

**O‘ZBEKISTON RESPUBLIKASI  
OLIV TA‘LIM, FAN VA INNOVATSIYALAR VAZIRLIGI**

**SAMARQAND DAVLAT ARHITEKTURA – QURILISH UNIVERSITETI**

**“KELISHILGAN”**

o‘quv ishlari bo‘yicha  
prorektor \_\_\_\_\_

M.T.Shodmonqulov

Ro‘yxatga olindi: № 13/A

«99» avgust 2025 yil



**MATERIALLARNING MUSTAHKAMLIGI 1**

**FAN DASTURI**

<b>Bilim sohasi:</b>	700 000 - Muhandislik, ishlov berish va qurilish sohalari
<b>Ta‘lim sohasi:</b>	730 000 - Arxitektura va qurilish
<b>Ta‘lim yo‘nalishi:</b>	60730300 – Qurilish muhandisligi

**Kurs ma'lumotlari**  
Course Information Form

Modul kodi Code KRM 2070	O'quv yili 2025-2026	Semestr 3	ECTS – Kreditlar 3-semestr -6			
Modul turi Majburiy	Ta'lim tili O'zbek/rus		Auditoriya soatlari			Mustaqil ta'lim (soat/hafta) Independent Education (hour/week)
Fan nomi Title	Jami yuklama	Ma'ruza (soat/hafta) Lecture (hour/week)	Amaliy (soat/hafta) Practical (hour/week)	Laboratoriya (soat/hafta) Laboratory (hour/week)		
Materiallarning mustahkamligi 1	3-semestr -180	2	2		8	

<b>Dastlabki shart</b> Prerequisite	INS1322 Statika
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<b>Semestr</b> Semestr	<b>Kuzgi</b> Fall
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<b>Kurs tili</b> Course language	<b>O'zbek, Ingliz, Rus</b> Uzbek, English, Russian
<b>O'quv kursi</b> Level of Course	<b>Birinchi kurs</b> First Cycle
<b>Ta'lim yo'nalishlari</b> Course type	60730300 - Qurilish muhandisligi: bino va inshootlar qurilishi
<b>Kurs toifasi</b> Course Category	Asosiy Core Courses
<b>Dars shakli</b> Mode of Delivery	An'anaviy (Yuzma – yuz muloqot) Face – to - face

<b>Ma'sul kafedra</b> Owner academic unit	Qurilish muhandisligi Department of Civil Engineering
<b>Kursga ma'sul</b> Cours Coordinator	Kubaymurat Ismayilov, Normat Melikulov
<b>O'qituvchilar</b> Instructor(s)	Kubaymurat Ismayilov, Normat Melikulov, Sirojiddin Amanov, Sherzod Yaxshiboyev, Olimxon Ubaydulloyev, Dilfuza Ismatova, Nilufar Shodmonqulova
<b>Yordamchilar</b> Asistant(s)	

<b>Fanni o'qitishdan maqsad</b> Course objectives	Deformatsiyalanuvchan qattiq jismlarning asosiy tushunchalarini o'rganish, materiallarning mexanik xususiyatlari haqida bilimlarga ega bo'lish.
<b>Fanning mazmuni</b> Course content	Kirish, asosiy tushunchalar; ichki kuchlar va kuchlanganlik holati; deformatsiyalanish holatlari; kuchlanish va deformatsiya orasidagi munosabat(GUK qonuni); deformatsiya energiyasi; ruxsat etilgan kuchlanishlar; sterjenlar mustahkamligi, ko'ndalang kesimni o'zgarishini mustahkamlikka ta'siri, mustahkamlik nazariyalari; normal (bo'ylama) kuch, siljish, burilish, egilish.// statically determined structures, trusses, static friction. Fundamentals of elastostatics: section loads and stresses, displacements, distortions, Hooke's law, bending and torsion of members, surface moments of inertia, calculation of statically indeterminate systems
<b>Tavsiya qilingan yoki talab qilinadigan adabiyotlar ro'yxati</b> Recommended Or Required Reading	1. Ismayilov K., Usmonkulov A.Q., Toshev S.Q., Boltaev Z.I., Axmedov Sh.R. Materiallar qarshiligi. Darslik.– Samarqand, "Samarqand davlat chet tillar instituti" nashriyoti, 2023. – 488 bet. 2. Ismayilov K. V.K.Kachurinning materiallar qarshiligi masalalar to'plami yechimlari (cho'zilish-siqilish). Darslik. Toshkent, "SHANHOFF" 2022.-224 b. 3. Качурин В.К. Материаллар қаршилигидан масалалар тўплами./– Тошкент, «Ўзбекистон», 1993–336 б. 4. Мансуров К.М. Материаллар қаршилиги курси./–Тошкент, «Ўқитувчи», 1983 – 504 б. 5. Usmonkulov A.Q., Ismayilov K., Adilov O.K., Yaxshiboyev Sh.R. Materiallar

	<p>qarshiligi. O'quv qo'llanma. – Toshkent, “MASHHUR PRESS” nashriyoti 2018. – 344 bet.</p> <p>6. Феадосьев В.И. Сопротивление материалов./ – Москва.: Издательство МГТУ им.Н.Э.Баумана, 2003– 592 с.</p> <p>7. Александров А.В. и др. Сопротивление материалов.// – Москва, «Высшая школа», 2003 – 560 с.</p> <p>8. Винакуров А.И. Сборник задач по сопротивлению материалов.//– Москва.:Высшая школа, 1990–383 с.</p> <p>9. Beer F.P., Johnston E.R., DeWolf J.T., Mazurek D.F. Mechanics of Materials, 7-th Edition.- New York. McGraw-Hill Education, 2015 (897p).</p> <p>10. Pytel A., Kiusalaas J. - Mechanics of Materials (2nd ed) – 2011.</p> <p>11. INAN, M “ Cisimlerin Mukavemeti ”, İTÜ Vakfi, İstanbul, 2001. (Ders Kitabı)</p> <p>12. Ismayilov K., Toshev S.Q., Amonov S.S., Xolikov D.Sh. Materiallar qarshiligi (Ikkinchi nashr). O'quv qo'llanma. Toshkent "Mashhur-press" 2019. –272 –b.</p> <p>13. Усмонкулов А.К., Исмаилов К., Индиаминов Р.Ш., Тошев С.К., Шодмонкулова Н.У. Материаллар қаршилиги. Ўқув қўлланма. Самарқанд, «TURON NASHR» нашриёти, 2023 -180 б.</p>
<b>Tavsiya etilgan qo'shimcha dastur komponentlari</b> Recommended Optional Program Components	Yo'q\ (bor bolsa yoziladi)  None

## Kursni o'rganish natijalari

Course learning outcomes

1	Ushbu kursni muvaffaqiyatli tamomlagan talabalar deformatsiyalanadigan qattiq jismlar haqida tasavvurga ega bo'ladi;
2	Talaba elastik jismni cho'zilishi va shaklini o'zgarishini, deformatsiyalarini tahlil qila oladi;
3	Talabalar materiallarning mexanik xususiyatlarini o'rganadilar;
4	Kuchlanish (potensial) energiyasi va elastik jismlar uchun ruxsat etilgan kuchlanishlar haqida tasavvurga ega bo'ladi;
5	Oddiy kuchlanganlik holatida, cho'zilishda, buralishda va egilishda konstruktsiya elementlarini loyihalaydi;

## Haftalik mavzular va tegishli tayyorgarlik ishlari

Weekly Subjects and Related Preparation Studies

Hafta Week	Mavzular Themes	Resurslar Related preparation
1.	Kirish. Asosiy tushunchalar.	[12] (1-bob)
2.	Ichki kuchlar va kuchlanishlar. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[2] (1-bob)
3.	Deformatsiyalanish holati. Kuchlanish va deformatsiya orasidagi bog'lanishlar (Guk qonuni); [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[2] (1-bob)
4.	Cho'zilish va siqilishda xususiy og'irlikni hisobga olish. Teng qarshilikli bruslar. Pog'onali sterjenlar. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[1] (2-bob)
5.	Kuchlanish energiyasi; Ruxsat etilgan kuchlanishlar; Sterjenlar mustahkamlik asoslari. Ko'ndalang kesim tanlash [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[12] (1-bob)
6.	Materiallarni mexanik xususiyatlarini tajribada o'rganish.	[2] (3-bob)
7.	Bo'ylama kuchlar ta'siridagi statik noaniq masalalar. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ] Truba ichidagi bosim. Temperaturaning o'zgarishi, turli xil materiallarda normal (bo'ylama) kuch ta'siri	[2] (2-bob)
8.	Murakkab kuchlanganlik holati (1-oraliq nazorat)	[4] (4-bob)
9.	Siljishda kuchlanish va deformatsiya [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[4] (5-bob)
10.	Tekis kesim geometrik xarakteristikallari [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[4] (6-bob)
11.	Tekis kesim geometrik xarakteristikallari [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[4] (6-bob)
12.	Buralish. Doiraviy va doiraviy bo'lmagan vallarning buralishi. Buralishda statik noaniq	[11] (6-bob)

	masalalar. Ochiq profilli yupqa devorli doirasimon elementlarning buralishi. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	
13.	Buralish. Doiraviy va doiraviy bo'lmagan vallarning buralishi. Buralishda statik noaniq masalalar. Ochiq profilli yupqa devorli doirasimon elementlarning buralishi. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[11] (6-bob)
14.	Egilish. Sof egilish. Tekis sof egilish. Ichki kuchlarni aniqlash, misollar. [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[11] (8-bob)
15.	Egilish. Sof egilish. Tekis sof egilish. Ichki kuchlarni aniqlash, misollar. (2-oraliq nazorat) [ <a href="https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre">https://www.tu.berlin/smb/studium-lehre/lv-der-grundmechanik/statik-und-elementare-festigkeitslehre</a> ]	[11] (8-bob)

## Baholash jarayoni

Evaluation System

Mashg'ulot turi Activities	Soni Number	Baholash Percentage of Grade
<b>Darsga qatnashish</b> Attendance / participation		
<b>Laboratoriya ishi</b> Laboratory		
<b>Amaliy ish (qo'shimcha vazifa)</b> Application		
<b>Kurs ishi</b> Field work		
<b>Maxsus kurs amalyoti (ish joyida)</b> Special course internship (work placement)		
<b>Testlar</b> Quizzes / studio crtics		
<b>Uyga vazifani baholash</b> Homework assignments		
<b>Ijodiy ish (taqdimot)</b> Presentations / jury		
<b>Loyiha ishi</b> Project		
<b>Seminar</b> Seminar / workshop		
<b>Oraliq nazorat</b> Mid -Terms	2	60
<b>Yakuniy nazorat</b> Final	1	40
<b>O'zlashtirish ko'rsatgichi</b> Percentage of in – term studies		60
<b>Yakuniy imtihon bahosi</b> Percentage of final examination		40
<b>Jami</b> Total		100

## ECTS taqsimoti

ECTS workload table

Topshiriqlar Activities	Soni Number	Davomiyligi (soat) Duration (hour)	Umumiy yuklama Total workload
<b>Mashg'ulot soati</b> Course hours	15	4	60
<b>Laboratoriya ishi</b> Laboratory			
<b>Amaliy ish (qo'shimcha vazifa)</b> application			
<b>Kurs ishi</b> Field work			
<b>Mustaqil ta'lim</b> Study hours out of class	15	8	70
<b>Maxsus kurs amalyoti (ish joyida)</b>			

Special course internship (work placement)			
<b>Uyga vazifani baholash</b> Homework assignments	1	20	20
<b>Testlar / Viktorina</b> Quizzes / studio critics			
<b>Loyiha ishi</b> Project			
<b>Ijodiy ish (taqdimot)</b> Presentations / seminar			
<b>Oraliq nazorat</b> Mid – terms (Examination +Examination prep. Duration)	2	10	20
<b>Yakuniy nazorat (nazorat va nazoratga tayyorlanish soati)</b> Final (examination +examination prep. Duration)	1	10	10
		<b>Jami yuklama</b> Total workload	180
		<b>Jami yuklama / 30 (soat)</b> Total workload / 30(h)	180/30=6
		<b>Kredit</b> ECTS credit	6.0

<b>Qo'shimcha eslatmalar</b> Extra Notes	Yo'q\ (bor bolsa yoziladi) None
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Oliy ta'lim, fan va innovatsiyalar vazirligi tomonidan 2025-yil uchun tasdiqlangan xalqaro e'tirof etilgan tashkilotlarning reytingida top 300 talikka kiruvchi Technische Universitat Berlin (TU Berlin) (QS-2146) ning "Heat transfer" fan dasturi tahlil qilinib ushbu asosda fan dastur ishlab chiqildi. "Materiallarning mustahkamligi 1" fanining dasturi tayyorlanib 12 ta mavzusi yangilandi.[ Civil Engineering Syllabi]

Fan dasturi Samarqand davlat arxitektura qurilish unversiteti Kengashning 2025 yil \_\_\_ - avgustdagi \_\_\_-sonli yigilishi qarori bilan ma'qullangan.

**Kafedra mudiri:**

**Tuzuvchilar:**

Karimov G'.

Ismayilov K.

Meliqulov N.