

**ROBOTEAM**

**INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA**

**2018/2019 SESSION**

**PROPOSAL FOR**

**ROBOCON Malaysia 2019**

**“Satu Langkah, Seribu Lonjakan”:**

**Perkongsian Ilmu**

**DATE:**

4th -7th APRIL 2019 / 28 REJAB 1440H -1 SYA’BAN 1440H

**VENUE:**

UNIVERSITI TENAGA NASIONAL (UNITEN), KAJANG

**ORGANIZER:**

MINISTRY OF HIGHER EDUCATION (MOHE) AND INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA (IIUM)

1. **INTRODUCTION**

*In the name of Allah The Most Compassionate, The Most Merciful. Praise be to Allah, Lord of the universe; praise and salam upon His Final Prophet, Muhammad (p.b.u h.).*

ABU Asia-Pacific Robot Contest Malaysia (ABU Robocon Malaysia) aims to create friendship among university students with similar interests and compete to represent Malaysia in the host country where Mongolia will be the host country for ABU ROBOCON 2019. The event is also broadcast in many countries as well. Each team will represent their university in advance engineering and broadcasting technologies in the region.

Each year competition has different topics, but two robots must be used to complete the tasks. To build the robots, contestants, who are restricted to only undergraduate students, push process rich knowledge in programming, mechanical design and electronic circuit design. For note, we have been participated the contest every year since the inception and the last was 2013. For ROBOCON Malaysia 2018, our ability to successfully win the second runner up in ROBOCON 2018 is our first benchmark in ABU ROBOCON Competition to maintain and keep winning in this prestigious competition.

For ROBOCON 2019, we will send one team which will be divided into three divisions which are Coding, Circuit and Mechanical. Our ultimate aim is to win this competition in order to bring IIUM’s reputation to the next level which is being one of the best universities in innovation, alongside with debate which IIUM already renowned for. With this competition, we want to be the benchmark for the start of innovation in IIUM. For ROBOCON 2018, our robots cost us almost RM20k. Therefore, for ROBOCON 2019 which needed us to build four-legged robot, this might cost us more budget than last year. So, we humbly request for more budget for this year. We already attached all the details and estimated budget in the estimated budget below. With enough preparation and enough budget, we firmly believe that building a high-end robot with top notch performance is achievable. The robot that we build will reflect our beloved university itself to show the novelty and innovation made by IIUM student with the aids by the university, in terms of financial, staffs’ expertise and facilities.

In this competition, the students will apply the knowledge that they have learnt in and outside of the class. Here in IIUM, we will build the robot using the facilities provided by the university such as the Mechatronic Lab, Workshop Technology Lab and in our own Robot Design Lab in E2, Kuliyyah of Engineering. Hence, Kulliyyah of Engineering will also play one of the most vital roles towards the success of IIUM ROBOCON Team in the prestigious tournament.

**2.0 BACKGROUND OF COMPETITION**

ABU Asia-Pacific Robot Contest (ABU Robocon) is an Asian Oceanian College robot competition, founded in 2002 by Asia-Pacific Broadcasting Union. ABU Robocon extended the concept from NHK Robocon which started in 1991 and restricted to teams from Japan only. Each year the competition has different topics, but generally speaking two or more robots must be used to complete the tasks. One of the robots would be manual control while the others are automatic. The best robots usually weight more than 10 kg and span in one square meter area. To build the robots, contestants, who are restricted to be undergraduate students, must possess rich knowledge in programming, mechanical design and electronic circuit design.

Each game is between two teams, often named red and blue. The playing field is symmetrical and robots from both teams start at the same condition (except for Robocon 2015 which employed a turn-based game based on badminton). A typical game (except for Robocon 2015) lasts for three minutes but can end sooner if one team achieve a K.O victory which immediately finishes the game. In case that no teams achieve the K.O condition, the team get higher score after three minutes will be declared winner.

Earlier editions of Robocon tend to emphasize the competitiveness of the game, in which winners achieve their win by employing strategic approaches to deploy their robots as well as preventing their opponent from reaching the goal. For example, this strategy was notable in Vietnam's win in Robocon 2004 and 2006, and China's win in Robocon 2008. To mitigate the problems, later editions reduce the combat nature and put more emphasis on technology, designing and making robot perform complicated maneuvers, which require teams to be more creative on designing robots. In the competition, robots compete to complete a task within a set period of time.

This year, ABU Robocon will be held in Ulaanbaatar, Mongolia. The contest theme is "GREAT URTUU: Sharing the knowledge”. The concept of the ABU Robocon 2019's Theme & Rules is based on deliver information fast by using a relay messenger system called “the Urtuu”. Duration of each game is 3 minutes.

Each team will have two robots which consisting one automatic robot and one manual robot. The manual robot carries the Gerege as a testimony from the Khangaiurtuu, which is the starting point. It goes along Forest, Bridge, and crosses the Line 1 next to Gobi urtuu, which is the starting point of the automatic robot. After manual robot reaches Gobi urtuu, it passes Gerege to automatic robot. Once automatic robot successfully receives Gerege, it can go along the Gobi area. Automatic robot must go by four legs, like a horse, and cannot use wheels to move. Automatic robot passes through Sand dune and Tussock and directs to Mountain urtuu. After automatic robot reaches Mountain urtuu, manual robot can enter Throwing zone to throw Shagai, and must earn 50 or more points. In case that manual robot earns 50 or more points, automatic robot is allowed to climb the Mountain. Afterwards, if it reaches Uukhai zone and raises the Gerege first, the team is the winner, which is called “UUKHAI”.

1. **OBJECTIVES** 
   1. To represent the university and promote the engineering programs offered in the faculty of engineering.
   2. To expose students the development process of robotics systems that requires multi discipline subjects from mechanical, electronics and programming.
   3. To develop teamwork, leadership, communication skills.
   4. To provide platform for IIUM engineering students to display their side skill.
   5. To develop students’ hand-on skills on building a robot system.
   6. To guide students towards realizing achieving the vision and mission of IIUM.
   7. To create networking among the student of participate university.
   8. To encourage critical and creative thinking for IIUM engineering student.

**4.0 NAME OF THE PROGRAMME**

ROBOCON Malaysia 2020

**5.0 DATE**

4th -7th APRIL 2020

**6.0 VENUE**

Universiti Tenaga Nasional (UNITEN), Kajang, Selangor

**7.0 ORGANIZER**

Ministry of Higher Education (MoHE) and International Islamic University Malaysia (IIUM)

**8.0 TEAM MEMBERS**

Kindly refer to Appendix A

**9.0 PROPOSED TENTATIVE**

Kindly refer to Appendix B

**10.0 TIMELINE OF WORKFLOW**

Kindly refer to Appendix C

**11.0 ORGANIZING COMMITTEE**

Kindly refer to Appendix D

**12.0 ESTIMATED BUDGET**

Kindly refer to Appendix E

**13.0 LEARNING OUTCOMES & PROGRAMME OUTCOMES**

Kindly refer to Appendix F

**14.0 GAMEPLAN**

Refer to Robocon Malaysia 2020 Rulebook.

**15.0 CONCLUSION**

Our aim is to be the winner of ROBOCON Malaysia 2020 and thus be the representatives of Malaysia to the international level which is in Mongolia. Hopefully, it will enhance our knowledge on technology where we will apply what we have learnt in university in this industrial level competition. We appreciate all the cooperation and support given by IIUM, who trust us to be the benchmark on the starting of innovation technology in IIUM and those who contribute to the success of this program and bless this project. We are truly thankful to the university authorities in making this event a reality. May Allah S.W.T. bestow His blessings. InshaAllah.

Prepared by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

(**NUR YANA QAISARA BINTI YAHAYA**)

Secretary,

IIUM ROBOCON TEAM 2019.

Checked by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

(**ABDUL WAFI BIN ISMAIL**)

Program Manager,

IIUM ROBOCON TEAM 2019.

Verified by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

**(ASSISTANT PROFESSOR DR. ABD HALIM BIN EMBONG)**

Advisor,

IIUM ROBOCON TEAM 2019,

International Islamic University Malaysia

Recommended by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

**(ASSOC. PROF. DR. HASMAH MANSOR)**

Deputy Dean (Student Affairs and Alumni),

Kulliyyah of Engineering,

International Islamic University Malaysia

Approved by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

**(PROF. DR. AHMAD FARIS BIN ISMAIL)**

Dean,

Kulliyyah of Engineering,

International Islamic University Malaysia

Approved by,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_\_/2019

**(ASSOC. PROF. DR. ZULKIFLI BIN HASAN)**

Deputy Rector of Student Affairs,

International Islamic University Malaysia

***Appendix A***

|  |
| --- |
| **TEAM MEMBERS** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **NAME** | **MATRIC NO** | **MAHALLAH** | **NRIC** |
|  | Abdul Wafi Bin Ismail (LEADER) | 1524755 | LOC | 960903-10-6091 |
|  | Nur Yana Qaisara Binti Yahaya | 1717832 | Aminah | 971004-26-5084 |
|  | Nur Syamimi Binti Mokthar | 1624164 | Maryam | 971124-09-5024 |
|  | Nurulsaidatul Nadiha Binti Shamsuddin | 1627478 | Ruqayyah | 970919-10-6968 |
|  | Muhammad Hamdi Bin Badrulhisham | 1623219 | Ali | 971024-05-5535 |
|  | Mohamad Asyraaf Bin Azhar | 1525321 | Ali | 961202-02-5701 |
|  | Muhammad Luqmanul Hakim Bin Zulkifli | 1717071 | Ali | 980328-01-6433 |
|  | Muhammad Amir Bin Abdul Kadir | 1626699 | Zubair | 960811-01-6507 |
|  | Muhammad Amirul Basit Bin Norzaki | 1629011 | Ali | 970520-06-5025 |
|  | Muhammad Hanif Bin Razali | 1718481 | Ali | 980301-02-5495 |
|  | Mu'adz MohdRosli | 1525179 | Ali | 900305-14-6195 |
|  | Muhammad Syahmi Bin Zulkefli | 1719551 | Ali | 980915-07-6051 |
|  | Adli Musthaqeem Bin Abidin | 1715311 | Ali | 980918-12-6333 |
|  | Ahmad Solihin Bin Ishak | 1520307 | Ali | 960414-10-5805 |
|  | Ahmad Alif Nazmi Bin Mohd Rosdi | 1712233 | Ali | 970220-05-5377 |
|  | SyahmiAiman Bin Yussri | 1611695 | Siddiq | 961227-04-5039 |
|  | Irfan Rahim Zabidi | 1529569 | Ali | 951213-03-6255 |
|  | Sulbalqiyah Idris | 1526588 | Asma | 960530-11-5314 |
|  | MohdAliff Bin Mohd Abd Musthalib | 1425057 | Ali | 950821-02-5897 |
|  | Ahmad Syarifuddin Bin Ahmad Fakhri | 1513993 | Ali | 960417-10-6117 |
|  | Ahmad Khilfi Bin Zaini | 1723303 | Ali | 980815-43-5117 |
|  | Nurnatasyah Azira Binti Shahru Hasimin | 1717122 | Asiah | 970117-10-6384 |
|  | Muhammad Ilman Bin Muhammad Amin | 1818227 | Ali | 990911-14-6891 |
|  | Wan Zalikha Bt Wan Zaidi | 1625280 | Maryam | 970524-03-5974 |
|  | FathulNaim Bin Fadhlullah | 1629551 | Zubair | 970207-11-5081 |
|  | Nik Izzati Binti Nik Mustaffa Kamal | 1629806 | Maryam | 970719-07-5810 |
|  | Muhammad Amiruddin Bin Bustaman | 1711905 | Ali | 980907-13-5623 |
|  | Nurasikin Binti Abdulrazak | 1628152 | Halimah | 970820-04-5202 |
|  | Siti Nurul Huda Bt Abd Rahim | 1715404 | Asiah | 980805-56-5284 |
|  | Nur FirzanahIwani Binti Ibrahim | 1716682 | Asiah | 981016-10-6194 |
|  | MohdAmierol Bin Mohd Zaid | 1629881 | Ali | 971102-05-5267 |
|  | Hanna Farihin Bt Mohd Fadglullah | 1626374 | Aminah | 970312-14-5530 |
|  | Yasmin Binti Yajid | 1714422 | Asiah | 980820-02-5286 |
|  | Muhammad Hanif Farhan Bin Rozi | 1628807 | Ali | 970804-07-5479 |
|  | Raimi Bin Ridzuan | 1814103 | Ali | 990109-07-5635 |
|  | Ameer Syamil Bin Mohd Sahabudin | 1816347 | Ali | 991005-01-5237 |
|  | Muhammad Irfan Bin Mohamad Salini | 1814705 | Ali | 990912-14-5073 |
|  | Muhammad Aidil Fahmiey Bin Osman | 1819369 | Siddiq | 991004-09-5159 |
|  | Mohamad Ariff Izdhar Bin Subri | 1819319 | Ali | 991217-02-5293 |
|  | Haziman Bin Sairin | 1815401 | Ali | 991206-10-5167 |
|  | Muhammad Syakirul Aiman Bin Abdul Rahman | 1815531 | Zubair | 990131-05-5999 |
|  | Siti Hajar Binti Jayady | 1716802 | Asiah | 981230-12-6452 |
|  | Muhammad Syukri Bin Mohd Talib | 1813723 | Ali | 990806-01-5355 |
|  | Muhammad Danial Bin Mohd Rosli | G1732641 | LOC | 941001-14-6015 |

***Appendix B***

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| **PROPOSED TENTATIVE** |

**Day 1 (4th April 2019)**

9.00 am : Test Run

1.00 pm : Lunch Break

3.00pm : Test Run

**Day 2 (5thApril 2019)**

8.00 am : Registration

9.00 am : Grouping Round (Robin Round)

1.00 pm : Lunch Break

4.00 pm : Grouping Round (Robin Round)

**Day 3 (6thApril 2019)**

8.00 am : Registration

9.00 am : Grouping Round (Robin Round)

1.00 pm : Lunch Break

4.00 pm : Grouping Round (Robin Round)

**Day 4 (7th April 2019)**

9.00 am : Quarter Final

11.00 am : Semi-Final

1.00 pm : Lunch Break

2.00 pm : Final

3.00 pm : Closing Ceremony

***ORGANIZING COMMITTEE***

Advisor : Assistant Professor Dr. Ahmad Imran bin Ibrahim

Program Manager : Muhammad Luqmanul Hakim bin Zulkifli (1717071)

Asst. Program Manager : Muhammad Syahmi Bin Zulkefli (1719551)

Program Coordinator 1 : Muhammad Hanif Bin Razali (1718481)

Program Coordinator 2 : Adli Musthaqeem Bin Abidin (1715311)

Secretary : Siti Nurul Huda Bt Abd Rahim (1715404)

Secretary 2 : Yasmin Binti Yajid  (1714422)

Financial Controller 1 : Huda binti Abu Na’aim (1713324)

Financial Controller 2 : Nik Izzati Binti Nik Mustaffa Kamal (1629806)

Sponsor : Nur Hanisah binti Azmi  (1628124)

: Nur Mirrah Husnaa binti Mohd Mokhtar (1623018)

: Nur Firzanah Iwani Binti Ibrahim (1716682)

General Task : Muhammad Syukri Bin Mohd Talib (1813723)

: Muhammad Hafiz Bin Samsuri  (1815713)

: Muhammad Iqbal Bin Mohd Ghazali (1815805)

: Muhammad Fariz bin Mohamad Yazid (1812263)

: Muhammad Aidil Fahmiey Bin Osman (1819369)

***Appendix D***

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| **TIMELINE OF WORKFLOW** |

**WORKFLOW**

1. **Mechanical**

|  |  |  |
| --- | --- | --- |
| **TASK NAME** | **START** | **END** |
| Base Manual SW | 10/11/2018 | 8/12/2018 |
| Throwing mechanism SW (manual) | 1/12/2018 | 21/1/2019 |
| Gripping mechanism SW (manual) | 7/12/2018 | 31/1/2019 |
| Base Auto SW | 10/11/2018 | 8/12/2018 |
| Walking mechanism SW (auto) | 17/11/2018 | 19/12/2018 |
| Gripping mechanism SW (auto) | 1/12/2018 | 21/1/2019 |
| Fabricate Base (manual) | 10/11/2018 | 19/12/2018 |
| Fabricate Legs (auto) | 17/12/2018 | 17/1/2018 |
| Fabricate Base (auto) | 26/12/2018 | 14/1/2019 |
| Fabricate throwing mechanism (manual) | 2/1/2019 | 28/1/2019 |
| Fabricate gripping mechanism (manual) | 9/1/2019 | 4/2/2019 |
| Fabricate gripping mechanism (auto) | 9/1/2019 | 4/2/2019 |

1. **Circuit**

|  |  |  |
| --- | --- | --- |
| **TASK NAME** | **START** | **END** |
| Test and collect details/specs of components | 1/12/2018 | 21/1/2019 |
| Schematic diagram manual (EAGLE) | 17/12/2018 | 17/1/2018 |
| Schematic diagram auto (EAGLE) | 17/12/2018 | 17/1/2018 |
| Fabricate circuit (manual) | 9/1/2019 | 4/2/2019 |
| Fabricate circuit (auto) | 9/1/2019 | 4/2/2019 |

1. **Coding**

|  |  |  |
| --- | --- | --- |
| **TASK NAME** | **START** | **END** |
| Flowchart (manual) | 2/2/2019 | 8/2/2019 |
| Flowchart (auto) | 2/2/2019 | 8/2/2019 |
| Manual Robot maneuver testing | 10/12/2018 | 18/12/2019 |
| Automatic Robot leg maneuver testing | 9/1/2019 | 20/1/2019 |
| Manual Robot movement through Khagai Area code | 2/1/2019 | 4/2/2019 |
| Automatic Robot movement through Gobi Area code | 14/2/2019 | 24/2/2019 |
| Automatic Robot movement through Mountain Area code | 5/2/2019 | 24/3/2019 |

***Appendix E***

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| **ESTIMATED BUDGET** |

**UNIT: MECHANICAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **ITEM** | **QUANTITY** | **UNIT PRICE (RM)** | **AMOUNT (RM)** |
| 1 | 152mm Omni Wheel | 4 | 310 | 1240 |
| 2 | Power Window (R) | 3 | 90 | 270 |
| 3 | Power Window (L) | 3 | 90 | 270 |
| 4 | 24V Planetary Gear Motor | 4 | 230 | 920 |
| 5 | Planetary + Encoder IG42E-49K (12V 120RPM) | 5 | 260 | 1300 |
| 6 | Steel Plate | 2000\*2000\*2 mm | 100 | 100 |
| 7 | Hollow Steel bar (0.5in) | 0.5in\*0.5in\*6000mm  x 5 | 10 | 50 |
| 8 | Hollow Steel bar (3/4 in) | 0.75in\*0.75\*6000mm x 5 | 15 | 75 |
| 9 | CO2 welding gas | 2 | 60 | 120 |
| 10 | Welding wire spool 5kg | 1 | 120 | 120 |
| 11 | Paint | 3 | 66 | 198 |
| 12 | 6x19x5 mm groove ball bearing | 20 | 2.5 | 50 |
| 13 | 6x13x5 mm groove ball bearing | 50 | 2.5 | 125 |
| 14 | 5-inchCytron robot wheel | 8 | 50 | 400 |
| 15 | Linear bearing/guides | 4 | 400 | 1600 |
| 16 | eSun 1 kg ABS Filament 1.75mm | 4 | 200 | 800 |
| 17 | Laser cutting service | Approx. |  | 2000 |
| 18 | 12V 5/2 Way Pneumatic Valve | 4 | 120 | 480 |
| 19 | Pneumatic Cylinder 25mm 200mm | 4 | 150 | 600 |
| 20 | Pneumatic fittings (valves, hose converter) | Approx. |  | 200 |
| **TOTAL EXPENSES (RM)** | | | | **10918** |

**UNIT: ELECTRICAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **ITEM** | **QUANTITY** | **UNIT PRICE (RM)** | **AMOUNT (RM)** |
| 1 | 5800mAh 3C battery | 12 | 160 | 1920 |
| 2 | MD13S motor driver | 13 | 40 | 520 |
| 3 | ARM cortex M0 | 1 | 70 | 70 |
| 4 | Limit switch | 15 | 40 | 600 |
| 5 | Electronic components (resistors, diodes, capacitors, donut boards, buttons, fuses and switches) | Approx. | Approx. | 240 |
| 6 | External rotary encoder | 4 | 80 | 320 |
| 7 | DC-DC buck converter | 2 | 40 | 80 |
| 8 | Wires (18 AWG + single/multicore) | Approx. | Approx. | 300 |
| 9 | Wire connector/housing (female pin header + male pin header + battery socket + wire sockets) | Approx. | Approx. | 300 |
| 10 | 8 channel Darlington drivers (ULN28003/ULN2803/ULN2803A) | 4 | 10 | 40 |
| 11 | Battery 7.4v 2C | 4 | 60 | 240 |
| 12 | Battery voltage level checker | 2 | 8 | 16 |
| 13 | Battery charger | 1 | 120 | 120 |
| 14 | Heat shrink | 10 | 7 | 70 |
| 15 | Voltage level indicator | 8 | 10 | 80 |
| 16 | Raspberry Pi 3 | 2 | 170 | 340 |
| 17 | Arduino MEGA | 2 | 180 | 360 |
| **TOTAL EXPENSES (RM)** | | | | **5616** |

**UNIT: ARENA**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **ITEM** | **QUANTITY** | **UNIT PRICE (RM)** | **AMOUNT (RM)** |
| 1 | Extended high-density polystyrene | 2 | 100 | 200 |
| 2 | 3.0mm HSS Drill Bit | 2 | 2.50 | 5 |
| 3 | 4.0mm HSS Drill Bit | 2 | 3.50 | 7 |
| 4 | 5.0mm HSS Drill Bit | 2 | 5.80 | 11.60 |
| 5 | BOSCH 4” cutting disc | 5 | 4.80 | 24 |
| 6 | BOSCH T118a Jigsaw Blade for metal | 2 | 7.80 | 15.60 |
| 7 | Duravoc Adhesive (white glue) | 1 | 12.80 | 12.80 |
| 8 | Badak 4” Flap Disc AP120 | 5 | 8.80 | 44 |
| 9 | Wood File | 1 | 30 | 30 |
| 10 | 5L Wood Paint (Red,Green,Gray) | 3 | 130 | 390 |
| 11 | 60mm hollow steel tube | 6m | - | 100 |
| 12 | 2mm steel plate | 1x1m | 100 | 100 |
| 13 | Nylon rope | 10m | 60 | 60 |
| **TOTAL EXPENSES (RM)** | | | | **1000** |

**MISCELLANEOUS**

|  |  |  |
| --- | --- | --- |
| **NO** | **UNIT** | **PRICE (RM)** |
|  | PRINT, PHOTOSTAT, FUEL, TOUCH N GO, ETC | 1000 |
|  | REGISTRATION | 500 |
| **TOTAL EXPENSES (RM)** | | **1500** |

**DURING COMPETITION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **ITEM** | **QUANTITY** | **UNIT PRICE (RM)** | **AMOUNT (RM)** |
| 1 | Breakfast | 43 x 4 days | 5 | 860 |
| 2 | Lunch | 43 x 4 days | 10 | 1720 |
| 3 | Mineral Water | 5 | 17 | 85 |
| 4 | Transport | - | - | - |
| **TOTAL EXPENSES (RM)** | | | | **2665** |

**EXPECTED INCOME**

|  |  |  |
| --- | --- | --- |
| **NO.** | **SOURCES** | **TOTAL (RM)** |
| 1 | Student Affair Development and Division (STADD) | 20,000.00 |
| 2 | Sponsorship | 5000.00 |
|  | **TOTAL (RM)** | **25,000.00** |

***Appendix F***

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| **LEARNING OUTCOMES & PROGRAMME OUTCOMES** |

|  |
| --- |
| IIUM-Full-Logo-Colour2  **KULLIYYAH OF ENGINEERING** |

|  |  |
| --- | --- |
| Programme Level | Kulliyyah of Engineering |
| Name of Programme | Robot Contest Malaysia (ROBOCON Malaysia) 2019 “Satu Langkah, SeribuLonjakan”: PerkongsianIlmu |
| **Programme Type** | Competition |
| **Programme Synopsis** | This is a national competition organized every year to find Malaysia’s representative to the international level. The team must build two robots which are manual robot and automatic robot. The benefits of this program are to make students involved in robotic skills and to make IIUM be a renowned university in innovation. |
| **Rationale for conducting the programme** | * To apply engineering knowledge in robot design, circuit and programming * To represent Malaysia in ABU ROBOCON 2019 in Mongolia and to bring IIUM to the next level for innovation. |
| **Transferable Skills** | |  |  | | --- | --- | | Skill | How they are developed? | | Leadership | By managing this competition in the management team, the students can develop this leadership skill. | | Communication | students can develop communication skills with each other and learn to pitch in the management team. | | Teamwork | By doing work together every working hour, the teamwork become stronger day by day. | | Innovative | Developed by applying all the things we have learnt in the class such as mechanical, circuit and programming in building robots. | | Creativity | Developed by applying all the ideas from each member and combining all the ideas in making robots. | |
| **Learning Outcomes of the activity/programme** | Upon completion of this competition, students should be able to:   1. Have real experience and manage to implement multi discipline subjects including mechanical, electronics, and programming to the real-life application. 2. Enhance their leadership and communication skill. 3. Realize and achieving the soul of vision and mission of IIUM. 4. Manage to broaden the network among the participant from variety of university in Malaysia. |
| **Mapping of course / module to the Programme Learning Outcomes** | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Programme outcomes | | | | | | | | | | | | | | | | |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 8 | | 9 | | 10 | | 11 | 12 |
| 1. Students are able to apply their process of robotics systems that requires multi discipline subjects from mechanical, electronics and programming. | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | |  |
| 1. Perform a good teamwork, leadership and communication skills. |  | ✓ |  |  | ✓ |  | ✓ | ✓ | | ✓ | | ✓ | | ✓ | |  |
| 1. Try to realize and achieving the vision and mission of IIUM. | ✓ | ✓ | ✓ |  |  |  | ✓ | ✓ | | ✓ | | ✓ | |  | | ✓ |
| 1. Create networking among students of participate university. |  |  |  |  |  |  | ✓ |  | |  | |  | |  | |  |

**Kulliyyah Programme Outcomes and the relation between KOE PO with outcomes from EAC, MQF domain, MOHE domain and Soft Skills. At the end of the programme, students are able to:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KOE PO** | **EAC** | **MQF Domain** | **MOHE Domain** | **Soft Skills** |
| **1. Engineering Knowledge (T)** - Apply knowledge of mathematics, sciences, engineering fundamentals and **specialization to solve complex materials engineering problems**. | 1 | 1 & 6 | 1 | - |
| **2. Problem Analysis (T)** – Identify, formulate, perform relevant literature review and **analyze complex materials engineering problems**, and reaching substantiated conclusions using **first principles of mathematics, natural sciences and engineering sciences**. | 2 | 1 & 6 | 1 | 1 |
| **3. Design/Development of Solutions (A)** – Design solutions whilst **exhibiting innovativeness**, for complex materials engineering problems and design systems, components or processes that meet specified needs; **with appropriate consideration of cost, sustainability issues, environmental impact, public health and safety, engineering ethics as well as cultural and social needs**. | 3 | 2, 3 & 6 | 2 | 1 |
| **4. Investigation (D) - C**onduct investigation on complex materials engineering problems whilst **displaying creativity**, by using research-based knowledge and method, including design of experiments, **analysis and interpretation of data**, and synthesis of information to provide valid conclusions. | 4 | 2 & 6 | 2, 3 | 1 |
| **5. Modern Tool Usage (A & D) -** Create and apply appropriate techniques, resources and **modern engineering/IT tools**, which includes making prediction and modelling of the complex materials engineering activities with understanding of limitations. | 5 | 6 & 7 | 7 |  |
| **6. The Engineer and Society (ESSE)** - Apply reasoning based on contextual knowledge to **assess societal, health, safety, legal, cultural, contemporary issues**, and the consequent responsibilities relevant to professional engineering practices. | 6 | 3 & 4 | 5 | 4 |
| **7. Environment and Sustainability (ESSE)** - Understand the impact of professional engineering solutions in **societal, global, and environmental contexts** and demonstrate knowledge of and need for sustainable development. | 7 | 3 & 4 | 5 | 4 |
| **8. Ethics (ESSE)** –Apply professional ethics with **Islamic values** and commit to responsibilities and norms of professional engineering code of practices. | 8 | 3 & 4 | 6 | 4 |
| **9. Communication (S)** - **Communicate effectively within the engineering** community and with the society at large, which include but not limited to writing effective reports and documentation, **delivering effective presentation** as well as giving and receiving clear instructions. | 9 | 5 & 7 | 4, 7 | 2 |
| **10. Individual and Team Work (S) -** Able to function effectively both as an individual or member of a team, or a **leader in a diversified multi-disciplinary** team setting. | 10 | 5 & 8 | 5, 8 | 3 |
| **11. Life Long Learning (S) -**Recognize the need for and have the preparation and ability to engage in independent and **life-long learning** in the broadest context of technological change. | 11 | 7 | 7 | 5 |
| **12. Project Management and Finance (S) -** Demonstrate and apply engineering management and financial principles into one’s work which include being **an effective member/leader in projects** with multidisciplinary settings and identify opportunities of **entrepreneurship**. | 12 | 8 | 5, 8, 9 | 6, 7 |

**LEARNING OUTCOMES OF OTHER DOMAINS**

|  |  |  |
| --- | --- | --- |
| **MQF learning outcomes domains:** | **MOHE Domain Learning Outcomes** | |
| 1. knowledge 2. practical skills 3. social skills and responsibilities 4. values, attitudes and professionalism 5. communication, leadership and team skills, 6. problems solving and scientific skills 7. information management and lifelong learning skills; and 8. managerial and entrepreneurial skills | **MOHE learning outcomes domains:**   1. Knowledge in Specific Area-Content 2. Practical Skills 3. Critical Thinking and Scientific Skills 4. Communication Skills 5. Social Skills, Teamwork and Responsibilities 6. Values, Ethics, Moral and Professionalism 7. Information Management and Life Long Learning 8. Management and Entrepreneurship 9. Leadership Skills | **Soft Skills Learning Outcomes:**   1. Critical Thinking and Problem-solving Skills 2. Communication Skills 3. Teamwork Skills 4. Ethics & Moral Professionalism 5. Life-long Learning and Information Management 6. Entrepreneurial Skills 7. Leadership Skills |