

Contents

<i>BITSian Business Conclave (BBC)</i>	5
Stock Market Simulation	5
Bid-Wiser	5
Night en Vegas	6
<i>Civil</i>	7
CAD Wars	7
Krazy Bridge	7
Lift it Up	8
The Rollercoaster Ride	8
<i>Coding</i>	9
Acyut Challenge	9
Hackathon	9
International Coding League	10
Online Hackathon	10
Anti-Coding	10
C Doku	11
Code Relay	11
Hack-a-date	12
<i>Mechanical</i>	13
RollCage	13
Reverse Engineering	13
Junkyard Wars	14
<i>Mechatronics</i>	15

Drone Prix.....	15
Full Throttle Grand Prix.....	17
AirBorne	22
Dual Mode Vehicle Challenge	22
Battle at Waterloo	24
Water Rocketry	25
<i>Papers & Projects</i>	26
DHITI.....	26
Paper Presentations:	27
Prototype Presentation	29
<i>Robotics</i>	31
I strike	31
Robots at War	32
Student Design Competition	35
Track-O-Mania.....	37
Arduinoix	38
Analogue Design Challenge.....	38
Circuit Design Challenge	39
Hackatronics	40
<i>Sciences</i>	41
APOGEE Innovation Challenge	41
Strategia	41
Chem Wars.....	42
Dexter’s Laboratory	42
Gambling Mathematics	43

Physics of the Impossible.....	43
Unravel.....	44
Who Dunnit.....	44
Zombie Mathematics.....	45
<i>Quizzing</i>	45
Over Head Transmission.....	45
Biz Quiz	45
Brain of BITS.....	46
India Quiz.....	46
Jeopardy	47
Sci-Tech Quiz	47
42.....	47
Doper's Quiz.....	47
LIT Quiz.....	48
<i>Miscellaneous</i>	49
Ahvaan	49
A Debating Event.....	49
Bob the Builder	49
Checkmate	49
Everyone Dies	50
Fresh Event	50
Goodbye Earth	50
I Report	51
Join & Win.....	51
Media Mania	51

Mind-sweeper.....	52
POLYSIS	52
Qrious.....	53
Raze and Rise.....	53
Taboo	53
Treasure Hunt.....	54
Word Amaze	54
Wordstock	54
<i>Miscellaneous Information</i>	56
<i>Contact Information:</i>	57

BITSian Business Conclave (BBC)

Stock Market Simulation

Stock Market Simulation is a joint collaboration of the Economics and Finance Association and the Association of Computing Machinery BITS Pilani.

The best way to grow your money is to **invest** it!!

Step into the shoes of the greatest investors of all time – Be the next John Templeton, Philip Fisher, Benjamin Graham, Warren Buffet, Peter Thiel, Rakesh Jhunjhunwala, Radhakishan Damani, Raamdeo Agrawal and more...

Seen your dad betting hard on the reds and blues on the niche black screen? Ever wondered about those fluctuating numbers that made little sense in your childhood??

Playing with Stocks is regarded as one of the most refined gambles of the Smart.

The fascination towards Stocks can be gauged by the fact that Global Stock Markets alone account for \$69 Trillion worth of the world's \$294 Trillion Financial Assets capital.

Registration:

- This event requires individual participation.
- Download & register on the APOGEE 2018 official app to play the first round.

Rules:

- Each Investor shall be assigned Rs. 10,00,000 on registration.
- Keep a look out for the news notifications on your app & trade.
- The objective is to maximize your returns by investing in the right stocks. Watch on for all the Bulls to ride & avoid the Bears.

- No eliminations.
- **Round 1:** APOGEE App-Round Online (22nd Feb – 24th Feb 2018): This is an online round where the participants can register on the APOGEE 2018 Official app for the challenge and bet using their virtual money.
- Use the powers of Compounding to maximize your assets for betting in the Final Round.
- **Final Round:** On Campus SMS Challenge.
- The final round happens at the campus of BITS Pilani.
- Gather at the iconic Rotunda on the **live trading floor**, with the last set of news from world over, you win only when you bet it all in.
- Fresh registrations are allowed for the final round separately.
- The indices get influenced by a set of events and news items tickering in.
- The player with the maximum Portfolio Value is declared winner of this game.

Contact:

Monark – 9414043547

Aman – 9711701191

Bid-Wiser

Going Once!

Going Twice!

And sold!

Did you change your bid?

Blink and its gone! It's only a matter of two seconds.

Witness the fever of Live Auctions at the only such event in APOGEE.

Opening the doors of traditional auction houses, we bring to you a new way to bid on World-class art, collectibles and more, with an innovative twist.

Registration:

- Participants must form teams of two to four members.
- The registration for this event will take place on the spot.

Rules:

- A continuous event conducted in sessions.
- Register with your friends for a session and participate in the bidding.
- Compete with your opponents to place a higher and smarter bid on every product and try to acquire it.
- **Round 1:** Top 2 teams of each set with the highest net worth Qualify for the next level.
- **Final Round 2:** All winners from various sessions of round 1 would contest in final round.
- Each team will be required to purchase at least one product. Teams with no items purchased are automatically eliminated.

Contact:

Monark – 9414043547

Aman – 9711701191

Night en Vegas

“Cause the house always wins. Play long enough, you don’t change the stakes.

UNLESS. When that perfect hand comes along, you bet, and you bet big, then you take the house.”

Ever wondered how Bond defeated Le Chiffre in Casino Royale?

Aside from his good looks he also had the guts to take that big risk.

Economics & Finance Association presents to you this APOGEE 2018, a series of games where you’ll need a valiant heart to make a move.

Look out for the stars, for as the night settles in, it’s time to bid all your Money – Goodbye.

Play as long as you can, for either you get rich or you get drunk trying.

And don’t ever forget: what happens in Vegas, stays in Vegas!!

Registration:

- Download & register on the APOGEE 2018 official app to claim your virtual e-wallets.

Rules:

- Each registered player gets a bank account and virtual money to use in tricky challenges based on Game Theory & Probabilities.
- The players with the highest **golden chips** at the end, wins the House.

Contact:

Monark – 9414043547

Aman – 9711701191

Civil

CAD Wars

Problem Statement will be released by Second week of January.

Registration:

- This event requires preregistration.
- Participants can register in teams of not more than seven.

Rules:

- Each team should consider the following factors given below and make an innovative model (In AUTOCAD/STAAD PRO/REAL 3D MODEL) for the building.
- The Competition is a two-stage competition:
- **Stage 1:**
 - a) All the teams should mail their case analysis with the model's file (if in AUTOCAD/STAAD PRO) or images of the model (if it is an actual 3D MODEL) to the contacts listed below.
 - b) A design analysis report should be included with the model. The report should contain the ability of the structure to handle the problems.
 - c) In the report, it should be mentioned (in about 100 words) at which location should the model turned be into an actual project (hypothetically) so as to minimize the cost of construction.
 - d) The mail's subject should consist of the event name.
 - e) They should submit a word report of not more than 30 pages.
 - f) Selected teams will be shortlisted for the next round.
 - g) All the short-listed teams will also be intimated via email.
- **Stage 2:**
 - a) Final round of the event will be held in BITS Pilani during APOGEE.
 - b) The shortlisted teams will have to present their analysis and model to a panel of judges.

- The decision of the judges will be final and binding.
- Furthermore, these ideas should “**Strictly not be copied form the internet**”. If it is found that the idea is plagiarized / copied the respective team would be straight away “**disqualified**” from further participating in the event.
- Grading will be done based on following criteria: -
 - a) Content of the presentation.
 - b) Presentation of the ideas i.e. whether the presentation is able to capture the attention of the audience, clearly convey the opportunities underlying the idea and whether the visuals are simple, clear and effective with good use of graphs and charts.
 - c) Innovativeness, uniqueness and benefits of the idea.
 - d) Impact on the environment.
 - e) Economically sound and feasibility of the ideas.

Contact:

Rahul Singh - 7891778874

f2015856@pilani.bits-pilani.ac.in

Sahil Bedmutha - 8600764347

f2015723@pilani.bits-pilani.ac.in

Krazy Bridge

A bridge is a structure built to span and provide a passage over a physical obstacle. This event will test your skills to approach the problem in an innovative manner. With just scrap, you are expected to build a bridge that can bear maximum load and undergoes minimum deflection. You have the freedom on the type of bridge you construct.

Registration:

- Teams must have a minimum of 3 members and a maximum of 6 members.
- Registrations will be done on the spot.

Rules:

- Each team has to make a bridge using boxes, thermo coal, cardboard, ice cream sticks, newspaper, glue etc. satisfying the given specifications.
- All the material required will be provided.
- Physical Specifications of the bridge are:
 - a) Height of deck ≥ 10 centimetres.
 - b) Span of bridge ≥ 40 centimetres
 - c) Pier spacing ≥ 10 centimetres
 - d) Width of deck ≥ 8 centimetres
- Keep in mind that we will only test the weakest point of the bridge. So try to make the bridge with uniform strength throughout its span.
- The bridge must have a level, seamlessly constructed roadway. The deck will be subjected to concentrated/movable loads along the deck of the bridge.
- **Judging criteria:**
 - a) The strength of the bridge. It is governed by the maximum load it can bear.
 - b) Aesthetic Sense
 - c) Efficiency

Contact:

Ashwani Chhatre - 7240466860

Lift it Up

A **jack** is a mechanical device used as a [lifting device](#) to lift heavy loads or to apply great forces. A **hydraulic jack** uses [hydraulic power](#).

This is based on Pascal's Principle. According to Pascal's principle, in a hydraulic system a pressure exerted on a piston produces an equal increase in pressure on another piston in the system. If the second piston has an area 10 times that of the first, the force on the second piston is 10 times greater, though the pressure is the same as that on the first piston.

Registration:

- Registration will have happen on the spot.

- Participants must come in teams of two to five.

Rules:

- You are required to design an efficient and effective hydraulic jack with the materials provided.
- Materials provided: 1 50ml syringe, 2 20ml syringes, 1 wooden plank, 4 wooden columns, 1 mete plastic tube, 1 bicycle spoke, 1 mug, cutters and scissors, fevicol, tape and feviqwik, pens, scales, compasses, ball bearings and copper wire.
- Jack must be in working condition. All the connection should be good.
- **Judging Criteria:**
 - a) Evaluation will be out of 50 points.
 - b) Your hydraulic jack must be stable. It will be evaluated for 10 points.
 - c) There must be minimum leakage problems. It will be evaluated for 10 points.
 - d) A jack lifting heavier load to higher height will be awarded higher points. It will be evaluated for 30 points.

Contact:

Ashwani Chhatre - 7240466860

The Rollercoaster Ride

Students are required to build a marble roller coaster using **paper**.

Registration:

- The registrations for the event will be on the spot.
- Participants must come in teams of not more than five.

Rules:

- The duration of the event is 150 minutes.
- **Materials provided:** 5 chart paper, 10 A4 sheets, marble, tape, fevicol and scissors.

- Your team may use more than one marble.
- Only gravity should be used to propel the “COASTER”.
- Use of internet is allowed during the event.
- Each model will be entitled to two runs.
- **Roller Coaster Model Rules:**
 - a) The model should be designed according to the marble given to you.
 - b) The starting position at the top of the first hill should be clearly marked.
 - c) Size restrictions - the height should not be more than **2m**.
 - d) Minimum height of the roller coaster should be **45cm**.
- Teams are not allowed to touch their model once the ride begins.
- The decision of the judges shall be final. Any coaster that violates the rule above or the spirit of the competition will be disqualified.
- **Judging Criteria:**
 - a) The longest time to go from the start position to the finish will be the official time for that model.
 - b) Technical points: Your roller coaster must have a “thrill factor.” There must be at least one loop, at least one turn, and if possible, a “jump”. Judging on this aspect will be based on Horizontal curves, vertical curves, thrill, vertical jump height, start height bonus, Stability etc.
 - c) Points will be awarded for creativity and addition of interesting events like the free fall of the marble, uncontrolled movement through a funnel, Frisbee, disc or similar to the ride. Judging on this aspect will be based on your creativity and complexity.

Contact:

Rahul Singh – 7891778874

Coding

Acyut Challenge

Robots will harvest, cook, and serve our food. They will work in our factories, drive our cars, and walk our dogs. Like it or not, the age of work is coming to an end.

AcYut in collaboration with BITSACM presents India’s only collegiate humanoid robotics challenge where you get to solve a problem set by our team and watch your code run on India’s first indigenous humanoid robot, AcYut. You also get the opportunity to watch your code displays it prowess at Robocup as AcYuT takes on competitors from around the globe and beats them at soccer!

Registration:

- Participants may come in teams of three to five.

Rules: (Not finalised)

Instructions: (Not finalised)

Contact:

Anmol – 8283807756

Vikram - 9845696520

Hackathon

Have you ever dreamt of exploring the world of Artificial Intelligence by solving a real life problem? If yes, then your ticket to turning this enthralling thought into reality is right in front of you. BITS-Pilani presents the premier machine learning hackathon this APOGEE 2018.

Registration:

- The registration of the participants would happen on the spot.
- Participants must come in teams of not more than four.

Rules:

- The expected duration of the event is 24 hours.
- This hackathon is a problem specific competition.
- The problem and dataset will be released on the first day of the event.
- All the coding should be done during the 24 hours of the event only.
- Participants are expected to bring all libraries and software necessary to build the solution of the problem statement. Organizers will provide power strips.
- Your entry will be instantly disqualified if your code: **directly** calls unmanaged code or **directly** reads, writes or executes any database object other than those created by your module.
- The solution will be judged on the basis of accuracy on the test dataset.
- Rules are subject to change.

Contact:

Divanshu Gupta – 8003399658

International Coding League

Talk is Cheap. Show me the code- Linus Torvalds

Do you think you have mastered Competitive coding, the greatest mind sport? Do you feel the urge to solve Mind blowing problems and play the Game of Codes? Here's your stage to step on and prove your coding skills – A challenging stage, a nail biting one! BITSACM presents ICL - International Coding League: a competitive programming contest based on the ACM ICPC this Apogee 2018. In February some of the best minds in the country are to gather to compete for the crown.

Registration:

- Registration for this event will take place online.
- Fill the following form to be eligible for the prizes: **Link TBA.**

Contest:

- The contest will be held online nationwide.
- The duration of the contest will be 3 hours.

- The round will consist of 6 algorithmic problems.
- The participants are expected to use C, C++, Java or Python to solve the problems.
- Any form of malpractice will lead to disqualification.
- The decision of the authorities will be final and binding.
- Participants can view sample problems on the following url: <https://www.codechef.com/ICL2017>

Contact:

Anmol - 8283807756

Divesh Uttamchandani - 8955001303

Online Hackathon

Learning from solved real world problems, participants will need to complete machine learning challenges in the post-workshop hackathon.

Registration:

- Online registrations.
- Participants may register in teams of three to five.

Rules:

- The problem statement and competition will be hosted on Kaggle.
- The Hackathon will be an online single round event running to 7 days.
- Participants will be supplied with a data set and a baseline solution to get them started.
- The participants will have to come with their own unique solution.
- Late Submissions will not be accepted.

Contact:

Arka – 7908804630

Alex - 9983560468

Anti-Coding

Do you want to check the verso of coding? Are you fatigued by traditional

competitive programming? Do you want a break, out of this coding blasé? A ‘yes’ for any of these tells us you are watching the right space. Anti-Coding is an on-campus event in which participants need to write code unconventionally. To make it much more interesting we choose a theme every year; bend the rules and make one code a brain teaser for another. We are excited to announce this year’s theme: Code Obfuscation.

Registration:

- Registrations will be done on the spot and will begin 30 minutes prior to commencement of the event.
- Participants must come in teams of at most two.

Rules:

- The event will comprise 2 rounds:
- The preliminary round aimed at selecting the participants eligible for the next rounds.
- This round will involve some basic questions on programming and aptitude to ensure a minimum programming capability of the participants required for the next rounds.
- The teams selected for the next round will be solely selected based on their score in this round.
- Qualified teams enter the final round where each team shall be given a problem statement.
- This will be a simple problem like printing a factorial, but the aim of code would be minimizing the ASCII sum of the code with some constraints.
- Code must be written in C language.
- Each team will be required to try to make their code as small as possible and using characters with lesser ASCII value.
- The teams shall submit their codes for the problem after 45 minutes after the commencement of this round.
- Use of internet will not be permitted.

- Use of mobile phones or any other electronic media will lead to immediate disqualification.
- **Judging Criteria:**
 - a) The team with the lowest ASCII sum solution to the problem will be declared as winner.
 - b) In case the tie is still unresolved, the score for the previous rounds will be considered.
 - c) The decision of the judging committee will be final and binding.

Contact:

Anshul Jain - 8003325758

C Doku

C-Doku is an on campus Apogee Event. It consists of solving the Sudoku based on solving a few number of C/C++ questions.

Registration:

- Registration will be done on the spot on a first-come-first-serve basis.
- Participants must come in teams of two.

Rules:

- The duration of the event is two hours.
- This is a paper based event.
- Judging will be based on the extent to which Sudoku is solved.

Contact:

Abhishek V Joshi – 9769320230

Code Relay

Have you ever run in a relay race?

Code Relay brings to you the opportunity to solve programs with your team like in a relay race. Switch between writing code and figuring out what your teammate has written.

The team which solves the questions 1st wins!

Registration:

- Registration will be done on the spot on a first-come-first-serve basis.
- Participants must come in teams of two.

Rules:

- The duration of the event is two hours.
- Participants are not allowed to communicate with any other participant including teammates in any form.
- The allowed languages are C, C++, Java and Python.
- Team members are to use the same language.
- Any form of malpractice will lead to disqualification.
- The decision of the authorities will be final and binding.

Contact:

Anmol – 8283807756

Manan – 9409400446

Contact:

Anshul Jain - 8003325758

Hack-a-date

Hack-a-date is a quizzing event with a twist. Both the participants must answer the questions correctly to score points.

Registration:

- Registration for the event will be done on the spot.
- Participants must come in teams of two, one boy and one girl.

Rules:

- The theme will be: A cybernetic future.
- There will be five rounds with a rapid fire round.
- Two questions would be asked per team in each round.
- Questions will be rotated among the teams.
- Time limit of 30 seconds would be kept for each question.
- Team with maximum points wins.
- In case of same scores a tie breaker round will be conducted.

Mechanical

RollCage

In an era with ever increasing importance to automation, APOGEE invites you to go hard-core mechanical. RollCage is a competition with a vision to innovate in automation of mass production and assembly stations. The participants would be required to apply their critical thinking skills to innovate and reinvent a new approach for a mechanism. The main goal of this event requires the participants to build an automated mechanism using only mechanical and fluid power components.

Registration:

- Participants must come in teams of three to five members.
- Registration for this event would happen prior to the fest.

Rules:

- **Round 1:** An online quiz based on aptitude, automation, mechanisms and basic mechanical knowledge.
- **Round 2:** Qualified teams will have to send their virtual solutions for the problem statement in the form of 1 CAD model and a single page description at manu-assoc@bits-apogee.org.
- These solutions would be judged on the basis of effectiveness, robustness, feasibility and design simplicity.
- **Round 3:** The teams selected further for final round will have to fabricate the mechanism from the scratch using the given inventory only during the duration of the event.
- The organizers will reject incomplete, inconsistent or improper tasks and documents.
- All entrants are regarded as having the full understanding of the rules and regulations governing the competition. The decision of the jury shall be final and binding.

- The organizers shall provide various tools required for dismantling the device as well as sheets of paper and other items required for preparing the running note.
- All disputes are subject to the decision of the event managers.

Contact:

Manpreet Singh – 7000082622
Ashutosh Purohit – 7240466858

Reverse Engineering

The competition inherent in the modern market structure forces firms to produce only the best; simultaneously keeping in mind the customer's needs. Reverse Engineering, as many of you might already have heard of involves going back to a concept from the prototype. This technique is often adopted by organizations while developing new products or improving the existing products. It is also used for studying the technology used by competitors and Market leaders of that Industry.

In this competition the participant has to prove his understanding of fundamental concepts as an engineer. It requires them to have a systematic approach to analyzing and reasoning the engineering design of devices and systems.

Registration:

- Participants must come in teams of three to five members.
- Registration for this event would happen prior to the fest.

Rules:

- **Round 1:** An online quiz based on aptitude, automobile and basic mechanical knowledge.
- **Round 2:** Qualified teams will be given an online case study problem. The teams have to mail (or share) their report/solution to us at manu-assoc@bits-apogee.org.

- **Round 3:** The teams will be given a mechanical device which they are required to disassemble to the smallest components; note down the specifications of each component; complete and engineering drawing representing the electrical circuitry / major structural components (whatever is applicable), and then re-assemble the component.
- Teams will be provided with the problem statement for Round 3 on-the-spot.
- The organizers shall provide various tools required for dismantling the device as well as sheets of paper and other items required for preparing the running note.
- The organizers will reject incomplete, inconsistent or improper tasks and documents.
- All entrants are regarded as having the full understanding of the rules and regulations governing the competition.
- The decision of the jury shall be final and binding.
- All disputes are subject to the decision of the event managers.
- **Judging Criteria**
 - a) Round 1: Based on online quiz score.
 - b) Round 2: Based on the online case study (open or closed type).
 - c) Round 3: The basic judging principle is – The more the number of components identified along with proper specifications, the more the marks the team is awarded.
 - d) Aesthetics and neatness of the disassembly and assembly will be considered too.
 - e) For electrical and electronic devices, a proper electrical circuit diagram is required.
 - f) For mechanical devices, proper diagram of the basic components with dimensions is necessary.
 - g) The team's skills at innovation and understanding of the task at hand will earn more marks.

Contact:

Manpreet Singh – 7000082622

Parth Sharma – 7014468469

Junkyard Wars

Do you have the imagination and will power to transform useless things into some great mechanisms? Then this is the event for you. BITS Pilani presents a new transformed version of famous Discovery Channel show “Junkyard Wars”. This event will check the participant’s knowledge of Engineering and ability to work in an exhausting situation. The participating teams are supposed to have sound theoretical and practical knowledge of Mechanical Engineering.

It is a complete day and night event wherein the participants are required to make a vehicle from the junk provided to them in 36 hours in the final round. For this purpose, the BITS Workshop will be kept open during the complete event and participants can make use of the required machine tools. The teams will be selected for the final round from two initial rounds.

Registration:

- A team may not have more than 5 members.
- Students from colleges other than BITS may use a wild-card entry for Round - 2.
- Test for the Wild-card entry will take place on the day same as Round - 2.

Rules:

- **First Round:**
 - a) The first round would be an online quiz of MCQ type.
 - b) The questions will be based on basic engineering concepts and will also be related to automobiles in particular.
- **Second Round**
 - a) The second round will be a more of an imaginative and open end type where the shortlisted teams will be required to present a solution to the given problem statement.

Mechatronics

Drone Prix

Feel the sweat trickling down your forehead, feel the adrenaline pumping through veins and feel the cheers of the crowd fade away behind the hum of the rotors. This APOGEE even sky is not the limit!!!

Design a remote controlled Multi Rotor to race against the hurdles and the ticking clock. The arena will be open ground. However, the maximum flight altitude will be 15 meters. The competition comprises of scoring at 5 different levels including elimination rounds.

Kindly read all the rules and specifications clearly and contact us for any discrepancies.

Registration:

- A team may have at most four members, excluding the mentor.
- The mentor is optional and is not allowed to operate the UAV.
- Professionals are allowed to participate.

Rules:

- Every team should have a name.
- A particular team can obtain a maximum of 2 chances to complete a level.
- Carbon fibre props are not allowed as they can harm someone if gone out of control.
- Teams should carry their own battery chargers.
- There should be no loose item attached to DRONE and it must pass the inspection
- Every DRONE should be capable of arming/ disarming
- Only one pilot can fly the drone in a round from the team (pilot can be changed in every round).

b) The problem would be based on a hypothetical situation and the participants are required to showcase their know-how in the current technology as well as their thinking ability to depict a solution to the given problem.

c) Organizers will interact personally to each team to judge their designs and then top 3 teams will be selected for the final round.

- **Final Round**

a) In this round the selected teams will get a problem statement based on that they have to make the working mechanism on a three wheeler.

b) The engine, wheels and a steering system will be provided for by the organizers.

c) For making it the teams will get the full access to the BITS Workshop where they will get the Junk and various tools like Lathe, Welding etc.

d) Teams will have to build their model in the span of 36 hours (within restricted slots only).

e) Manufacturing will be followed by a small test run of the mechanism.

- The problem statements of last two years were: a rag-picking mechanism and a trebuchet (catapult mechanism for throwing).

- **Judging Criteria:**

a) Design

b) Quality of the manufacturing

c) Performance

d) Safety Measures

- Rules will be specifically explained at the time of event and the above order does not signify any particular weightage to the points mentioned.

Contact:

Aman Shah – 9824600711

Manpreet Singh – 7000082622

- All drones should be ready 15 minutes prior to the beginning of the rounds in a ready-to-go position.
- Participant should bring all the essential accessories required for them.
- Charging points to charge the batteries will be provided to the participants at the venue but teams are expected to keep their batteries pre-charged.
- Exchange of quad between teams is not allowed.
- If any miss behaviour found they will be disqualified immediately.
- Judges decision is final.
- Pilots should follow all safety instructions.
- **Drone Specifications:**
 - a) The UAV should fit in a box of dimensions 650mm × 650mm x 650mm (length x breadth x height) without propellers.
 - b) The UAV weight should not exceed 3 kgs (without remote control).
 - c) Only Quad Copters are allowed in the event.
 - d) The electric voltage between any two points on the UAV should not exceed 26V at any time of the competition.
 - e) Readily available remote controlled systems with dual frequency from the markets are strictly prohibited
 - f) It is preferred if a team has a handmade frame for the drone, extra points will be awarded for it.
 - g) Every pilot should control the drone from a fixed distance designated by a white line and negligence would result in disqualification (if they neglect twice)
- **First person view (FPV):**
 - a) Participants should have FPV (not mandatory) along with FPV goggles, video receiver, antenna, FPV camera, battery etc.
 - b) Teams are expected to provide a live streaming of FPV on the screen available at the venue, extra points will be awarded to them for this.
 - c) Participant have to prior inform if they will provide FPV on the screen. This information should be given to the contacts below by first week of February. If failing to do so, no bonus points will be awarded.
- **Contest:**

- a) There are total 5 Evaluation rounds, as follow:
- b) **Team Promotion:**
 1. Each team has to upload a video with their team's name and team's ID on Drone-Acharaya facebook page and with #bitsapogee #droneprix
 2. Video should contain a 15 -20 seconds of their drone in working condition.
 3. Teams should start posting their video from 5th February 2018.
 4. For every 25 likes, 1 point will be awarded to the team.
 5. Final score of the teams will be awarded as per the number of likes on the post by 23:59:59, 20th February 2018.
 6. Maximum number of points that can be awarded for this round are 20 points.
- c) **Technical and Innovation inspection:**
 1. Each team participating will undergo a technical inspection of the UAV they have designed.
 2. Any team member can be called for questioning/Interview during the TI.
 3. Maximum 30 points will be awarded to the teams on the basis of various factors like design, stability, knowledge and presentation.
 4. This is mandatory round to clear.
- d) **Spot Landing:**
 1. After the TI is cleared then the team will go for the spot landing.
 2. In this, pilot has to land the UAV on a dart (as shown in the figure) from the height of 10 ft. at a distance of 25 ft. in a marked area.
 3. Teams have to submit the name of the two pilots who will be flying during the event as per priority.
 4. Second pilot cannot take controls in between the flight.
 5. The points will be as per the precision in landing and the time duration of landing on a dart board like concentric circles.
 6. The maximum points will be 40 which can be done in two attempts.
 7. Teams clearing this round in second attempt will be evaluated out of half of the total points.

8. Top 10 teams will be promoted to next round.

e) **Hurdle World:**

1. After clearing the spot landing the team move onto the Hurdle World.
2. In this round teams have to clear the hurdles according to the fight instructions of the referee (which will be same for all the teams)
3. Pilot can choose any spot in the arena. Pilot can't move around and has to stay within the bounds at the chosen position till the end of the flight.
4. This round consists of a maximum of 50 points and all the teams will be given just a single chance to clear the course.
5. Top 5 teams will be promoted to next round.

f) **Skillway**

1. This round consists of 2 components
2. In first component, a ball will be placed inside a maze, participant have to remove that ball using the thrust of their drones in limited time
3. Layout of the maze will be provided at the venue itself.
4. In second component, drones will have to complete laps of arena dogging some hurdles in the provided time limit.
5. Teams will be evaluated on the basis of number of laps completed in that time limit.
6. Final winner will be decided on the basis of this round.

Contact:

Satyam Gaba – 7240466720

f2015469@pilani.bits-pilani.ac.in

Chandrakant Pandey – 8468810477

chandrakantpandey162@gmail.com

Full Throttle Grand Prix

Sports Cars are one of the most ultimate man-made machines and their race is full of adventures and a must watch event. On the course of F1 racing BITS-Pilani is conducting Remote Controlled racing event “The Full

Throttle Grand Prix”. This competition is to show your knowledge about engineering behind remote controlled cars and feel the effect of ultimate driving experience. The event requires racing of your self-built RC cars on a race track. Although it may look simple to you but you will face cut-throat competition, and finally it is the quality of the car and driver ability which will decide the winner

Build a Remote Controlled IC engine powered car to traverse a race track in the minimum possible time. The time trial track may be composed of several turns with increasing difficulty levels. The teams with the top best time to lap this track qualify for racing. Final round will be a race.

Registration:

- Participants may come in teams of five members.
- Participants must submit an abstract giving the complete description of their vehicles based on the following lines.
 - a) If the teams are fabricating the vehicle by themselves then steering mechanism and the chassis layout should be explained in detail, along with proper diagrams. Picture(s) showing all the three should be attached.
 - b) Photographs of chassis without assembly should also be submitted. If the participants have already proceeded building their chassis, then they can send the photo of their car in the current state. These photographs are required to verify that the components have been built by the participants themselves.
 - c) Photograph of the car in the current state must also be sent with the name of the photograph as the date on which it is taken.
 - d) Specification of all other components like the engine, remote controllers etc., must be specified.
 - e) The complete abstract along with the photos, the name of the team and the names of the team members.
 - f) If readymade cars are used by the team then the team should mail the exact specification of the car.

- g) Write the name of team along with the name of team leader and team members with contact numbers and e-mail ids. Put the <team name>_<College>_FTGP in the subject and mail your abstract to mechassoc@bits-apogee.org . You must also confirm your registration by calling the contact information given.
- h) A confirmation mail will be sent to the Team leaders.

Rules:

- **Vehicle Specifications:**

- a) The vehicle should fit in a box of dimensions 800mm X 700mm X 600mm at every given point of time in the race.
- b) The external device used to control the vehicle is not included in the size constraint.
- c) The use of IC Engines for propulsion is essential. Motors should not be used for this purpose. However DC motors and servos can be used for steering mechanisms or any other mechanism apart from propulsion.
- d) Only one IC engine should be used in the vehicle. Use of any other sources such as chemicals, compressed gas, rockets etc for propulsion is not allowed. The maximum allowed capacity of IC engine to be used is 4.5 cc (i.e. Participants can also use 4.2cc, 3.5cc, 2.5cc, or any other IC engine with less power).
- e) The vehicle has to be necessarily controlled by a wireless remote control system throughout the competition. The vehicle must have two remote control of different frequencies or an alternate frequency remote control circuit which can be switched to either frequency before the start of the game. This is done to avoid frequency interference between the two competing vehicles.
- f) Remote control systems from toys might be used. Remote control systems available in the market may also be used.
- g) The vehicle parts can be ready made. But there will be extra points if you make chassis and steering mechanism by yourself (See judging criteria for more detail).

- h) If you are making your car then other functional parts like motors and servos, gears, springs, engine, remote control systems, batteries, wheels, braking mechanism are allowed to be used as directly available from the market.
- i) The vehicle must have an on-board power supply to provide electricity to any mechanism requiring electric power. The electric voltage anywhere in the machine should not be more than 12V at any point of time.
- j) Participants are advised to use a proper cooling mechanism to prevent overheating of the engine.
- k) Verify with the organizers if you have the slightest doubt whether a component can be used or not.

- **Competition rules:**

- a) The track will have check points at regular intervals.
- b) If a machine tumbles, or halts, or goes off the arena at any point on the track, only one of the participants is allowed to lift it up and place it at the nearest checkpoint behind that point.
- c) The vehicles have to be fully controlled using only the remote control unless there is a need to touch the vehicle as stated above. There will be a time penalty every time the machine requires lifting by the team member.
- d) Any vehicle is not allowed to leave any disintegrated part on the race track amidst of the race. In case this happens, the team will be disqualified.
- e) The teams are also not allowed to damage the opponent's vehicle deliberately. If found guilty, the accused team will be disqualified.

- **General Rules:**

- a) Depending on the number of teams participating and other time constraints, the arena will be given to the participants for practicing. The time slots will be given on the basis of first come first serve basis, but little duration for practising is assured to everyone.

- b) All the teams must have a team name.
 - c) Organizers reserve the right to change any of the above rules. The participants will be informed about the same through the highlighted text on APOGEE website.
 - d) Participants can address their queries indirectly via e-mail or forum and directly by calling up the organizers.
 - e) Some online resources for help will be uploaded soon.
- Organizers and judges' decision shall be considered as final and binding on all.
- **Contest:**
 - **Round 1:**
 - a) Best of two trials will be considered (least time taken to reach the finish line) for the teams to qualify for the second round.
 - b) The track will be free from obstacles.
 - c) The exact number of teams qualifying for the second round will be decided based on the number of participants.
 - d) If participants are using an IC engine, they can start the engine and the BOAT will be placed in the water and released it when the signal is given.
 - e) There will be penalty for touching the boundary.
 - **Round 2:**
 - a) Teams qualifying round 1 will participate in this round. .
 - b) Round 2 is meant to test the speed, steering skills of the boat through various obstacles on the track. Details of the track will be uploaded later.
 - c) Race Track: Race track details will be uploaded later but will essentially contain a loop/ turn The event will be conducted in BITS Pool having dimensions 25m*10m*2m.
- **Disqualification:**
 - a) Failure to comply with any of these rules, not limited to items covered in this section, may result in disqualification by the Official. Disqualification may be for a single class or for the entire event.
- b) Disqualification means that the driver will not be allowed to race or continue racing. Any driver who is disqualified for the entire event may be required to leave the racing facility. There will be no refund of entry fees to a disqualified driver.
 - c) Any of the following actions on the part of a driver or member of his crew will result in mandatory is qualification from an event:
 1. Not taking a vehicle or radio to the inspection area when directed to do so.
 2. Operating a vehicle near the track that could endanger others in the area.
 3. Drinking intoxicating beverages, using illegal substances, or showing evidence of being under the influence of an intoxicating beverage or illegal substance in the pits or the race area.
 4. Taking part in a protest demonstration in the pits, on the track, or in the surrounding area before, during, or after a race.
 5. Entering restricted areas or event scoring areas without proper authorization.
 6. Assaulting another individual.
 7. Turning on a radio during a race to affect another driver's vehicle.
 - d) The following offenses by a driver or member of his crew may result in disqualification if deemed appropriate by the Race Director. If not deemed appropriate, the minimum penalty will be no score for the race in question. A second offense of the same type may result in immediate disqualification.
 1. Using an engine, motor, part or vehicle that does not comply with the rules.
 2. Subjecting a Race Official to improper language or other demeaning actions.
 3. Allowing another individual to substitute for them in a race. In this case, both drivers may be subjected to disqualification. Only genuine cases will be entertained.

4. Ignoring a black flag.
5. Deliberate abusive nerving, bumping, or blocking.
6. Not submitting his vehicle for technical inspection prior to racing (when prerace inspection is in force).
7. Use of illegal or banned tire-cleaning or traction chemicals or compounds.
8. **Note:** A disqualified or penalized driver may protest the decision of the Official assigned to the event. The decision of the Official will be final.

- **Black Flag:**

- a) A black flag will be given to a driver whose driving, vehicle operation, or performance constitutes a hazard to the other vehicles in the race. This includes insufficient skills to compete in the class, unsportsmanlike driving, and intentional hitting of other vehicles, intentional short coursing, intentional corner cutting, intentional blocking when being overtaken, illegal or improper vehicle numbers and other such acts.
- b) When a driver is given the Black Flag, it means that driver must pull his/her vehicle off the track immediately. The driver will remain on the drivers stand until that heat or race is over.
- c) A black flag ruling may be used at any time for unsportsmanlike conduct or abusive language to other drivers or race officials.
- d) A driver who receives three warnings in an event from a referee or race official will be black-flagged.
- e) Any vehicle that loses its body or that cannot be controlled properly due to radio problems, race damage, or missing parts will be black-flagged.

- **Protests:**

- a) Protests may be submitted against:
 1. Vehicles or parts of vehicles
 2. Technical issues
 3. Results
 4. Race procedures, policies or decisions.

- b) Protests considered by the Race Director to be frivolous or unsportsmanlike will not be accepted.
- c) Protests may only be submitted by drivers properly entered in the event which is the subject of the submitted protest.
- d) A written request will be entertained only.
- e) The protest must be filed within 15 minutes of the associated development that defines the results, procedures or policies being protested.
- f) The protest must explain the problem and have a solution. If the event rules are referred to in the arguments, they must be quoted or referred to by rule number.
- g) If the Official determines the protest is valid, both officials will discuss a possible solution for this issue. If changes are made to any rules or procedures for the event as the result of a valid organizational protest, the Race Official must submit a written report of the protest and the action(s) taken for other teams during the event.

- **Judging Criteria:**

- a) The judging is divided in two parts: (a) Design Event (25%) (b) Racing Event (75%)
- b) In the design event, a panel of judges will be judging the vehicle on the designing part. However, this is applicable to only those teams who have themselves designed and fabricated the steering system and chassis of the vehicle. Teams bringing the readymade cars will have their evaluation in 75% of total marks i.e. the team loses 25% marks straightaway.
- c) In the racing event, the control of the vehicle and the driving skill of the participant will be the judging parameter. The track will consist of sharp turns and a little elevation also.
- d) Lap time will be another criterion to decide the winner.

- **Penalties:**

- a) Failure to comply with any ROAR rules, not limited to those items covered in this section, may result in a penalty being assessed by the Race Official.
- b) Time penalties will be added to the time recorded for the race in which the penalty is incurred.
- c) Lap penalties incurred during a race will be subtracted from the total laps recorded for the race in which the penalty was incurred. Lap penalties that are incurred due to a penalty statement of assessment to best qualifier or main in this section will apply.
- d) The Official may assess “stop and go” penalties, with or without delay, instead of time penalties. During a “stop and go” penalty, the vehicle must be stopped in the pit lane or other designated area, and lifted high enough for another vehicle to pass underneath it.
- e) Jumped starts:
 1. Definition: A jumped start is any movement of a vehicle between the time the Starter announces the start time and the starting signal.
 2. Penalties: A ten second penalty will be assessed for a jumped start in a qualifier using a girded stationary start, and a one lap penalty will be assessed for a jump start in a main race. Neither type of race will be re-started for a jumped start.
 3. A stop and go penalty may be assessed if the driver does not pull over and allow the other vehicles to pass before continuing.
 4. If a jumped start is not called by the officials immediately at the start of a race but can be verified afterwards by at least two race officials using any recording device, a ten second penalty will be added to that offenders’ qualifying time or if a main event, a one lap penalty will be assessed.
- f) Corner Cutting or Short-Coursing:
 1. Definition: Corner cutting or short-coursing is any deliberate or accidental manoeuvre that shortens the length of the course for a vehicle traveling around the track.

2. Penalty: For each incident, cutting a marked corner will incur a ten second penalty and short-coursing will incur a one lap penalty. (See penalty chart at end of this section)
3. Improper Re-Entry to the Racing Surface:
 - Definition: Improper re-entry is any manoeuvre that adversely affects the ability of other drivers in the race to safely operate their vehicles in the vicinity of the vehicle re-entering the racing surface, whether from the pit lane or any other point.
 - Penalty: A ten second penalty in that qualifier or main. 5.14.8
- g) Refuelling, repairing, or servicing a vehicle in the pit lane or on the racing surface, a “stop and go” penalty is assessed.
- h) Driving in the opposite direction to the racing direction while on the racing surface: A one-lap penalty in that qualifier or main. Note: This rule applies to normal racing laps, to any driving prior to the start of any race and to any driving for re-negotiating a cut corner or correcting a short-coursing infringement.
- i) Operating a radio in the pits without the permissions would lead to a minimum of a one lap penalty from the best qualifier or the main may be assessed at Race Official discretion.
- j) Failure by a driver to maintain a closed throttle or zero speed setting while his vehicle is in the hands of a marshal: A ten second penalty in that qualifier or main.
- k) Failing to respond in a timely way to an Official directive: One lap penalty subtracted from the best qualifier or main.

Action	During Qualifying	During Main
Improper re-entry to racing track	5 seconds penalty	10 seconds penalty
Corner cutting	5 seconds penalty	10 seconds penalty
Short Coursing	10 seconds penalty	1 lap penalty for each incident
Refueling in pit lane or the racing surface	Stop and Go penalty	Stop and Go penalty

Driving in opposite direction of the track	10 seconds penalty	1 lap penalty
Failure to reduce throttle while in hands of a turn marshal	5 seconds penalty	10 seconds penalty
Failing to respond to a Race Official request	10 seconds penalty	10 seconds penalty

Contact:

Aman Shah – 9824600711

AirBorne

Make a remote-controlled hovercraft that can handle 200gm weight and outrun other opponents on a smooth track ridden with obstacles.

Registration:

- Participants may come in teams of at most six members.
- Participants must register for the event on the website prior to the fest.

Rules:

- The vehicle must strictly and purely be a hovercraft, i.e., it should operate by creating a cushion of high-pressure air between the hull of the vessel and the surface below. Any other vehicular design will be rejected.
- The hovercraft must fit inside a cube of side 50 cm.
- The use of IC engines is strictly prohibited. Only electric motors will be allowed.
- Ready-to-Fly (RTF) and Almost-Ready-to-Fly (ARF) kits are strictly prohibited.
- Glass/carbon fibre sticks, servo-mount, motor-mount can be purchased and used if required.
- Use of ready-made actuators/motors, remote control units, electronic speed controllers and propellers is allowed.

- The hovercraft MUST operate using wireless transmission.
- The maximum voltage difference between any two points must not exceed 12V.
- **Arena Specifications:**
 - a) The track will be smooth with sharp turns and obstacles. The hovercraft should be able to cross slopes, hurdles, water and other obstacles on the track. The hovercraft should be able to cross the various obstacles on the track.
 - b) The width of the track will be 80cm.
 - c) The ramp shall have a slope of 15 degrees.
 - d) In addition to the above track, which tests the manoeuvrability of the hovercraft, there will be an acceleration event in which the hovercraft is required to complete a straight distance of 20m in minimum time.
- The final ranking of the teams will be made on the combined score from the manoeuvrability track and the acceleration event.

Contact:

Sai Prasad Ippili – 7297884134

Dual Mode Vehicle Challenge

1963, Eight years into the Vietnam War, the Americans have understood a few things: Men can't kill everything with small arms, they can't go everywhere either. Tanks are not the solution. They get bogged down in the swamps and, then, they get taken out like fish in a barrel by the Cong. They are sick of it and need some transport vehicle which can navigate swamps, ponds, rivers, and the whole list. As an engineer, you have to build a remote controlled vehicle which can navigate through water and land.

To build a remote controlled 'all-terrain' vehicle that can move and steer on both land and water and is able to move from water to land and vice versa without any physical human involvement.

Registration:

- Participants may come in teams of at most five members.

Rules:

- The vehicle should fit in the box of 40 cm x 30 cm x 30 cm at all points of time.
- The external remote control is not included in this size constraint.
- The power supply must be on-board. It cannot be on the remote or any other accessory except the bot. The on-board power supply on the machine and the wires/receiver of the radio controller must fit within the above mentioned box.
- There is no restriction on the number of batteries you can use, given that you follow the above mentioned rule. Battery swapping in the middle of the race is allowed at a cost of 150 points.
- The machine cannot be constructed using readymade Lego kits or any readymade mechanism. The chassis, the steering mechanism and the conversion mechanism are supposed to be handmade. But you can make use of readymade gear assemblies.
- Participants can make use of any materials to fabricate the chassis; there is no restriction on weight of the vehicle however the participants must keep in mind it has to manoeuvre through water also.
- Participants are supposed to use electric motors for the propulsion of the vehicle.
- Use of IC engines or any other kind of propulsion is strictly prohibited.
- The potential difference between any two points on the vehicle should not exceed 24V at any point of time. Use of any energy storage device (other than batteries) is not allowed.
- You can use wired or wireless remote controls. Also, take care that the wires won't interfere with the motion of your or any other bot. Such interference may lead to disqualification.
- Any violation of the above mentioned rules can lead to disqualification.
- **Contest:**
 - a) There will be two rounds.
 - b) **First round** will be a qualifying round in which the ability of the vehicle to run on both land and water would be tested.
 - c) There would be two separate stretches, one of land and other of water.

- d) The **second round** will be a circuit round in which the participants have to complete 2 laps of the given circuit in the shortest possible time. The circuit will consist of some obstacles.
 - e) It is desirable that there be no human intervention in the second round at all.
 - f) In case you are forced to get the bot back on track, the bot has to be placed at the nearest checkpoint already passed. A penalty would also be levied.
 - g) If the bot goes off track completely, there would be a penalty of 30 points.
 - h) In case the bot is unable to switch from land-water or vice versa, you can skip it to the next check point at a cost of 100 points.
- **Judging Criteria:**
 - a) The scoring pattern for the final round will be as follows.
 - b) $PT = 700 - (\text{Total time taken in sec} \times 2)$
 - c) $PO = 20 \times (\text{No. of obstacles touched})$
 - d) $PI = 10 \times (\text{No. of human interventions})$
 - e) Final score = $PT - PO - PI$. In case of tie for 1st or 2nd place after the second round there would be a one on one drag race between the teams on a straight stretch of land.

Instruction:

- The arena image will not be revealed beforehand. A few hints are provided here to get you planning on the right track.
- The track would be 2-3ft wide. A few obstacles for the DMV would be installed to challenge the bot and the driver.
- The terrain can be anything varying from clay, sand, marble etc. The Teams are advised to have a good ground clearance to be able to manoeuvre on any kind of surface.
- A few inclined planes would be present on the track. Successfully traversing them would result in bonus points.
- A few tips for the event:
 - a) Carry extra batteries. It is of utmost importance and no kind of assistance would be provided in case you run out of juice.

- b) Waterproof your bot 100%. Even the slightest leaks can end the competition for you.
- c) Plan your design well in advance and practise as much as you can.
- d) A quick internet search on streamlines and power-torque characteristics can help you a lot.

Contact:

Chetan S Jois – 7891779006

Battle at Waterloo

Ever wanted to feel the power of the driving force of the racing Power boats? Come and build your own Speed boat at Battle of Waterloo. Apogee 2018 gives you an opportunity to build your own RC motor boat and prove your mettle against other racers. Build a wireless remote controlled BOAT which travels a specified race track in the least possible time. You will get a chance to showcase and race your boat this Apogee in the BITS Swimming Pool.

Registration:

- A team may consist of at most four members.
- The registration would be on the spot.

Rules:

- Maximum dimensions of the boat allowed, including the rudder and propeller, at any point of time during the race:
 - e) Length: 80 cm
 - f) Breadth: 35 cm
 - g) There is no constraint on the height.
- The boat can be powered either by an IC engine or a DC electric motor. Use of any other kind of power source is strictly prohibited.
- The boat must have only one of these power source for propulsion.
- If powered by an IC engine, the capacity (displacement volume) should not be more than 3.2cc.
- If powered by electric motors, the potential difference across the motor terminals should not be more than 12volts DC.

- In addition to the power sources for propulsion you may use dc motors or servo motors for rudder controller.
- The boat must be manoeuvred by a wireless remote control, if any controls are used.
- It must be participant's responsibility to keep the boat's electric components water-proof
- Participants are advised to design the boat to prevent any damage that could be caused to it when it hits the boundaries of the track.
- If you have any doubts regarding the specifications of the boats, rules or if your boat uses different components or concepts, which the problem statement does not specify, please contact the organizers to confirm the validity of the same. Do not assume anything yourself.
- The organizers reserve the right to change a part or whole of the specifications and rules mentioned above. Changes, if any, will be updated in the website.
- Organizers' decision shall be final and binding to the participants at the any point of time.
- **Contest:**
 - a) **Round 1:**
 1. Best of two trials will be considered (least time taken to reach the finish line) for the teams to qualify for the second round.
 2. The track will be free from obstacles.
 3. The exact number of teams qualifying for the second round will be decided based on the number of participants.
 4. If participants are using an IC engine, they can start the engine and the BOAT will be placed in the water and released it when the signal is given.
 5. There will be penalty for touching the boundary.
 - b) **Round 2:**
 1. Teams qualifying round 1 will participate in this round. .
 2. Round 2 is meant to test the speed, steering skills of the boat through various obstacles on the track. Details of the track will be uploaded later.

3. Race Track: Race track details will be uploaded later but will essentially contain a loop/ turn The event will be conducted in BITS Pool having dimensions 25m*10m*2m.

- **Judging Criteria:**

- h) Design
- i) Performance
- j) Points gained in each round

Contact:

Aman Shah – 9824600711

Water Rocketry

Design a water rocket that is completely powered by the thrust delivered by water expelled at high pressure along with its launch pad.

Registration:

- Participants may come in teams of at most three members.

Rules:

- The rocket and its components must be handmade. No readymade rocket is allowed.
- The rocket body should be made only with plastic bottles of aerated soft drinks of maximum capacity 2.5L and should be free of any fabrication failures or dents caused by heat exposure. More than one bottle can be used but the total volume must be less than 2.5L.
- Each team must have their own launch pads.
- The water rocket must use only compressed atmospheric air as its source of energy. Pressure compressors shall be provided at the venue. The pressure inside the container (rocket body) before launch should not exceed 60 psi for the two rounds.
- Water to be filled in the rockets will be provided by the organizers. Calculations regarding amount of water to be used is left to the choice of the team.

- Two trials will be given to each team and best of two will be taken into consideration.
- The rocket must be launched from a stationary position using a fixed launch pad.
- Slingshots, trebuchets, catapults, cannons, and all other devices that may assist launching are strictly prohibited. In other words, the internal pressure of the rocket must be the only source of energy for the rocket.
- Water rockets can have multiple stages. Parachute, gliding mechanisms are permitted.
- Use of electronic components and chemical explosives are banned.
- The point where the rocket hits the ground first will be taken as the point of landing and measurements will be taken considering this point.
- Teams are advised to get more than one water rocket, in case of any damage to one. But the water rockets must be identical.
- The participants are allowed to use variations of their water rockets at different rounds. However, only one design must be maintained throughout a single round.
- The team will be disqualified/given another chance to remodel if the model is found to be dangerous in anyway.
- Decision of the organizers is final and binding.
- **Judging Criteria:**
 - a) First round: Range Test
 - 1. Here the maximum range is tested.
 - 2. The distance between the launch pad and the point of landing is measured and taken to be the points in that round.
 - 3. From this, 10 teams will be shortlisted for the next round.
 - b) Second round: Accuracy Test
 - 1. At a distance of 70m from the launch pad, a target is placed. Target contains concentric circles of radii 2m, 4m and 6m.
 - 2. If the rocket lands at the centre, team gets 100 points, second ring 75 points, and outer ring 50 points. If otherwise, no points are awarded.
 - 3. Three teams will qualify for the final round.
 - 4. In the case of any tie, the time of flight will be noted and the team with the least time gets into the next round.

- c) The organizers will decide to permit the launching of the rocket after inspection of both the rocket and launch pad considering factors such as safety and permissible mechanisms mentioned in the rules. In such cases, the decision of the organizers will be final and binding.

Contact:

Sai Prasad Ippili – 7297884134

Papers & Projects

DHITI

“Have faith in people. They are basically good and smart. Given the right tools, they can do wonderful things.” – Steve Jobs.

Technology today has seeped into every aspect of our lives. But we must not forget about the society and its problems. We, the youth form more than half of our nation's population. Our ideas and knowledge base can solve a multitude of different problems faced by the communities today.

We invite people to bring forth their ideas that can revolutionize the use of technology to improve people's lives. It is only by solving such basic problems that development will occur collectively in every community and not selectively.

APOGEE, BITS Pilani presents to you the social event of the annual technical extravaganza - DHITI.

Dhiti (Sanskrit for “An idea”) is a platform for passionate individuals who ideate and aspire for technology to reach the grassroots. Here we will provide you with problems and mentors to form feasible solutions to various issues and provide recognition to your solution. So, let's put our ideas and knowledge bases to some real use.

Problem Statements would be updated later.

Registration:

- Teams of maximum 4 can participate in the event. Teammates can be from different colleges.
- All the participants are required to register on the APOGEE 2018 website, and also register for Dhiti.

Rules:

- **Round 1:** Abstract Submission

- Abstracts will be evaluated and selected by the judges and selected abstracts will be eligible to proceed to next round.
- **Round 2: Mentorship**
- The prototypes will be made and submitted for evaluation. Selected prototypes will be invited to APOGEE 2018 for final Round
- **Round 3: Presentation**
- **Implementation:** The winners of DHITI will get an opportunity to implement their prototypes under an NGO (Depends on the NGO).
- **Judging Criteria:**
 - a) **Unique and innovative:** They can be a modification of an already existing solution but should not be an exact replica of it.
 - b) **Effective:** They must provide better results than solutions which are already in use.
 - c) **Cost-effective:** The materials being used for implementing should be easily available and cheap.
 - d) **Feasible:** Keep in mind the target population/region. The ease of installation and the easy availability of the resources is also to be considered.
 - e) **Sustainable:** The solutions should be designed in such a way that they can be easily modified in future to adapt to the needs and conditions at that time.
 - f) **Social Impact:** Should have a large social impact. It should affect the living conditions of a large number of people rather than only a few.
 - g) **Replicable:** Easily replicable so that they can be implemented over different regions rather than addressing a problem in a single particular area.
- Ideas presented by the teams should be original. Plagiarism of any kind will lead to the disqualification of the team.
- At any point of time latest information will be that which is on the website. However registered participants will be informed about the changes on the website through mail.
- Decision of the Judges will be treated as final and binding for all.

Contact:

Romil Sorathia: 9879554747

Abhishek Agarwal: 8094760857

Paper Presentations:

“Research is to see what everybody else has seen, and to think what nobody else has thought” - Albert Szent-Gyorgyi

The Paper Presentation event, held during APOGEE is a competition where participants get an opportunity to exhibit the results of their investigations or researches. This event has been an integral part of APOGEE since its advent and has seen papers from diverse backgrounds of science, engineering, humanities and management being presented and evaluated. There could be no better platform for the ingenious minds out there to showcase their intense knowledge and communicative skills to the audience in an intriguing manner than through presentations.

Papers are invited for research done under any of the subject areas mentioned below. The accepted papers will be showcased at the festival in the form of presentation delivered by the author, from 22nd to 25th February, 2018 at BITS Pilani in front of a panel of esteemed judges.

Registration:

- A maximum of 2 students per team are allowed to present a paper. In case of team participation, both the members are required to be present on the spot of the event.
- A participant may be in multiple teams presenting papers.
- Participants must register for the event prior to the fest.

Rules:

- **Categories:**
 - a) **Sciences**
 1. Biological Sciences
 2. Mathematics
 3. Chemistry
 4. Physics
 - b) **Liberal Arts**

1. Film, Media and Communication Studies
 2. Sociology
 3. Politics
 4. Philosophy
 5. Psychology
 - c) **Engineering**
 1. Electrical & Electronics
 2. Electronics & Instrumentation
 3. Electronics & Communication
 4. Chemical
 5. Civil
 6. Material Sciences
 7. Mechanical
 8. Computer Science
 - d) **Miscellaneous**
 1. Environmental
 2. Economics & Finance
 3. Management
 4. Pharmacy
- A particular paper can be presented only in one category. Also, participants can present more than one paper. However, the abstracts should be submitted separately.
 - Only genuine and original paper abstracts should be uploaded. Abstracts found copied from any source like internet/journals etc. will be disqualified.
 - Plagiarized content will be strictly dealt with and would lead to participant's disqualification. In case of any discrepancy, organizers decision will be final and binding.
 - **Contest:**
 - a) There will be four rounds in the event out of which the first round is optional, the rest are compulsory.
 - b) **Round 1:**
 1. This round is the First Round of Abstract Submission.
 - c) **Round 2:**
 1. This round is **optional**. But, you are encouraged to submit your abstracts in this round even if you feel they are not up to the potential.
 2. The submission of abstracts will be through the Google form and the abstract should strictly adhere to the prescribed format: https://drive.google.com/file/d/0Bxy7m_UckynMnN2ZjAwclpEeFdJVUhzY0RnY19UMWJiR1Rn/view?usp=sharing
 3. Participants have to upload their abstracts for screening in the appropriate format using the Google form. The prescribed format must be followed, failing which may lead to disqualification of the participants. The deadline for abstract submission is **22nd October 2017, 11:59 PM**.
 4. Plagiarism check would take place for the abstracts, after which they will be checked by our esteemed faculty.
 5. Feedback from the professors will be provided within 10 days.
 - d) **Round 3:**
 1. This round is the Final Round of Abstract Submission. This is a **compulsory** round.
 2. The deadline for second round of abstract submission is **7th November**.
 3. For participants who have submitted their abstracts in the first round should improvise their abstracts on the basis of feedback given from the round of abstract submission.
 4. Submission of the abstracts will be through a Google form the link of which will be provided later.

done for all the papers and abstracts, failing to which the participant can be disqualified.

e) **Round 4:**

1. This is the final round and will be held during APOGEE 2018(21nd-25th Feb, 2018).
2. Shortlisted students are expected to present their work on-stage using PowerPoint in front of a panel of judges at BITS Pilani.
3. Maximum time limit for the presentation is 8 minutes which will be followed by a question answering session. The judges will decide the winners. Decision by the judges will be **Final**.

Contact:

Deepanshu Singh: 9896120321

Prototype Presentation

BITS Pilani welcomes projects in various fields of Science and Engineering for APOGEE. The project presentation competition at BITS Pilani features projects from a variety of scientific research areas. With categories dedicated to both evergreen fields like infrastructure and new frontiers of technology such as simulations or mathematical modelling, we assure you a platform beyond compare.

Registration:

- Teams must have a maximum of **6 members**.
- A participant can participate in a **maximum of two projects**. The online submission portal automatically disallows attempts at participating in more than two projects.
- Teams must register on the official projects portal: <https://bits-apogee.org/2018/portal/#/projects/instr/>
- Name changes will be entertained for a short period of time, specific details of these name changes will be expressed to you later and will be done directly using the portal.

Rules:

- **Categories:**

- a) **Automation:** Automation is the use of control systems to control process and/or machinery replacing human operators. Projects competing under this category aim at reducing the need for human sensory, physical and/or mental requirements and minimizing error.
- b) **Communication and Network Systems:** The projects deal with the collection/ transmission/ collation/ dissemination etc. of information. New applications on existing networks and/or new network system designs are solicited.
- c) **Design Appliances:** The projects aim at conceptualization and/or development of a new or improved appliance, having their application in any of the varied spheres of human activity. An appliance is a device composed of hardware components dedicated to a specific function.
- d) **Economic Modelling and Finance:** This category would deal with the understanding of an enterprise business and improving its performance through creation of economic models (enterprise models). This will include modelling of the relevant business domain (relatively stable) and business processes (relatively volatile). Projects related to the current or probable future economic scenario or aimed at improving the same and projects that aim to provide reasons and solutions to imminent financial issues would also be included.
- e) **Health and Nutrition:** The projects aim at maintaining, restoring and improving human health through study, diagnosis, treatment and possible prevention of disease and injury as well as studying the metabolic and physiological responses of body to diet, metabolic pathways etc.
- f) **Energy:** This category includes projects dealing with sustainable forms of energy which are eco-friendly in nature. It also includes projects focusing on innovative techniques that will help in conserving energy to curb the current energy crisis.
- g) **Environment:** This category calls for projects dealing with environment-friendly technical opportunities for environmental improvement and sustainability by promoting better protection,

conservation or management of natural resources that will enhance the delivery of environmental services by communities.

- h) **Infrastructure:** The projects have application/concepts in the network of factors which enables a country's economy/local infrastructure or an industrial operation to function effectively. This includes such matters as transport, power, finances, housing, and education.
- i) **Industrial Processes and Applications:** The projects related to the various processes and applications in industry. Innovative ideas for existing processes and new, economical process applications will be appreciated.
- j) **Materials Science:** The projects involve the use/modification of properties of matter and its applications to various areas of engineering and sciences. Also solicited are projects dealing with development of new materials for specific/general use in society.
- k) **Software Design (Application Development):** A chance to prove one's intellect, creativity & expertise at software development, this category gives one complete freedom to decide the objective and genre of the software and the platform to be used to develop it. The main focus is on innovation, utility, implementation and other relevant parameters of such projects. Novelty of the idea and potential to bring about a revolution in the concerned field will be given due credit.
- l) **Software Design (Adaptive Technology):** A category exclusively concerned with the design and development of applications that allow computers to evolve some sort of intelligence of their own. This category includes projects which display ingenuity in the fields of Artificial Intelligence, Machine Learning, Natural Language Processing, Swarm/Business/Social/Computational Intelligence, and Computer Vision, among others. Projects will be evaluated both on the basis of how sensitive the systems are to the outside stimulus and the self-learning and decision making capability of the system.
- m) **Signal Processing:** This category includes projects involving the analysis, interpretation and manipulation of signals. Signals of interest would include sounds, images etc. Also included are

projects with applications capable of converting signals from one form to another and/or effective presentation of the same for efficient utilization of information contained in them.

- n) **Simulation and Mathematical Modelling (Chemical):** The projects in this category describe the use of computer aided modelling and simulation in the development, integration and optimization of industrial processes. Mathematical modelling is used to result interpretation, full-scale process performance analysis and further demonstrate similitude comparisons of experimental results from different systems as a tool for broadening the applicability of the calculation methods.
 - o) **Simulation and Mathematical Modelling (Non-chemical):** Any real world phenomenon, be it in financial infrastructure, computer algorithm or mechanical design has a mathematical formulation as its basis. Projects in this category model the same.
 - p) **Transportation:** This category includes projects related to various modes of transport as in air, water and road. The project should basically be designed to provide a rapid, safe and economically compatible movement of people and goods. Various projects related to road network, railways etc. can be included.
- **Contest:**
 - a) There will be three rounds in the event.
 - b) **Round 1:** Abstract Submission.
 - 1. All teams are required to submit abstracts at the time of registration.
 - 2. A project cannot be submitted under two categories.
 - 3. Abstracts will be shortlisted and made eligible for the next round on the basis of a plagiarism check.
 - 4. Abstracts that show heavy plagiarism will be disqualified.
 - 5. Non-Bitsian teams would be directly advanced to the final round.
 - c) **Round 2:** Project Pitching.
 - 1. This round is only for Bitsian participants.

2. Teams will be asked to present their prototypes to a panel of professors judging the category, along with a presentation.
3. All team members must be present at the time of the pitching.
4. Teams are strongly advised to bring prototypes of their project in the pitching rounds. Any team not having a prototype might be disqualified, which will be on the professor's discretion.

d) **Final Round:** Prototype Presentation.

1. People who do not have a prototype will **NOT** be allowed to present their projects.
2. The time limit for each presentation is **5 minutes**.
3. Internet connectivity will be provided.
4. **Every team member** is expected to be there for the presentation. Only present team members will receive certificates.

- **Judging Criteria:**

- a) Innovation
- b) Execution
- c) Feasibility
- d) Understanding

Contact:

Apoorv Saxena – 7239805667

Disha Jain – 9926642057

Mrigank Manauj – 7366968950

Sahili Totale – 9521518111

Robotics

I strike

Build a computer controlled robot which can move on a road with the help of overhead camera.

Registration:

- Participants must register for the event on the website prior to the fest.
- Participants may come in teams of not more than four.

Rules:

- The competition consists of two rounds.
- The first round is an elimination round.
- On the basis of the points obtained in round 1, the top teams advance to round 2.
- Round 1: The image for the final track will be given to the participants and a path from start to finish has to be paved using image processing.
- Round 2: The teams have to make their bot traverse on the path paved by them in round 1 in order to reach to the finish point.
- If the bot loses track at any time, it should start from beginning.
- **Pre-Game Setup:**
 - a) The participants will get 20 minutes of setup time for calibration and testing prior to the competition and according to a schedule that will be made available at the start of the event.
 - b) In the setup time, the participants should have their program ready for execution.
 - c) During calibration, there can be minor modifications to the code (like fine-tuning filters, etc.) but there can be no changes in the algorithm being used. All changes should be made in the presence of the judges.
 - d) There can be no more modifications to the code after the calibration.

- **Arena Specifications:**
 - a) **Round 1:** The width of the moving lane would be 30 cm everywhere.
 - b) The arena is a maze and participants are expected to pave a path from start to finish using image processing.
 - c) The start point is marked as a red block and finish point as a blue strip adjacent to a green block.
 - d) The rest arena is a black and white maze, white being the path to traverse on.
 - e) **Round 2:** The participants have to move their bot on the path paved by them in round 1.
 - f) The bot completing the task in the least time without fouls will be declared as the winner.
- **Robot Specifications:**
 - a) The bot must fit into a cube of 20 cm x 20 cm x 20 cm at all times. It may not expand at any point during its run beyond these dimensions.
 - b) The participants are suggested to paint their bots black in colour on top for proper detection and processing.
 - c) The robotic equipment is to be fully autonomous. Human operators are not permitted to enter any information into the equipment during a run.
 - d) The bot must be fully independent, with motoring mechanisms self-contained. However, it can communicate with the computer using either wired or wireless data transfer and can use external power supply. The length of wire will not be included in the size of the bot if it is wired.
 - e) The human operator should not directly control the motion of their robots with a joystick or by keyboard commands under any circumstances.
 - f) The power supply for the bot should not exceed 24V between any two points in the circuit.
 - g) The bot cannot be built of ready-made toys or Lego kits. But ready-made motor drive circuits, development boards or communication interfaces can be used.

h) Any robot that is deemed by event organizers to be harmful or damaging to either people or the track will be disqualified immediately.

- **Judging Criteria:**
 - a) Preference would be given to the bots which complete the entire track.
 - b) Each team would be given two chances with a penalty.
 - c) Exact scoring charts (including penalties) will be made available in due course of time and uploaded on the website.
 - d) In case of tie, the bot which completed the track fastest wins.
- The organizers reserve the right to make changes to the rules and the event pattern. Any significant change will be communicated well in advance. The areas of likely change are the judging criteria and the size of the grid in the 2nd round.
- In case of any discrepancies/disputes the decision of organizers will be final and binding.

Instruction:

- There would be one overhead camera above the arena perpendicular to the ramp.
- In case of overhead camera, the participants must use the camera provided by the organizers.
- The details of the camera provided by the organizers will be put up soon.

Contact:

Vutukuri Anoop Reddy – 8233013579

Robots at War

Design a remote controlled robot to combat with the opponent's bot. The arena will be a rectangle measuring 24ft x 24ft. However, the fight zone will be 20ft x 20ft, pushing the opponent bot out of this fight zone will result in victory. The arena might be on hard and uneven ground and will be enclosed by a 5ft high wire meshes all around.

Registration:

- A team may consist of at most 4 members.
- Participants must register on the APOGEE website prior to the fest.

Rules:

- The machine should fit in a box of dimension 750 mm x 750 mm x 1000 mm (lxbxh) at any given point during the match.
- The external device used to control the machine or any external tank is not included in the size constraint.
- The machine should not exceed 50 kg of weight including the weight of pneumatic source/tank.
- If the tank is external, its weight would be considered 1.5 times its actual weight.
- Weight of wireless robots and robots having on-board power supply will be counted as 0.6*Actual Weight.
- Weight of adaptors and the remote controller will not be counted.
- The electric voltage between any two points on the robot should not exceed 36V at any time.
- The machine can be controlled using a wired or wireless device throughout the fight.
- In case of wireless control, the robot must be installed with a dual frequency radio to prevent interference with the opponent's robot. In case of any interference in the wireless systems, no possibility of rematch exists.
- Readily available remote controlled systems with dual frequency from the markets may be used.
- Before the event, each robot will be inspected by the judges and if the robot is declared as dangerous either to the spectators or the course of the event, it may be disqualified on the spot.
- The machine can be powered electrically only. Use of an IC engine in any form is not allowed.
- On board Batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells).
- All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
- Use of damaged, non-leak proof batteries may lead to disqualification.

- Battery Eliminators are allowed and power source would be available at the venue for the Eliminator.
- Special care should be taken to protect the on-board batteries. Change of battery will not be allowed during the match.
- Robot can use pressurized non-inflammable gases to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 8 bar.
- The storage tank and pressure regulators used by teams need to be certified and teams using pneumatics are required to produce the safety and security letters at the registration desk at the venue. Failing to do so will lead to direct disqualification.
- Participants must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge. Also there should be provision to check the cylinder pressure on the bot.
- Robot can use non-inflammable liquid to actuate hydraulic devices e.g. cylinders.
- The maximum pressure in cylinder should not exceed the rated pressure at any point of time.
- You must have a safe way of refilling the system and determining the on board pressure. All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armour to ensure that if ruptured it will not escape the robot. The terms 'pressure vessel, bottle, and source tank' are used interchangeably.
- All hydraulic components on-board a robot must be securely mounted. Special care must be taken while mounting pump, accumulator and armour to ensure that if ruptured direct fluid streams will not escape the robot.
- All hydraulic liquids are required to be non-corrosive and your device should be leak proof.
- Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.
- Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons with following exceptions and limitations:
 - a) Liquid projectiles
 - b) Any kind of inflammable liquid
 - c) Flame-based weapons
 - d) Any kind of explosive or intentionally ignited solid or potentially ignitable solid

- e) Nets, tape, glue, or any other entanglement device
- f) High power magnets or electromagnets
- g) Radio jamming, tazers, tesla coils, or any other high-voltage devices.
- h) Tethered or un-tethered projectiles
- i) Spinning weapons which do not come in contact with the arena at any point of time are allowed
- In no case should the arena be damaged by any bot.
- **Safety Rules:**
 - a) Special care should be taken to protect the on-board batteries and pneumatics, robot without proper protection will not be allowed to compete.
 - b) If you have a robot or weapon design that does not fit within the categories set forth in these rules or is in some way ambiguous or borderline, please contact the event organizers. Safe innovation is always encouraged, but surprising the event staff with your brilliant exploitation of a loophole may cause your robot to be disqualified before it even competes.
 - c) Each event has safety inspections. It is at their sole discretion that your robot is allowed to compete. As a builder you are obligated to disclose all operating principles and potential dangers to the inspection staff.
 - d) Proper activation and deactivation of robots is critical. Robots must only be activated in the arena, testing areas, or with expressed consent of the event coordinators.
 - e) All weapons must have a safety cover on any sharp edges.
 - f) All participants build and operate robots at their own risk. Combat robotics is inherently dangerous. There is no amount of regulation that can encompass all the dangers involved. Please take care to not hurt yourself or others when building, testing and competing.
- **Contest:**
 - a) A robot is declared victorious if its opponent is immobilized.
 - b) A robot will be declared immobile if it cannot display linear motion of at least one inch in a timed period of 30 seconds.
 - c) A bot with one side of its drive train disabled will not be counted out if it can demonstrate some degree of controlled movement. In

case both the robots remain mobile after the end of the round then the winner will be decided subjectively.

- d) A robot that is deemed unsafe by the judges after the match has begun will be disqualified and therefore declared the loser.
- e) The match will be immediately halted and the opponent will be awarded a win.
- **Judging Criteria:**
 - a) **Aggression** – Aggression is judged by the frequency, severity, boldness and effectiveness of attacks deliberately initiated by the robot against its opponent.
 - b) If a robot appears to have accidentally attacked an opponent, that act will not be considered Aggression.
 - c) **Control** – Control means a robot is able to attack an opponent at its weakest point, use its weapons in the most effective way, avoid arena hazards, and minimize the damage caused by the opponent or its weapons.
 - d) **Damage** – Through deliberate action, a robot either directly, or indirectly using the arena hazards, reduces the functionality, effectiveness or defensibility of an opponent.
 - e) Damage is not considered relevant if a robot inadvertently harms itself.
 - f) If a pressure vessel or a rapidly spinning device on a robot fragments, any damage to the opponent will not be considered "deliberate".
 - g) **Strategy** – The robot exhibits a combat plan that exploits the robot's strengths against the weaknesses of its opponent.
 - h) Strategy is also defined as a robot exhibiting a deliberate defence plan that guards its weaknesses against the strengths of the opponent.
 - i) Strategy can also involve using the arena hazards (if any) to gain an advantage.

Contact:

Vutukuri Anoop Reddy - 8233013579

Satyam - 7240466720

Student Design Competition

The ASME Student Design Competition provides a platform for you all to present your solutions. Each team is required to design, construct and operate a prototype meeting the requirements of the problem statement.

APOGEE-2018 Student Design Competition: **Robot Soccer.**

You may choose to construct a team that is just one device or a team with multiple devices that are remotely controlled and must fit in a specified box provided by your team. The competition will have a multi-game group stage followed by a semi-final and final round for the top teams.

Rules:

- **General Rule:**

- a) At the start of the competition, your *football squad* (all robot devices and controls, any extra batteries, and any tools your team would use to make minor repairs during the competition) must fit within a rigid sizing box that is no more than 50 cm x 50 cm x 50 cm (internal dimensions). This sizing box *must be provided* by your team.
- b) Your *football squad* will be sequestered inside your sizing box throughout all of the rounds of the competition. Teams will have one minute to prepare your device(s) to compete in each round after removal from the box.
- c) All energy for the device must be provided by rechargeable batteries. No other forms of stored energy (such as pre-compressed springs or gas) are allowed unless the stored energy of this component is returned to the initial state (for example an initially compressed spring must be re-compressed using the energy from the battery).
- d) Teams may replace batteries between rounds; however replacement batteries must be identical to the original and mounted in the same way to the device.
- e) Your device or devices must be controlled either via remote control through a transmitter/receiver radio link or through an umbilical cord.

- f) Transmitter/receiver radio links may be any commercially available model controller. Radio transmitters may have their own batteries and these batteries *do not* have to be rechargeable. All radio controllers will be shut off and stored within the team's box during the competition unless the team is competing.
- g) Communication between controller and device(s) must be able to be secured to allow for at least 3 other teams simultaneously using live controllers, as well as other games taking place in the same auditorium area.
- h) If umbilical cord controller(s) are used, mechanical forces on the umbilical cord may not be used to help propel or control the device, and *a dedicated team member must manipulate any cords to avoid interference with other competitors*. The umbilical cord must be detachable from the vehicle using a commercial connector.
- i) The umbilical cord may not be a part of the supporting structure of the device.
- j) The umbilical cord may only be used to transmit the commands from the controller.
- k) Teams will receive a penalty for any event where the umbilical cord is used to apply mechanical force to the device.
- l) Flying devices are not allowed. Devices must remain intact throughout the game (for example, a part of the device may not be fired at a ball).

- **Individual Game Rules:**

- a) The playing surface dimensions are 5m x 5m, with boundary wall barriers that are at least 8 cm tall. Goals are 50 cm wide by 50 cm high, located in the centre of each side of the playing surface. A 50 cm x 50 cm penalty box in front of each goal will be marked by tape on the ground. See Figures 1 and 2.
- b) The playing surface will be level, and may be either hard surface or carpet typically found in public areas.
- c) At the start of each game, the four teams will be randomly assigned a colour (blue, red, green, or yellow) for that round. The colour determines the goal the team is defending and the points that will be earned for each goal scored.

- d) Games consist of *two 5 minute halves*. At the start of the 1st or the 2nd half of each game, eight tennis balls (two balls marked with each of the four colours) will be placed on a 1m x 1m square marked by tape on the ground as shown in Figure 1.
 - e) All teams' devices will begin both the 1st the 2nd half of each game within the penalty box that is their designated colour for that game.
 - f) All devices must leave their penalty area at the start of play, and **all teams** must stay outside of **all penalty areas** during the game unless there is a ball inside a penalty box.
 - g) All the teams' devices will attempt to gain control of the balls and score goals in any of the other three goals that are not their team's designated colour. A team scores a goal when a ball that they *control and propel* goes into another teams' goal.
 - h) Teams will earn points for goals scored against the other teams as follows:
 1. Five points for scoring with a ball into the same colour goal.
 2. Two points for scoring with a ball into a different colour goal.
 3. Shot that deflects off another team, into a goal counts as a goal for the original team controlling and shooting the ball
 - i) Teams lose one point for every goal scored in their own goal. This includes deflected or own-goals.
 - j) Once a ball has been scored it will remain off the playing surface, but will be repositioned at the start of the 2nd half. If a ball leaves the playing surface over the boundary wall, a judge will quickly replace the ball at its original starting position in the middle.
 - k) If all eight balls are scored in less than 5 minutes, the half will end at that time.
 - l) The following rules apply to team control of a ball:
 1. A team may push, or secure a ball within their device in any way they chose.
 2. Teams may only attempt to control one ball at a time.
 3. Teams may only attempt to steal a ball from another team when the ball is touching the ground (see next rule for further interactions between teams).
 - m) The following rules apply to team interactions:
 1. Some contact between devices will be allowed and should be expected. Devices must be robust to survive low speed collisions.
 2. Teams are allowed to play defence and block other teams (but must remain outside all penalty boxes).
 3. Intentional *fouls* and overly aggressive behaviour will be stopped by the judges.
 4. Excessive contact with other devices or repeated attempts to control more than one ball may result in a **yellow card** – the team must then remain motionless for 60 seconds before the judge allows the team to resume competing. Teams may earn more than one yellow card in a game, but multiple yellow cards do not turn into red cards as they do in traditional football.
 5. Behaviour that is unprofessional and likely to damage another device may result in a **red card** – the team will be removed from that game. A second red card during another game will cause that team to be removed from the entire competition
- **Overall Competition Scoring Rules:**
 - a) Each team will receive a score for each round (points for all balls in the other team goals, minus balls scored in their team goal).
 - b) All teams will compete in as many preliminary rounds as can be run during the competition (the group stage), and every team will get to compete the same number of times.
 - c) Preliminary rounds will have either four or three teams in each round. If a round only has three competitors the two coloured balls for the missing team will not be put in play.
 - d) Teams will be sorted during the group stage so that different teams compete against each other as much as possible.
 - e) At the end of the preliminary rounds, total scores for each team will be added. The top eight scoring teams will continue to the semi-finals. If necessary, the tiebreaker will be 1) total number of five point goals scored in preliminary round, 2) if still tied, highest number of points scored in one preliminary game, 3) if still tied, a coin toss.

- f) In the semi-final rounds, seeded teams 1, 4, 5, and 8 will compete, and seeded teams 2, 3, 6, and 7 will compete.
- g) Each of the two semi-finals will consist of two rounds with the same teams (colours will be re-drawn for the 2nd round). The top two scoring teams from each of the two semi-finals will advance to the finals. If necessary, the tiebreaker will be 1) total number of five point goals scored in two semi-final rounds, 2) if still tied, the higher seeded team.
- h) There will be one final match between the top finishers from the semi-finals. The team with the most points is the champion. If teams are tied, only the tied teams will compete in a final shootout: all eight balls will be put in play and the tied teams will compete in one five minute half. If tied, this will be repeated until there is a winner.

Contact:

Sai Prasad Ippili – 7297884134

Track-O-Mania

Maze solving line follower - A game where your problem solving skill is tested along with your ability to build a line following bot.

Registration:

- Each team may have a maximum of four members.
- Registration for the event will take place on the spot.

Rules:

- **Contest:**
 - a) The event consists of two rounds: - Elimination round and the Final round.
 - b) **Eliminations:** A straightforward track consisting of some "U" turns and right angle turns. Complete the track in the minimum time possible.
 - c) **Final:** Start from the start point and reach the finish point of the track, keeping track of the path traversed. Detect the tag at the

finish and glow a **red led**. Traverse back to the starting point via the **shortest path** possible. The time taken to traverse back to the start from the finish point will account for performance of the bot.

- d) The time will start with the foremost point of the robot touching the start line and will end with the rearmost point of the robot touching the finish line.
 - e) When any robot crosses the start line before the referee's signal, the passage will be interrupted and resumed from the beginning.
 - f) The time is measured using a stop-watch or with the available equipment. In any case the time recorded by the judges will be final.
 - g) Each team will be given 3 trials out of which the best time will be considered by judges.
 - h) Nudging/Pushing or any type of manual handling of the robot will lead to cancellation of that run.
 - i) Only two minutes will be given to each team to calibrate their sensors after their first trial.
 - j) Any damage to the arena by the robot will lead to its immediate disqualification.
- **Robot Specifications:**
 - a) The bot must fit into a cube of 30 cm x 30 cm x 30 cm at all times. It may not expand at any point during its run beyond these dimensions.
 - b) Robots should not leave behind parts or damage the track in any manner.
 - c) Teams are allowed to bring only one robot.
 - d) Only one member of the team is allowed to handle the bot.
 - e) Participants are not allowed to keep anything inside the arena other than the bot.
 - f) Laptops/personal computers are not allowed near the arena. The bot should not receive any kind of input from outside the arena.
 - g) No external power supply will be provided. Only batteries are allowed as power source.

- h) In case of any disputes/discrepancies, the organizers' decision will be final and binding. The organizers hold the right to disqualify any robot found violating any of the rules above.

- **Track Specifications:**

- a) **Round 1 & 2:** The track will be a white line on a black background. The line will be of 2 cm thickness, with slight variations not exceeding 5% error.
- b) **Round 2:** Start from the start point and reach the finish point of the track, keeping track of the path traversed. Detect the tag at the finish and glow a **red led**. Traverse back to the starting point via the **shortest path** possible. The time taken to traverse back to the start from the finish point will account for performance of the bot.
- c) The event will be held outdoors. In case of unfavourable circumstances, the event might be held indoors.
- The event organizers reserve the right to make minor modifications to the above rules. The changes will be duly notified. Please check the website frequently for updates.
- In the event of ambiguity, the organizers' interpretation of any clauses of the rules shall prevail.

Contact:

Vutukuri Anoop Reddy – 8233013579

Satyam – 7240466720

Arduinoix

Mazes are one of the oldest puzzles known to man. Mazes have been built with walls and rooms, with hedges, turf, corn stalks, hay bales, books, paving stones of contrasting colours or designs, bricks and turf. An intricate maze will be awaiting you at Arduinoix. It's the race against time. **BOTS will be provided during the event.** Contestants have to write Arduino code for the given bot to manoeuvre it through the event arena (maze).

Registration:

- Participants must register on the spot.
- Participants may come in teams of at most three members.
- **Prerequisites:**

- a) No prerequisites for the elimination round.
- b) Arduino code is loosely based on C, thus basic knowledge of C programming is required for the Showdown Round.

Rules:

- **Elimination Round:** General quiz consisting of questions based on Aptitude, Coding and the basics of Arduino/microcontrollers.
- **Top 5** teams to be selected for Showdown round.
- **Showdown Round:** Selected teams will be given **1 hour** to write the code to perform given task.
- The bot has to autonomously traverse the arena once the code is uploaded.
- Points will be awarded on the basis of time taken and number of collisions with the obstacles.
- Each team will have maximum of three trials at the arena and one test run.
- The best time will be considered by the judges.
- Hard-coding of path is not allowed.

Instructions:

- Teams have to bring their own laptop.
- Microcontroller used will be Arduino UNO.
- PIN diagram for the controller will be provided.
- Arduino IDE if not available will be provided at the venue.
- The bot will consist of IR/Ultrasonic sensors.
- In case of any discrepancy, the decision of organizers will be final and binding.

Contact:

Divanshu Gupta – 8003399658

Analogue Design Challenge

Are you intrigued by electronics? Are you bored of designing circuits on paper and want to try your skills on a world class designing platform? Then

put on your thinking caps and get ready to rack your brains, Analogue Design Challenge is here.

The problem will be based on Analogue Design and the designing will be done using Cadence. You have to design the circuit based on the requirement specifications provided to you and within the given time limit.

Registration:

- Participants must register on the spot.
- Teams of at most two people only can contest for this event.

Rules:

- **Round 1:**
 - a) The first round will be pen and paper based.
 - b) The first round will have a time limit of 1.5 hours.
 - c) Questions will be based on the basics of Analogue Electronics, Design Parameters, Microelectronic Circuits and Electronic Devices.
- **Round 2:**
 - a) You must design the circuit using Cadence Environment keeping in mind the given specifications.
 - b) Teams should draw circuit diagram of the design depicting all the principles and theories involved in on a chart sheet.
- **Judging Criteria:**
 - a) Design of circuit
 - b) Required Specifications met by the design or not.
 - c) Low Power Dissipation will be preferred while judging
 - d) Exploration of concepts/theories
 - e) Neatness of the implemented circuit
 - f) Temperature Variation tolerance of the Circuit
 - g) In case of incomplete solution, it shall be judged on the method of approach and closeness to the real solution
- The decision of the judges will be final and binding.

Instruction:

- Computer terminals with the required software already installed will be provided to the participants for Round 2.
- Volunteers will also be present during the competition to provide any help with the working of the software

Contact:

Satyam Gaba – 7240466720

Circuit Design Challenge

Are you an electronics buff? Do you want to convert theoretical knowledge into a practical application? Can you do it fast enough? Then, Circuit Design Challenge is the place for you.

The problem will be based on Analogue and digital electronics and to be designed on a breadboard. You have to design an electronic circuit that meets the requirements of the problem by using the components provided by us.

Registration:

- Participants must register on the spot.
- Teams of not more than three participants only can contest for this event.

Rules:

- The rounds are open in nature, you will be provided question sheets/components on the registration desk and you need to submit them back within the specified time limit.
- All the necessary components will be provided and the circuit must be designed using these components only.
- Other components/materials may not be used. However, in case something is damaged, you may request the organizers to replace the components/parts.
- Power supply and other testing devices like multimeter, CRO (if needed) and other tools will be made available in a shared hall.

- Teams should draw circuit diagram of the application depicting all the principles and theories involved in circuit as well as the working of the application on a chart sheet.
- **Judging Criteria:**
 - a) Design of circuit
 - b) Compactness of design
 - c) Efficiency of the application
 - d) Desired output
 - e) Exploration of concepts/theories
 - f) Breadboarding skills/neatness of the implemented circuit
 - g) Additional functions/options available in the applications
 - h) In case of incomplete solution, it shall be judged on the method of approach and closeness to the real solution
- The decision of the judges will be final and binding.

Contact:

Satyam Gaba – 7240466720

Hackatronics

Are you one of those people who itch to open it up whenever you look at a new gadget? Do you share the spirit of gadget-hacking? If so, you're looking at the right event.

This APOGEE, we give you the opportunity to open things up and make something useful and innovative out of them. Hack! Innovate! Build!

Registration:

- Participants may come in teams of at most four members.
- Registrations for the event will take place on the spot.

Rules:

- **Contest:**
 - a) The event would consist of two rounds.
 - b) Round 1 will be a quiz on the gadgets and electronics used in daily life.

- c) At the beginning of round 2, a problem statement is given to the qualified participants along with a list of available components.
 - d) The components would include one or more electronic appliances (specifications to be given in the list) along with certain general hardware and other miscellaneous components required for implementation of the problem statement.
 - e) Round 2 will consist of two stages-
 - f) **Stage 1:** The participants are expected to provide an on-paper solution to the problem statement that uses only the components given in the list. Exceptions can be made on the last clause, based on the discretion of the organisers.
 - g) **Stage 2:** After a brief inspection of the afore-mentioned solution, components are given to the teams and they are expected to implement the solution. Teams can also submit an optional write-up explaining the merits and/or limitations of their design. Usage of internet is allowed throughout round 2. Certain restrictions might be imposed on this.
 - h) Teams failing to adhere to the rules and the restrictions imposed, shall be penalised or disqualified.
 - i) The decision of the organisers will be final on all issues of conflict.
 - j) The organisers reserve the right to make changes to the rules and the event pattern. Any significant change will be communicated well in advance.
- **Judging Criteria:** The final on-paper solutions and hardware implementations will be evaluated by the judges. The following are the judging criteria
 - a) Simplicity
 - b) Innovation
 - c) Practicality & cost-effectiveness
 - d) Robustness of the solution
 - e) Extent of implementation (A bonus score will be awarded for the complete implementation of a solution.)

Contact:

Satyam Gaba – 7240466720

Sciences

APOGEE Innovation Challenge

APOGEE Innovation Challenge, an exceptional technical symposium, aims at quenching your thirst for hands-on experience in real life problems plaguing the industrial world. Organized in collaboration with various multinational companies, this event presents before you existing challenges faced by these companies who seek their solutions from you.

Exciting internship offers and cash prizes await the winners. Participation certificate shall be given to all members of each team which present solutions during APOGEE '18. Needless to say, you can brag about cracking a professional challenge while still being in college.

These problems, which happen to be discipline specific (one need not belong to that discipline), are to be solved by participants in teams of 2-4 in a month. After scrutiny by company officials, top 5 teams will be presenting their final solutions during APOGEE '17.

Registration:

- Participants may form teams of two to four members.
- Any student from 1st to 5th year can apply. However, they may be some restrictions as not all of them can go for internships. This may be cleared with the company during result announcement.
- Registrations for this event will happen prior to the fest and teams must choose their problem statement at the time of registration.

Rules:

- Participants will have 30 days to revert with a solution from the release of the problem statement.
- The abstracts of the solution are to be uploaded on the APOGEE 2018 website before the deadline, in the format desired by the company.
- The preliminary solutions uploaded by the participating teams will be scrutinized and the top few would be selected to give a detailed

presentation of their solution to the company officials during APOGEE 2018, with prototypes if applicable to the problem statement.

- Internships or cash prizes will be awarded to the winners by the companies from each.

Contact:

Aditya Khandelwal – 8970597340

Garv Sharma: 8433208598

Strategia

The participants will be required to solve a case study, and present its solution. Certain incentives will be awarded to the participants based on the score of the first round, which can be used in the subsequent rounds.

Registration:

- Participants may come in teams of two or three.
- The event will have on the spot registration.

Rules:

- The event will consist of 2 rounds.
- **Round 1:** A small guesstimate, crossword puzzle or mini case study will be given to each team with appropriate descriptions and clues.
- Points will be awarded on the basis of the approach chosen and the end result or the number of questions answered correctly.
- Points allotted in Round 1, will be used to buy some perks which can be in the form of additional time, external help or some other advantage as chosen by the teams.
- **Round 2** - A case study will be given to each team.
- The teams will be required to analyse the case study on the basis of various parameters and provide a solution.
- A time frame would be given, after which they would be required to present it.

- Points will be awarded for the presentation separately.
- The total points of both rounds will decide the final winner.

Contact:

Saniya Dasot – 9887770000

Chem Wars

Attack your rivals, defend yourself, and do everything in an eventful journey to make sure, you are the last team standing.

Registration:

- Participants must participate individually.
- Registration for this event will take place on the spot.

Rules:

- **First Round:** Money earning round.
- A set of riddles will be provided to each team and points will be awarded depending on time taken and number of questions correctly answered in the crossword. The points earned will be converted to virtual money.
- **Second Round:** Resource buying round.
- The teams qualified will be asked to buy chemicals, reagents etc. by bidding.
- Further, a number of chemicals will be shown on slides and the teams have to form reactions with their chemicals bought and shown.
- The heat of reactions of all correct reactions will be added and converted to points.
- **Third Round:** All-out war.
- The questions will be sold to the highest bidder and the buyer would have the option of either answering the question or using it as an attack on others.

- The buyer would receive double the points for answering the question correctly and lose double the points for an incorrect answer.
- If the attacked team fails to answer the question, they would lose thrice the points but a correct answer would reward thrice the points.
- **Judging Criteria:**
 - a) The team with the highest war points would be declared the winner.
 - b) In case of a tie, the team with greater points in a previous round would be declared the winner.

Contact:

Shubham Gupta – 9785368904

Dexter's Laboratory

A fun-filled quizzing and laboratory based event of the Apogee which provoke your practical thinking and logical approach to solve the mystery behind Dexter's stolen invention.

Registration:

- Participants must come in teams of two.
- The registration for this event will take place on the spot.

Rules:

- **Elimination Round:** The first round will be an elimination round consisting of basic engineering and science questions.
- The top ten teams from this round would be asked to solve some problem statements based on one of the labs (biology, chemistry or chemical engineering), the solutions to which will help the teams crack the laboratory round.
- **Laboratory Round:** The second round would require performing real-time laboratory experiments to unravel more clues.

- The clues collected in the different rounds help solve the mystery behind Dexter's stolen invention.
- **Judging Criteria:**
 - a) The team which finishes first would be declared the winner.
 - b) In case of a tie, the team with more points in the first round would be declared the winner.

Contact:

Chirag Parikh – 8003170752
 Rithwik Mavuluri – 8500297725
 Shubham Gupta – 9785368904

Gambling Mathematics

Come with your team and show your skill to gamble in real time.

All you should know is- How well you can handle your money (points in this event!). You need not know rules of Gambling as they would be told on spot at the event.

Registration:

- Participants must come in teams of at most two.
- Participants can register online for this event (can register as teams or join a team).
- On the spot registrations are will also be available.

Rules:

- The event will be conducted in two rounds.
- The first round (Eliminations) will be a gambling session where teams will gamble on mathematics related questions on an online interface. The aim is to score as high as possible.
- The second round will be a gamble session on Mathematical Puzzles that require some tricks.

- Use of internet during the event is not allowed. If any team is found guilty, it will be disqualified.
- In any case of any conflict the final decision will be of the event coordinator.
- **Judging Criteria:**
 - a) First round will be an elimination round
 - b) The team with maximum money (points) at the end of the event will be declared as winner.

Contact:

Anamya Agarwal – 9462238799

Physics of the Impossible

Do you live physics as every nanosecond of time flows? What is the physics hidden in sunlight, in music, in cooking? Do you feel physics no matter where, when and whatever you're doing?

Physics Society presents you a plethora of questions, situations, paradoxes and mysteries all in one, in, the Life of Phy.

Registration:

- Participants may come in teams of two or three.
- Registration for this event will take place on the spot.

Rules:

- The event consists of 3 rounds.
- **Round 1:** First Round will be a written MCQ round. You'll have to think out of the box for given puzzles and paradoxes.
- The top ten teams from will enter the next round.
- **Round 2:** Logic behind magic!
- This round consists of fun physics questions based on videos and visuals and you'll have to explain the reasoning behind the phenomenon involved.

- The evaluation will solely depend on the speed and accuracy of the team in cracking the logic.
- **Final Round:** Top six teams from previous round will enter the final round.
- The round will consist of formulating theories on how to become superheroes by using practical physics approach.
- Teams will have to formulate a theory in agreement with the given superhero characteristics.
- Two teams with theory that explains most of the facts will be winners.

Contact:

Ritik Jain – 8003182689

Unravel

This is a quizzing event where some simple logical reasoning questions will be given a face of Biology.

Registration:

- Participants may come in teams of two or three.
- The event will have on the spot registration.

Rules:

- This event will have two rounds.
- **Round 1:** Logical acumen, puzzle solving, basic scientific knowledge will be tested.
- **Round 2:** Questions will be based on some interactive demonstrations and videos.
- **Judging criteria:**
 - a) Round 1 - Based on accuracy of answers.
 - b) Round 2 -Based on how well you use the video/demonstration and science to explain your answer.

Contact:

Chirag Parikh – 8003170752

Who Dunnit

A murder has occurred in the locality. The teams participating will be rigorously screened and the best 6 will be put on the case to crack it. They will use resources available to them. The team that is able to solve the case fastest will be rewarded.

The candidates must appear in teams of 2 or 3 and will participate in 7 to 8 rounds of quizzes for screening. The final 6 teams will be chosen from the participants and be provided a murder mystery which they must solve with the help of chemicals available in the chemistry laboratory.

Registration:

- Registration for this event will take place on the spot.
- Participants may come in teams of two or three.

Rules:

- The preliminary screening (First round) will be done using objective quizzes containing aptitude and logical reasoning questions with star questions as tie breakers.
- There will be 7 to 8 screening rounds. Screening round and the final event will happen on two different days.
- The second or the final round will be solving of the murder mystery. Winner would be the team solving it first. Chemical experiments will be done in the chemistry laboratory.
- Use of unfair means leads to disqualification.
- **Judging Criteria:**
 - a) The screening round quizzes will have a standard answer key. Each round has star questions which will be used to rank teams in case of ties.
 - b) The best 6 teams will be chosen for the final.
 - c) The murder mystery in the second round is solved by cracking clue after clue.
 - d) The first team which arrives at the answer satisfactorily and in the minimum time will be announced as the winner.

Contact:

Rithwik Mavuluri – 8500297725

Zombie Mathematics

Answer the tricky questions of your opponents and restrict their moves. It will be an online game where two teams will be playing against each other. The motive of each team will be to answer questions on each of its move in order to restrict other's way. The team that will survive till end will be the ZOMBIE of the event!

Registration:

- Each team must have two members.
- Teams can register online for this event.
- On the spot registrations will also be available.

Rules:

- It will be an online game where two teams will be playing against each other.
- Each team will have to answer questions on each of its move in order to restrict other's way.
- The team that will survive in the battle with all the other participating teams will be the 'ZOMBIE' of the match.
- The most resistant zombie will be declared as winner.
- Use of internet and mobile phones during the event is strictly prohibited. If any team is found guilty, it will be disqualified.
- In case of any conflict the final decision will be of the event coordinator.

Contact:

Anamya Agarwal – 9462238799

Quizzing**Over Head Transmission**

Over Head Transmission, which is one of the biggest crowd pullers during APOGEE, is an event which is sure to test your lateral thinking abilities as well as simple General Knowledge. For the quizzical enough, OHT offers ample proof that quizzing isn't all about mugging.

Hosted by Major Chandrakant Nair.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of not more than three.

Rules:

- This is a general quiz.
- Two rounds - prelims and finals.
- Top 8 Teams will be selected for the final round after the elimination.
- In case of any discrepancy, the decision of the quizmaster will be regarded as final and binding.

Contact:

Saurav Shenoy – 9972069127

Biz Quiz

Do economics and finance interest you? This quiz will challenge your knowledge, test your limits and broaden your horizons.

Hosted by Kushan Patel.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of not more than three.

Rules:

- This is a business themed quiz.
- Two rounds - prelims and finals.
- Top 8 teams will be selected for the final round after the elimination.
- In case of any discrepancy, the decision of the quizmaster will be regarded as final and binding.

Contact:

Saurav Shenoy – 9972069127

Brain of BITS

The most prestigious quiz in a BITSian's life, Brain of BITS, which is hosted by the previous winner, is the perfect stage to test your mettle against the best quizzers on campus. Bringing in much needed heat into the air, this winter BoB is sure to set some heads rolling, as a new quizmaster will test the QQs of veteran and amateur quizzers alike. This is a lone wolf quiz. Your only team mates are your common sense and your nerves.

Hosted by BoB 2017, Mustansir Mohammed Mama.

Registration:

- Participants can register on the spot for the event.
- This is a solo quiz.
- Only BITSians can participate.

Rules:

- This is a general quiz.
- There will be two rounds - prelims and finals.
- Top 6 from prelims qualify for the finals.
- In case of any discrepancy, the decision of the quizmaster will be regarded as final and binding.

Contact:

Saurav Shenoy – 9972069127

India Quiz

"India is the cradle of the human race, the birthplace of human speech, the mother of history, the grandmother of legend, and the great grandmother of tradition. Our most valuable and most instructive materials in the history of man are treasured up in India only."

-Mark Twain

India Quiz introduces you to the different facets of India which you might have seen or heard of, but never experienced. Its people and places, its colour and hues, its opulence and magnificence are presented to you in a four hour format which promises to give you a whirlwind tour of India. It has been a successful crowd puller for the past few years and with all humility claims to be one of the foremost quizzing competitions of BITS-Pilani.

Hosted by Major Chandrakant Nair, a name synonymous with India-themed quizzing.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of not more than three.

Rules:

- The quiz will only contain questions pertaining to topics related to India.
- Two rounds - prelims and finals.
- Top 8 teams will be selected for the final round after the elimination.
- In case of any discrepancy, the decision of the quizmaster will be regarded as final and binding.

Contact:

Saurav Shenoy – 9972069127

Jeopardy

A quirky quiz game-show where you give your answer as a question.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of two.

Rules:

- Two rounds - One paper and pen elimination round and finals.
- Top 6 Teams will be selected for the quiz show after the elimination.

Contact:

Sarvesh - 91 8003123620

Sci-Tech Quiz

A sci-tech quiz in a tech fest in an institute of science and technology. This quiz will comprehensively examine your scientific knowledge and technological expertise, while providing a very enjoyable experience.

Hosted by Kushan Patel.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of not more than three.

Rules:

- This is a science and technology themed quiz.
- Two rounds - prelims and finals.
- Top 8 Teams will be selected for the final round after the elimination.
- In case of any discrepancy, the decision of the quizmaster will be regarded as final and binding.

Contact:

Saurav Shenoy – 9972069127

42

A quizzing event based on the theme of astronomy and physics.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of two.

Rules:

- **Round 1 (Elims):** A set of one-word/line questions will be asked to all the teams based on the knowledge of general astronomy and 10+2 physics.
- Top 6 teams of all will be selected on the basis of their scores in this round.
- **Round 2 (Final):** Another set of questions will be given to all the finalist teams for which they will have to build up the scenario as required or give a possible explanation for the given scenario.
- Marks will be awarded on the basis of scientific accuracy of the answers.
- Internet access is not allowed during both the rounds of the quiz.

Contact:

Sri Harsha – 7073224880

Pratyush Dubey - 9462740174

Doper's Quiz

This APOGEE, delve into the world of the Narcotics in our mind-boggling quiz. The questions will be based on real-life applications and situations in which the contestant will have to think logically and realistically. Audio and Visual aids will be provided to the participants in order to make the quiz more interesting.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of two or three.

Rules:

- Two rounds - elimination and finals.
- **First Round** will have 15 questions which will be text and audio-visual based.
 - a) Each correctly answered question will grant 10 points to the team.
 - b) Elimination will be done on the basis of final points at the end of the round and top 5 teams will be selected for the next round.
- **Second Round** will have 10-15 questions.
 - a) This round will also contain both text and audio-visual based questions.
 - b) This round teams can use the points they scored in the first round to purchase the lifelines for second round.
- The winners will be selected on the basis of points scored after the 2nd round.

Instructions:

- Participants will be given a chance to purchase lifelines at the beginning and after competing 5 questions of the round.
- Participants can choose to not purchase any lifeline at the beginning to save points for purchasing special lifeline after first 5 questions are over.
- **Know My Number:** This lifeline would provide the participants with the number of letters in the answer. This would be available for purchase from beginning.
- **Special lifeline Sneak Peak:** The use of this lifeline would be to provide the first and the last letter of the answer. This would be available only after first 5 questions of second round have been completed.

Contact:

Jayendra Agrawal – 8840431488

LIT Quiz

A quiz all about literature.

Registration:

- Participants can register on the spot for the event.
- Participants must come in teams of not more than three.

Rules:

- The quiz will be conducted in multiple rounds, with the first one being an elimination round.
- The quizmaster(s) may select between 6-8 teams for the next round, as per their discretion.
- The points-system for the successive rounds will be announced at the time of the quiz.
- The quizmaster's decision is final and binding on all issues relating to marking and answer.

Contact:

Divya Padte - 9461846305

Miscellaneous

Ahvaan

A Debating Event.

Registration:

- Participants may register for this event on the spot or online.
- This event would have individual participation.

Rules:

- **Eliminations:** 15 Questions (MCQs and Fill Ups) 2marks each.
- Six contestants would qualify for the main event.
- **Round 1:** Each participant has to present his/her views on a socio-political topic for five minutes.
- Participants would need to pick a chit randomly to decide the topic they must speak on from around 8-10 topics.
- Participants would be given 1-2 minutes for preparation.
- **Round 2:** Based on Round 1, two participants will be shortlisted for the final round.
- The finalists will be asked to debate on a given topic.

Contact:

Kaustubh Sharma – 8878888255

Bob the Builder

A pile of junk, knowledge of basic laws of science and a lot of creativity, that's all it takes to make an awesome contraption. Creative Activities Club brings to all a contraption making competition. The entire inventory will be provided on the spot along with a problem statement.

Registration:

- The registrations for this event will take place on the spot registrations,
- Participants must come in teams of three or four.

Rules:

- The entire inventory will be provided on the spot along with a problem statement.
- **Judging Criteria:**
 - a) Number of steps
 - b) Number of energy conversions
 - c) Complexity
 - d) Robustness
 - e) Creativity
 - f) Successful Completion

Contact:

Aakash Shah – 8003335581

Checkmate

Intelligence is not to make no mistakes, but to see quickly how to make them good.

~ Bertolt Brecht

A contest designed to test the mental aptitude of the contestants. What matters is your perseverance to get out of unforeseen situations. It may consist of brain teasers, mind boggling puzzles and other aptitude questions to juggle your brain

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- The contest may consist of brain teasers, mind boggling puzzles and other aptitude questions to juggle your brain.
- Duration of the event would be 2 hours (tentative).

- The team that accumulates the maximum points in minimum time shall be declared as the winner.
- Any form of malpractice shall lead to disqualification of the team(s).
- The decision of the authorities shall be final and binding.

Contact:

Anmol – 8283807756

Shivani – 9899981468

Everyone Dies

This is a fun event where the contestants are required to plan an apocalyptic scenario with the help of some objects given to them.

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- Teams will be given a list of objects - to be used - with each object having an associated cost.
- They are required to plan an apocalypse and with keeping the total cost minimum.
- The team with best (least total cost) and sure-to-work solution wins the competition.
- Internet access is not allowed, any relevant scientific data needed will be provided on request.

Contact:

Sri Harsha – 7073224880

Pratyush Dubey – 9462740174

Fresh Event

An event never seen before, devised from scratch by students.

Registration:

- Registrations for this event will take place on the spot.
- Participants may form teams of any size.

Rules: (Rules for this event will be updated later.)

Contact:

Vivek – 8003343891

Goodbye Earth

It's the year 2050. Humans have left Planet Earth and are trying to build a colony on other planet. Your team is in-charge of this settlement and thus you have to take care of various aspects of this new colony. There will be three rounds in the event which will be declared then and there. Round will test your creative abilities and scientific aptitude.

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- This event will consist of three rounds.
- **Round 1:** Choose among different resources and various professionals you want to take along with you.
- **Round 2:** Invest in companies that maximize the resource usage and increase power output. And it doesn't just stop there; you have to come up with innovative new energy systems, new devices to extract energy and minerals.
- **Round 3:** Based on the creativity and innovation five teams will be shortlisted from the first two rounds.
- They will be provided with the description of around 5 different types of solar cookers.

- Based on the conditions of the planet they have to choose and design a prototype of solar cooker with the materials provided.
- A cumulative score of the participants will be calculated based on their points in each round.

Contact:

D Saketh Kumar – 7702860741

I Report

Your chance to showcase your art of reporting. Show your creativity & sense of humor and get cracking with short video clips in which any event is being reported. Apart from a video camera, this event requires innovation on your part and you get to put forward the best funny ideas you can come to. So Lights! Camera!! Report!!!

Registration:

- Participants must form teams of three to five members.
- Registration for this would happen online.

Rules:

- The maximum duration of a clip should be 3 minutes.
- Send the Youtube link of your short video(s) to us at ahp@bits-apogee.org/WhatsApp the video/link on the given contact number.

Contact:

Abhinav Gupta – 9729724253

Join & Win

As is the case that "the one who deserve is the one who observe" the same goes with our event Join & Win, where you spectate all around to win here. The keen observant of the events throughout the day get a chance to answer various questions and puzzles based on the events held on that day and answering and gaining maximum points makes you the winner.

Registration:

- The registrations for this event will take place on the online portal.
- This event takes individual participants

Rules:

- Players will have to answer questions based on the events that took place on that day or that will be conducted on the next day.
- The portal opens for 3 hours daily between 21:00 to 23:59
- Each correct response carries 4 points
- 1 mark will be deducted for an incorrect response.
- For every player, score tab will be reset to zero points after each day.
- In any case of any conflict the final decision will be of the event coordinator.
- The player with the maximum points at the end of each day's play shall be declared winner.

Contact:

Anamya Agarwal – 9462238799

Media Mania

Test your skills in the world of Journalism. This event aims at bringing out the hidden journalist inside you.

Participants will be tested on their '**awareness**', '**reporting skills**', '**communication skills**' and whatever one can imagine of, by the word '**media**'. Specific details and rules of the various rounds of this event will be declared on the spot to retain the surprise element.

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- There will be an elimination round at the start that will test your basic journalist skills.
- A limited number of teams will be selected for the next round.
- After a few rounds there will be a wild card entry from the audience based on a written questionnaire.
- Final rounds will test the analytical skills, wit, judgment, promptness and perspective of the participating teams.
- **Judging Criteria:**
 - a) Different rounds will have different criteria.
 - b) On one side there will be some straight point based rounds whereas on the other side some rounds will test your creativity, humour and innovative skills on stage.

Contact:

Abhinav Gupta – 9729724253

Mind-sweeper

Ever dreamed of beating a computer which learns as you challenge it? This is the event in which you'll challenge not only a computer but your own smartness.

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- The contest would be of 2 hours duration.
- Judging will done on the basis of the highest number of points scored while playing the game.

Contact:

Abhishek V Joshi – 9769320230

POLYSIS

If you believe the major issues in the country is primarily due to institutional voids in policy making and implementation process and if you think you can create a policy agenda from the existing issues in the society and structure a well-designed solution for the same, POLYSIS (Policy Analysis) is one of a kind opportunity to contest your opinions with top minds in the country.

Registration:

- Participants may form teams of two to five members.
- Registration for this event would happen prior to the fest.

Rules:

- **Contest:**
 - a) **Round 1:** *Analysis on a current policy: Online submission of analysis on a case study / current policy related topic (pre APOGEE).*
 - b) **Round 2:** selected teams would be given a public policy topic or given problem statement a week in advance
 - c) **Policy building:** Presentation of a scalable model of public policy or given problem statement by selected teams in front of panel of judges during APOGEE.
- Critical analysis of the given case study/ topic should be original and references (if any) to be mentioned suitably.
- Proposed corrective measures or policies should be holistic and feasible. The in-depth analysis of the proposed changes will be appreciated more than the quantity or number of proposed changes.
- **Judging Criteria:**
 - a) Round 1:
 - Problem(s) identification in the policy case study
 - Solution feasibility

- b) Round 2: Marks will be given for content and analysis, not on polished language, although good presentation skills are obviously cherry on the cake.
- c) Judges will decide the winners.

Contact:

Suman Chukki - 9481185369, 8310763292

Orious

"A deception that elevates us is dearer than a host of low truths."

An online quizzing events. Based on the theme, Retrofuture you will find various pic-connect questions. The participant gets to progress to the next level only after correctly answering the present.

Registration:

- This is a pre-apogee, online event.
- This event requires individual participation.

Rules:

- You will have to solve a question to proceed to the next question.
- Maximum 3 skips allowed.
- The one with the highest score wins

Contact:

Anshul Jain – 8003325758

Raze and Rise

The objective in this event is to maximize your net worth.

Registration:

- The registrations for this event will be on the spot.
- This event requires team participation.

Rules:

- **Eliminations:** The elimination round shall be a pen and paper round consisting of mind boggling questions.
- The top 6 teams scoring the maximum points will qualify to the next round.
- **Finals:** The rules for the final round shall be disclosed on the spot.

Contact:

Siddhant Gangwal – 9928142365

Taboo

Test yourself with all the words you can dredge up as you try to convey the given word without using words that are Taboo.

Registration:

- The registrations for this event will take place on the spot.
- Teams may have two or three members.

Rules:

- The event will be conducted in multiple rounds, with the first one being an elimination round.
- The first will be a classic Taboo round, allowing 2 turns per team, each turn lasting 2 minutes.
- Every successful word guessed will fetch you +1 point, while uttering any of the words deemed 'Taboo' will result in a negative point (-1).
- Passing a word (choosing not to guess) will result in neither gaining nor losing points (0).
- Star-marked words will be used to resolve ties.
- The host(s) may select between 8-10 teams for the next round, as per their discretion.

- The points system for the successive rounds will be announced at the venue.
- The events host's decision is final and binding on all issues relating to marking and answers.

Contact:

Divya Padte – 9461846305

Treasure Hunt

Solve fun clues using your knowledge and reasoning to progress through the Hunt.

Registration:

- Registrations for this event will take place on the spot.
- Participants may form teams of any size.

Contact:

Vivek – 8003343891

Word Amaze

This event shall test your Hindi vocabulary.

Registration:

- Participants may register for this event on the spot.
- This event requires individual participation.

Rules:

- This event will have three rounds.
- Round 1: Hangman
- In this round, an incomplete Hindi word will be displayed.
- The word is to be identified with help of 4 clues which will be displayed one by one.

- On answering through first clue, 40 points will be awarded. On answering through the second, third and fourth clues, 30, 20 and 10 points will be awarded respectively.
- **Round 2: Rapid Fire**
- In this round, miscellaneous questions will be asked.
- 10 questions are asked in 1 minute. For each question, 5 points will be awarded.
- **Round 3: Grand connect**
- In this round, the word is to be guessed with the help of video, picture and text related to that word.
- For a correct answer, 20 points will be awarded while for an incorrect answer, 5 points will be deducted.

Contact:

Kaustubh Sharma – 8878888255

Wordstock

Brainy word puzzles to test your logic, vocabulary, creativity and command over the English language.

Registration:

- Participants must come in teams of two.
- Registrations for this event will take place on the spot.

Rules:

- This event will be conducted in two rounds.
- One paper and pen elimination round, following which 6 teams qualify for an interactive finals.

Contact:

Vivek – 8003343891

Miscellaneous Information

Certificates

- Common Oasis participation certificate will be given to all outstation participants.
- Certificate policy for events is decided by the Department of Controls.
- Participants are required to collect the certificates for the positions procured by them after the announcement of the relevant results from the Controls Booth.
- Certificates not claimed up to one month after the culmination of Oasis will not be mailed.

Prize Money

- Prize money allotment for each event is decided by the Department of Controls.
- The finalists of all events are required to submit accurate bank details (Account holder's name, Account No., IFSC Code, Bank Address) to the coordinator of the event or to The Department of Controls for distribution of prize money.
- The Department of Controls shall not be held responsible for any failure to provide this data correctly and all consequences that it might entail.

Accommodation

- Refundable caution deposit per participant shall be charged.
- Free lodging for all the participants. Accommodation will be provided in the hostel common rooms and boarding at student messes.
- Required accessories, per common room basis, will be provided in room beforehand itself.
- If any of the items provided in common rooms are found damaged or misplaced, participants will be charged accordingly.

- Each participant must provide his/her latest identification card and the team bona fide certificate attested by the head of the institution. The failure of the participant to provide the identification card will result in him/her not being allowed to register.
- Teams are required to produce their confirmation letter at the time of registration.

Other Useful Information and General Rules:

- Events and Prizes are subject to cancellation according to participation, the decision of the organizers will be final and binding.
- Food will be provided at the students' messes, coupons for which can be purchased.
- In case of any dispute, the decision of the organizers will be final and binding.
- Unless otherwise specified, team members of a particular team for an event may be from different colleges.
- Unless otherwise specified, participants may not be in two teams for a single event.
- Unless otherwise specified, participants must be registered for APOGEE 2018 to take part in any event.
- Some events may allow participants that are not actively pursuing an undergraduate degree. These participants may not be eligible for other events.
- Participants will be expected to follow all the rules of set by the institute and the organizing body. Failing to do so might lead to cancellation of registration.
- Vehicles will not be allowed inside campus. Vehicles can be parked outside the institute premises. The organizing body shall not be held responsible in the event of damage to or theft of the vehicle.

Refer to the APOGEE 2018 website for further details: www.bits-apogee.org

Contact Information:

For details regarding projects, registration and events, please contact:

Himangshu Baid
CoStAAn, Department of Controls
Ph: 9704050069
Email: controls@bits-apogee.org

For details regarding registration, invites and conformation, please contact:

Alanckrit Jain
CoStAAn, Department of Publications and Correspondence
Ph: 9582553659
Email: pcr@bits-apogee.org

For details regarding accommodation, please contact:

Anshuman
CoStAAn, Department of Reception and Accommodation
Ph: 8839439699
Email: recnacc@bits-apogee.org

For details regarding Sponsorship and Marketing, please contact:

Keshav Jain
CoStAAn, Department of Sponsorship and Marketing
Ph: 9833175804
Email: keshav@bits-apogee.org

For details regarding Online Publicity, please contact:

Vaibhav Jain
CoStAAn, Department of Art, Design and Publicity
Ph: 8239737593

Email: adp@bits-apogee.org

For details regarding website, please contact:

Hitesh Raghuvanshi
CoStAAn, Department of Visual Media
Ph: 8003398809
Email: dvm@bits-apogee.org

For details regarding papers or Think Again, please contact:

Abhishek Gupta
CoStAAn, Papers Evaluation and Presentation
Ph: 9929011689
Email: pep@bits-apogee.org