

**İNŞAAT MÜHENDİSLİĞİ PROGRAMLARINDA YAPIM YÖNETİM EĞİTİMİNİN KARŞILAŞTIRILMASI**  
**(TÜRKİYE VE KKTC ÖRNEKLEMİ)**  
**A COMPARATIVE OF CONSTRUCTION MANAGEMENT EDUCATION IN CIVIL ENGINEERING**  
**PROGRAMS (TÜRKİYE AND TRNC SAMPLE)**

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**ÖZET**

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Yapım yönetimi, inşası yapılacak olan yapının planlama aşamasından yapıyı tamamlayıp yıkım sürecinin bitimine kadar süren uzun ve karmaşık bir süreçtir. Bu sürecin yönetilmesi alanında uzman bireylerle verimli ve faydalı olmaktadır. Bu çalışmada, Türkiye ve Kuzey Kıbrıs Türk Cumhuriyeti (KKTC)'nde bulunan inşaat mühendisliği programlarında, lisans düzeyinde verilen yapım yönetimi eğitiminin değerlendirilmesi, güncel durumunun sergilenmesi, ders içeriklerinin analiz edilmesi ve iki ülkede verilen bu dersin ve ders içeriklerinin karşılaştırılması amaçlanmıştır. Bu amaç doğrultusunda Türkiye'de ve KKTC'de bulunan bütün üniversitelerin (devlet ve vakıf) inşaat mühendisliği lisans programları araştırma kapsamına dahil edilmiştir. Sonuç olarak; 2022 yılı eylül ayı itibarıyla Türkiye'de 117 üniversitede inşaat mühendisliği programının bulunduğu, bunlardan 61 üniversitede yapım yönetimi ve ilişkili derslerin yer aldığı görülmüştür. KKTC'de 9 üniversitede inşaat mühendisliği programı bulunduğu, bunlardan 7 üniversitede yapım yönetimi ve ilişkili derslerin yer aldığı görülmüştür. Ders içerikleri incelendiğinde yaklaşık %80 oranında benzerlik gösterdiği, büyük bir çoğunluğun dersin ismini yapım yönetimi olarak kullandığı tespit edilmiştir. Buna ek olarak proje yönetimi, inşaat yönetimi sıklıkla kullanılan isimler arasında yer aldığı görülmüştür. Yapım yönetimi ve ilişkili derslerin sadece inşaat mühendisliği değil mimarlık, işletme vb. disiplinlerde de eğitim planına dahil edilmelidir. Bunun yanı sıra sadece lisans eğitiminde değil lisansüstü eğitimle de konu daha detaylı ve uzmanlaştırma amacıyla uygulamaya geçirilmelidir.

**Anahtar Kelimeler:** Yapım yönetimi, inşaat mühendisliği, ders içeriği, Türkiye, KKTC

**ABSTRACT**

Construction management is a long and complex process that covers from the planning stage of the building to be constructed to the completion and the end of demolition process. Managing this process is efficient and useful with experts in the field. In this study, the aim is to assess the current status of construction management education provided at undergraduate civil engineering programs in Türkiye and the Turkish Republic of Northern Cyprus (TRNC), to analyze the course contents and to compare the course and course contents in the two countries. For this purpose, the undergraduate civil engineering programs of all universities (state and foundation universities) in Türkiye and TRNC were included in the scope of the study. As a result, as of September 2022, 117 universities in Türkiye have civil engineering programs, 61 of which provide construction management and related courses. It has been concluded that there are civil engineering programs in 9 universities in TRNC and 7 of these universities provide construction management and related courses. When the course contents were analyzed, it has been determined that there is approximately 80% similarity and that the majority of them name the course as construction management. In addition, project management and construction management are among the frequently used course titles. Construction management and related courses should be included in the curriculum not only in civil engineering but also in departments such as architecture, business administration, etc. Furthermore, not only in undergraduate education but also in postgraduate education, the courses should be put into practice in more detail and with the aim of specialization.

**Keywords:** Construction management, civil engineering, course content, Türkiye, TRNC

## **1. INTRODUCTION**

Our country is constantly growing and its needs are increasing with this growth. Construction has been the most significant factor in this growth. Construction is a field that includes more than 250 sub-fields and provides goods and services to these fields. This has led to construction being characterized as the engine of the economy (Oladinrin et al., 2012; Wells, 1985). For nearly three decades, the Turkish construction industry has had a market that has progressed enough to make a name for itself abroad. Thus, it has become a sought-after industry in the international business world (İNTES, 2013; Aydın, 2014).

The term construction, which started to be used with the first human being, forms the basis of the most essential need, shelter, which has been through different civilizations throughout history. The construction sector is the backbone of the construction industry. The biggest characteristic that distinguishes this sector from other sectors is that it has a wide range and a different structure (Daşdelen, 2006).

The term construction management refers to managing the growing and complex construction process on this long journey. This complex process consists of planning, programming, design, proposal, tendering, contracting, construction (yapım), acceptance, occupancy and demolition.

The construction management process involves many participants. Entrepreneurs, consulting, suppliers, contractors, training organizations are some of them.

Construction management used to be seen as a simple and easy concept. However, rapidly developing and growing technology and the construction sector projects in accordance with this technology have started to grow and turn into a complex structure (Ahuja et al., 2010; Lam et al., 2010; Martínez et al., 2016; Sardoud, 2015; Parsamehr et al., 2022). This has not only complicated the process, but has started to lead to a major deadlock. Therefore, the construction process needs to be planned and organized efficiently. In other words, there is a need for experienced persons in the field of construction management who can facilitate this process and complete it in the most efficient way. In order to meet this need, civil engineers who have received this education are needed. This education should be provided in the form of adding construction management and related courses to the curriculum of undergraduate education or providing postgraduate education in this field (Doloi, 2013; Khademi, 2014; Memon et al., 2011; Parsamehr et al., 2022). In this field, which is studied all over the world, students take courses from different fields such as architecture, law, civil engineering and business administration. In addition to all these, studies have recently been conducted on the use of construction management and education in different fields, its current status, future applications and drawbacks (Kesim, 2018). It is used in many fields such as construction management, geographic information systems (GIS) (Cengiz & Güney, 2011; Cengiz, 2012; Cengiz et al., 2016), building information modeling (BIM), restoration projects (Ünver & Alptekin, 2021), mining works (Keleş & Keleş, 2017), computer engineering (Yitmen & Dikbaş, 2002; Ertekin, 2008), Nanotechnology (Demirdöven & Arditi, 2012).

In this study, the aim is to assess the construction management education given at undergraduate civil engineering programs in Türkiye and TRNC, to present the current status and to compare this course provided in the two countries.

## **2. CONSTRUCTION MANAGEMENT EDUCATION IN TÜRKİYE AND THE WORLD**

The construction sector is a structure that constantly updates itself, changes and cooperates with different disciplines. For this reason, it is very important that faculty members in civil engineering programs educate civil engineers who are experts in this field. Runeson explained this as "Universities not only teach knowledge but also provide the techniques and skills to develop and advance that knowledge" (Runeson, 2018).

Other than analysis and design, construction management education contributes civil engineers to the legal, economic and managerial planning and implementation of the project during the project process. The historical development of construction management in Türkiye is listed below.

- ✓ It was first given in 1967 by Prof. Dr. Doğan SORGUÇ from the Middle East Technical University under the title "Construction Strategies". This education was canceled after a short period of time (Kuruoğlu and Ezcan, 2018).
- ✓ In 1976, it was planned to include the Construction Engineering Program in the curriculum at the Middle East Technical University, but it was canceled before it could be implemented (Sorguç, 1993).
- ✓ Until the 1980s and 1990s, no attempt was made to introduce a program on construction management.

In the following years, construction management and related courses were included in the curriculum of the programs.

- ✓ The most important step related to the issue was the introduction of Master's degree programs related to construction management in the 1990s (Berköz and Kanoğlu, 1993).
- ✓ Today, there is no department related to construction management . This problem has been solved by adding courses in the compulsory/elective category to the Civil Engineering programs of universities providing undergraduate education.
- ✓ Engineers or architects who intend to specialize in construction management get a master's degree in construction management and related fields (Kesim, 2018).
- ✓ Other than the master's degree, institutions and organizations such as the Chamber of Engineers, Chamber of Architects, MENTOR Project Management Training and Consultancy, BİYMED (Information Management Engineering Training and Consultancy Services) organize seminars or provide optional information through certificate programs (Daşdelen, 2006).

All over the world, the idea of construction management first emerged in the 1930s. In the same period, the construction management sector was introduced. Later in the 1960s, construction management became a necessity. For this reason, computer-aided programs started to be developed. In 1975, construction management became a form of professional management. In 1980, construction management started to be used as a management style. Since 2000, it has been continuously revised to its current form (Arioğlu et al., 1991).

The constant change in world balances leads to an awareness of the importance of construction management. This awareness increases the idea that education on construction management should be given more emphasis. This has led to education on construction management in different countries around the world be provided. The United States of America is the country that has established a certain order, scope and systematization of construction management and education worldwide. In the US, research has been conducted on the integration of knowledge from different disciplines in the construction management process, which brings together multiple disciplines.

In the United States, there are many organizations in the field of construction management education. The most important of these is the American Council for Construction Education. This company was founded in 1974. The company organizes its education programs with the aim of providing, encouraging and supporting quality construction management education on a global platform, without any profit motive. For this purpose, they made an agreement with the The Chartered Institute of Building (CIOB) in the UK and recognized each other's equivalence. Construction management education in the US is provided in three ways. These are 2-year institute or college education (associated degree), 4-year bachelor's degree (baccalaureate degree) and Master's degree (Maaster Degre). People who have successfully completed these educations are awarded Construction Management Specialist, Construction Management Bachelor's Degree and Construction Management Master's Degree certificates respectively (Daşdelen, 2006; Kesim, 2018).

## **2.1. Titles of Construction Management Courses in Türkiye**

Within the scope of the thesis study, 117 of 210 universities in Türkiye have civil engineering programs. The 8-semester education plans of these universities have been analyzed and it has been seen that 61 universities have courses related to Construction Management. Table 1 shows the course titles and course status. According to the table, 18.03% (11 universities) of the 61 universities with construction management courses and related courses added construction management and related courses as elective courses, while the remaining 81.97% (50 universities) added the courses as compulsory courses.

**Table 1.** Course title and status

<b>Universities</b>	<b>Course Title</b>	<b>Course Status</b>
Akdeniz University	Management Organization	Elective
Antalya Bilim University	Building management	Compulsory
Atatürk University	Construction Management	Compulsory

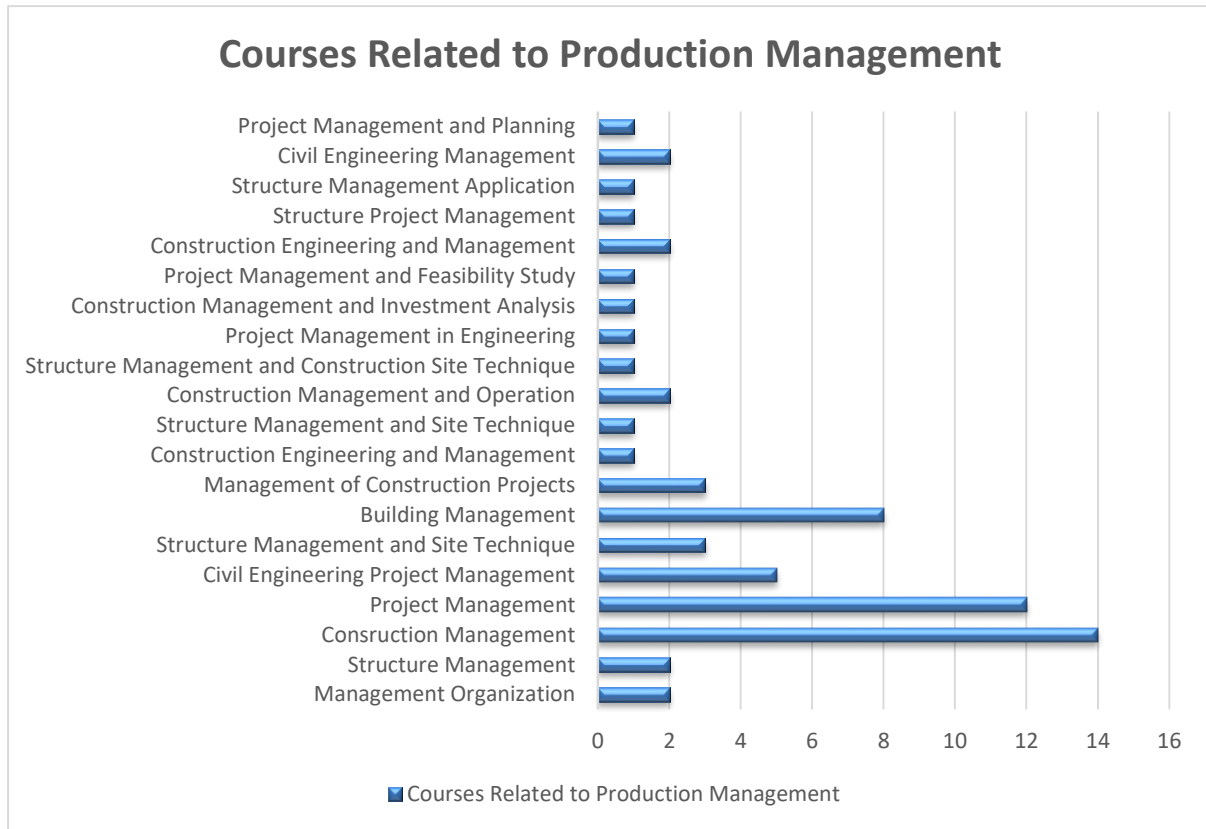
Aydın Adnan Menderes University	Construction Management	Compulsory
Bahçeşehir University	Project Management	Elective
Balıkesir University	Construction Management	Compulsory
Başkent University	Construction Engineering Project Management	Compulsory
Bayburt University	Building Management and Building Construction Technique	Compulsory
Bilecik Şeyh Edebali University	Building Management and Building Construction Technique	Compulsory
Bingöl University	Construction Engineering Project Management	Compulsory
Bitlis Eren University	Project Management	Elective
Bursa Technical University	Construction Management	Compulsory
Bursa Uludağ University	Construction Management	Elective
Çanakkale 18 Mart	Project Management	Elective
Çankaya University	Construction Engineering Project Management	Compulsory
Çukurova University	Project Management	Compulsory
Dokuz Eylül University	Building management	Elective
Düzce University	Construction Management	Compulsory
Erciyes	Construction Project Management	Elective
Erzincan Binali Yıldırım University	Project Management	Elective
Erzurum Technical University	Construction Engineering And Management	Compulsory
Eskişehir Osmangazi University	Building Management and Building Construction Technique	Elective
F. S. M. Vakıf University	Construction Engineering And Management	Compulsory
Fırat University	Construction Management	Compulsory
Giresun University	Building Management and Building Construction Technique	Compulsory
Hacettepe University	Construction Management	Compulsory
Hakkari University	*Building Management and Building Construction Technique *Management and Organization	Compulsory
Harran University	Construction Management	Compulsory
Isparta University of Applied Sciences	Construction Engineering And Building Management	Compulsory
İnönü University	Construction Management	Compulsory
İskenderun Technical University	Construction Management	Compulsory
İstanbul Aydın University	Project Management	Compulsory
İstanbul Beykent University	Project Management	Compulsory
İstanbul Bilgi University	Construction Management and Investment Analysis	Compulsory

İstanbul Gelişim University	Construction Management	Compulsory
İstanbul Medeniyet University	Project Management and Feasibility Study	Compulsory
İstanbul Okan University	Construction Engineering And Management	Elective
Istanbul Commerce University	Construction and Project Management	Compulsory
Istanbul University-Cerrahpaşa	Project and Construction Management	Compulsory
İstinye University	Construction Project Management	Compulsory
İzmir Kâtip Çelebi University	Building Project Management	Compulsory
İzmir Institute of Technology	Building Engineering Management	Compulsory
Karamanoğlu Mehmetbey University	Construction Management	Compulsory
Kastamonu University	Construction Management	Elective
Kırklareli University	Project Management	Compulsory
Konya Technical University	Building Management Application	Compulsory
KTO Karatay University	Construction Management	Compulsory
Malatya Turgut Özal University	Construction Management	Compulsory
Marmara University	Construction Engineering And Management	Compulsory
MEF University	Construction Management	Compulsory
Muğla Sıtkı Koçman University	Project Management	Compulsory
Munzur University	Project Management	Compulsory
Nevşehir Hacı Bektaş Veli University	Construction Management	Compulsory
METU	Construction Engineering And Management	Compulsory
Osmaniye Korkutata University	Construction Management	Compulsory
TED University	Construction Engineering And Management	Compulsory
Tekirdağ Namık Kemal University	Construction Management	Compulsory
Yalova University	Project Management and Planning	Compulsory
Ufuk University	Project Management	Compulsory
Yeditepe University	Construction Management	Compulsory
Zonguldak Bülent Ecevit University	Project Management	Compulsory

Figure 1 shows a graph of the courses related to construction management in civil engineering programs at universities in Türkiye.

In the research studies, 14 universities used the title of construction management. Related to this title, project management is included in the education plan of 12 universities, construction management 8, civil engineering project management 5, construction management and building construction technique 4. In addition to these,

construction project management (3), Construction management and administration (2), Construction engineering and management (2), Construction engineering and administration (1), Construction management and building construction technique (1), Project management in engineering (1), Construction management and investment analysis (1), Project management and feasibility study (1), Construction project management (1), Construction management application (1), Construction engineering management (1), Project management and planning (1) are other courses taught in universities and related to construction management .



**Figure 1.** Courses related to Construction Management

## 2.2. Assessment of Construction Management Courses on Credit and ECTS Basis

Within the scope of the thesis study, the credits and ECTS of the Construction Management course and other related courses in Türkiye are given in Table 2. When the table is analyzed in terms of credits/AKTS, the highest number of credits/AKTS belongs to 3/5 with 18. In other words, in 18 universities, courses related to construction management are provided as 3 credits and 5 ECTS. In the second place, 3/4 is implemented in 12 universities, and in the third place, 3/3 is implemented in 6 universities. 2/3 is included in the education plan in 5 universities, 3/6 in 4 universities, 2/4 in 3 universities and 4/5 in 2 universities. In addition, a total of 8 universities use 2/5, 3/7, 2.5/4, 4/4, 4/6, 2.5/3, 3/2 and 3.5/5 implementations, one each. In addition, the education plans of 3 universities could not be accessed from the university websites.

**Table 2.** Credit/ECTS status at universities in Türkiye

Universities	Course Title	Credit	ECTS
Akdeniz University	Management Organization	2	3
Antalya Bilim University	Building management	3	5
Atatürk University	Construction Management	3	4
Aydın Adnan Menderes University	Construction Management	2	5
Bahçeşehir University	Project Management	3	7

Balıkesir University	Construction Management	2.5	4
Başkent University	Construction Engineering And Management	3	5
Bayburt University	Building Management and Building Construction Technique	2	4
Bilecik Şeyh Edebali University	Building Management and Building Construction Technique	3	5
Bingöl University	Construction Engineering Project Management	3	5
Bitlis Eren University	Project Management	3	5
Bursa Technical University	Construction Management	4	4
Bursa Uludağ University	Construction Management	4	6
Çanakkale 18 Mart	Project Management	3	5
Çankaya University	Construction Engineering Project Management	3	4
Çukurova University	Project Management	3	5
Dokuz Eylül University	Building management	2	3
Düzce University	Construction Management	3	3
Erciyes University	Construction Project Management	3	3
Erzincan Binali Yıldırım University	Project Management	2	3
Erzurum Technical University	Construction Engineering And Management	3	4
Eskişehir Osmangazi University	Building Management and Building Construction Technique	3	6
F. S. M. Vakıf University	Construction Engineering And Management	3	5
Fırat University	Construction Management	3	5
Giresun University	Building Management and Building Construction Technique	2	4
Hacettepe University	Construction Management	None	None
Hakkari University	*Building Management and Building Construction Technique	3	5
	*Management and Organization	3	3
Harran University	Construction Management	2.5	3
Isparta University of Applied Sciences	Construction Engineering And Building Management	3	3
İnönü University	Construction Management	3	6
İskenderun Technical University	Construction Management	3	4
İstanbul Aydın University	Project Management	3	5
İstanbul Beykent University	Project Management	2	4
İstanbul Bilgi University	Construction Management and Investment Analysis	4	5
İstanbul Gelişim University	Construction Management	3	6

İstanbul Medeniyet University	Project Management and Feasibility Study	3	4
İstanbul Okan University	Construction Engineering And Management	3	5
Istanbul Commerce University	Construction and Project Management	3	3
Istanbul University-Cerrahpaşa	Project and Construction Management	3	4
İstinye University	Construction Project Management	4	5
İzmir Kâtip Çelebi University	Building Project Management	3	6
İzmir Institute of Technology	Building Engineering Management	3	5
Karamanoğlu Mehmetbey University	Construction Management	3	4
Kastamonu University	Construction Management	3	4
Kırklareli University	Project Management	3	4
Konya Technical University	Building Management Application	3	3
KTO Karatay University	Construction Management	3	2
Malatya Turgut Özal University	Construction Management	3	4
Marmara University	Construction Engineering And Management	None	None
MEF University	Construction Management	3	5
Muğla Sıtkı Koçman University	Project Management	3	5
Munzur University	Project Management	2	3
Nevşehir Hacı Bektaş Veli University	Construction Management	2	3
METU	Construction Engineering And Management	3	5
Osmaniye Korkutata University	Construction Management	3	4
TED University	Construction Engineering And Management	3	5
Tekirdağ Namık Kemal University	Construction Management	3.5	5
Yalova University	Project Management and Planning	3	5
Yeditepe University	Construction Management	None	None
Zonguldak Bülent Ecevit University	Project Management	3	4

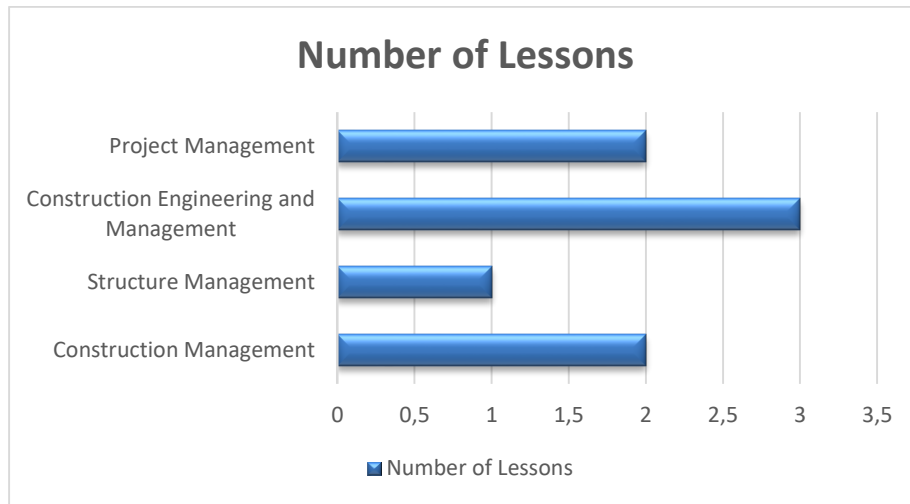
### 2.3. Titles of Construction Management Courses in TRNC

Within the scope of the thesis study, 9 of 21 universities in TRNC have civil engineering programs. The 8-semester education plans of these universities have been analyzed and it has been seen that 7 universities have courses related to Construction Management. Table 3 shows the titles and course status of the courses and Figure 2 shows the title and number of courses.



**Table 3.** Course title and status

Universities	Course Title	Course Status
Eastern Mediterranean University	Construction Management	Compulsory
University of Kyrenia	Construction Engineering And Management	Compulsory
Girne American University	Construction Engineering And Management	Compulsory
European University of Lefke	Construction Management	Compulsory
Cyprus International University	Building management	Compulsory
	Project Management	Compulsory
Near East University	Construction Engineering And Management	Compulsory
Bahçeşehir Cyprus University	Project Management	Elective



**Figure 2.** Courses and numbers

When the Table and Figure are analyzed, it is seen that the most used title is Construction Engineering and Management (3). The ranking continues as Project Management (2), Construction Management (2) and Building Management (1).

#### 2.4. Assessment of Construction Management Courses on Credit and ECTS Basis

There are a total of 21 universities in the TRNC. Of these universities, 9 have civil engineering programs and 7 have construction management and related courses (Table 4). The courses in the table are given as Credit/AKTS.

Among the universities in TRNC, 2 of them implemented 4/6, 2 of them implemented 3/3, 1 of them implemented 4/4, and 1 of them implemented 3/7 in their education plans. In addition, Cyprus International University has planned the Construction Management course as 4/6 and the Project Management course as 3/4.

**Table 4.** Credit/ECTS status at universities in TRNC

Universities		Credit	ECTS
Eastern Mediterranean University	Construction Management	4	6
University of Kyrenia	Construction Engineering And Management	4	4

Girne American University	Construction Engineering And Management	3	3
European University of Lefke	Construction Management	3	3
Cyprus International University	Building management	4	6
	Project Management	3	4
Near East University	Construction Engineering And Management	4	6
Bahçeşehir Cyprus University	Project Management	3	7

### **3. COMPARISON OF CONSTRUCTION MANAGEMENT COURSES AND THEIR CONTENTS IN UNDERGRADUATE CIVIL ENGINEERING PROGRAM IN TÜRKİYE AND TRNC**

A comparison of the universities in Türkiye and TRNC and the Construction Management course and related courses is presented below.

#### **1. Status of construction management and related courses**

- In Türkiye, the title of construction management was used the most (in 14 universities). This is followed by project management (12 universities), construction management (8 universities), civil engineering project management (5 universities), construction management and building construction technique (4 universities). In TRNC, it is seen that the title Construction Engineering and Management (3) is used the most. **The ranking continues as Project Management (2), Construction Management (2) and Building Management (1).**
- In Türkiye, construction management and related courses are included in the curriculum as compulsory in 50 universities and as elective in 11 universities. In TRNC, it is compulsory in all universities except Bahçeşehir Cyprus University.
- In Türkiye, when courses are evaluated in terms of credits/ECTS, 3/5 is the most common practice (18 universities), 3/4 is the second most common practice (12 universities), and 3/3 is the third most common practice (6 universities). In the TRNC, 2 universities implement 4/6 and 2 universities implement 3/3.
- Construction management and related courses are usually included in the curriculum in the 7th or 8th semester in both Türkiye and TRNC.

#### **2. Content of construction management and related courses**

- In Türkiye, the course titled Construction Management is the most common course in the curriculum. When the content of this course given in 18 universities is analyzed, the following are the content of the course in general terms;
  - ✓ Construction management concepts
  - ✓ Building quantity and unit price formation
  - ✓ Statistical time planning approaches, performance evaluation and review technique, Monte Carlo modeling
  - ✓ Management of construction contracts
  - ✓ Inspection in building production
  - ✓ Work planning in construction management; CPM and PERT methods
  - ✓ Critical Path Method (CPM) - Arrow diagram
  - ✓ Critical Path Method (CPM)-Matrix Method
  - ✓ Construction tender models and preparation of tender documents
  - ✓ Inspection of the construction process in the public and private sector
  - ✓ Human resource management in construction industry
- In the universities in the TRNC, the course was added to the program by using the title of construction management the most. When the content of this course is analyzed, it can be seen that it includes the following topics:
  - ✓ Stages of construction projects within the scope of project management and construction management
  - ✓ Pre and post tender design in construction projects,
  - ✓ Quantity, cost calculation and preparation of tender documents
  - ✓ Resource management, contracts, project planning, organization charts
  - ✓ Tender types.

The content of this course in the two countries is 80% similar. However, CPM and PERT methods used in work planning in construction management are not included in the course content under the title of Construction Management in TRNC universities. All universities have emphasized cost analysis in this course. Inspection and human resources management are among the main topics included in the content. Unlike the course in Türkiye, construction management course in TRNC is focused more on construction project stages and organization chart.

- Another course in Türkiye is project management. When the content of this course given in 12 universities is analyzed;
  - ✓ Project Assessment
  - ✓ Project Organizational Structures
  - ✓ Project scope, schedule and cost management
  - ✓ Human resources management
  - ✓ Communication management
  - ✓ Risk Management
  - ✓ Supply management
  - ✓ Cost and time based project planning; planning methods; Gantt and bar diagrams, Networks, (CPM and PERT)
  - ✓ Arrow and priority systems
- Another course that is included in the education program at TRNC universities is the project management. When the content of this course is analyzed, it can be seen that it includes the following topics:
  - ✓ Project integration management
  - ✓ Project scope management
  - ✓ Project communication management and teamwork
  - ✓ Health and safety
  - ✓ Environmental management
  - ✓ Risk management and sustainability
  - ✓ Entrepreneurship and feasibility report

It is seen that this course in the two countries is 75% similar to each other. In Türkiye, unlike TRNC, CPM and PERT methods, supply management and cost analysis are also included. The topics that are different in the TRNC are environmental management, entrepreneurship and feasibility.

- The last course compared in Türkiye is construction engineering and management. This course is available at Okan University, Başkent University and TED University in Türkiye. This course, which private universities add to their curriculum, is one of the most preferred course titles in the TRNC. When the content of this course is analyzed, it can be seen that it includes the following topics:
  - ✓ Construction Management Fundamentals
  - ✓ Construction Cost Estimation and Bidding
  - ✓ Contract types and project delivery methods
  - ✓ Planning, scheduling, CPM and cost estimation
  - ✓ Construction risks and construction project management
  - ✓ Finance and business plan in construction projects
  - ✓ Financial control and accounting of businesses
  - ✓ Project cost control
  - ✓ Equipment organization.
- When the content of the construction engineering and management course, which is included in the education in 3 universities in TRNC, is examined, it is seen that it covers the following subjects;
  - ✓ Engineering fundamentals
  - ✓ Construction machinery
  - ✓ Construction work tools, description, types, selection, assessment of their efficiency
  - ✓ Construction labor law, general specifications for common works, labor rights
  - ✓ General profile of the construction building sector, company and land organization
  - ✓ Preparation of work schedules
  - ✓ Ensuring work and worker safety
  - ✓ Assessment of human rights and relations
  - ✓ Quantity calculations

It is seen that the contents of this course, which is given in universities in Türkiye and TRNC, do not correspond to each other except for the cost issue. In universities in Türkiye, planning, control and organization topics were mostly preferred. In the TRNC, topics such as work and worker safety, construction machinery, and work

schedules were addressed.

#### **4. RESULT AND RECOMMENDATIONS**

The development of technology, the improvement of the economy and the updating of needs lead to the formation and development of different fields in the field of construction. One of these fields is construction management. In the literature studies, construction management is generally included in postgraduate education. In this study, the status of undergraduate civil engineering programs of all universities in Türkiye and TRNC and the course contents of construction management and related courses included in the curriculum of these programs were examined. The results obtained are itemized.

- It has been determined that construction management and related courses are included in the education plan of 61 universities in Türkiye, while this number is 7 (Seven) in TRNC.
- When the course titles are analyzed, construction management is the most common title in Türkiye, while construction engineering and management is the most common title in TRNC.
- When the course contents were analyzed, it was seen that the course contents of the courses included in the education plan in Türkiye and TRNC were mostly similar.
- When the credit/ECTS system was examined, it was seen that the 3/5 was widely used.
- Construction management and related courses in universities should be included in the curriculum of more universities.
- Construction management and related courses should be changed from elective courses to compulsory courses.
- Construction management and related courses should be included not only in the civil engineering program but also in the curriculum of all disciplines related to the construction sector.
- Construction management should not only be limited to undergraduate education, but postgraduate education should also be enhanced.

#### **REFERENCES**

- Oladinrin T.O., Ogunsemi D.R., Aje I.O. Role of Construction Sector in Economic Growth. Empirical Evidence from Nigeria, African journal online,2012; 7(1): 50-60.
- Wells J. The role of construction in economic growth and development. Habitat International, 1985; 9: 55–70.
- İNTEŞ, Construction Sector, Its Problems and Solution Suggestions. Ankara: Turkish Construction Industrialists Employers' Union, 2013.
- Aydın M. Comparative Evaluation of Project and Construction Management Master's Programs in Turkey and TRNC, Istanbul Technical University, Institute of Science and Technology Master Thesis, paper page: 57, İstanbul, Türkiye, 2014.
- Daşdelen A. Construction Law in Construction Management Education, Istanbul Technical University, Institute of Science and Technology Master Thesis, sayfa no:13, İstanbul, Türkiye, 2006.
- Ahuja V., Yang J., Shankar R. Benchmarking framework to measure extent of ICT adoption for building project management, Journal of construction engineering and management, 2010; 136(5): 1-15.
- Lam P., Wong F., Tse K. Effectiveness of ICT for construction information exchange among multidisciplinary project teams, Journal of computing in civil engineering, 2010; 24: 365–376.
- Martínez-rojas M., Marín N., Vila M.A. The Role of Information Technologies to Address, Data handling in construction project management, 2016; 30: 1–20.
- Sardroud J.M. Perceptions of automated data collection technology use in the construction industry. Journal of computing in civil engineering, 2015; 21: 54–66.
- Parsamehr M., Perera U.S., Dodanwala T.C., Perere P., Ruparathna R. A review of construction management challenges and BIM-based solutions: perspectives from the schedule, cost, quality, and safety management, Asian journal of civil engineering, 2023; (2023) 24: 353–389.

- Doloi H. Cost Overruns and Failure in Project Management: Understanding the Roles of Key Stakeholders in Construction Projects. *Journal of construction engineering and management*, 2013; 139(3): 1-13.
- Khademi S.S. Time Over run Analysis in North Cyprus Building Construction Projects, 2014.
- Memon A.H., Rahman I., Razaki M., Asmi A., Aziz A. Time Overrun in Construction Projects from the Perspective of Project Management Consultant (PMC). *Journal of surveying, construction and property*, 2011; 2: 54–66.
- Kesim K., Evaluation of Construction Management Education in Architecture Undergraduate Programs, İstanbul Kültür University Institute of Science and Technology, Master Thesis, paper page. 25, İstanbul, Türkiye, 2018.
- Cengiz AE. Using Geographic Information Systems (GIS) in Building Management, Anadolu University Institute of Science and Technology, Master Thesis, paper page. 12, Eskişehir, Türkiye, 2012.
- Cengiz A.E., Çabuk A., Aytekin O., Özdemir İ. A Research on GIS and BBM Integration in Construction Management, 4th Project and Construction Management Congress, 3-5 November 2016 Anadolu University, Faculty of Engineering, Department of Civil Engineering, Eskişehir. 2016
- Cengiz A.E., Güney Y. Geographic Information Systems (GIS) Applications in the Management of Construction Projects, *Electronic Journal of Map Technologies*, 2011; 3(2): 38-52.
- Ünver H., Alptekin O. Evaluation of Construction Management Process in Street Improvement, *Journal of Contemporary Local Governments*, 2021; 30(1): 99-126.
- Keleş M.K. Keleş A.E. The Place of Data Mining Applications and Heuristic Optimization Algorithms in Construction Management, *Çukurova University Journal of Engineering and Architecture Faculty*, 2017; 32(1): 235-242.
- Yitmen İ., Dikbaş A. Web-based integrated construction management system model, *itümagazine/a architecture, planning, design*, 2002; 1(1): 30-41.
- Ertekin S.S. Web Based Production Management System Model Proposal for Corporate Design Implementation Process, İstanbul Technical University, Institute of Science and Technology, Master Thesis, paper page. 82, İstanbul, Türkiye, 2008.
- Demirdöven JB., Artiti D. Nanotechnology Applications in Buildings and Construction Management, 2nd Project and Construction Management Congress, 13 – 16 September 2012, İzmir Institute of Technology, Urla-İzmir, 2012.
- Runeson G. Educational Needs of Construction Managemnt Personnel. <http://www.irbnet.de/daten/iconda/CIB15501.pdf>. Erişim Tarihi: 19 Aralık 2022.
- Kuruoğlu M., Ezcan, V. 2018, Is Construction Project Management in the Right Place in Turkey? <http://murat.kuruoglu.com.te/MURKUR/documan/pdf/insaat%20proje%20yönetimi%20dogru%20yerdemi.pdf>. Access Date: November 24, 2022.
- Sorguç D. Construction Management Lecture Note II. (İstanbul: ITU Printing House, 1993).
- Berköz S., Kanoğlu A. Production Management Education in Turkey. Turkish Civil Engineering 12th Technical Congress, 313-337, 1993.
- Arioğlu Ü., Günay G., Erkut H., Uygur M. Organizational Building Models in Construction Companies. XI. Civil Engineering Technical Congress, 763-776, İstanbul: ITU, 1991.