



Engineering Academy

Our evening academy offers advanced engineering projects that cover a lot about the engineering world. It sets an actual engineering environment for the students to get a taste of how actual engineering projects works.

Like our ASA and other programs the academy follows the same “Understand – Design – Build – Test – Compete” structure. The academy programs also add a lot of other aspects to the process; from budgeting and trading materials, to testing different materials to understand the mechanics of the materials, to understanding the different rule each engineer plays in the actual engineering projects.

Academies locations and schedules

The below are the locations and the days each academy will run, however the start and end dates for the academies will be confirmed on 10th of September.

Venue	Day(s)	Time	cost
Kings School Al Barsha	Monday & Wednesday	3:00 – 4:30 pm	1,300AED for term 1 (20 workshops) or 3,500AED for a year (term 1,2&3)
Kings School Al Barsha	Monday & Wednesday	5:00 – 6:00 pm	1,300AED for term 1 (20 workshops) or 3,500AED for a year (term 1,2&3)
Kings School Dubai	Sunday & Tuesday	3:30 – 4:30 pm	1,300AED for term 1 (20 workshops) or 3,500AED for a year (term 1,2&3)
Horizon International School	Sunday	4:40 – 5:30 pm	750 AED for term 1 (10 workshops) or 2,200 AED for a year (term 1,2&3)

- Members of any of the academies get an additional 15% discount on any of other programs and 10% discount on any on our holiday camps.

Sample project to understand how it works

Each student enrolled in one of our academies gets a structure layout for the project they will be doing like the one below. This will help parents get involved in the experience, and follow up with our students on what they learn each day. The project layout will include; outline of the project, schedule, objectives and learning outcomes

Design a bridge with tested materials within a specific budget

The goal of the project is to build a bridge within a given budget and specifications that can carry the heaviest load. Each team will be given a budget to buy materials, rent tools or hire an expert to modify a certain task. If a team bought a material that they don't need, they would be able to return it at a lower cost. However, they can sell it to other teams or trade it for other materials. This project will not only help students understand about engineering and improve critical thinking and problem solving skills, it will also help the students understand more about trading and economy.

Outline:

- Students are required to design and build a bridge within 20 classes; 1.5 hours each session
- Test different materials to understand the different characteristics of materials and how they behave under load
- The chosen materials should be purchased precisely in order to finish building their bridges within the budget
- Available budget: \$300 per bridge
- Available **materials** (not limited to the following): different types of wood, cubes, bars (metal), screws, cables
- Available tools (not limited to the following): Saw, drill, screw driver

General procedure:

- Introduction to engineering, different types of bridges, cost analysis and sustainability
- Design the chosen type of bridge
- Test the materials
- Start constructing the bridge
- At last, test and finalize the project

Material testing depends on:

- Weight of the material
- Size of the material
- Price of the material
- How they react to loads (some can carry tension but not compression, some are the opposite and some can handle both.)

Objectives:

- Detailed introduction to engineering & different types of engineering
- Understand how real engineering projects are done; design, test material, budget, level the resources, build a sample and test it, and construct the real project
- Detailed introduction to civil engineering
- Different types of bridges & the usage of each one
- Introduction to cost analysis & budgeting
- How to design & sketch the type of bridge, dimensions and materials
- Understand the mechanics of different materials
- Understand load distribution

Learning outcomes:

- Complete understanding of what engineers do
- When to use which type of bridge
- How to do blue prints before any construction & building
- Complete understanding of cost analysis & how to apply the concepts
- Understand how different materials have different characteristics and behave differently under loads
- Understand the rules different engineers play in a project

Detailed schedule:

Session 1	Introduction to Engineering, different types, focus on civil engineering, different types of bridges, cost analysis & budgeting	Session 2	Introduction to design/sketch, why having a blue print is important in engineering
Session 3	Recap and start designing the bridges (detailed designs with exact dimensions & initial chosen materials)	Session 4	Continue with the design of the bridge & start testing the materials to choose the material
Session 5	A challenge to introduce and focus on cost analysis and budgeting	Session 6	A challenge to introduce the importance of a foundation/base of any structure
Session 7	Start building the foundation/ base of the bridge	Session 8	A challenge to introduce the importance of the body of the bridge and its symmetrical shape/sides

Session 9	Build the body of the actual project	Session 10	A challenge to understand how to connect the two symmetrical sides of the bridge and where are the strong/weak points of the bridge (the points where the load mostly concentrates on)
Session 11	Based on the previous class challenge start connecting the symmetrical sides of the bridge	Session 12	Introduction to cables (tension) and their strengths and use in this project, will cables make the bridge stronger or weaker, if stronger, which points are the strongest points to connect the cables to
Session 13	Based on the understanding of tension do a challenge and apply the concepts in order to proceed with the actual project	Session 14	Apply the tension concept on the actual bridge projects by using cables and connecting them at the right points with the right angles
Session 15	Finalizing the bridges	Session 16	Testing the bridges using a challenge and a sample bridge (smaller demo bridge built through-out the classes), take notes of the weak points of the sample bridge in order to fix and edit the actual bridge for the competition
Session 17	Based on the tests done in the previous class modify and finalize the changes	Session 18	A challenge and test to ensure the understanding of the students of the learned concepts through-out the classes Go through the rules of the competition days and divide the groups
Session 19	Competition	Session 20	Presentation day