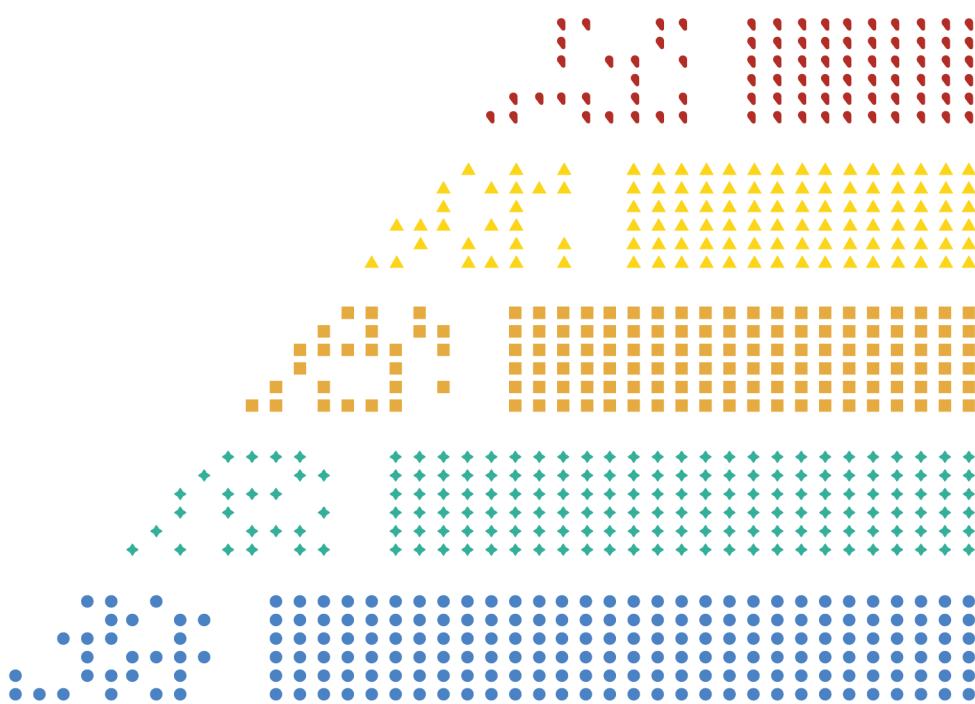


ATENEO DE MANILA
UNIVERSITY



Think.
Create.
Solve.

2016 Asia-Manila Regional
Programming Contest
December 14-16, 2016

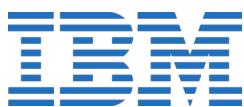




ATENEO DE MANILA
UNIVERSITY



IBM | event sponsor



THE GROVE
by Rockwell

acer

accenture



Smart

UBER

frapper la rue

ClickTheCity.com
Around the City Online



Fortunato T. de la Peña

Secretary

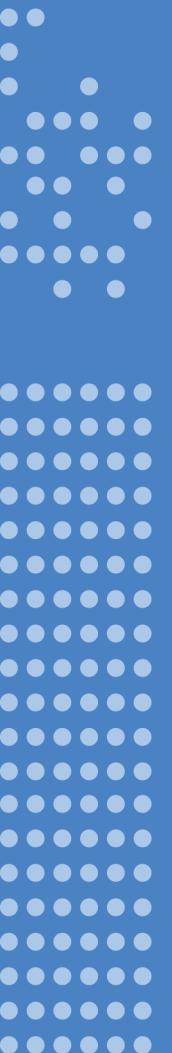
Department of Science and Technology

Republic of the Philippines



It is with pleasure that I commend the Ateneo de Manila University -- School of Science and Engineering, for representing the Philippines in the hosting of the 2016 ACM International Collegiate Programming Contest (ICPC) Asia Manila Regional Contest, a three-day international event, that gathers aspiring programmers from Asia-Pacific and Philippine Universities to compete in various programming fields, such as mathematics and computer science.

In line with the administration's goal of sustained economic growth with equitable impact to all Filipinos, the ACM-ICPC supports the vision and thrust of the Department of Science and Technology (DOST) to strengthen industry-academe synergy as well as to improve human resource capacities in different S&T areas, such as programming, that are critical to uplifting the lives of the Filipino people. Particularly, the programming sector contributes significantly to industries such as 3D animation and graphics design; database, networking and systems administration; program and software development; technical support and writing, and IT-BPM, among many others.



It is in this light that I express the Department's full support to the successful conduct of the ACM-ICPC. It is an initiative that proves the commitment of the Ateneo de Manila University, and other collaborating schools, to build the Filipino IT talent, and improve the quality of related fields in the country.

My best wishes as you bring our nation one-step closer into the competitive programming world.

MABUHAY!

Dr. Marlene M. De Leon

Chairperson, Department of Information Systems and
Computer Science
Ateneo de Manila University



I would like to congratulate all of you for your participation in the 2016 ACM International Collegiate Programming Contest Asia-Manila Regionals.

This is exciting for us because it has been over 10 years since the Department of Information Systems and Computer Science of the Ateneo de Manila University last organized a leg of the ACM-ICPC Regionals.

I would like to express my gratitude to those who helped make this event possible: Dr. Kardi Teknomo for serving as the Regional Contest Director; our panel of judges; our technical team, headed by Mr. Mark Bautista; Ms. Jessica Sugay, the Computer Society of the Ateneo (CompSAt), and all of our student and alumni volunteers for tirelessly organizing this event.

I would like to thank the various units of the Ateneo de Manila University, the Rizal Library, the Office of the Vice President for the Loyola Schools, the Office of the Dean of the School of Science and Engineering, the University Communication and Public Relations Office, the Office of the Associate Dean for Student and Administrative Services, the Facilities Management Office, and the Campus Safety and Mobility Office.

Finally, I would also like to thank all our sponsors: IBM, Acer, Rockwell Land, Smart Communications, RCBC, and Accenture. We truly appreciate your support and we hope that you will continue to support other similar events that foster communication and collaboration in the field of Computing.



Prof. CJ Hwang

Director, ACM-ICPC Asia Super-Region
Professor of Computer Science
Texas State University, Texas, USA



It is a great pleasure to be present for the
2016 Asia-Manila Regional Contest.

The ACM International Collegiate Programming Contest (ICPC) is an activity of the ACM that provides college students with an opportunity to demonstrate and sharpen their problem-solving and computing skills. The ACM-ICPC Asia Regional Contests invite Asian students to meet, to establish friendships, and to promote fair competition in programming and in applying the use of algorithms and theory. In a nutshell, you are now participating in the Asian leg of the world's largest programming olympics.

In Asia, where I serve as the Director of the ACM ICPC, we cover all territories and countries except Arabic speaking countries in the Middle East. Asia Regional Contests do not divide the region by political territories. A team that advances to the World Finals represents the team's university, not the team's political boundary. This year, 2016, we have 23 sites to hold the Asia Regional Contests, and Manila is one of them.

I would like to encourage more young Filipinos to participate in the ACM ICPC. Because the ACM ICPC is a mult-tier programming contest, you can start with having programming contests within your own universities. The winners can then join the provincial contests, and further proceed into the regionals, like this event. Winners of these regional contests would be qualified for the World Finals. If you have more participants from your country joining these contests, then the Philippines will gain a higher country score which will allow you to send more competing teams to the World Finals.

I would like to thank the Ateneo de Manila for hosting this great international event, especially Dr. Kardi Teknomo for serving as the Regional Contest Director and his organizing committee, the team of judges, for making this Regional Programming Contest a reality. I would like to thank the government support from CHED and DOST. I would like also to thank the sponsors: IBM, Acer, Rockwell Land, Smart Communications, RCBC, Accenture, Frappe La Rue, Uber, ClickTheCity, and When In Manila.



Dr. Kardi Teknomo

Regional Contest Director
ACM-ICPC Asia-Manila 2016
Ateneo de Manila University



It is with great pleasure that I greet the occasion of the 2016 Asia-Manila Regional Contest of the ACM-ICPC (Association of Computing Machinery - International Collegiate Programming Contest). I would like to thank the host institution, the Ateneo de Manila University, which is known for its excellence in innovation and research. As the Asia-Manila Regional Contest Director, I thank all of you, representatives from different universities, sponsors, and government officials for being part of this prestigious competition.

The ACM-ICPC is considered as the “olympics of programming competitions.” It is quite simply the oldest, largest, and most prestigious programming contest in the world. The ACM-ICPC is a multi-tier, team-based, programming competition, Headquartered at Baylor University, Texas, it operates according to the rules and regulations formulated by the ACM. Contest participants come from over 2,000 universities that are spread across 80 countries and six continents. Regional contests such as this one are organized by local universities of different regions spread across the globe. In the Philippines, the last Regional Contest was held in 2001 at the University of the Philippines, Diliman.

The winner of this regional contest will receive an invitation to compete in the World Finals next year in Rapid City, South Dakota, USA. More importantly, all the participants, even at the regional contest level, will also get some bragging rights as the top coders of the country and of the Asian region!

Global trends have shown that one of the most credible alternatives to grow the economy is through the information and communications technology (ICT) sector. This is because ICT can sustainably empower the youth, create room for innovation, enhance productivity in other sectors, and create jobs. It is our hope that our societies, especially here in Asia, would be able to enjoy these benefits through the “olympics of programming competitions” that builds a strong foundation in programming and digital computing among our top students. Therefore, I would like to call on the universities, companies, and members of the government, who have been supporting this important event, to continue to advance their level of support for the upcoming contests in the near future.

To all of the participants, the actual result of this programming contest would begin when you start contributing to society, by developing superb systems to enhance the economies of our countries and of the Asian region.

It is my sincere duty to thank all of you for making this regional contest a reality. It is my hope that you enjoy your stay in Metro Manila.

Schedule of Activities



Day 1: Wednesday, 14 December 2016

Opening Ceremony and Practice Session

Start	End	Activity	Venue
12:00 PM	2:00 PM	On-Site Team Registration	MVP Roof Deck
2:00 PM	3:00 PM	Opening Ceremony	MVP Roof Deck
3:00 PM	3:30 PM	Afternoon Snacks	MVP Roof Deck
3:30 PM	6:00 PM	Contest Orientation Practice Session Reminders	5F Rizal Library

Day 2: Wednesday, 15 December 2016

Contest Proper and Closing Ceremony

Start	End	Activity	Venue
8:30 AM	9:30 AM	Registration and Breakfast	Leong Hall Lobby
9:30 AM	3:30 PM	Regional Contest Proper	5F Rizal Library
12:00 NN	1:00 PM	Lunch Service	1F Rizal Library (Coaches) 5F Rizal Library (Contestants)
3:30 PM	5:00 PM	Afternoon Snacks and Campus Tour	5F Rizal Library
5:00 PM	6:00 PM	Closing Ceremony	Leong Hall Auditorium
6:00 PM	8:00 PM	Dinner	Leong Hall Roof Deck

Day 3: Wednesday, 16 December 2016

Optional Excursion

Start	End	Activity	Venue
8:00 AM	9:00 AM	Assembly and Breakfast	Leong Hall Lobby
9:00 AM	9:10 AM	Departure for Excursion	Leong Hall Lobby
9:30 AM	3:00 PM	Optional Excursion	Excursion Venues
3:00 PM	5:00 PM	Return to ADMU	ADMU

Teams



Ateneo de Davao University	Nanyang Technological University
BlueKnights-1	APT
BlueKnights-2	ThaThu
Ateneo de Manila University	National Taiwan University
ABL Tree	G00dMeow
Fuchsia Moth	JBros
Möbius	
NSF Mangoes	
Ateneo de Naga University	National Tsing Hua University
Xavier	Magikarp
Bicol University, Polangui Campus	NTHU_Jinkela
1BUPC	NTHUccu
2BUPC	
De La Salle University	National University, Philippines
Clean Mind	NU CCS Wizards Circle Team 1
FEU Institute of Technology	NU CCS Wizards Circle Team 2
Exceptions	
FPT University	National University of Singapore
Unstoppable	Pandamonium
Ho Chi Minh City University of Science	Technological Institute of the Philippines, Quezon City
HCMUS-Serendipity	Code Slayer
Institut Teknologi Bandung	Keyboard Fighters
Ainge WF	TIP Sapiens
Korea University	
Never Give Up	
SRC	

**University of Asia
and the Pacific**

Dragon Exceed
Dragon Traverse

University of Mindanao

Team UM 1

University of San Carlos

Zenith

**University of the
Immaculate Conception**

Nairud
Olemop

**University of the Philippines,
Diliman**

Quiwarriors 1
Quiwarriors 2
Quiwarriors 3

**University of the Philippines,
Los Baños**

Eliens - Makiling
Eliens - Pegaraw

Contest Rules



Each team will be randomly assigned a workstation.

Teams will compete to solve 12 algorithmic problems in 5 hours.

Each problem consists of the following:

problem statement: a description of the problem (in English)

input-output specifications: details on input and output format, including constraints

which should be handled (output must have an exact match with the format specification)

sample input-output

time limit: maximum time allowed for the program to run and produce expected output

Teams may request for clarifications about the problems using the contest management system.

If all judges agree that ambiguity is present in the problem, a broadcast of the clarification will be made to all teams.

Should a contestant require use of the restroom during the contest proper, the contestant will be accompanied by a designated usher.

Submissions

Teams should submit their source code using the contest management system any time during the contest period.

A problem is solved when it is accepted by the judges. To accept or reject a submission, judges will compile and test the program with a different set of test data which have been prepared in advance.

Each submission will get one of the following responses:

Accept: The program produced the correct output within the specified run time and memory limits without any errors. This program is accepted by the judges and the problem is considered as solved.

Wrong Answer: The program did not produce the correct output.

Runtime Error: The program crashed (runtime error) when processing the test data.

Time Limit Exceeded: The program took more than the specified time limit to produce output and properly terminate.

Compile Error: The submitted source code can not be compiled.

Fair Competition

A team may be disqualified due to any form of cheating or any attempt at cheating. A team may also be disqualified for any act that jeopardizes the contest (e.g. hacking or tampering with equipment, dislodging electrical or network cables, distracting behavior, etc). All teams are expected to uphold sportsmanship and the spirit of fair competition. Contestants are not allowed to access any webpages or websites.

Ranking

Teams are ranked according to the most number of problems solved. Teams who solve the same number of problems are ranked by least total time. The total time is the sum of the time consumed for each solved problem (in minutes). The time consumed for a solved problem is the time elapsed from the beginning of the contest to the submission time of the accepted run, plus 20 penalty minutes for every rejected submission of that problem.

All inquiries, concerns, and protests on the results must be brought to the attention of the Regional Contest Director and the Chief of Judges within three (3) days of the competition's closing ceremony before elevating such concerns to ACM ICPC.

Team Notebook

Each team may bring reference material for use during the contest proper, according to the following limitations:

It may contain up to 25 pages of reference materials, machine-printed on single-sided Letter (8 x 11 inches) or A4 size paper (210 x 297 mm), with pages numbered on the upper right hand corner.

It may contain code listings, algorithms, hints, or any other necessary notes.

Each team member may have an exact copy of the team reference document.

Text and illustrations must be readable by a person with correctable eyesight without magnification from a distance of 0.5 meter.

The team may also bring stationery (pens, pencils, erasers, rulers, protractors, etc.), and a printed English dictionary (not electronic) without any annotations. Each team will be provided with blank paper during the contest proper.

All materials (team notebooks, stationery, etc.) will be collected on the first day (Dec 14) for inspection. The materials will then be placed in the team's designated workstation for the contest proper.

No other materials are allowed in the contest area.

Teams are not allowed to bring:

- any digital materials (e.g. e-books, soft copy code, etc.)
- any digital devices (e.g. flash drives, external hard drives, keyboards, etc.)
- any other electronic devices (e.g. mobile phones, smart watches, calculators, laptops, etc.)

Contestants are expected to switch off all communication devices and surrender such devices to their respective coaches for the duration of the contest.

Computing Environment

Hardware

Desktop Computer
Intel Core i5
4GB RAM
500GB HDD
Ubuntu 16.04.1 OS

Programming Languages

Java 1.8.0 update 111
Javadocs 1.8.0 update 111
Python 2.7.12 (python on command line)
Python 3.5.2 (python3 on command line)
GCC/G++ 5.4.0

Development Environment

Eclipse Cppa Neon 1 v4.6.1 with PyDev
Sublime 3 build 3126
Atom 1.12.4

Contest Management System

PC^A2 9.3.3

Local Information



Telecommunications

When calling Manila from abroad, phone numbers follow the format:

Landline numbers: +63-2-###-####

Mobile numbers: +63-9##-###-####

Prepaid mobile SIM cards are widely accessible in airports, malls, convenience stores. ACM-ICPC Asia-Manila recommends the services of Smart Communications.

Electrical Voltage

Electrical voltage in the Philippines is 220 volts. Gadgets and appliances that require 110 volts should use a voltage converter.

Language

The Philippines, especially Manila, is generally bilingual (English and Filipino). Provinces and regions across the country also speak a variety of dialects.

Weather / Climate

The Philippines has a tropical monsoon climate. The month of December falls within the dry season, with occasional rainshowers. The average temperature in December falls between 22°C and 32°C.

Getting Around

When traveling from the airport, or any other place in Metro Manila, there are several options for transportation. ACM-ICPC Asia-Manila recommends the following:

UBER

Download the mobile application and register for an account. This service requires an internet connection.

Specify your pick-up point and your destination.

If coming from the airport, specify the airport terminal as the pick-up point, e.g. NAIA Terminal 3.

The application will display the estimated fare to be paid. Payment may be made in cash or charged via credit or debit card.

The application displays a notification with the vehicle and driver information. Most Uber vehicles accommodate four passengers and two medium luggage.

Metered Taxi

Taxis are clearly marked and appear in a variety of colors. The flag-down rate is Php 30.00. Always insist that the driver activates the meter.

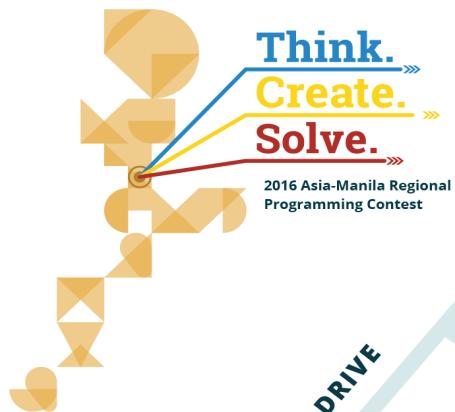
If coming from the airport, look for the queue for the yellow metered taxi. Metered taxis usually accommodate four passengers and two medium luggage.

Car Service

At the airport, there are counters for different car services. These car services provide a vehicle and a driver. These usually cost more than Uber or Metered Taxi. It may be worth considering when travelling with a large group.

Hotels also offer the paid option to arrange for transportation from and to the airport.

For more airport information, visit
<http://www.manila-airport.net/>

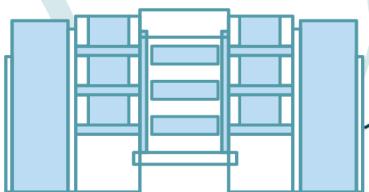


Think.
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Solve.

2016 Asia-Manila Regional
Programming Contest

FR. MASTERTON DRIVE

Social Sciences Building



LEONG HALL

Old Rizal Library

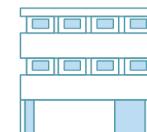
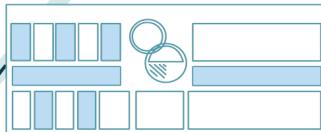


RED BRICK ROAD

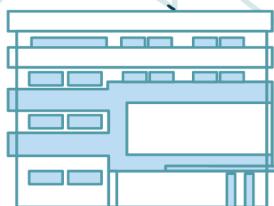


Horacio Dela Costa
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XAVIER HALL
(DROP-OFF POINT)

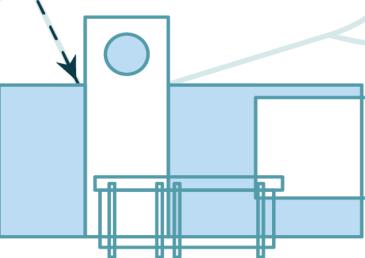


Kostka
Hall



MVP CENTER FOR
STUDENT LEADERS
(ROOFDECK)

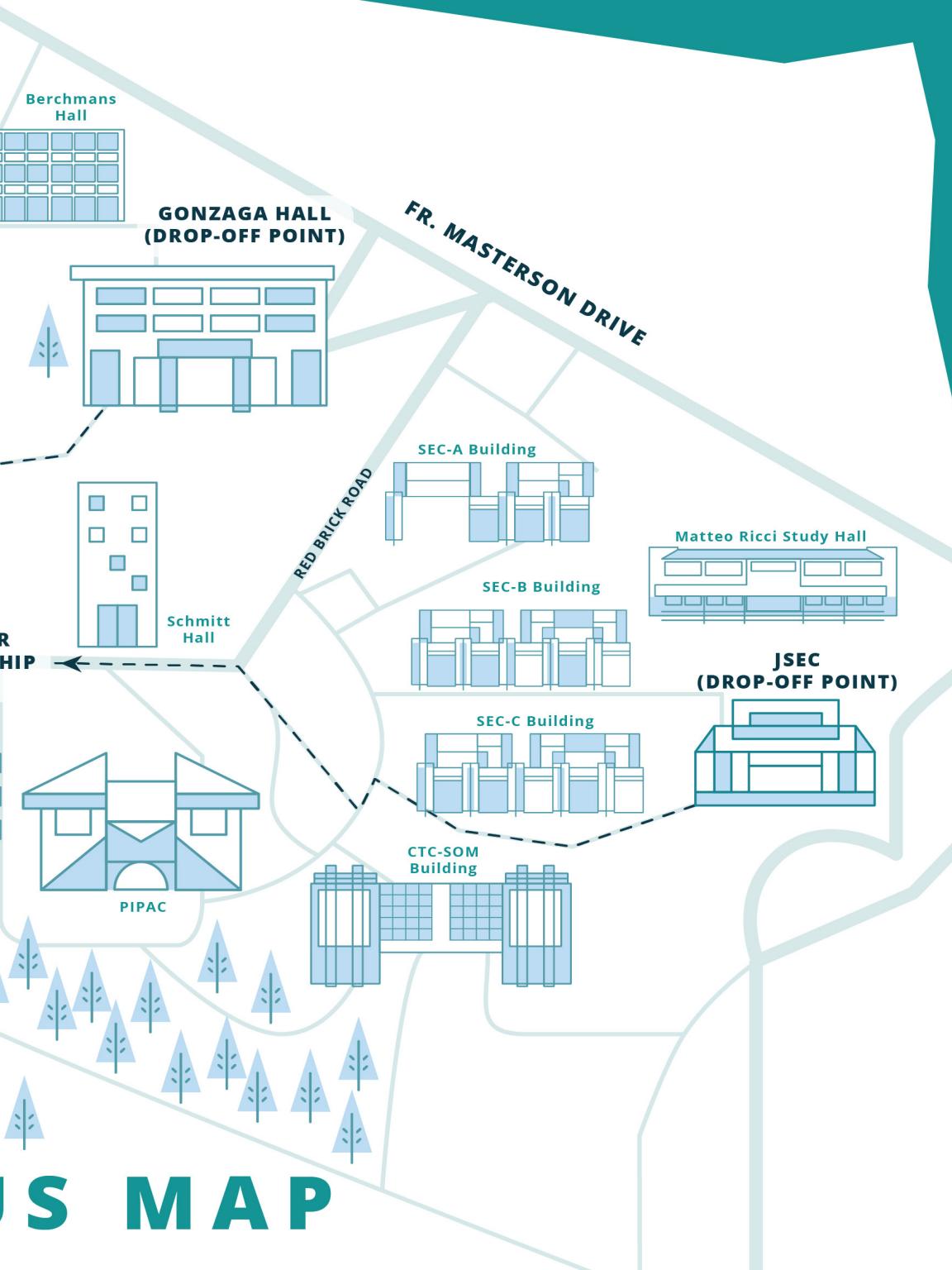
Faura Hall



NEW RIZAL LIBRARY

ATENEO
GATE 3

CAMPUS



KATIPUNAN

↑ TO UP
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B. GONZALES

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F. DELA ROSA

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ESTEBAN ABADA

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TO MARIKINA,
EASTWOOD VIA C-5

EXIT TO
NORTH
BOUND

ATENEO
GATE 3

EXIT
FROM
JSEC

ATENEO
GATE 2

LEGEND

-  Food/Drink
-  Grocery/Convenience Store
-  Bank/Others

1 - Sinangag Express

2 - Katsu Cafe

3 - Bo's Coffee

Regis Center:

4 - Bobby Box

5 - Quiznos

6 - Sebastian's Ice Cream

7 - Brown's Gourmet

8 - Buffalo's Wings N' Things

9 - CoCo Fresh Tea & Juice

10 - BonChon Chicken

11 - The Study

12 - Sweet Ecstasy

13 - Mom & Tina's Bakery

14 - Red Mango

15 - Hot Star Fried Chicken

16 - Wicked Waffle

17 - KFC

18 - Pancake House

19 - The Old Spaghetti House

20 - Gillian Gail Dessert Buffet

43 - Rustan's Supermarket

44 - 7-11

45 - 7-11

46 - Ministop

47 - Robinsons

48 - 7-11

21 - Zark's Burger

22 - Flaming Wings

23 - Fat Persian

24 - Cello's Doughnuts

25 - Cafe Sweet Inspiration

26 - Roku

27 - Yellow Cab

28 - Manang's Chicken

29 - Kenny Rogers Roasters

30 - Jollibee

31 - Army Navy

32 - Starbucks

33 - Shakey's

34 - Wok Dis Way

35 - Barkin' Blends

36 - Derf's

37 - Third Cup Cafe

38 - Eat!

39 - McDonalds

40 - Brickfire

41 - Chubby Chicken

42 - Starr's

49 - Banco De Oro (BDO) Katipunan

50 - Banco De Oro (BDO) Regis Center

51 - Fully Booked

52 - Bank of the Philippine Islands

(BPI)

53- National Bookstore

Location Maps

Campus - Microtel Acropolis

<https://goo.gl/maps/T3oUB8QgtuC2>

Campus - Microtel UP Ayala Technohub

<https://goo.gl/maps/7RbitJDYSut>

Campus - SEAMEO Innotech

<https://goo.gl/maps/TpRedCcnLxH2>

Campus to UP Town Center

<https://goo.gl/maps/irZfgRPD8dp>

Campus to Eastwood City

<https://goo.gl/maps/qnTWmpuBSMq>

Campus to SM Marikina

<https://goo.gl/maps/VpHno2nPf8B2>

Campus to Gateway Mall

<https://goo.gl/maps/NjuFBCejjW42>

Shuttle Schedule

ACM-ICPC Asia-Manila will provide shuttle services to transfer between partner hotels and the Ateneo de Manila campus. Participants who intend to make use of this service should inform the organizers via email at info.discs@ateneo.edu or text message (SMS) at +63 908 343 5761.

Shuttle service is available to participants staying at Microtel Acropolis, Microtel UP Technohub, SEAMEO Innotech International House, and UP University Hotel.

Day	From	To	Shuttle departs at
Wednesday, 14 December	Hotel	Ateneo de Manila	11:30 AM Hotel Lobby
Wednesday, 14 December	Ateneo de Manila	Hotel	6:30 PM Leong Hall Driveway
Thursday, 15 December	Hotel	Ateneo de Manila	7:30 AM Hotel Lobby
Thursday, 15 December	Ateneo de Manila	Hotel	8:00 PM Leong Hall Driveway
Friday, 16 December	Hotel	Ateneo de Manila	7:30 AM Hotel Lobby
Friday, 16 December	Ateneo de Manila	Hotel	5:30 PM Leong Hall Driveway

Important Contact Numbers



ACM-ICPC Asia-Manila Hotline

+63 908 343 5761

Emergency Numbers

When dialing from a local telephone in Metro Manila, dial the number directly. If using a mobile phone, local or international, use the format +63-2-###-####.

National Emergency Hotline

911

National Disaster and Risk Reduction and**Management Council (NDRRMC)**

911 5061 to 65

911 1406, 912 2665, 912 5668, 911 1837

Red Cross

143

527 0000, 527 8385 to 95

Department of Interior and Local Government (DILG)

+63 917 627 9627

Philippine National Police (PNP) Hotline

117

722 0650

+63 917 847 5757

Bureau of Fire Protection

426 0219, 426 3812, 426 0246

Metro Manila Development Authority (MMDA) Hotline

136

882-4150 to 77

Embassy and Consulate Numbers

Embassy of the Republic of Indonesia

892 5061 to 68
unitkom.manila@kemlu.go.od
<http://www.indonesianembassy.org.ph>

South Korea

Embassy of the Republic of Korea
856 9210
ph04@mofa.go.kr
http://embassy_Philippines.mofa.go.kr

Singapore

Embassy of the Republic of Singapore
856 9922, 856 9922
singemb_mnl@mfa.sg
<http://www.mfa.gov.sg/manila>

Taiwan

Taipei Economic and Cultural Office in the Philippines
887 6688
phl@mofa.gov.tw
<http://www.roc-taiwan.org/>

Vietnam

Embassy of the Socialist Republic of Vietnam
521 6843
vnembph@yahoo.com
<http://www.vietnamembassy-philippines.org>

People



Honorary Chairs

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Dr. Evangeline P. Bautista, SOSE Dean

Dr. Marlene M. De Leon, DISCS Chairperson

Directors

Prof. C.J Hwang, ACM-ICPC Asia Director

Dr. Rafael Saldaña, ACM-ICPC Asia Philippines

National Contest Director

Dr. Kardi Teknomo, ACM-ICPC Asia-Manila

Regional Contest Director

Judges

Dr. Allan Sioson, Ateneo de Naga University

(Chief of Judges)

Dr. Felix Muga, Ateneo de Manila University

Dr. Pablo Manalastas, University of the Philippines

Diliman

Dr. Philip Christian Zuniga, University of the Philippines

Diliman

Dr. Caslon Chua, Swinburne University Australia

Mr. Kevin Atienza, Kalibrr





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Ms. Lisa Agbay
Mr. Andrei Jaramillo
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Mr. Tristan Manalang
Mr. Ronald Panergo
Ms. Melinda Nicdao
Ms. Joannie Jaramilla

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Ms. Mikee Jazmines
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Ms. Alyssa Ty
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Ms. Ceara Agay
Mr. Japheth Samaco

Acknowledgements

Department of Science and Technology,

Republic of the Philippines

Commission on Higher Education,

Republic of the Philippines

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Dr. Maria Luz Vilches

Office of the Vice President for the Loyola Schools

Dr. Evangeline Bautista

Office of the Dean of the School of
Science and Engineering

Rizal Library

Department of Information Systems and
Computer Science

University Communication and Public Relations Office

Office of the Associate Dean for Student and
Administrative Services

Facilities Management Office

Campus Safety and Mobility Office

Computer Society of the Ateneo (CompSAT)

Dr. Alejandro K. Tan

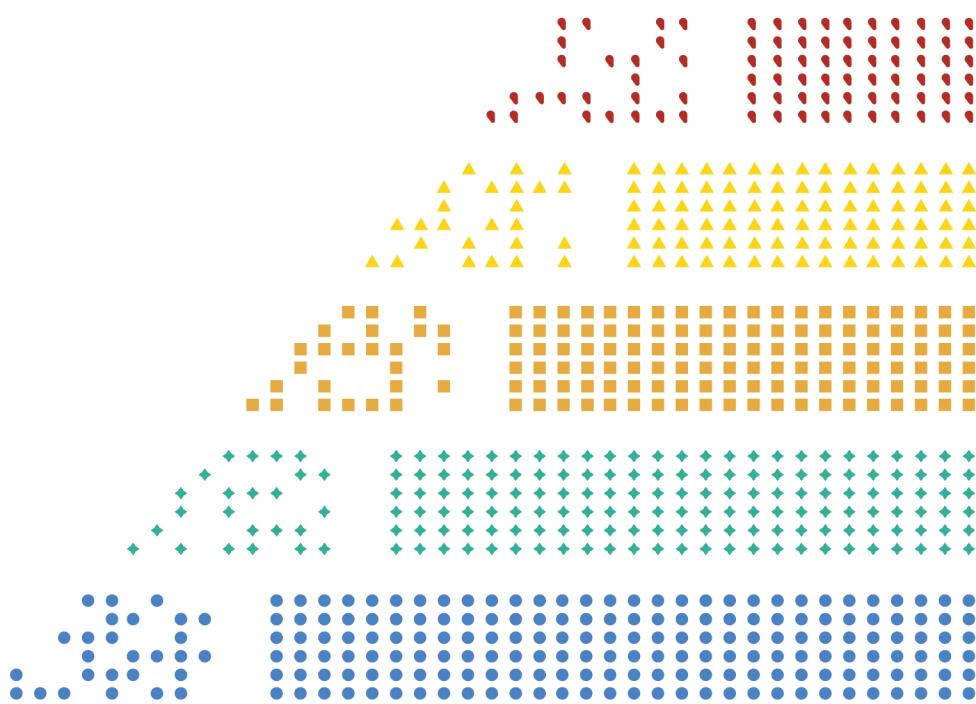
Mr. Christopher Castillo

Mr. Glen Charles Lopez

Mr. Paolo Antonio Gonzalez









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UNIVERSITY



acm International Collegiate
Programming Contest

IBM | event
sponsor



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