



## CHAIRMAN'S CORNER



Another academic year is drawing to an end. The faces and names are different; the only constant at this time of year is the high level of energy and excitement tinged with anxiety, uncertainty, and some sadness at the prospect of the "sudden end" of a four-year journey.

I have gone through and witnessed all these mixed emotions as a graduating senior and, counting this year, 15 times as a professor in the CEE Department. It is difficult to believe that 15 years have passed since I returned to AUB to join the faculty! It truly feels like yesterday... But so much has happened since "yesterday" and so many things have changed; yet the familiarity of context and tradition has not.

In the past fifteen years, I have witnessed the graduation of approximately 600 Civil Engineers, now professional colleagues. I have lived with them the jubilations of landing their first jobs, receiving their first acceptance letters into the graduate school of their dreams, weddings, births, ..., but also some disappointments, heartaches, and even few tragedies. Over the years, I have remained in direct contact with many, have followed up on the progress and accomplishments of others through the grapevine, and sadly lost contact with many more. Still, the bond created by one's passage through AUB and specifically through the department, keeps us/them coming back to the proverbial nest for advice, a second opinion, or just to say hello. In looking back at all these memories and looking forward to many more, I realize that it is this part of our job as professors in this department and university that is the most rewarding. What is still more remarkable is that I have welcomed (and will do so again very

soon) some of the students who passed through the program in "my times" as colleagues and fellow faculty. This cycle has been ongoing for years and the CEE Department today is in a unique position where we can boast of four such "generations" of faculty members. This corner is also meant to update students and alumni about the state of the department. In that respect, all that can be said is that we are doing very well. As I noted in the Fall issue of this newsletter, our PhD programs are on track and set to produce the first graduates by 2011. The new program in Construction Engineering which will start in the coming Fall has just accepted its first class, and the applications to the Civil Engineering program are at their highest in recent memory. In fact, entry into the program for next Fall was the most competitive across the whole university. The CEE Department has successfully recruited new faculty members who will be joining us this Fall in the areas of Transportation Engineering and Construction Engineering. Both are excellent graduates from the top US programs and we are very proud and excited to count them among us. Finally, our preparations for accreditation are on track and we have been officially informed that we will be visited by the ABET team in October-November 2009. I will end this message by wishing the CEE Class of 2009 the best as they go through the agony and exhilaration of their last few weeks in the program. I truly hope that we will be able to count them among the thousands who have gone through the department and remained emotionally and professionally connected to it, and who truly make our strength, real asset and resource.

With my best wishes of safety, continued success, and prosperity to all,

*Salah Sadek*

## STATE OF THE ART DRIVING SIMULATOR INSTALLED AT THE CEE LABS IN FEA

departmental release

The Transport Research Unit (TRU) at the Faculty of Engineering and Architecture of AUB has just received the region's possibly most advanced automobile driving simulator, a \$150,000 machine that will allow researchers to investigate a wide range of topics spanning the domains of traffic engineering, road safety, as well as driver behavior and cognition.

The DS-600c Research Simulator is built by DriveSafety and features a fully integrated, high performance, high fidelity driving simulation system designed for use in driving research and training applications.

The simulator, housed in the Bechtel Engineering building, features a full-width automobile cab surrounded by large 180° wraparound viewing screens. The cab includes the windshield, driver and passenger seats, center console, as well as dash and instrumentation. Real-time motion simulation is provided through a specially designed platform.

CONTINUED ON P.2

## STATE OF THE ART DRIVING SIMULATOR INSTALLED AT THE CEE LABS IN FEA

Using advanced scenario authoring tools, the simulator provides an ideal environment for researchers to create purpose-built driving scenarios to accomplish their desired research goals. "Driving laboratories" may be developed by leveraging the extensive library of roads, intersections, vehicles, traffic patterns and landscapes, plus the ability to script specific traffic events and behaviors and to perform advanced real-time data collection while participants drive the simulator.

"This is a significant new addition to the Department of Civil Engineering's research infrastructure," Salah Sadek, department chairman, noted as he observed the final tests being conducted on the simulator. "This simulator will enable the relationship between the driver and the vehicle to be thoroughly investigated, and opens up the possibility for investigating a wide range of research topics as well as providing opportunities for numerous inter-departmental final year projects."

"The driver is immersed in a real driving environment," said civil engineering professor and director of TRU Isam Kaysi, who is working on bringing together a multidisciplinary research team from various departments within and outside of FEA to capitalize on the new simulator. "The driver feels as if he or she is actually driving and experiences the associated

sights, sounds and emotional responses." The vehicle's movements and the driver's responses are all recorded by the system for later analysis.

The simulator was funded by a grant from ASHA.



*Prof. Kaysi taking the simulator for a drive*

## THE ENVIRONMENTAL ENGINEERING RESEARCH CENTER

Affiliated with the Department of Civil and Environmental Engineering (CEE) are a number of laboratories and facilities accessible to CEE students. The Environmental Engineering Research Center EERC, currently located at the CCC-Scientific Research Building, stands out as a main research facility and a community service laboratory that has been serving for 16 years. The center operates under the faculty supervision of Professor George Ayoub and is coordinated by Dr. Lucy Semerjian with Mr. Joseph Daoud as the assistant technician.

As a research facility, the EERC allows both CEE faculty and students to conduct experiments and research relating to physical, chemical, and biological contaminants. The sources can be from various environmental matrices such as municipal and industrial waters and wastewaters, sludge, leachate, solid wastes, sediments and air.

Available analytical equipment range from dedicated environmental equipment to routine laboratory apparatus and allow the assessment of analytical parameters that are of environmental and public health significance. Package experimental setups are available to instruct students on



*Atomic Adsorption Spectroscopy*

various treatment processes such as ion exchange, filtration, aeration, reverse osmosis, sedimentation, aerobic and anaerobic digestion, flotation, permeability, and fluidization. All analyses are conducted according to the latest standard operating procedures as approved by the American Public Health Association, American Water Works Association, and Water Environment Federation. Within its academic role, EERC caters for hands-on experiments and demonstrations as part of undergraduate course requirements.

As a service facility, EERC continues to receive numerous environmental samples from non-AUB community, namely from construction and engineering companies, residential, commercial, educational, agricultural, recreational, as well as governmental and non-governmental facilities. Its main role, however, remains in its potential as a research facility for CEE faculty, researchers and graduate students majoring in Environmental and Water Resources Engineering or Environmental Sciences. Throughout its service years, EERC had a significant contribution to numerous graduate theses and publications in international journals and conferences.



*Routine Laboratory Apparatus*

## DR. GHASSAN CHEHAB JOINS THE CEE DEPARTMENT



catherine shadarevian

With the past few years' construction surge in the region, the market for civil engineers has expanded radically. Civil engineering has become the first choice for FEA applicants; a natural consequence is the need for more professors. Dr. Ghassan Chehab joined the AUB family as an assistant professor in Civil Engineering. He has moved from Pennsylvania State University

where his domain as an assistant professor was related to pavements and construction materials. AUB and Lebanon are familiar environments to Dr. Chehab: he earned his BE in 1996, and his Masters in Engineering Management in 1998, both from AUB. To him, Lebanon means "home" and with its well-established reputation and academic excellence, AUB is a fertile ground for his interests and ambitions. Dr. Chehab's research has touched many fields: construction methods and materials, recycled materials, non-destructive testing, and

construction materials' management and sustainability. Construction, as a field under civil engineering, is one path that Dr. Chehab sees suitable for professionals willing to work directly on site. Construction engineering is not limited to commercial and residential structures; in fact tunnels, bridges, highways, airports, and all sorts of sites require thorough quality control and construction management intervention in order to be efficiently undertaken.

Environmental awareness is strictly taken into consideration in this branch of construction engineering, which roughly deals with all facets of construction: management, materials, contracts and specifications, construction equipment, site logistics, personnel and manpower...etc

When asked about the new Construction Engineering degree that the FEA will be offering as of next fall, Dr. Chehab underlined that it is a BS and not a BE degree and believes therefore that a masters degree in engineering management would be a suitable addition to it.

We all wish Dr. Chehab a successful stay at AUB.

## CIVIL AND ENVIRONMENTAL ENGINEERING: TOUGHEST MAJOR TO GET INTO AT AUB

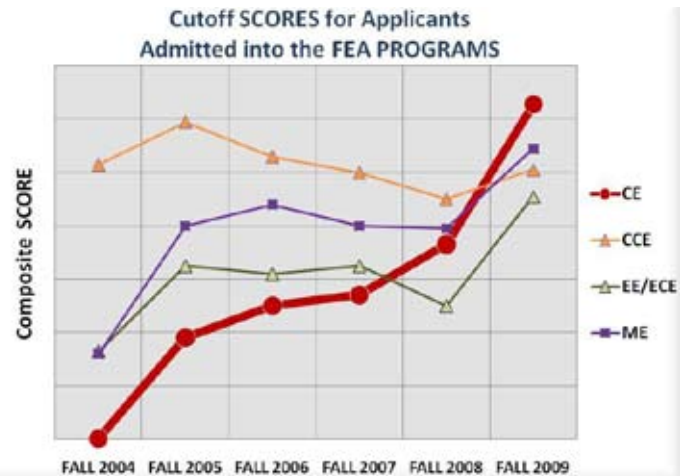
Admission into the Civil and Environmental Engineering (CEE) program was the most competitive across AUB for the Fall of 2009.

With the still increasing need for infrastructure development and improvement in Lebanon and the region, and with the surge in construction, water resources, and urban planning and transportation projects due to the extensive population growth, civil engineering has become the market's spotlight. Indeed, demand for civil engineering is soaring. As a matter of fact, 9.3% of all students applying to join AUB next fall have put civil engineering as their first choice, making the CEE program the most sought after at the faculty of engineering and architecture (FEA), and even at the whole university. "This is

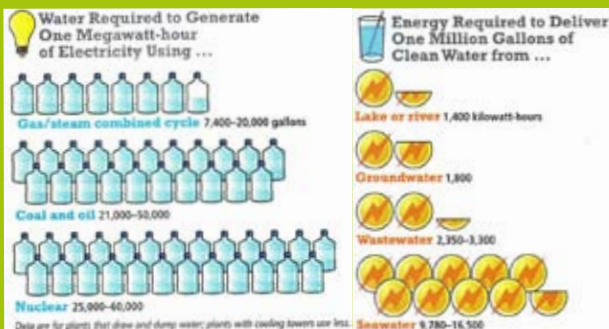
ultimately a reflection of the trends in the job market" stated Dr. Salim Kanaan, director of admissions at AUB. This hike, which began three years ago, has also been reflected in the construction engineering BS program which showed significant interests.

Following a basic supply and demand analogy, the increased demand has resulted in a sharp rise of the entry requirements into the program. The CEE composite score on which

admission into the program is based, which combines both SAT scores and high school performance, was the highest among all other majors offered at AUB for the Fall of 2009. The figure below shows a time series plot of the composite scores of various engineering majors at FEA for the past five years. All majors' scores have risen significantly; in particular, CEE's recent jump is clearly apparent. ONWARDS AND UPWARDS CIVIL ENGINEERING!!



## Water Energy Dilemma



Energy is needed to supply water. Water is needed to produce energy. Both resources are reliant on one another – and both may be running short. Is there a way out?

Source: Earth 3.0 Scientific America

## FIRST "HAPPY HOUR" EVENT HELD ON BECHTEL TERRACE

*ramiatallah* This year, the Civil Engineering Society (CES) held the first "Happy Hour" gathering on the Bechtel terrace. The idea behind this event is to allow the student body and faculty to come together, interact, and get better acquainted with each other. Attendees included CES cabinet members, students from all years as well as a large number of professors. Students got the chance to meet with members of the CES cabinet and raise issues they thought the Society could attend to. Furthermore, students and faculty alike were able to enjoy the weather as they discussed academic issues and conferred about career choices and future academic possibilities. The event was mainly aimed at the 1st and 2nd year students as the faculty felt that they do not usually get a chance to meet them and get to know them better. First year student Sami Menassa described the event as "helpful and enjoyable" as it helped him put his interests in traffic and transportation engineering into perspective. Samer Farroukh, a second year student, told CES cabinet members that he was "glad to hear the CES is planning to make these events a regular thing".



*Students and Faculty conversing about various issues*

## SPREADING THE AUB CEE FLAG

*lorisikhonian* Once again, the name of AUB is raised high...this time through sports. The fourth year civil engineering student, Wael Harb, won the "top scorer" award of the Bank of Beirut Lebanese Rugby League Championship in which four local universities: LAU, UOB, AUB, USJ and one local club, Jounieh, participated. Wael tells us more about the award in the following interview:

*How long have you been playing Rugby?*

Actually it all started pretty recently; I've only been playing for 3 years now.

*How do you balance your time between sports and education?*

You didn't mention work; I'm working in a consulting engineering firm as well (Rafik El-Khoury & Partners). So basically with all these activities, I can barely find time to sleep at night. But it's all worth it.

*What do you plan on doing next?*

Keep working for the same firm long enough to gain considerable experience, and then there is a huge plan I'm working on.

*Have you ever thought of continuing your career in Rugby?*

Yes, I thought about it a few times, but after getting several injuries I disregarded it.

*Why did you choose to major in Civil Engineering?*

It's a very vast and challenging domain, and it offers the possibility of doing business. Also, it is one of the few majors where one could easily become independent and self-reliant.

*Any last words?*

I just want to add that you're doing a wonderful job with the Newsletter. I really appreciate the efforts you're putting in because every article you write, regardless of how small it is, is bound to affect at least one person.



*Wael Harb being tackled in a rugby game*

## ALUMNI

We want to hear from you!  
Send us your news (recent publications, honors, promotions...) with photos to [civilnews@aub.edu.lb](mailto:civilnews@aub.edu.lb)

## SPRING START DINNER: ENJOYING THE CEE EXPERIENCE

**ramsey/nasr** The annual Spring Start dinner was held on the 6th of March at the Palm Beach hotel in Ain el-Mreisseh, Beirut. The rooftop restaurant offered a menu which included a wide variety of foods from Lebanese meze and main courses to drinks and desserts. The students could enjoy an uninterrupted 180 degree sea view as they were dining and socializing. The notion is that students had a great evening; they were animated by the music and the vibrating atmosphere which usually accompany such events. At the end of the evening, tombola was drawn and many valuable prizes were won by students from all academic years. The dinner was also marked by the distinguished presence of Chairman Sadek, Prof. Mabsout, and Dr. Fawwaz. The CES would like to thank all those who once again made this event another success and the Consolidated Contractors Company (CCC) for sponsoring the event.



*Students enjoying a drink at the bar*

## ENGINEERS AND THE H/SC COURSES

**amir/salam** The engineering curriculum at AUB includes 10 courses in humanities, languages, ethics, economics, and other social sciences. The objective is to help broaden the education of engineers, improve their communication and presentation skills, and enhance their awareness of their social and environmental responsibilities.

We engineering students look at humanities and/or social sciences courses with views of disinterest, and sometimes even consider them to be superfluous, irrelevant, or a waste of time. Yet the individual in society, if to forge a role of significance, must have a broad view of things in order to have the capacity to deal with all seasons and assume leadership and change.

It is partly because of this broad education and culture that AUB engineering graduates attain leadership positions in both business and government. This must be continuously enhanced and developed considering global competitiveness

which requires, in addition to intellectual capacity, technical abilities, and professional ethics, a mass of interpersonal skills and the ability to work in teams. That in turn requires an understanding and appreciation of diversity in cultures and business practices, and finally a good grasp of the social, economic, and environmental impacts of engineering projects. Indeed, a broad view of education can prepare engineering students to succeed in a changing world, a globalized economy, and in tackling the multitude of challenges facing our planet, most important of which are environmental preservation, equitable economic growth versus global overpopulation, shrinking freshwater resources, and renewable energy issues.

Students who are attuned to these issues and challenges and are prepared through a good educational program will be in a strong position to meet these challenges and to assume leadership in business and society.

## CEE ALUMNUS LETTER



Different life experiences have shaped my career and outlook on life, but my years at the CEE in AUB are one of the,

if not the most, influential. How often is one given the opportunity to be in a setting that brings together: the best set of undergraduate students in a given geographic area, exceptional and well-rounded professors, and facilities, curriculum and staff that keep you motivated and challenged to excel? There is no way you can get it wrong; you WILL be successful in WHATEVER you choose to do next! I'm someone who the opportunities in life have steered away from Civil

Engineering; a field that I hold dear to my heart but never really worked in. After graduating from CEE at AUB in 1998, I completed my master's degree in Information Systems at MIT. I have also studied at Harvard University and the University of California, Berkeley, and interacted with faculty and students from other universities. Besides my graduate work, I've been working in the software, real estate and healthcare industries. In all these endeavors, the challenges I encountered always found solutions derived from the knowledge I gathered during the four years I spent at AUB. In the CEE program you not only learn content, but you also learn process. Whether in studying and taking an exam, working on a project, or simply arguing with a professor

over a grade, you are exposed to that process of overcoming a stressful situation. While other universities are much focused on the content they deliver to undergraduates, CEE at AUB has managed to teach the process, although many times in a subtle way that the student doesn't feel it. There is a pattern which is very evident to CEE graduates the moment they take their first career step and tackle their first challenge. It is this type of knowledge that makes us – repeating the words of the Chairman – a special group of individuals joined together by a long standing tradition and pride. I am always privileged and honored to be part of such a group.

*christian manasseh*

## THE CEDAR ISLAND PROJECT – REDEFINING LEBANON?

alexandera/covero With the proposed Cedar Island Project, Noor International Holding aims at replicating the engineering ventures of the Gulf in what they call “a magnificent tribute to Lebanese heritage”.

Headed by the Chairman of the Kuwaiti based Investment Company, Dr. Mohammed Saleh, the US \$8.2 Billion endeavor is an off-land development of an approximately 331 km<sup>2</sup> semi-floating city in the shape of the Lebanese national symbol, the cedar tree. The island city includes planning schemes for residential, commercial, recreational and touristic sites, distinguished by luxurious experience in harmony with a modern lifestyle.

Dr. Saleh expects the project to reinforce Lebanon's position as a forefront touristic and investment figure at the international level. Apart from attracting investments and visitors from around the world, this project is also expected to generate around 50,000 new jobs.

The project is not without concerns however, ranging from environmental to cultural. Several environmental groups, such as Green Peace, oppose any such project with concerns for the disruptive impact it will have on marine life. Prominent environmental hydrologist, Dr. Nadim Farjallah, claim that “the island will cause disruption in long shore currents that carry sands and nutrients northward”, which will affect not only Lebanon, but the entire region as a whole. Another issue is the fact that such a project requires massive amounts of sand and excavating such volumes will cause irreversible damages to any area(s) serving as the source. The company subsequently proposed constructing part of the island, mainly the branches of the cedar tree, as floating or submersible structures in order to mitigate these excavation impacts. It is also claimed that any decision in regard to the



*Preliminary Design of the Proposed Cedar Island Project*

location of the island will be based on reclamation laws and will be such that the island will serve as a new habitat for marine life.

This project has led to a division of opinions amongst common people as well, creating on one side a group of supporters and on the other an opposition citing environmental and cultural damage as a reason. This division is felt across the cyber world; from blogs to social networking sites like Facebook, the opposition is voicing concerns that the archeological sites and ancient towns, which lie at the heart of Lebanese heritage and identity, will go unnoticed in the presence of a new glamorous and posh destination. Concerns for its potential environmental impacts are also apparent.

Midst all this controversy, Noor International Holding is still walking through the long corridors of Lebanese bureaucracy seeking the required authorization and decrees. When or if Dr. Saleh and his team get the ‘go ahead’, it is estimated that it would take them 3 to 4 years before realizing the idea and with it change the image of Lebanon.

## Ethics Corner

### Shortcut?

Bruce Carson's civil engineering firm has a contract with the state to specify the route of a new road connecting two major cities. Bruce determines that the shortest workable path will save 20 minutes from what would otherwise be a two-hour trip, but it would require the state to destroy a farmhouse that has been in the Jones family for 150 years. Bruce visits the Jones family to get some idea of what it would cost the state to purchase their home and the land immediately surrounding it.

Not surprisingly, the prospect of losing the home their family has maintained for the past 150 years is upsetting to the family. “What's 20 minutes compared to 150 years of family tradition?” objects Robert Jones, who has lived in the farmhouse the entire 63 years of his life. The family insists that no amount of money would tempt them to sell their home to the state or anyone else.

Bruce knows that one option would be for the state to exercise eminent domain and condemn the farmhouse. Should he recommend this to the state? Why or why not?

Source: Engineering Ethics, Concepts and Cases, 3rd Edition

## WHAT ARE YOUR VIEWS AND OPINIONS REGARDING THE PROPOSED 'CEDAR ISLAND' PROJECT OFF THE LEBANESE COAST?

Here is what some CEE students and one of their Professors had to say about the issue.

**Hicham Fayad, 3rd Year**



"I feel that it's going to be a waste of money. The cost of backfilling and all other related construction work is huge. Furthermore, it's made for the very rich. Not anyone will be able to rent or purchase apartments on such an expensive island."

**Prof. Shadi Najjar**

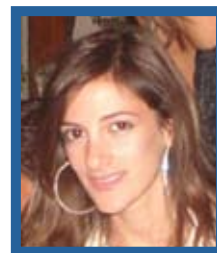
"As an idea it's fine, especially given the success of other [artificial islands] in the Gulf. The main issue here in Lebanon, however, is that the coast is not similar to that of e.g. Dubai...



specifically the water depth. In Dubai and Qatar the reclamation depths were about 5-6 m, 10 m at most... [in contrast] the expected depth for the Cedar Island is around 20-25 m in some locations. This translates into millions of cubic meter of reclamation material that will need to be dredged from both on- and off-shore sites; this means e.g. destroying a mountain or dredging an area 10-20 km<sup>2</sup>, which will surely have environmental impacts. Another issue is that caused by the mere presence of the island, which will lead to destruction of beaches due to the blockage of the natural process of replenishment of sediments. At the end of the day, all of this [groundwork] is very costly and make the idea, although interesting, not very feasible."

**Julie Souto, 3rd year**

"I don't support the idea...we are not that kind of country. It's going to cost a fortune to build and no normal person will be able to pay 'thousands of dollars' for a night in one of their hotels..."



**Kristina Stephan, 2nd year**



"It's an excellent idea...[the island] will attract many tourists and encourage investments in Lebanon. I doubt however that it will happen given the maintenance required...e.g.

the Palm Islands in Dubai are suffering problems of erosion. But I do hope they go through with it..."

## COMPOSTING: A FORGOTTEN SOLUTION TO WASTE MANAGEMENT

*zakhariaelmir* Scientifically speaking, fermentation is a biochemical reaction which converts chemical energy of a given carbon source into a form of energy readily usable by the cell in the absence of oxygen. Composting occurs in a natural way and needs little to no human intervention whatsoever. Simply put, composting is the process of feeding organic waste to microorganisms.

The society we live in is one of consumption. Waste generation is at its highest levels ever, and a very sizeable portion of municipal waste is of organic nature: fruits, vegetables, bread crumbs, seeds, meats, and the list goes on...

In large communities such as Beirut, composting can be advantageous in a number of ways. In urban environments, composting is a very suitable way of reducing landfill requirements achieving volume reductions ranging from 40 up to 80%. Once it is produced, compost can act as a soil conditioner which reduces the need for fertilizers, helps increase organic content for crop nourishment, and contributes to the prevention of soil erosion. This means that it can be marketed and profited from. Furthermore, composting is not a polluting practice and has little environmental impacts; this can be contrasted with sewer treatment for instance which produces harmful sludge that

requires separate and expensive handling. In fact, the high temperatures reached during the compost process tend to kill off most of the pathogens in the waste. Compositing is also performed at a smaller scale specific to households, referred to as domestic composting. In environmentally conscious neighborhoods, a typical initiative on behalf of the people would be to buy compost bins (plastic or metal buckets with openings allowing oxygen to penetrate the compost) and place them in the backyard or anywhere near the house (not indoors). The household must perform a simple separation task in which the organic and non-organic litter is separated. Everything organic is placed in the compost bin and the microorganisms take over from there. A medium sized bucket would be enough to rid a 4-individuals household from their organic waste for an entire year. With problems such as Saida's waste mountain and the high costs of Sukleen services, as well as many other environmental challenges Lebanon faces, it must be every citizen's duty to contribute in reducing the amount of garbage generated. And as civil and environmental engineers, we must endorse any effective solution which makes our world a cleaner and more sustainable place; composting is undoubtedly one of those solutions.

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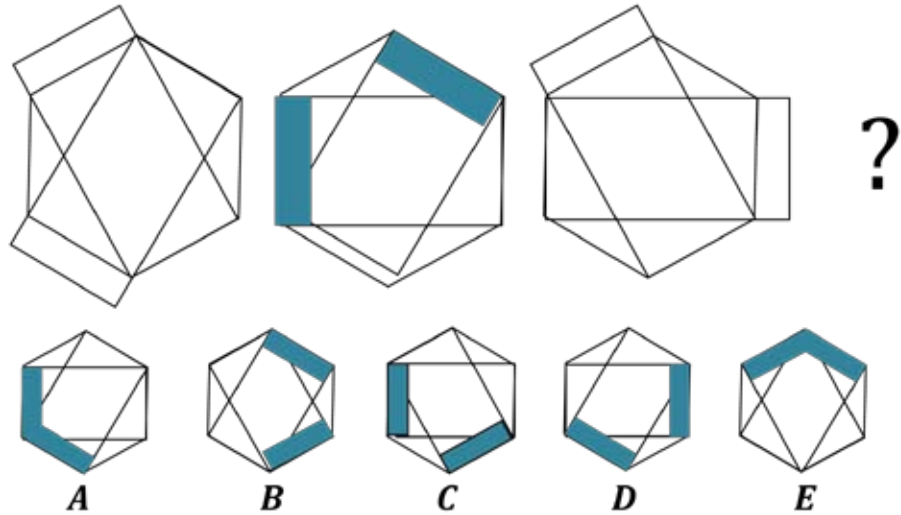
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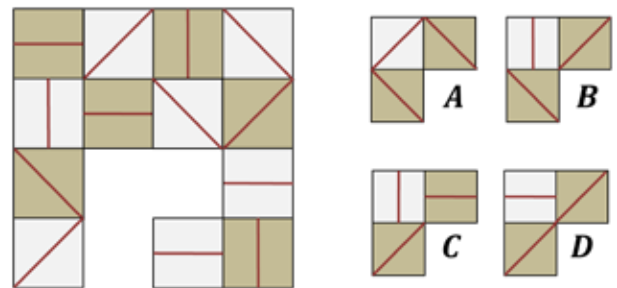
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# Brain Gymnastics

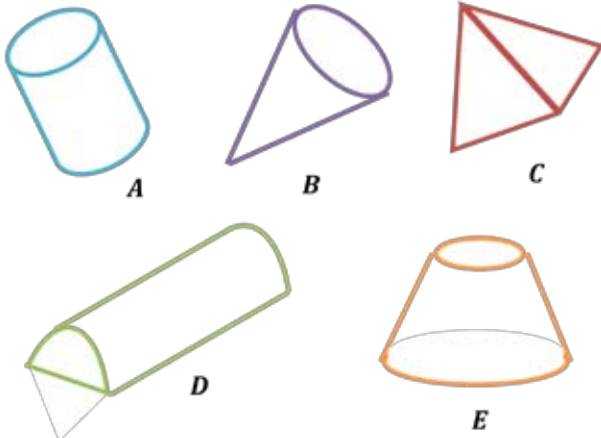
**1** Which figure comes in place of the question mark?



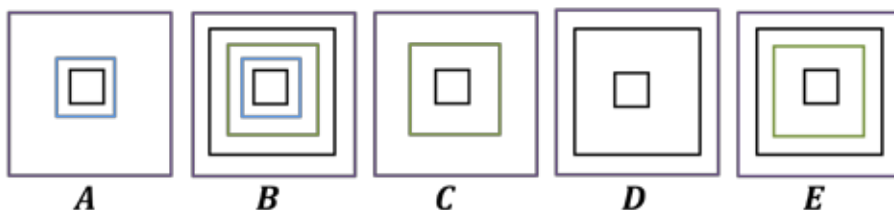
**4** Which of the figures fits into the square



**2** Which of the figures does not fit in with the rest?



**3** Which of the figures does not fit in with the rest?



**Key**  
1. B. The flaps are retracted and extended in alternating order as the shape rotates clockwise.  
2. C. None of the other shapes consist entirely of straight line segments.  
3. E. All other shapes have odd number of squares whilst this one has an even number of squares.  
4. B. Rows and columns house all four types of lines.

Brain Teasers by LexVero

Your feedback, suggestions, comments, and contribution are welcome. Please direct them to [civilnews@aub.edu.lb](mailto:civilnews@aub.edu.lb)

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