet accreditation requirements and will be identified in the 2016-2017 catalog.
- 8) Attach course outlines associated with this program
- 9) Although a requirement for course syllabi, there is no evidence of a programmatic focus on information literacy at this time. The library provides a huge selection of old text books, industry related videos and other resources that can provide students additional learning opportunities when necessary.

At



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Catalog: 2015–2016 Catalog Year

CADD 100: Introduction to Computer Aided Drafting

General Information

- ✦ **Name:** Introduction to Computer Aided Drafting
- ✦ **Discipline:** Computer Aided Drafting (CADD)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** IS 101, MATH 110 or higher
- ✦ **Recommended:** DFT 100, COT 204 or equivalent experience

Course Outline

I: Catalog Course Description

Uses AutoCAD software to produce working drawings. Emphasizes constructing and editing two-dimensional geometry and placing drawing annotation.

II: Course Objectives

Upon completion of this course the student should be able to:

- ✦ Work with drawing files
- ✦ Create and place basic two dimensional drawing objects
- ✦ Edit drawing objects
- ✦ Control viewing of drawing
- ✦ Use drawing aids
- ✦ Place and edit text
- ✦ Use basic dimensioning commands to dimension a drawing
- ✦ Create and use layers
- ✦ Set and edit object properties
- ✦ Print/plot drawings on media

III: Course Linkage

Linkage of course to educational program mission and at least one educational program outcome.

The mission of the Associate Applied Science in Drafting Technology is to provide employment-related knowledge and skills necessary to succeed in the current drafting environment.

This course addresses the following Associate of Applied Science Degree Student Learning Objectives of ensuring that students:

- ✦ Have knowledge of the subject matter to a level appropriate for the emphasis of their degree.
- ✦ Can acquire the skills and perform the tasks necessary for meaningful employment and career enhancement.
- ✦ Are able to present themselves effectively to a potential employer.
- ✦ Utilize effective communication and computation skills.
- ✦ Make use of all available resources in order to remain current in their chosen career field.

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Catalog: 2015–2016 Catalog Year

CONS 108: Construction Materials and Methods

General Information

- ✦ **Name:** Construction Materials and Methods
- ✦ **Discipline:** Construction (CONS)
- ✦ **Units (Credits):** 4
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** [Career and Technical Education](#)

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** MATH 110 or higher

Course Outline

I: Catalog Course Description

Studies the various types of buildings and structures utilized in industrial, commercial and residential construction. Examines peculiarities and potential problem areas for each type of construction. Construction sequencing, inspection sequencing and required testing will be outlined as well as observable "red flags" that can be indicative of potential problems.

Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

II: Course Objectives

Introduce the fundamental principles and practices common to the industry for materials familiarization and construction methods.

Provide exposure to common software and calculators.

Prepare the student for estimating and other construction courses.

III: Course Linkage

Linkage of course to educational program mission and at least one educational program outcome.

This course is a required in the Associate of Applied Science Degree in Construction Technology, Construction Project Management, and may be used to fulfill the requirement in a partnership program for a Bachelor of Technology Degree in Construction Management.

The mission of the Associate of Applied Science Degree in Construction Technology, Construction Project Management is to provide management training that addresses topics of critical importance to subcontractors, general contractors, superintendents and project managers.

This course fulfills Western Nevada College's Student Learning Objectives of ensuring that successful students:

- ✦ Have knowledge of the subject matter to a level that is appropriate to the construction industry.
- ✦ Possess the skills necessary to perform essential tasks within the construction industry.

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Search:

Catalog: 2015–2016 Catalog Year

CONS 109: Construction Materials and Methods II

General Information

- ✦ **Name:** Construction Materials and Methods II
- ✦ **Discipline:** Construction (CONS)
- ✦ **Units (Credits):** 4
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 108

Course Outline

I: Catalog Course Description

Teaches students about the typical materials used in the construction of bridges, roads, pathways, and small commercial buildings. Includes testing procedures, material properties, design, specification, and installation methods using certification standards and guidelines.

Non-transferable for a NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Catalog: 2015–2016 Catalog Year

CONS 118: Construction Contract Documents

General Information

- ✦ **Name:** Construction Contract Documents
- ✦ **Discipline:** [Construction](#) (CONS)
- ✦ **Units (Credits):** 2
- ✦ **Transfer Information:** **Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** BUS 107, ENG 100 or higher with C average

Course Outline

I: Catalog Course Description

Explores various bid documents including architectural and engineering blueprints, shop drawings and proposals. Common construction contracts and their implications will be explained as well as accepted procedures for resolution of contract disputes. Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Catalog: 2015-2016 Catalog Year

CONS 120: Blueprint Reading and Specification

General Information

- ✦ **Name:** Blueprint Reading and Specification
- ✦ **Discipline:** Construction (CONS)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education
- ✦ **Prerequisites:** None

Course Outline

I: Catalog Course Description

Equips students with technical and practical interpretation of blueprints. Assignments are made in relation to complete sets of working drawings. Students study construction relationships between architectural, structural, electrical and mechanical drawings, bidding along with inspection procedure technique.
 Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

II: Course Objectives

Introduction to the fundamental principles and practices common to the industry.

Provide exposure to common software.

Prepare the student for working with blueprints and construction take-off estimates.

III: Course Linkage

Linkage of course to educational program mission and at least one educational program outcome.

This course is a required course in the Associate of Applied Science Degree in Construction Technology, Construction Project Management, and may be used to fulfill the requirement in a partnership program for a Bachelor of Technology Degree in Construction Management.

The mission of the Associate of Applied Science Degree in Construction Technology, Construction Project Management is to provide management training that addresses topics of critical importance to subcontractors, general contractors, superintendents and project managers.

This course fulfills Western Nevada College's Student Learning Objectives of ensuring that successful students:

- ✦ Have knowledge of the subject matter to a level that is appropriate to the construction industry.
- ✦ Possess the skills necessary to perform essential tasks within the construction industry.
- ✦ Can effectively use the communication and computational skills necessary for the construction industry.
- ✦ Are able to utilize all available resources in order to remain current in the construction industry.
- ✦ Develop an appreciation of the importance of social, ethical, legal and diversity issues.

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Catalog: 2015–2016 Catalog Year

CONS 121: Principles of Construction Estimating

General Information

- ✦ **Name:** Principles of Construction Estimating
- ✦ **Discipline:** Construction (CONS)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 216, CONS 120

Course Outline

I: Catalog Course Description

Presents basic criteria and procedure for estimating labor and material in residential and commercial applications.

Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

II: Course Objectives

Introduction to the fundamental principles and practices common to the construction industry.

Provide exposure to common software.

III: Course Linkage

Linkage of course to educational program mission and at least one educational program outcome.

This course is a required in the Associate of Applied Science Degree in Construction Technology, Construction Project Management, and may be used to fulfill the requirement in a partnership program for a Bachelor of Technology Degree in Construction Science.

The mission of the Associate of Applied Science Degree in Construction Technology, Construction Project Management is to provide management training that addresses topics of critical importance to subcontractors, general contractors, superintendents and project managers.

This course fulfills Western Nevada College's Student Learning Objectives of ensuring that successful students:

- ✦ Have knowledge of the subject matter to a level that is appropriate to the construction industry.
- ✦ Possess the skills necessary to perform essential tasks within the construction industry.
- ✦ Can effectively use the communication and computational skills necessary for the construction industry.
- ✦ Are able to utilize all available resources in order to remain current in the construction industry.
- ✦ Develop an appreciation of the importance of social, ethical, legal and diversity issues.

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Catalog: 2015–2016 Catalog Year

CONS 205: Construction Site Safety

General Information

- **Name:** Construction Site Safety
- **Discipline:** Construction (CONS)
- **Units (Credits):** 1–3
- **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- **Academic Division:** Career and Technical Education
- **Prerequisites:** None

Course Outline

I: Catalog Course Description

Includes ten hours of authorized training addressing the OSHA construction standards. Additional topics include the identification of asbestos, lead and radon in potential construction projects. Upon completion, students will be issued a course completion wallet card by the U.S. Department of Labor's Occupational Safety and Health Administration.

Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Catalog: 2015–2016 Catalog Year

CONS 216: Structural Layout Assembly

General Information

- ✦ **Name:** Structural Layout Assembly
- ✦ **Discipline:** Construction (CONS)
- ✦ **Units (Credits):** 2
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 205, CONS 108, MATH 110 or higher

Course Outline

I: Catalog Course Description

Studies correct layout procedures for flooring systems, walls and roof systems as well as the integration of all structural components utilized in these systems. (wood frame emphasis) A portion of the course is practical and the student will lay out a floor system, roof system and construct a bearing wall to industry standards.
Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Catalog: 2015–2016 Catalog Year

CONS 281: Construction Planning Scheduling And Control

General Information

- ✦ **Name:** Construction Planning Scheduling And Control
- ✦ **Discipline:** [Construction](#) (CONS)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** [Career and Technical Education](#)

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** [CONS 216](#)

Course Outline

I: Catalog Course Description

Explores project implementation including logistics, scheduling, delegation of responsibility and quality control.

Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Catalog: 2015–2016 Catalog Year

CONS 351: Advanced Project Supervision

General Information

- **Name:** Advanced Project Supervision
- **Discipline:** [Construction](#) (CONS)
- **Units (Credits):** 3
- **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- **Academic Division:** [Career and Technical Education](#)

Prerequisites and Recommended Courses

- **Prerequisites:** [CONS 121](#), [CONS 281](#) Admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Provides the management skills for on-site execution of a construction project. Topics include skills and techniques recognized by industry as essential for the contemporary field superintendent.

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Catalog: 2015–2016 Catalog Year

CONS 451: Advanced Internship in Construction

General Information

- ✦ **Name:** Advanced Internship in Construction
- ✦ **Discipline:** [Construction \(CONS\)](#)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information:** **Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** [Career and Technical Education](#)

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** [CONS 281](#) admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Studies project management techniques on-site under the supervision of a project manager or superintendent.

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Catalog: 2015–2016 Catalog Year

CEM 100: Fundamentals of Construction Management

General Information

- ✦ **Name:** Fundamentals of Construction Management
- ✦ **Discipline:** Construction Management (CEM)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education
- ✦ **Prerequisites:** None

Course Outline

I: Catalog Course Description

Provides an overview of the construction industry roles, responsibilities, and risks from perspectives of owners, constructors, designers, financial institutions, and government agencies. Study of construction process techniques and applications.

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Catalog: 2015–2016 Catalog Year

CEM 330: Soils and Foundations for Construction

General Information

- ✦ **Name:** Soils and Foundations for Construction
- ✦ **Discipline:** Construction Management (CEM)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 114 Acceptance into the BTech program, or consent of advisor.

Course Outline

I: Catalog Course Description

Introduction to basic concepts of soils and foundations including compaction, compressibility, settlement, shear strength and site investigations.

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Catalog: 2015–2016 Catalog Year

CEE 411: Environmental Law

General Information

- ✦ **Name:** Environmental Law
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Examines current federal laws, rules and regulations concerning the environment. Emphasis on court decisions and interpretations of the law.

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Catalog: 2015–2016 Catalog Year

CEE 462: Construction Cost Estimating

General Information

- ✦ **Name:** Construction Cost Estimating
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 121, MATH 126 or higher, admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Develops students full comprehension of cost estimation in all aspects of construction. Covers quantity take-off, labor cost, equipment costs, subcontracts, overhead costs, profit, and bidding. Special emphasis will be placed on commercial construction.

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Catalog: 2015–2016 Catalog Year

CEE 463: Project Scheduling

General Information

- ✦ **Name:** Project Scheduling
- ✦ **Discipline:** [Civil Engineering](#) (CEE)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** [Career and Technical Education](#)

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** [CONS 281](#), [MATH 127](#) or higher, admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Covers project planning, order of project completion, scheduling basics, types of schedules, schedule outputs and reports, project progress, special topics.

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Catalog: 2015–2016 Catalog Year

CEE 464: Construction Law

General Information

- ✦ **Name:** Construction Law
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 2
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Covers bids and bid mistakes, contracts and contract documents, performance, liens, bonds, and arbitration vs. litigation, including case studies.

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Catalog: 2015–2016 Catalog Year

CEE 465: Construction Cost Accounting

General Information

- ✦ **Name:** Construction Cost Accounting
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 2
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** ACC 201 and admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Explores direct material costs, direct labor costs, other direct costs, indirect costs, progress billings, profitability and economic survival.

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CEE 465: Construction Cost Accounting

General Information

- ✦ **Name:** Construction Cost Accounting
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 2
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** ACC 201 and admission to the BTech program or consent of advisor

Course Outline

I: Catalog Course Description

Explores direct material costs, direct labor costs, other direct costs, indirect costs, progress billings, profitability and economic survival.

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Catalog: 2015–2016 Catalog Year

CEE 466: Construction Management

General Information

- **Name:** Construction Management
- **Discipline:** Civil Engineering (CEE)
- **Units (Credits):** 2
- **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- **Prerequisites:** CEM 456 admission to the BTech program or consent of advisor
- **Corequisites:** CEM 456

Course Outline

I: Catalog Course Description

Covers material to help students develop an understanding in the practices of construction management, taking into account construction manuals developed by the industry. Focuses on heavy civil projects and encourages participants to develop a complete bid package of such projects.

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Catalog: 2015–2016 Catalog Year

CEE 495: Special Topics

General Information

- ✦ **Name:** Special Topics
- ✦ **Discipline:** Civil Engineering (CEE)
- ✦ **Units (Credits):** 3
- ✦ **Transfer Information: Courses with numbers 300 to 499:** This is an upper division course that is designed to apply toward a WNC bachelor's degree, depending on the degree chosen. It may also transfer to other colleges and universities. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 108, CONS 114, CEM 456 admission to the BTech program or consent of advisor.

Course Outline

I: Catalog Course Description

Allows for study and/or experimentation in areas of special current and modern fields that concern construction managers. The course will train students to research different possibilities and their implications for the modern construction industry.

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Catalog: 2015–2016 Catalog Year

SUR 119: Construction Surveying

General Information

- ✦ **Name:** Construction Surveying
- ✦ **Discipline:** Surveying (SUR)
- ✦ **Units (Credits):** 2–4
- ✦ **Transfer Information: Courses with numbers 100 to 299:** This course is designed to apply toward a WNC degree and/or transfer to other schools within the Nevada System of Higher Education, depending on the degree chosen and other courses completed. It may transfer to colleges and universities outside Nevada. For information about how this course can transfer and apply to your program of study, please contact a counselor.
- ✦ **Academic Division:** Career and Technical Education

Prerequisites and Recommended Courses

- ✦ **Prerequisites:** CONS 108 or consent of instructor

Course Outline

I: Catalog Course Description

Presents care and use of surveying equipment. Profile elevation and closed traverse projects will provide hands-on experience. Construction staking will be explained in detail.

Note: Non-transferable for an NSHE baccalaureate degree. Non-applicable towards an AA or AS Degree.

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Attachment E – Five Year Assessment Plan

Outcomes	Year 1	Year 2	Year 3	Year 4	Year 5	Means of Assessment
Year	2015	2016	2017	2018	2019	
CEM 100 – Pre-test student’s fundamental knowledge of the construction management process.	X	X	X	X		Students will be given a multiple choice exam with 50 questions relating to fundamental construction management roles and responsibilities
CONS 291 – Post-test student’s fundamental knowledge of the construction management process.		X	X	X	X	Students will be given the same exam as given in CEM 100. Scores can be compared to determine a learning curve associated with SLO
CEM 456 – Post-test of all the required SLO associated with the four year degree including general studies, business, and management and construction courses.	X	X	X	X	X	Students are assigned a bid process project that follows the general requirements of an actual bid package. Grading will be based on project content and presentation before members of the advisory board. This project will determine if the existing SLO associated with the degree are providing the content that meets industry expectations

Five Year Assessment Plan

Program Name: Bachelor of Applied Science – Construction Management

Submission Date: 09/18/2015

List the program outcomes and/or student learning outcomes and briefly describe the means of assessment for each one. Insert an “X” in the column of each year the outcome will be assessed.