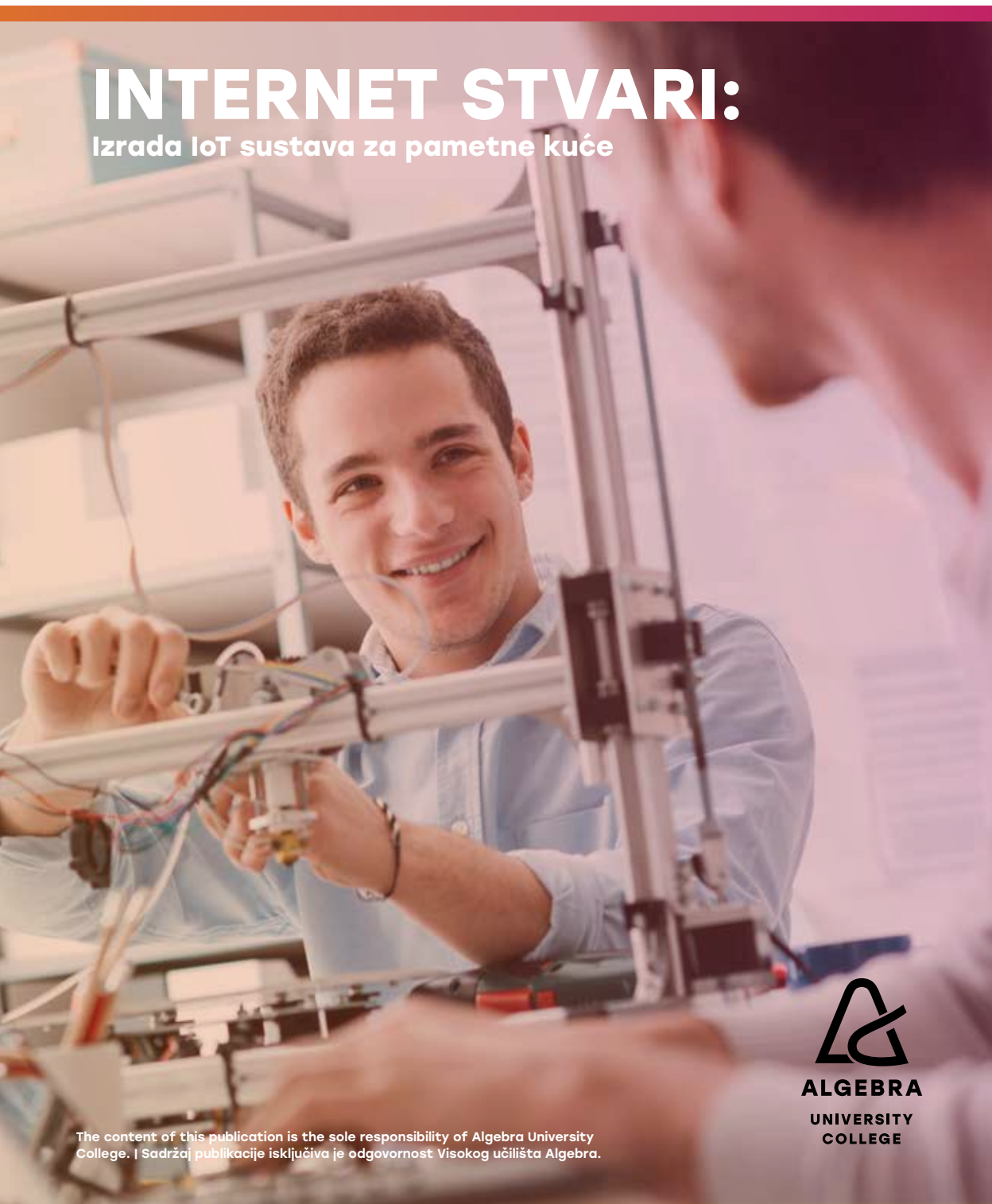


INTERNET OF THINGS:

Creating a Smart Home IoT System

INTERNET STVARI:

Izrada IoT sustava za pametne kuće



ALGEBRA
UNIVERSITY
COLLEGE

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ALGEBRA (TIIT) - Transformation and internationalization of Algebra's IT study program

WHY JOIN THE IOT WINTER SCHOOL PROGRAM?

Would you describe yourself as creative, curious and open minded? If your answer is yes to any of the 3 epithets, Algebra's IoT Winter School is the right choice for you!

Are you interested in spending two weeks in February learning about new trends in technology at a premier educational institution while adding new qualifications to your CV?

Algebra University College offers you an exciting and engaging course, so that you can spend your winter gaining new knowledge and skills. The course is designed to be both applicable, creative and suitable for students from all backgrounds so don't get discouraged if you are just introducing yourself to the world of digitalization, we have something for everyone!

Now that you know all the necessary steps you need to take for an unforgettable winter, it's time for you to head to Algebra and join the IoT winter school! You have until January 26th to apply for Algebra's Winter School. The best winter of your life is right on your doorstep, don't miss it!

Make friends for life and join dozens of young people in creating a digital future! Join us in Zagreb and see why we've been named the most exciting winter school in Europe.

#Excel at what you love doing!

Algebra International Crew

ALGEBRA (TIIT) - Transformacija i internacionalizacija IT studija Algebra

KOJE SU PREDNOSTI SUDJELOVANJA U PROGRAMU ZIMSKE ŠKOLE INTERNET STVARI?

Jesi li kreativna, znatiželjna i otvorena osoba? Ako si se prepoznao/la u jednom od ova tri pridjeva, Algebrina zimska škola Internet stvari pravi je izbor za tebe!

Želiš li provesti dva tjedna u veljači učeći o novim trendovima u razvoju tehnologije na vodećoj obrazovnoj instituciji u području digitalnih tehnologija i usput dopisati još jednu novu vještinu u svoj CV?

Visoko učilište Algebra nudi ti veoma zanimljiv program, stoga ovu zimu možeš provesti stječući nova znanja i vještine. Program je ujedno primjenjiv, kreativan i prikladan za polaznike različitog predznanja pa se ne trebaš obeshrabriti ako se tek upoznaješ sa svijetom digitalizacije. Imamo ponešto za svakoga!

Sada kad su ti poznati svi koraci koje trebaš poduzeti kako bi ti ova zima bila nezaboravna, vrijeme je da požuriš do Algebre i pridružiš se IoT zimskoj školi! Za zimsku školu možeš se prijaviti sve do 26. siječnja 2020. Približava se tvoja dosad najbolja zima, nemoj je propustiti!

Sklopi nova prijateljstva i pridruži se brojnim mladima u kreiranju digitalne budućnosti! Dođi u Zagreb i otkrij zašto našu školu nazivaju najuzbudljivijim zimskim programom u Europi.

#Budi izvrstan u onom što voliš!

Algebrin tim za međunarodnu suradnju

INTERNET OF THINGS:

Creating a Smart Home IoT System | 6 ECTS

This course is about building smart systems called IoT systems and it has two main goals: first, to teach students about architectures and building blocks of such systems, and second, to motivate students to envision their own applications of such systems. By the end of the course, students will have built a simple IoT system.

An IoT system architecture typically consists of microcontrollers, sensors, actuators and protocols. There are many choices when it comes to microcontrollers, varying both in strength, capabilities and

prices. In this course, you will learn about and use two popular microcontrollers together with their working environments: ESP and Raspberry Pi. The ESP platform is very popular mostly because of its integrated WiFi capabilities and the ease of use, while Raspberry Pi is popular for being very cheap but powerful Linux-based development platform. You will use sensors such as temperature, humidity and CO2 and export their readings via standard protocols (MQTT, TCP/IP) to Cloud service, where they will be stored in a database and visualized.

- Introduction to IoT
- Designing an IoT architecture
- Introduction to sensors, current, voltages and wiring
- Programming ESP in C++
- Using MQTT protocol on ESP
- Programming Raspberry Pi in Python
- Using MQTT protocol on Raspberry Pi
- Building REST API in Cloud for saving telemetry data in database
- Building web interface for visualizing telemetry data in Cloud

INTERNET STVARI:

Izrada IoT sustava za pametne kuće | 6 ECTS

Tema ovog kolegija izrada je pametnih sustava zvanih IoT sustavi, a cilj je kolegija najprije upoznati polaznike s arhitekturom i sastavnim elementima takvih sustava te ih potom motivirati da osmisle primjenu IoT sustava. Na kraju kolegija studenti će izraditi jednostavan IoT sustav.

Arhitektura IoT sustava uglavnom se sastoji od mikrokontrolera, senzora, aktuatora i protokola. Postoje brojni mikrokontroleri, a razlikuju se u snazi, karakteristikama i cijeni. Na ovom kolegiju

polaznici će naučiti o korištenju dvaju popularnih mikrokontrolera u njihovim radnim okruženjima – ESP i Raspberry Pi. ESP platforma veoma je popularna najviše zbog njenih integriranih WiFi karakteristika i jednostavnosti korištenja, dok je Raspberry Pi popularan zbog pristupačne cijene i snažne Linuxove razvojne platforme. Koristit ćemo senzore poput temperature, vlažnosti i CO2 te učitati njihove nalaze putem standardnih protokola (MQTT, TCP/IP) u servise u oblaku, gdje će ih se pohraniti u bazama podataka i vizualizirati.

- Uvod u IoT
- Dizajniranje IoT arhitekture
- Uvod u senzore, struju, napon i strujne krugove
- Programiranje ESP-a u C++
- Korištenje MQTT protokolom na ESP-u
- Programiranje Raspberry Pi-ja u Pythonu
- Korištenje MQTT protokolom na Raspberry Pi-ju
- Izgradnja REST API-ja u oblaku za spremanje telemetrijskih podataka u bazu podataka
- Izgradnja web sučelja za vizualizaciju telemetrijskih podataka u oblaku

WHO CAN APPLY

PROFILE

Highly enthusiastic and motivated students interested in the field of technology, applied science, social sciences and humanities, as well as arts students who aspire to personal growth and an effective start of their career. Students on their graduate and postgraduate studies are eligible to participate in this program.

Language of delivery is English.

The Winter School Program is designed for students with at least a pre-intermediate level of English and it is not suitable for beginners or students with the elementary level of English.

If you need any additional information, send an e-mail to international-office@algebra.university

TKO SE MOŽE PRIJAVITI

PROFIL

Entuzijastični i motivirani studenti zainteresirani za područje tehnologije, primijenjenih znanosti, društvenih i humanističkih znanosti, kao i studenti umjetničkih područja koji teže osobnom rastu i učinkovitim početku karijere. Studenti na diplomskom i postdiplomskom studiju ispunjavaju uvjete za sudjelovanje u ovom programu.

Program se izvodi na engleskom jeziku.

Program zimske škole namijenjen je studentima s minimalno srednjom razinom poznavanja engleskog jezika (B2) i nije prikladan za početnike ili studente s osnovnom razinom poznavanja engleskog jezika (A1, A2).

Ako su ti potrebne dodatne informacije, pošalji nam e-mail na: international-office@algebra.university

THE KNOWLEDGE YOU WILL GAIN

LEARNING OUTCOMES

- Evaluate applicability of a given IoT architecture
- Create a measuring device capable of sending its telemetry data via standard network protocols
- Create a gateway device capable of collecting telemetry data from multiple measuring devices and sending them to Cloud REST API
- Create a Cloud REST API capable of collecting and visualizing telemetry data

ZNANJA KOJA ĆEŠ USVOJITI

ISHODI UČENJA

- Evaluirati primjenjivost IoT arhitekture
- Razviti mjerni uređaj koji može slati telemetrijske podatke koristeći standardne mrežne protokole
- Razviti uređaj koji može prikupljati telemetrijske podatke iz raznih mjernih uređaja i slati ih u oblak REST API
- Izraditi REST API u oblaku koji može prikupljati i vizualizirati telemetrijske podatke



WHEN AND WHERE

DATES

February 17 – February 28, 2020

**Algebra University College
Ilica 242
HR-10000, Zagreb**

GDJE I KADA

DATUMI

17. veljače – 28. veljače 2020.

**Visoko učilište Algebra
Ilica 242
HR-10000, Zagreb**

HOW TO APPLY

APPLICATION

The Winter School application process is carried out online at the official program website: www.algebra.hr/TIIT/winterschool/

Applications are reviewed on a rolling basis, once you submit your application the admissions team will contact you to schedule an online interview. Applications must be submitted before January 26, 2020.

We work in small groups and places are limited, so make sure to apply on time.

KAKO SE PRIJAVITI

PRIJAVNICA

Postupak prijave za zimsku školu provodi se putem interneta na službenoj web stranici programa: www.algebra.hr/TIIT/winterschool/

Prijave se pregledavaju redovito, a nakon što predaš prijavu naš tim će te kontaktirati kako bismo zakazali online intervju. Prijave se moraju podnijeti do 26. siječnja 2020. godine.

Predavanja se odvijaju u malim grupama i broj mjesta je ograničen, stoga se obavezno prijavi na vrijeme.

ABOUT THE PROJECT

ALGEBRA (TIIT) - Transformation and internationalization of Algebra IT study program

European Social Fund, Operational Program Efficient Human Resources 2014-2020

UP.03.1.1.02.0021. / 2018 – 2021

Through the development of a double degree program with Paris Graduate School of Digital Innovation (EPITECH), and the development and implementation of three study programs conducted in English in the field of software engineering, this project aims at contributing to the internationalization of Algebra University College, as well as at advancing international cooperation in the higher education in Croatia. The project timeframe is from October 2018 to October 2021.

PROJEKTU

ALGEBRA (TIIT) – Transformacija i internacionalizacija IT studija Algebra

Europski socijalni fond, OP Učinkoviti ljudski potencijali 2014-2020

UP.03.1.1.02.0021. / 2018 – 2021.

Kroz razvoj združenog studija sa visokim učilištem EPITECH iz Francuske te kroz razvoj i provedbu obrazovnih programa na engleskom jeziku u području računarstva, projekt će doprinijeti internacionalizaciji Visokog učilišta Algebra te unaprijediti prekograničnu suradnju u visokom obrazovanju u RH. Projekt se provodi od listopada 2018. do listopada 2021. godine.

ABOUT ALGEBRA UNIVERSITY COLLEGE

Algebra University College is the flagship of the largest private educational organization in the Republic of Croatia and the region, and present in more than 20 cities across Croatia.

Founded in 1998, we currently have more than 150 full-time employees and more than 400 associated experts. Annually, we educate around 15.000 students through various seminars and short educational programs in lifelong learning, while in higher education we enroll more than 550 new students each year.

Our main campus is located in the heart of Zagreb, the capital of Croatia, while lifelong learning and training programs are also conducted in: Osijek, Pula, Rijeka, Zadar, Split, Šibenik and Varaždin, as well as in more than ten other smaller cities. We currently provide almost a thousand

shorter education programs (in duration of up to 2 weeks), 50 accredited lifelong learning programs and 12 accredited higher education study programs. Many of our programs are authorized by world software and equipment manufacturers such as: Microsoft, Cisco, Oracle, Red Hat, VMware, Adobe, Autodesk, EC-Council, IMC2 and others. We are an academic and/or educational partner of all the stated vendors, for most of them the only one in Croatia.

Majority of educational programs for the acquisition of new qualifications, as well as all study programs in higher education, are accredited by Ministry of Science and Education and are thus linked to the European Qualifications Framework (EQF) through our National Qualifications Framework. In addition, we are also dedicated to applied research.

Thus, the Algebra LAB provides research, services and solutions in areas of:

- **Data science**
- **Application of information technology in education including: digital educational content, distance learning systems and assessment systems**
- **Evidence based labor market and educational policy research and development**

O VISOKOM UČILIŠTU ALGEBRA

Visoko učilište Algebra dio je najveće privatne obrazovne organizacije u Republici Hrvatskoj i regiji, prisutne u više od 20 gradova širom Hrvatske. Osnovana 1998. godine, Algebra danas zapošljava više od 150 stalnih zaposlenika i preko 400 vanjskih suradnika. Godišnje educiramo oko 15 000 polaznika kroz razne seminare i kraće edukativne programe u obrazovanju odraslih, dok u visokom obrazovanju upisujemo preko 550 novih studenata godišnje.

Naš središnji kampus smješten je u srcu Zagreba, glavnog grada Hrvatske, dok se programi obrazovanja i osposobljavanja odraslih provode u Osijeku, Puli, Rijeci, Zadru, Splitu, Šibeniku i Varaždinu, te u više od deset drugih, manjih gradova. Trenutno imamo gotovo tisuću kraćih obrazovnih programa (u trajanju do 2 tjedna), oko 50 akreditiranih dužih obrazovnih programa za odrasle i 12 akreditiranih visokoškolskih

studijskih programa/smjerova. Mnogi od naših obrazovnih programa odobreni su ili se provode prema službenim nastavnim planovima ključnih svjetskih proizvođača softvera i opreme kao što su: Microsoft, Cisco, Oracle, Red Hat, VMware, Adobe, Autodesk, EC-Council, IMC2 i drugi. Mi smo akademski i/ili obrazovni partner svih navedenih dobavljača, za većinu njih i jedini u Hrvatskoj.

Većina obrazovnih programa za stjecanje novih kvalifikacija, kao i svi studijski programi u visokom obrazovanju, akreditirani su od strane Ministarstva znanosti i obrazovanja i time prepoznati unutar Europskog kvalifikacijskog okvira (EQF) kroz njegovu povezanost s Hrvatskim kvalifikacijskim okvirom (HKO). Osim akademskog fokusa, posvećeni smo i primijenjenom istraživanju.

Stoga, Algebra LAB provodi i istraživanja, pruža usluge i rješenja u sljedećim područjima:

- **Podatkovnoj znanosti**
- **Primjeni informacijske tehnologije u obrazovanju, uključujući digitalne obrazovne sadržaje, sustave za učenje na daljinu i sustave za ocjenjivanje**
- **Istraživanju i razvoju tržišta rada kao i obrazovne politike**

OUR STUDY PROGRAMS

Today we carry out total of 12 study programs / specializations on bachelor or master level. The courses at master level are organized exclusively in English, so international students as well as the ones on exchange can enroll in any program / course.

Undergraduate Professional Study Programs/Specializations (Bachelor)

Applied Computer Engineering – specialization in Software Engineering

Applied Computer Engineering – specialization in System Engineering

Multimedia Computing

Digital Marketing

Visual Communications Design

Specialist Graduate Professional Study Programs/Specializations (Master)

Applied Computer Engineering – specialization in Software Engineering

Applied Computer Engineering – specialization in System Engineering

Applied Computer Engineering – specialization in Data Science

Applied Computer Engineering – specialization in Game Development

Digital Marketing

Design and Communications Management

e-Leadership MBA

Learn more at www.algebra.university

NAŠI STUDIJI

Na Visokom učilištu Algebra trenutno provodimo 12 studijskih programa/smjerova na preddiplomskom i diplomskom studiju. Svi naši diplomski studiji provode se isključivo na engleskom jeziku, čak i za studente iz Hrvatske. Stoga se studenti na razmjeni i međunarodni studenti lako mogu uključiti u bilo koji studij ili kolegij.

Naši preddiplomski studiji provode se na hrvatskom i engleskom jeziku, a svi preddiplomski kolegiji dostupni na engleskom jeziku navedeni su na našoj web stranici za nadolazeći semestar.

Preddiplomski stručni studiji/smjerovi (Stručni/a prvostupnik/ca)

Primijenjeno računarstvo – smjer Programsko inženjerstvo

Primijenjeno računarstvo – smjer Sistemsko inženjerstvo

Multimedijsko računarstvo

Digitalni marketing

Dizajn vizualnih komunikacija

Diplomski stručni studiji/smjerovi (Stručni/a specijalist/ica)

Primijenjeno računarstvo – smjer Programsko inženjerstvo

Primijenjeno računarstvo – smjer Sistemsko inženjerstvo

Primijenjeno računarstvo – Smjer Podatkovna znanost

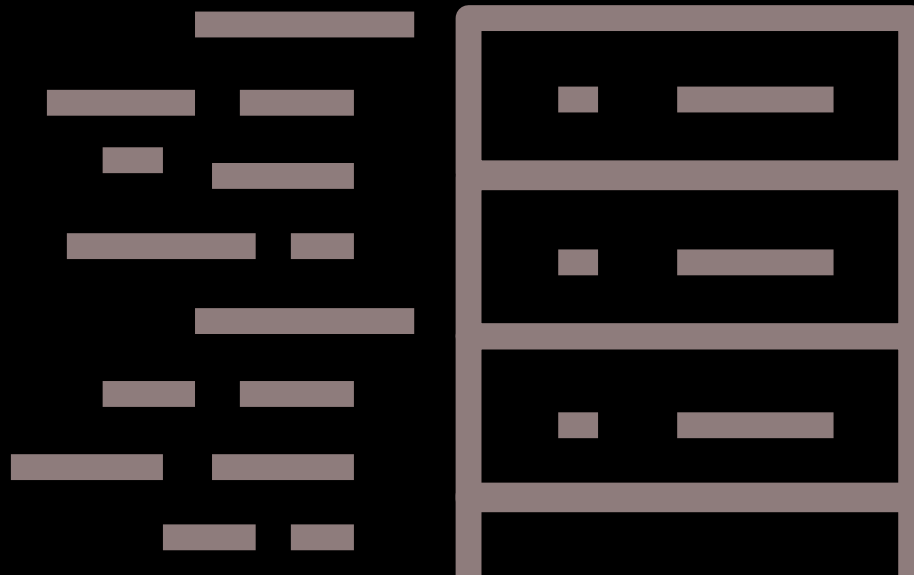
Primijenjeno računarstvo – smjer Razvoj računalnih igara

Digitalni marketing

Kreativno upravljanje dizajnom i komunikacijama

e-Leadership MBA

Doznaj više na www.algebra.hr/visoko-uciliste/





ACCOMMODATION

Accommodation is not subsidized by the project. However, if you need a place to stay while in Zagreb, the International Office will be happy to assist you in the process of finding suitable accommodation. We cooperate closely with some of the hostels in Zagreb and we ensured special prices for participants of the Winter School program.

SMJEŠTAJ

Cijena smještaja nije subvencionirana projektom, no ukoliko ćeš trebati pomoć oko traženja smještaja, rado ćemo ti dati dodatne informacije.

Odjel za međunarodnu suradnju Visokog učilišta Algebra osigurao je smještaj po posebnim uvjetima za polaznike zimske škole u nekoliko zagrebačkih hostela po pristupačnim cijenama.



CONTACT

International Office
Ilica 242, HR-10000 Zagreb,
Croatia – Europe
E-mail international-school@algebra.university
Phone +385 1 5808 863
More information:
www.algebra.university

Every effort has been made to ensure that the information in this brochure is accurate and up-to-date. However, some changes, for example of programs, courses, facilities or fees, may become necessary due to legitimate staffing, financial, regulatory and academic reasons. In such circumstances, Algebra will: (i) endeavor to keep any changes to a minimum; (ii) take all reasonable steps to minimize disruption to students; and (iii) keep students informed appropriately by e-mail advising where to seek further information if required.

If you require further information or confirmation of any matter, please contact us at international-office@algebra.university.

The content of this publication is the sole responsibility of Algebra University College.

KONTAKT

Odjel za međunarodnu suradnju
Ilica 242, HR-10000 Zagreb, Hrvatska
E-mail international-school@algebra.university
Tel: 015808863
Dodatne informacije:
<https://www.algebra.hr/visoko-uciliste/>

Uloženo je puno truda kako bi se osiguralo da su podaci u ovoj brošuri točni i ažurni. Međutim, neke promjene, na primjer, programi, tečajevi, olakšice ili naknade mogu postati potrebne zbog zakonitih kadrovskih, financijskih, regulatornih i akademskih razloga. U takvim okolnostima, Visoko učilište Algebra će: (i) nastojati sve promjene svesti na minimum; (ii) poduzeti sve korake kako studenti u svom radu ne bi bilo ometani; i (iii) informirati studente na odgovarajući način putem e-maila, savjetujući gdje potražiti dodatne informacije.

Ukoliko su ti potrebne dodatne informacije ili imaš bilo kakva pitanja kontaktiraj nas na international-office@algebra.university.

Sadržaj publikacije isključiva je odgovornost Visokog učilišta Algebra.



This project was co-financed by the European Union from the European Social Fund. Please find more info on EU funds at Ministry of regional development and EU funds web site: www.strukturnifondovi.hr

Projekt je sufinancirala Europska unija iz Europskog socijalnog fonda. Više informacija o EU fondovima molimo potražite na stranici Ministarstva regionalnoga razvoja i fondova Europske unije: www.strukturnifondovi.hr