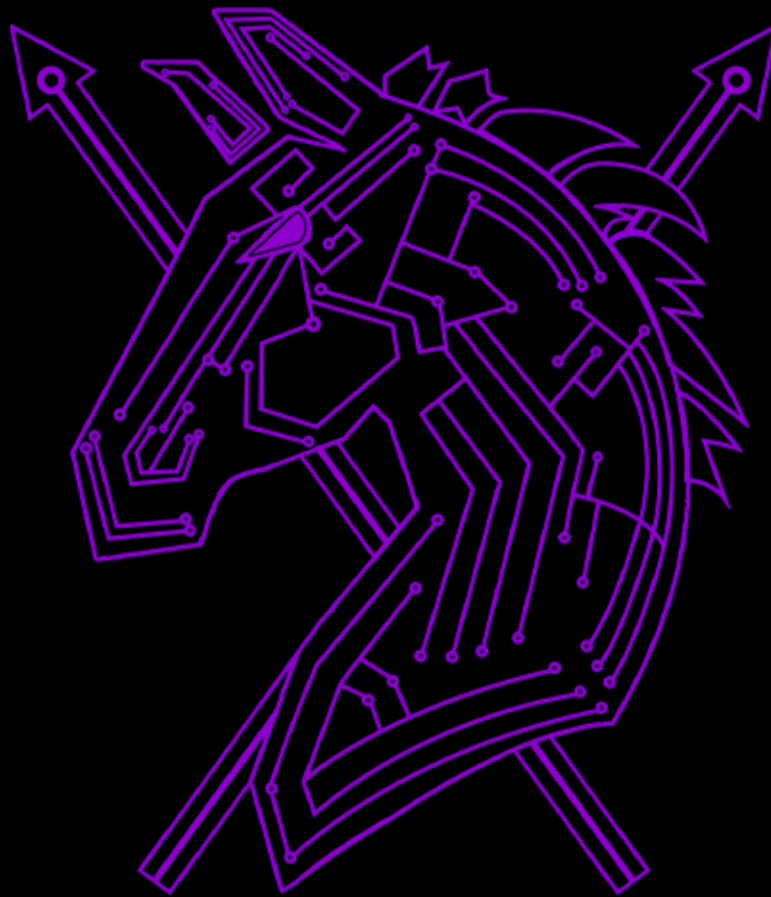




ACSEC VII

21 • 22 • 23 OCTOBER



Introduction

The Aitchison College Science Society (ACSS) is proud to host the seventh edition of the Aitchison College Science and Engineering Concept (ACSEC) from 21st to 23rd October 2022.

This year, despite the uncertainties, the ACSS hopes to provide you with an extraordinary and unforgettable experience at ACSEC, which will be conducted both physically and online. ACSEC VII aims to provide you with three days of learning and innovation, which push even the very best to their limits in the vast fields of science and technology. ACSEC aims to instil a passion for science in every delegate, while exploring each subject's vast applications and various aspects, with all of the 12 unique categories challenging in their own rights.

In this year's edition, the Olympiad plans to accommodate a deep understanding of science, while also inspiring innovative real-world applications.

From the Principal's Desk

Respected Sir/Madam,

Aitchison College will be hosting its annual Science and Engineering Concept from the 21st to the 23rd of October, 2022. On behalf of the ACSEC Team, staff and student body of Aitchison, I am pleased to invite you to the seventh edition of ACSEC which will be held physically, as well as virtually, catering to all delegates.



Aitchison College is one of the most prestigious educational institutions of its kind in South Asia and a member of the G20 group of schools. Our extensive facilities and societies encourage students to discover their potential. It has retained its character over the years by maintaining the public-school tradition of providing quality education that uses academic, sports and co-curricular activities as tools for character development. Today, our pupils represent all areas of Pakistan and truly reflect the demographic mix of our nation.

In 2013, the Aitchison College Science Society delivered Pakistan's first STEM Olympiad, ACSEC. The Society later revamped this event in February 2018. In its seventh version, we intend to set up a benchmark for future STEM Olympiads in Pakistan. The society hopes to welcome delegates once again from across the world, especially partner schools in the USA, UK, India and Australia among many others.

This three-day event is a STEM and Research Olympiad, in which students can grapple with innovation and logical advances. They will enhance their analytical capacities as they solve the most multifaceted riddles and puzzles, design the tallest rockets and solve forensic cases. Delegates will participate in different categories that are being managed and run by our most capable students.

We welcome all schools to ACSEC VII and wish for the success of this astounding project.

Your Sincerely,
Mr Michael Thomson,
Principal of Aitchison College.

From the Headmistress' Desk

Dear Sir/Madam,

On behalf of the faculty, students, and the ACSEC Team, it gives me immense pleasure to invite you to the seventh edition of the Aitchison College Science and Engineering Concept (ACSEC) being held from the 21st to 23rd of October, 2022.



This three-day Olympiad promises to deliver the best experience one can have at an Olympiad of this nature. With 11 categories requiring a different set of skills and knowledge, ACSEC has something for everyone. Be it an up-and-coming astronomer, a prospective environmentalist, or an Aristotle in the making, ACSEC is jam-packed with excitement for those passionate about science as well as those who are looking for a good learning experience and enjoyable time.

Under the guidance of the Deputy headmaster, Dr Muhammad Kamran, the brilliant team of boys; Rayaan Mirza, Khudadad Usman, Arhum Nadeem and Chaudhry Faizan have taken up this challenge of putting together 11 categories for the second hybrid event by the ACSS. The idea behind the event is inspired by the New York Academy of Sciences, which also uses online events to increase awareness in high school students regarding the field of STEM.

I sincerely hope that the platform created by the team can reach schools that otherwise would have found it difficult to participate. I hope your school participates in and learns through these exciting categories.

Regards,

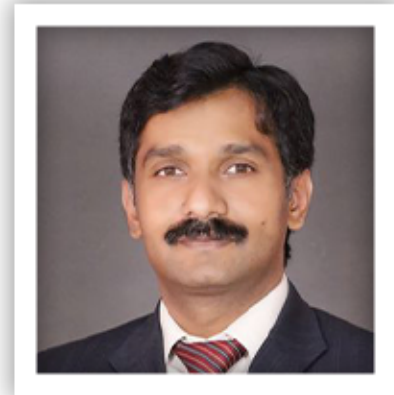


Ms Amina Kamran,
Headmistress,
Senior School, Aitchison College.

From the Staf Advisor's Desk

Dear Sir/Madam,

As the Deputy Headmaster of Senior School, Aitchison College, and the Staff Advisor of the Aitchison College Science Society (ACSS), I cordially invite you to the 7th edition of our flagship event the Aitchison College Science and Engineering Concept (ACSEC) being held this fall from the 21st to the 23rd of October, 2022.



The event is spearheaded by the society's members and is supervised directly by myself. I hope to see all of you this October to witness the product of our perseverance and hard work. Aitchison has had an illustrious history in science with many great minds and innovators being from our alumni. ACSS is one of the largest societies within Aitchison and it also includes 3 divisions: the Robotics Club, the Astronomy Club, and the Aerospace Division. ACSEC I was held in 2013 and was ACSS's first independent event, being largely a success. I witnessed the event as a teacher since I was not the Staff Advisor of the society at the time. I was delighted to see ACSEC II in February 2018 and ACSEC III in October 2018 after a 5-year hiatus. I felt proud to see the students working hard to shape the event to their liking yet making it enjoyable for delegates. With a new executive council sworn-in recently, ACSEC V had similar expectations but it turned out to be an even greater success for the school and in the STEM Circuit by attracting more than 700 delegates from all over Pakistan.

ACSEC VI was the first hybrid event hosted by the college and it proved to be a huge success, attracting over 1200 delegates from around the world. The event deviated from the standards of a fully physical or a fully online event and it truly lived up to its predecessors.

This year ACSEC will have 11 categories, with events ranging from the topics of Biology and Engineering to Mathematics and Research Skills. ACSEC promises to deliver an enjoyable experience to all delegates who attend and will cater to a wide skill-set. I hope all of you can join us on the 21st to 23rd of October, 2022, for one of the best Science Olympiads in Pakistan.

Regards,

A stylized, handwritten signature in black ink, appearing to read 'Muhammad'.

Dr Muhammad Kamran
(Staff Advisor ACSS)

From the President

I, Rayaana Mirza, President of the Aitchison College Science Society, would like to extend the warmest hand of invitation to your institution, to join us in celebrating science and its various branches, this year at ACSEC VII, from the 21st to the 23rd of October, 2022. As I recall my fondest memories, I am reminded of the months of hard work put into the event over the years, and with them, the drive to sow and nurture the seed of scientific intrigue in the minds of all those involved. And now, being

appointed as the President of the Science Society, I feel that an even greater responsibility has been entrusted onto me of creating an event worthy of carrying on that legacy. Having served the Director Registrations and Head of Core Team for ACSEC VI, I can say that it will be no easy feat to create an event on par with previous iterations, and one that sets an even precedent for many more events to come. But I can assure you that the ACSEC Team is ready to go above and beyond to provide an experience that will certainly be remembered.



Join us in this festival of science and technology and forge memories unlike ever before.

Regards,

A handwritten signature in black ink, appearing to read 'Rayaana Mirza'.

Rayaana Mirza,
President ACSS

From the Executive Council

We, the Executive Council of the Aitchison College Science Society, are proud to present the seventh edition of the Aitchison College Science and Engineering Concept.

Last year, with the help of our entire core team, we conducted the first ever hybrid ACSEC. And even though we may have felt overburdened at times, we still felt pride in the work that we were given, and considered it our obligation to organise an event with an experience that surpassed that of its predecessors. And this year, we're sure that the core team feels the same.

Now, as the executive council, we understand the level of responsibility entrusted to us and feel the burden of a huge task: maintaining the glorious legacy embedded into the history of this event. And so, as we advance towards diagnosing mysterious maladies and navigating labyrinthine lairs, we invite you to join us in creating lifelong memories and forging an unparalleled experience at ACSEC VII.

Regards,
Executive Council,
ACSS



Khudadad Usman Virk



Arhum Ibrahim Nadeem



Chaudhry Faizan Ahmed

The Institution

Aitchison College began as one of the five Chiefs' Colleges of Northern India. From a narrow imperial mission in 1886, it has grown into the nation's most diverse school and a truly national expression of education. As a boarding and day school, it offers both, international and national curriculums, unrivalled sports facilities, an extensive co-curricular program and many special interest clubs that enlarge boys' curiosity and social responsibility. Its educational approach is knowledge-based with an emphasis on exploring concepts through the use of discussion, adjunct faculty programs, and many internal and external competitions in which our boys usually excel. Aitchison hosts numerous annual conventions that promote; artistic expression, business entrepreneurship, scientific investigation, debating and public speaking.

It has retained its charisma over the years, maintaining the public-school tradition of providing quality education that uses academic, sports and extra-curricular activities as instruments for character development. The initial emphasis, when it was founded, on educating only the sons of the elite of the province has given way to a diversified curriculum, more suited to an egalitarian mix of pupils drawn from all parts of our country.

Today, our students are representative of all areas of Pakistan and truly reflective of the demographic mix of our nation. Aitchison College is a member of the G20 schools of the world. It has remained at the forefront of educational excellence since its inception and never fails to impress with its ever-growing platforms such as the Robotics and Astronomy Clubs and the newly-founded Aitchison College Centre for Strategic Studies which create exciting opportunities for students to present their game-changing ideas from a very young age.

Aitchison College Science Society

Over the last couple of years, the Aitchison College Science Society has evolved into one of, if not the most, active societies of Pakistan, continuing to collaborate with The Lahore Astronomical Society, The Buraq Planetary Society, and The Pakistan Innovative Foundation to equip its members such that they are able to impact the Pakistani community in a positive manner.

The Aitchison College Science Society has always upheld the College's motto of 'Perseverance Commands Success.' We have sent delegations to some of the most tightly contested Olympiads in Pakistan: ParaKratons, LGS MATCH, LUMS Psifi and JT Innoventions, dominating most in the previous academic year. Furthermore, a delegation consisting of our brightest hailed victorious at the Karachi Grammar School Olympiad 2019 and 2020 as well as the LUMS Psifi XI, solidifying our society's position amongst one of the most established platforms of Pakistan.

Moreover, it has taken radical measures to broaden its reach: qualifying in International Competitions such as the Asian Regional Space Settlement and Design Competition after a five-year hiatus and securing a Grade 11 2nd Prize in the much-coveted NASA Ames Space Settlement and Design Competition with its entry titled 'Atlas', competing against 10,000 other submissions.

The society members actively took part in the National and International STEM Olympiads covering every single event in the STEM Circuit. A team consisting of the society members qualified for the finals of the Pakistan Young Physicists Tournament Finals and will be representing Pakistan at International Young Physicists Tournament (IYPT).

The Aitchison College Science Society brought forth Pakistan's premier online high school science magazine - the Scientifica, the first school-based science magazine in Pakistan. It features knowledge on topics such as Physics, Metaphysics, Mechanics, Biology, and Chemistry which was read online in more than 50 different countries by a wide array of people.

Another critically acclaimed program was the ACSEC Initiative - a series of tree plantation drives and awareness sessions regarding Chronic Diseases as well as Hygiene Issues that garnered national appreciation from state officials. Its collaboration with the Lahore Conservative Society and PEYAM made the project continue with external projects. Likewise, the ACSS will continue to further highlight the raw talent growing in our students, promising to continue its endeavours this year.

The Seventh Edition

This year's edition of ACSEC will still be held in full swing. As part of the Hybrid experience, all sub-categories will be held online, as well as physically. All the coordination between the delegates and ACSEC Representatives will be carried out through WhatsApp. Quizzes and written tests will be held using a medium that does not allow any form of cheating, thus making the event completely fair. ACSEC VII will aim to provide each delegate a platform to showcase their scientific knowledge and logical thinking in every STEM field.

Online Delegates will receive links to the online session and may coordinate with members of the ACSEC Team to ensure that they gain access to their respective categories.

The Categories

We present to you our assortment of 11 distinctive categories, where you can showcase your prowess over STEM skills.

1. Robinson Challenge (Pure Sciences):

Named after the college's first Principal, Mr Walter A. Robinson, this category revolves around academic themes, covering the elements of pure sciences in a highly competitive environment. It will ignite a fervour of learning in the delegates by testing conceptual science in an entirely different manner. Being a compulsory category, Robinson Challenge will be simulated in the compulsory categories' time slot and allow such a team capacity that a large number of delegates from each team will be engaged at a time, decreasing the proportion of delegates that are roaming free on campus. The category will eliminate teams at each stage, putting them head-to-head in the final round in order to determine the winner of ACSEC's flagship category.

2. Langland Research Prize (Environment):

Dedicated to the late Major Langland, our second compulsory category will have delegates present innovative solutions for and debate on modern environmental problems, ranging from global warming to climate change and loss of natural habitat. This will allow awareness to be created surrounding growing environmental concerns.

3. Fibonacci's Trials (Mathematics):

Mathematics is the highest form of pure thought. It is with this in mind that we have designed this mathematics category. From proving age-old theorems to designing their problems, delegates will experience pure mathematics to the fullest extent. The concepts tested here, however, will be less focused on formulae and complex equations and more on interesting problems that will encourage delegates to think out of the box and put their mental prowess to the test.

4. Orion's Pursuit (Astronomy and Aerospace):

Astronomy categories have established a stereotype of requiring a generic space settlement design. Breaking the wheel, Orion's Pursuit in its iteration will revolve around two major space-centred themes: aerospace engineering and astronomy. Delving into the knowledge of the cosmos and modifying it to their purposes, delegates will act critically on the practical scenarios presented. This category will be focused on testing delegates' concepts of the workings of various celestial features, from Mars' geography to neutron stars, and on how well this astronomical know-how is executed to produce practical results.

The Categories

5. Mystery of Pipal Avenue (Crime and Forensics):

Forensic Science is one of the most thrilling and nerve-wracking branches of science. ACSEC's signature crime event will require delegates' application of deductive and critical reasoning backed up with lab chemistry. Be it interrogating the most tenacious criminals, cracking ciphers, connecting the dots to one focal point or analyzing each aspect of the dilemma at hand while also facing the twists and turns thrown at them, delegates will undoubtedly experience and enthralling ride as they try to bring the criminal to justice.

6. Asimo's Ascension (Robotics):

In line with the ever-growing passion of 'Mechatronics' in high school students, this category will test delegates' knowledge of technology, programming and electrical circuitry. More than theoretical tests, Asimo's Ascension will rigorously test delegates' design ingenuity as they acquire essential laboratory skills such as drilling, soldering, and circuit-building. An introductory lecture will also be held on the first day to teach the basics of robotics assembly, Arduino programming and controlling, with the aim of encouraging beginners to participate. A highlight of this category will be the showdown of the teams in an arena specially built for the delegates' robots. This arena will be an uplifted platform placed in front of the Barry Block rotunda and will attract a large number of delegates, effectively putting up a robotics exhibition.

7. R.A.C.E. (Fandom):

R.A.C.E is the only event at ACSEC which takes a break from the field of STEM and provides delegates with a platform to put to use, the hours they have spent watching their favourite TV Shows and reading their favourite comics. This event would feature a plethora of quizzes as delegates are compelled to compete in the field they love.

8. Wolf of Tech Street (Entrepreneurship):

While theoretical science may be engrossing, practicality takes preference in the real world. In line with this belief, Wolf of Tech Street will set a platform for the young thinkers and innovators of the future. The category will not only require delegates to explain the science behind their products but also package them in a way that can be profitable and appealing to investors and will inculcate business skills that last a lifetime.

The Categories

9. Icarus (Construction and Engineering):

Respecting the true essence of creativity and realizing that the outcome of any theoretical science endeavour is a practical execution of the concept, this category will focus on aspects of aeronautical, electrical, and mechanical engineering and the design of real-life models. In building, there is always more than one variable that affects the outcome and this time around extensive teamwork will be required to effectively account for those variables as delegates produce some of the most complex designs they have ever come across. From Rube-Goldberg Machines that allow the delegates to put together completely random components to aerodynamic modules that put the delegates in a tough spot while accounting for the amount of drag on the body, this category will demand deep thinking to optimize designs. All designs will be constructed and thoroughly tested in the summer holidays to ensure smooth proceedings on the days of the event.

10. Turing's Lair (Logic and cryptography):

Introducing a logical thinking space into a previously cryptography-only category, Turing's Lair will be the place to go for masterful thinkers. Merging the themes of logical reasoning and cryptographic skills, this category will set a gruelling atmosphere for the delegates as they battle with tedious encryptions and try to wrap their minds around mind-boggling problems. To start the competition on an equal footing, an introductory lecture will be held on the first day clarifying the ciphers to be used and a cipher guidebook will be provided to the delegates as well. Codes ranging from textbook ciphers such as the ADFGX and Caesar ciphers to much more elusive and intuitive problems requiring split-second decision makings, such as chess puzzles and the elusive Tower of Hanoi, will set delegates on the edge of their seats.

11. Darwin's Deductions (Biology and Medicine):

This year, the ACSEC team wishes to honour one of the most notable names in Medicine, Charles Darwin. Keeping up with the times, Darwin's Deductions will focus mostly on Synthetic Biology and Nanobiology. The category will put special emphasis on finding biological solutions to real-world problems, effectively testing participants' biological knowledge, thinking and practical skills at the same time.

Registration Details

All teams will be required to register via the Online Registration Form and fill the Waiver of Liability and the Institutional Consent forms available at acsec.com.pk

- Registration guidelines are posted on the website - Delegates are advised to read them carefully before registering.
- Each team will be led by a Head Delegate. All information, including team details and category preferences, must be filled in the Online Registration Form to complete the 1st step of registration.
- After receiving confirmation of online registration via email, payments can be made via physical payment at the College's Accounts Office in cash, Bank Drafts or Online Bank transfers.
- If outstation teams choose to courier their bank drafts, the Tracking Number of their courier must be sent to the Registrations Team via email to ensure security concerning payments.
- In the case of Online Bank Transfer, the account number and proof of successful transaction must be sent to the Registrations Team.
- In case of physical payment, the fee in cash has to be submitted to the Senior School Accounts Office. Institutions can send their Society representatives to drop the required amount at the Senior School Office once they have received confirmation of online registration.
- Once the 2 steps have been completed, the Head Delegates will be sent an email confirming their spot at ACSEC VII.
- All institutions are required to register their teams latest by the Registrations Deadline: 16th October 2022.
- Aitchison College holds the right to make amendments in the registration process at any time.

Payment Details

National Teams (Physical)	National Teams (Online)
Early Bird	Early Bird
Delegate Fee: PKR 4000	Delegate Fee: PKR 2500
Team Fee: PKR N/A	Team Fee: PKR N/A
Regular Window	Regular Window
Delegate Fee: PKR 4000	Delegate Fee: PKR 2500
Team Fee: PKR 4500	Team Fee: PKR 3000
International Teams (Physical)	International Teams (Online)
Early Bird	Early Bird
Delegate Fee: USD 35	Delegate Fee: USD 30
Team Fee: USD 65	Team Fee: USD 50
Regular Window	Regular Window
Delegate Fee: USD 50	Delegate Fee: USD 40
Team Fee: USD 65	Team Fee: USD 50

General Details

Event Date: 21st-23rd October, 2022

Team Size: 5-8 members including a Head Delegate

- Each team will participate in a total of 4 or 5 categories.
- The first 2 categories, Langlands Research Prize and Robinsons Challenge are compulsory categories.
- Each team will opt for 2-3 optional categories.
- Categories have limited spots and will be allocated on a first-come-first-serve basis.
- Winning a compulsory category will gain a team 5 points; the runner-up will gain a team 2.5 points.
- Winning an optional category will gain a team 3 points; the runner-up will gain a team 1.5 points.
- Once the fees are paid the ACSEC team is not liable for any refunds.
- The Best Team award, Sir Charles Aitchison Science Medal, will be decided by the accumulation of points of an individual team.
- The Best Delegation award will be decided by the accumulation of all individual team points of an institution.

Charter of Discipline

Inability to refrain from the following may result in the disqualification of the whole team:

- Use of vulgar language or disorderly conduct with the ACSEC administration or other delegates.
- The use of unfair, foul and unjust methods to gain an advantage or preference over other delegates.
- Noncompliance with the judges' decisions. The choices of the judges are deemed to be final and will not be argued over.
- Smoking, use of liquor, or the use of drug-related substances during the event.
- The portrayal of obscenity and hostile material.
- Unauthorized distribution of meeting/session links to individuals other than one's team members.
- Logging into meetings/sessions using vulgar names or through unauthorized accounts/emails.
- Disturbance of the proceedings of the sessions via spam messaging, talking or other means.

Dress Code

These rules are applicable for all delegates in all those sessions in which they are being asked to switch their cameras on.

- All clothing worn by the delegates must be clean, neat and in good condition.
- Clothing with inappropriate, suggestive or derogatory pictures or phrases is not to be worn.
- Jewellery or accessories that may be deemed inappropriate for the learning environment may be subject to review by the administration.
- It is mandatory for participants to wear formal/semi-formal western or eastern clothing (Collared shirt with jeans/trousers. Shalwar kameez, formal tops etc).
- Sheer clothing is not allowed.
- Shirts, kameez, and other tops should be of appropriate length.

**NOTE*: ALL OF THE AFOREMENTIONED DISCIPLINARY GUIDELINES WILL BE PROVIDED TO EACH DELEGATE AND THE ACCOMPANYING FACULTY MEMBER(S) OF EACH INSTITUTION PRIOR TO THE EVENT.*

Contact Information

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