



ACSEC III
19 - 21 OCTOBER



Introduction

The Aitchison College Science Society (ACSS) in collaboration with the key societies of Aitchison College bring you the Aitchison College Science and Engineering Concept 2018.

Following the first two editions of its flagship event, the ACSS aims to organize and firmly establish one of the most productive, prestigious, and competitive Olympiads of its kind. The competition aims to provide school and college level students with the opportunity to compete on a national platform, present ideas, research, and above all else actually think and try to do something about the problems we face in our daily lives. The main ideology behind this is to ensure that all inter-college barriers may be shattered.

The competition aims to provide high school level students with the opportunity to present ideas to impact the world and interact with other likeminded students. All in all, this will be an event that fuses science, research, thinking skills. One that switches our ubiquitous mind-set with regards to science from memorizing textbooks, and getting grades to what actually happens in the real scientific world.

Science and innovation are the key drivers in the speeding up of advancement in a society, they specifically adjust the expectations for everyday comforts of the general population, and the way they interface and speak with each other. Innovative changes give a root to the headway of monetary advancement, wellbeing framework and foundation. The improvement of science and innovation in creating nations assumes a pivotal part in the change of poverty level, and mechanical headway can be considered as a motor of development.

Some organizations like the Buraq Planetary Society, Intel International Science and Engineering Fair, Pakistan Science Club and Khwarizmi Science Society have been established without any government intervention in order to involve students in creative activities. But all these are at a fundamental level that needs to be overhauled to the advanced level by a systematic involvement of one or the other governmental funding agencies.

Over the years, there has been a renewed interest in STEM education for children. Furthermore, there has been an emphasis on using innovative and unconventional ways of doing so. Many Pakistani organizations aim to promote science education among young learners by offering them the opportunity to learn by ‘doing’.

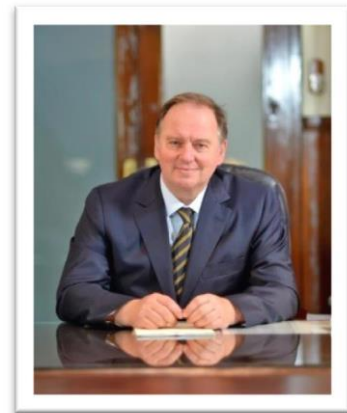
“Science Fuse” is a social enterprise which gives children an opportunity to experience science as a dramatic story of discovery. They are trying to change the way science is perceived, practiced and narrated across classrooms in Pakistan to inspire more children to pursue STEM (science, technology, engineering, and mathematics) education and careers. Their after-school learning programs are fun, interactive and hands-on. Moreover, these programs help children link science to their everyday lives. They also inculcate a sense of curiosity and help children develop critical thinking and logical reasoning skills.

The STEM Careers program has likewise been set up to motivate the youth of the country to decide on professions in science, mathematics and engineering and setting them up for support in the yearly International Olympiad in Physics, Chemistry, Biology and Mathematics and to urge designing understudies to think of imaginative answers for issues of national intrigue.

From the Principal's Desk

Respected Sir/Madam,

Aitchison College is hosting its annual Science and Engineering Concept from the 19th to 21st October, 2018. On behalf of the ACSEC Team, staff and student body of Aitchison, I am pleased to invite you to the third edition of ACSEC in Lahore, Pakistan.



Lahore is a city with a rich historical background boasting many great engineering and architectural feats, such as the Shalimar Gardens and the Lahore Fort. 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 calling in the world. 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 are representative of all areas of Pakistan and truly reflective of the demographic mix of our nation.

In 2013, the Aitchison College Science Society delivered Pakistan's first STEM Olympiad, ACSEC. The Society revamped this event in February 2018. In this third version, we intend to set up a benchmark for future STEM Olympiads in Pakistan. The society hopes to welcome delegates from across the world especially partner schools in 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 advance. They will enhance their analytical capacities as they solve the most multifaceted riddles and puzzles, build the tallest rockets and programme their own robots. Delegates will participate in different categories that have been managed and run by our most capable students.

I welcome all schools and wish every success for this astounding project.

Yours sincerely,
Mr. Michael Thomson,
Principal, Aitchison College.

From the Vice Principal's Desk

An invitation from the Vice Principal.

I am delighted to inform you that ACSEC III will take place from 19th to 21st October 2018. The previous ACSEC took place in February 2018 and was a great success, a large number of students took part in many exciting challenges. I am confident that the October edition will be even bigger and better. New additions to the programme include Computer Science and Robotics.



Having been involved in science competitions for many years, including the International Biology Olympiad, I believe they have an important part to play in education. They encourage students to take an interest in science and technology beyond the confines of the curriculum and challenge them to apply their theoretical knowledge to solving practical problems. Most importantly, they help students develop team work and communication skills.

I very much look forward to welcoming you to Aitchison College in October.

A handwritten signature in blue ink that reads "A Treharne". The signature is written in a cursive, flowing style.

Dr Andrew Treharne, MBE FRSA FLS FRSB
Vice Principal,
Aitchison College.

From the Headmistress's Desk

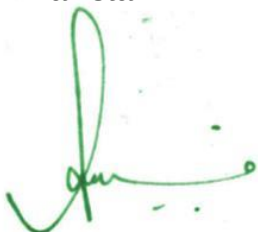
Dear Sir/Madam,

On behalf of the faculty, students and ACSEC Team, it gives me immense pleasure to invite you to the third edition of the Aitchison College Science and Engineering Concept (ACSEC) being held from the 19th to 21st of October 2018.

This three-day Olympiad promises to deliver the best experience one can have at an Olympiad of this nature. With 12 sub-events, each requiring a different set of skills and knowledge, ACSEC, has something for everyone, be it an up-and-coming engineer, a prospective doctor or a Sherlock Holmes 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.

The Aitchison College Science Society strives to make this event a unique and exhilarating experience for all participants and become a pioneer in science competitions held in Pakistan, with our hands-on approach to science and our aim to provide knowledge through a different approach, unlike those seen in the conventional education system these days.

I hope your institution will join us in our endeavours in allowing the young scientists of this country to express their ideas and in promoting scientific progress across Pakistan.



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



From the Staff 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 wish to cordially invite you to the 3rd edition of our flagship event, ACSEC. ACSEC is the Aitchison College Science and Engineering Concept and will be held this fall from the 19th to the 21st of October, 2018. 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 products 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 originally also incorporated the Aitchison College Flight Club and an Electronics Department. As it currently stands, ACSS has won 22 science Olympiads it has participated in the last few years, and is one of the largest societies within Aitchison. It also includes 3 clubs, the Robotics Club, the Astronomy Club and the Aerospace Division. ACSEC I was first held in 2013 and was the first independent event of the ACSS and was 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 of 2018. 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 on the 7th of April, ACSEC III has similar expectations.

This year, ACSEC will have 12 categories, with events ranging from the topics of Biology to Practical Engineering to Mathematics and Computer Science. ACSEC promises to deliver an enjoyable experience to all delegates who attend and will cater to a wide-ranging skill-set and aptitudes. I hope all of you can join us on the 19th to the 21st for one of the best Science Olympiads in Pakistan.

Best Wishes,
Mr. Muhammad Kamran
Deputy Headmaster,
Senior School, Aitchison College.

From the President ACSS

To future Champions of Innovation and Captains of Industry,

I, Mustapha Zeb Khan, President of the Aitchison College Science Society, extend a warm hand of invitation to our event. The 3rd edition of ACSEC will be held from the 19th to the 21st of October, in 2018. The Executive Council at large and I in particular, would hope you and your institutions can join us this fall.



ACSEC III will consist of 12 sub-events and categories, and for 3 days we will test your limits in your respective categories with regards to your skills and ability to compete. In the evening, we invite you to relax and take a break at our social events. No matter your talents, being Entrepreneurship, Biology or Robotics, you will find something for you at ACSEC.

My experience with ACSEC began as early as Grade 7, when the first edition of ACSEC was held. As I was technically too young to attend, I snuck into the event, and witnessed ideals of progress and intellectuality I would never forget. From tinkering with the projects on display to watching the sub-events from afar, I wished to officially take part in this grand endeavour. But alas, the tragedies of 2014 ensured that ACSEC wouldn't be held that year, and due to unforeseen circumstances for the next three years the walls of Aitchison had not seen the gusto of the Olympiad in its glory. Until this February, with me in A1, when the second edition of ACSEC was held, after the blood, sweat and tears of our Core Team. It was a resounding comeback, however there was still a long way to go, I had vowed to my team after the event, that if and when we came at the helm, we would make our next event a monument to effort, success and experimental genius.

As of the 7th of April 2018, the time has come. Our Core Team will ensure that you have an amazing experience at ACSEC. Elon Musk is once quoted as saying, "When something is important enough, you do it even if the odds are not in your favour".

From being an illegal and secret spectator at ACSEC I, to a category head at ACSEC II, to now the President of hopefully the largest edition to date, of ACSEC III, I have a deep emotional attachment to this event. I hope you will join us, forge your own experiences and memories.

Regards,
President ACSS

From the Executive Council ACSEC

Greetings Ladies and Gentlemen,

It gives us immense pleasure to invite science enthusiasts, technological masterminds and innovative, young scholars, to the third edition of the Aitchison College Science & Engineering Concept being held from the 19th to 21st October, 2018.

In middle school, we are told that science covers the study of everything around us. Our instructors teach us that science helps realize what makes things act the way they do. Why do hurricanes form? What is a black hole? How does global warming affect us? A scientist has to retain that level of curiosity into adulthood. If we don't ask questions we can't peruse answers. At ACSEC, we hope to make students more curious about the world around them.

This year, we have increased the total number of events to include disciplines of computer science, robotics, film and photography. In addition to that we have made two events compulsory for teams to participate in to ensure that each delegation can compete directly with every other team so that only the very best institutions can take home the coveted winner and runners up trophy. We will also have ten electable events this year, from which teams will have to select five preferences and will be allotted two to three events. However, these allotments will be made based on 'first come, first serve' basis so it is imperative that schools register as soon as possible to get their desired preferences. There is something for everyone at ACSEC III. We hope you can join us this fall, for a STEM Olympiad unlike any other.



Abdullah Imran Tahir
Head of the Event



Saeed Naeem
Director General



Mayed Ali Khan
Charges D'Affaires

Regards,

Abdullah Imran Tahir, Saeed Naeem, Mayed Ali Khan.
Exec. Council ACSEC,
General Secretaries ACSS.

The City

Lahore is a city with a rich historical background. It has always been of great importance. Under the Mughal Empire it thrived, with many great engineering and architectural feats such as the Shalimar Gardens and the Lahore Fort. In more recent times the city was a focal point for the independence movements of Pakistan and India, with the the Minar-e-Pakistan being contracted to commentate this.

Lahore is the current capital of the Punjab and Pakistan's second largest city. The love of good displayed by Lahoris (people of Lahore) is shown in festivals such as Lahore Eat. Lahore has many cultural events, one of interest being the Lahore Literary Festival, which is considered one of the premier events of South-Asia. Lahore is the home to one the major centers of *Qawwali* music, which is a form of Sufi expression and music that has undertones of Spirituality. The arts are heavily promoted in Lahore via the Al-Hamra Arts Council that regularly hosts plays and exhibitions that are amazing experiences in their own right.

The city is home to many educational institutes and colleges, some of note being CMH Medical School, Punjab University and most notably the Lahore School of Management Sciences (LUMS). In High-School and secondly education some top schools apart from Aitchison include Lahore Grammar's multiple branches. Lahore is home to the National Museum of Science and Technology, which is a must-see for any tourists visiting the city. Other Sci-Tech attractions are the *Lahore Science Mela* and the annual *Robotics Expo* held at Arfa Technology Park.

Lahore is a beautiful city to visit with many gardens and parks. It's heritage as a city that has razed to the ground and rebuilt and still survived to be a cultural icon is truly imbedded in its roots. It offers contemporary sites to see such as the Lahore Zoo, the Lahore High Court and Provincial Assemblies, while also offering some historical sites such as Hiran Minar, The Tomb of Allama Iqbal, and the Samadhi of Ranjit Singh. There is a saying in the Punjab province, "He who has not seen Lahore, has not lived".

The Institution

Aitchison College, Lahore, is one of the most prestigious educational institutions of its kind in South Asia. Aitchison College is not only one of the oldest schools in Pakistan but is widely acclaimed as one of the best. Accommodating students from all five provinces, Aitchison is truly unique in bringing diverse cultures together to form an extraordinary form of education. The extensive facilities and societies available are the perfect tool for opening the minds of the students and helping them discover their calling in the world. It has retained its character over the years, maintaining the public-school tradition of providing quality education that uses

academic, sports and co-curricular activities as tools 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 pupils 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 societies such as the Robotics, Aerospace and Computer Clubs which regularly create innovative and new creations, and students presenting their own inventions and theories from a very young age.

The Aitchison College Science Society

The Aitchison College Science Society has been conducting, and will continue to conduct activities, lectures, and workshops on a plethora of topics (Space Settlement Design, Induction, Series, Electric circuits, robotics, aero-dynamics etc.) as per schedule. A special emphasis has been, and will continue to be laid on experimental research, and practical work.

The Aitchison College Science Society has never backed away in face of adversity and has upheld the College's motto of 'Perseverance Commands Success'. 'We have sent delegations to some of the most toughly contested Olympiads in Pakistan:

The Aitchison College Science Society has dominated the circuit and has won 6 Best Delegation Trophies at competitions in the previous academic year including University level competitions such as the LUMS Psifi and many high school level competitions such as the Scimatics 17, LGS Defence Match, LGS Innoventions 17.

The NASA Space Settlement Design Competition is an annual competition, focused on delving students into making artificial settlements for humanity to develop themselves, beyond Earth. A delegation consisting of our best and brightest, competed against 10,000 students from all over the world, and their settlement 'Atlas' was successful in achieving a Grade 11 Second Prize.

The Aitchison College Science Society, at the start of this year brought forth Pakistan's premier online high school, science magazine - the Scientifica. the first school-based science magazine in Pakistan. It is bursting with 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.

Clubs

The society itself has formed subsidiaries, such as the Robotics Club, Astronomy Club and the Aerospace Club.

Robotics Club

The Robotics Club, ACRC was formed earlier this year and we have had huge success with the projects we have been developing. We teach students the basics of programming, circuitry and engineering at the club using Arduino Boards and external modules such as motors, sensors and LED's. We have successfully made a Gesture-Controlled rover, which uses Bluetooth signals to communicate between the Arduino itself and the motion sensitive glove which we use for guiding the rover. We have also developed a line-following rover which follows a line using motion and ultrasonic sensors controlled by an Arduino which we have coded ourselves.

Aerospace Club

The Aerospace Club is one of the more recent ventures of the ACSS and from its inception it has been immensely successful. We have developed a rocket which has travelled up to 1000 feet into the sky using our prior knowledge and knowledge that we have also acquired along the way. We are working on a re-usable rocket with more range and more controlled motion.

Astronomy Club

The astronomy club is one of the new editions of the ACSS. Our boys also took part in the NASA Ames Space Settlement Contest and achieved a second prize in grade 11 category. The Astronomy club has been carrying out a number of projects which include Space Settlement and has been researching on a number of topics. Our students also attended the Buraq Camp which is held annually. The astronomy club has also invited a number of notable speakers to speak on various topics.

Event Details

With a mélange of 12 distinctive events, which test your knowledge beyond what text books provide, ACSEC is a platform to showcase your talent in the fields of science and technology.

1. Robinson Challenge

This event, named after the first principal of Aitchison College, will be environment-themed. Participants, over the course of the 3 rounds, will be encouraged to not only recognize the environmental problems around them but also to stand up for the need to solve them.

2. Calculated Chaos

In this edition of the event we have the aim of breaking away from the stereotype that math holds in many people's minds as a banal, boring subject and make it as immersing and enjoyable as possible while at the same time intellectually challenging them to the fullest

3. Mystery of Pipal Avenue

The event is aimed at putting participants in the roles of actual teams working to solve a crime and simulating the entire scenario as real life. Participants will be required to use their observation and inference skills and to utilize their knowledge of science.

4. R.A.C.E

In R.A.C.E, each participant will be able to engage in an interactive and thought-provoking bonanza of exhilaration. Mind boggling challenges will ensure that all General Knowledge enthusiasts, fandom heads.

5. Belisarius

Belisarius aims to test the participants' core engineering skills, their ability to work as a team, and the level of their creativity.

6. Cosmic Corona

The event will be carried out over 3 days, spanning the duration of the larger Olympiad. The delegates will represent different aerospace and engineering companies vying for the contract, whereas the event heads will represent the executive board of the corporation Solaris.

7. Genetic Enigma

Generic Enigma is ACSEC's Biology Event. We plan on testing participants not only on their theoretical knowledge in the world of Biology but also their

aptitude and capability to apply that knowledge into practical situations and above all, innovate to find creative solutions to problems.

8. Daedalus' Labyrinth

This event will be centred on cryptography and logic, participants will be Required to decrypt complex jargon that slips right off the tongue and solve seemingly impossible logical puzzles and will have their minds pushed to the limits with cryptography and logical analysis.

9. Asimo's Ascension

Being the first of its kind at ACSEC, Asimo's Ascension will test the know-how of delegates when it comes to the use of technology , programming and electrical circuitry . The Delegates will find Asimo's Ascension to be one of the most unique and challenging events of the competition.

10. BitWise

Prepare for a journey comprehensively designed to cover each aspect of software engineering. From developing programs, to testing them; from writing code, to deciphering it; bitwise promises to quench the thirst of every aspiring programmer. And the best part is, it doesn't take a techno-wizard to participate, just know the basics of coding

11. Wolf of Tech Street

In this entrepreneurship-based event, teams will have to come up with a technological based solution to a problem concerning Pakistan. The teams will have to identify a problem in one of the sectors in Pakistan.

12. Pixels

Participants have to capture the spirit of ACSEC by taking pictures of different categories and events going on throughout the first and second day. They will have 24 hours to capture, edit and print the pictures and display them on boards.

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.
- All details, including the consent forms and members' details, will have to be filled to complete registration process.
- The Early Bird window will be open till the 15th of September.
- All institutions will be required to register their teams latest by 5th October, 2018.
- Payments should be made to the College's Accounts Office in cash, or Bank Drafts (for outstation and international teams only) along with the mentioned forms to ensure participation.
- All outstation and international teams will have to send the Tracking Number of their courier, including bank drafts and the Registration Package via email to ensure security concerning payments.
- The registration payment in cash has to be submitted to the Senior School Accounts Office.
- Institutions can send their Society representatives to drop the required documents to the Senior School Office once they have received confirmation of online registration.
- Once all the mentioned processes have been finalized, the Head Delegates will be sent a confirmation mail.
- Aitchison College holds the right to make amendments in the registration process at any time.

General Details

Date: 19th to 21st October, 2018

Team size: 6 – 10 members

Pakistani National Teams

Delegate Fee: Rs. 3500/- (EARLY BIRD) Rs. 3500/- (NORMAL WINDOW)

Team Fee: Rs. 4000/- (EARLY BIRD) Rs. 4500/- (NORMAL WINDOW)

Early Bird Deadline: 15th September, 2018

Normal Registrations Deadline: 5th October, 2018

International Teams

Delegate Fee: \$75 (EARLY BIRD) \$90 (NORMAL WINDOW)

Team Fee: \$90 (EARLY BIRD) \$100 (NORMAL WINDOW)

Early Bird Deadline: 1st September, 2018

Normal Registrations Deadline: 15th September, 2018

- Each team will have to participate in a total of four events.
- The first two events, Robinson Challenge and Calculated Chaos will be compulsory events in which each team will have to participate to be eligible for Best Institution Trophy.
- Each team can choose to take part in two or three electable events. In case of a scheduling clash, the members will have to divide themselves to participate in all categories.
- Each team will select four or five preferences from the remaining events and will be allotted two or three events from their preferences.
- Preferences will be allotted based on first come first serve basis as each event will have a team cap which will not be exceeded.

Charter of Discipline

Inability to avoid the following may result in immediate disqualification of the whole team.

- The exercise of vulgar language, physical abuse, or disorderly conduct with the ACSEC administration or the participants.
- Using unfair, foul and unjust means to gain an advantage or preference over opponents.
- Vandalism of school property.
- Non-compliance 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 ownership or use of drug related substances on school premises.
- Portrayal of obscenity and hostile material over the grounds and buildings.
- Creating unnecessary noise or disturbance.
- Misusing or harming any of the equipment given by the management.

Dress Code

- All clothing must be neat, clean, and in a condition of good repair.
- Clothing with inappropriate, suggestive or derogatory pictures or phrases may not be worn.
- Participants wearing jewellery or accessories that may be considered unsafe or inappropriate to the learning environment may be subject to review by the administration.
- It is mandatory for all participants to wear formal/semi-formal western or eastern clothing (Collared shirt with jeans/trousers, *Shalwar Kamiz*, formal tops, etc)
- Transparent clothing will not be allowed
- Shirts, Kamiz and other tops must not be without sleeves and should be of an appropriate length

Contact Information

Aitchison College,
Shahrah-e-Quaid-e-Azam,
Lahore 54000 Pakistan

UAN [92 42] 111 363 063 / ext 213

Fax: [92 42] 3636 2989

Official Website

acsec.com.pk

Headmistress Senior School

hmss@aitchison.edu.pk

Deputy Headmaster/Staff Advisor ACSS

dhmss@aitchison.edu.pk

Official Email

acsec3@gmail.com

President Science Society

mustaphazkbharwana89@gmail.com

+92 335 4047765

Head of the Event ACSEC

abdullahimr@icloud.com

+92 321 2220471

