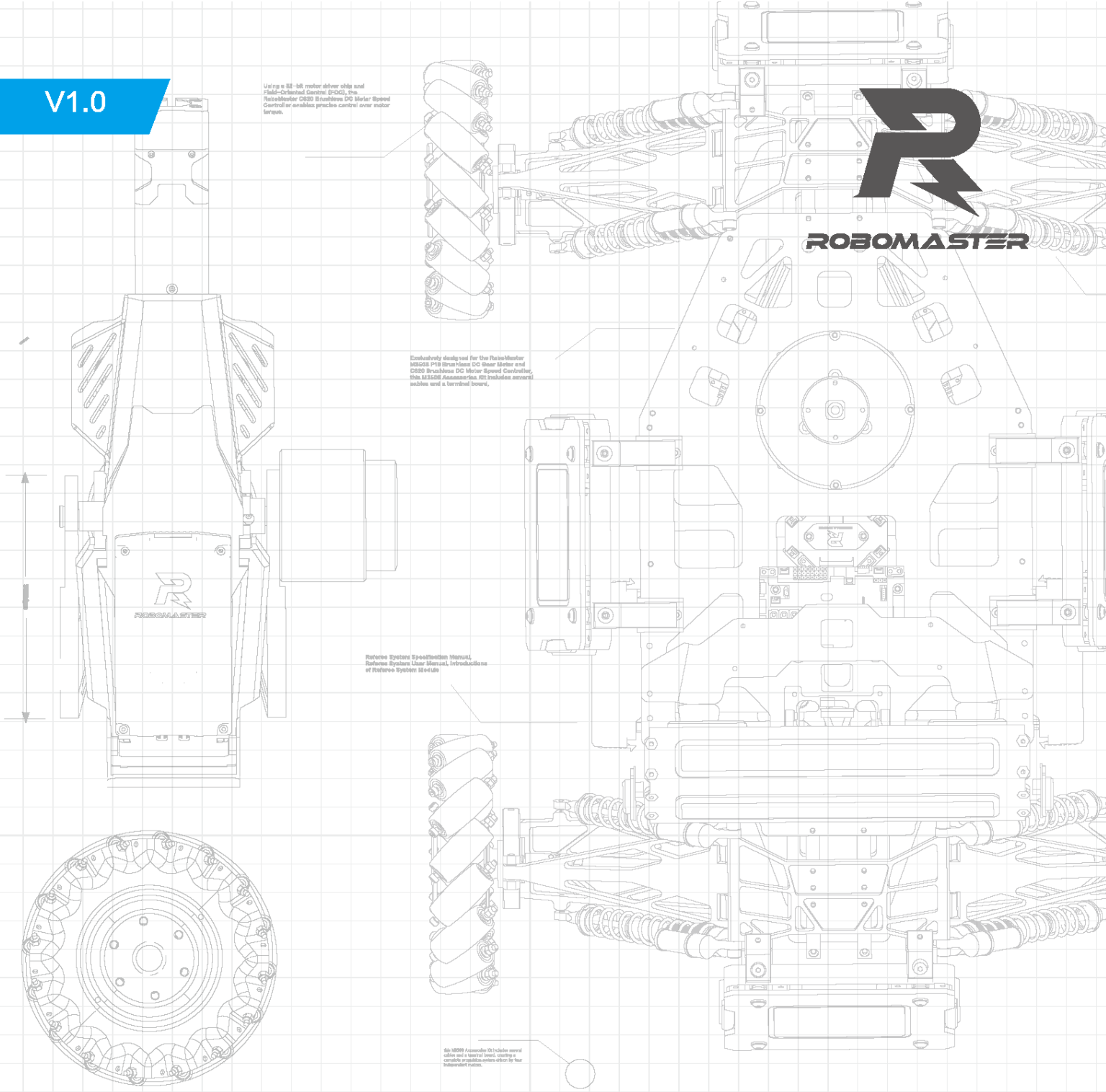
V1.0



ROBOMASTER 2021

UNIVERSITY CHAMPIONSHIP (INTERNATIONAL DIVISION)
ONLINE ASSESSMENT

PARTICIPANT MANUAL

Prepared by the RoboMaster Organizing Committee
Released on February 2021

Statement

Participants are forbidden from engaging or participating in any actions determined by the RoboMaster Organizing Committee (hereinafter referred to as "the RMOC") as involving public disputes or sensitive issues or causing offence to the public or certain social groups, or damaging the image of RoboMaster; otherwise, RMOC shall have the right to disqualify offending persons permanently from the competition.

Using this Manual

Legend

Prohibitions	Important notes	Hints and tips	Definitions and references

Release Notes

Date	Version	Changes
2021.06.18	V1.1	1. Updated the online assessment schedule 2. Updated the format of online defense 3. Added the grades of public sharing
2021.02.08	V1.0	First release

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1. Introduction

The RoboMaster Competition is initiated by DJI, serving as an academic exchange platform specially designed for technology enthusiasts from all over the world. Since its establishment in 2013, the RoboMaster has been committed to their mission – "honor the youths, empower ideas, serve young engineers across borders, and make their dreams come true". The RoboMaster is also dedicated to tapping the potential of young talents with engineering background while widely passing on the beauty of science & technology as well as innovation to the public.

The RoboMaster University Championship (RMUC) is sponsored by the Central Committee of the Communist Youth League of China and open to university/college students from all over the world. The RMUC focuses on evaluating the participants' abilities to apply scientific and technical knowledge in an integrated and practical context. It combines robotics-related areas such as Machine Vision, Embedded System Design, Mechanical Control, Inertial Navigation and Human-Computer Interaction, while integrating e-sports and robotics competition in an innovative manner. The robotic battles are growing to become more intuitive and engaging, drawing attention from both technology enthusiasts and the public.

Online assessment has been introduced for RMUC 2021 to replace the offline International Regional Competition due to the COVID-19 pandemic. Team from Hong Kong, Macau, Taiwan and Overseas that are unable to participate in the offline RMUC may participate in the online assessment as required by their circumstances. The RMOC will set prizes for each team on aspects such as robotics technical design and implementation, and team management and building.

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2. Participants and Requirements

2.1 Participants

For details on participants' roles and responsibilities, please refer to the "RMUC 2021 Participant Manual".

The team members entitled to the honorary certificates are subject to the member list submitted to the registration system and confirmed by the teams during the confirmation of member list period.

The team's Captain, Vice Captain (if any) and project manager must participate in online defense and the public sharing. There is no limit on the total number of participants. Teams are advised to include key team members for every robot type and specialization in the online assessment.

2.2 Participating Teams

Table 2-1 Categories of participating teams

Team Category	Remarks
Teams from Hong Kong, Macau, Taiwan and overseas	Team from Hong Kong, Macau, Taiwan and Overseas that have successfully applied for the RMUC 2021, but cannot participate in the Final Robot Assessment。

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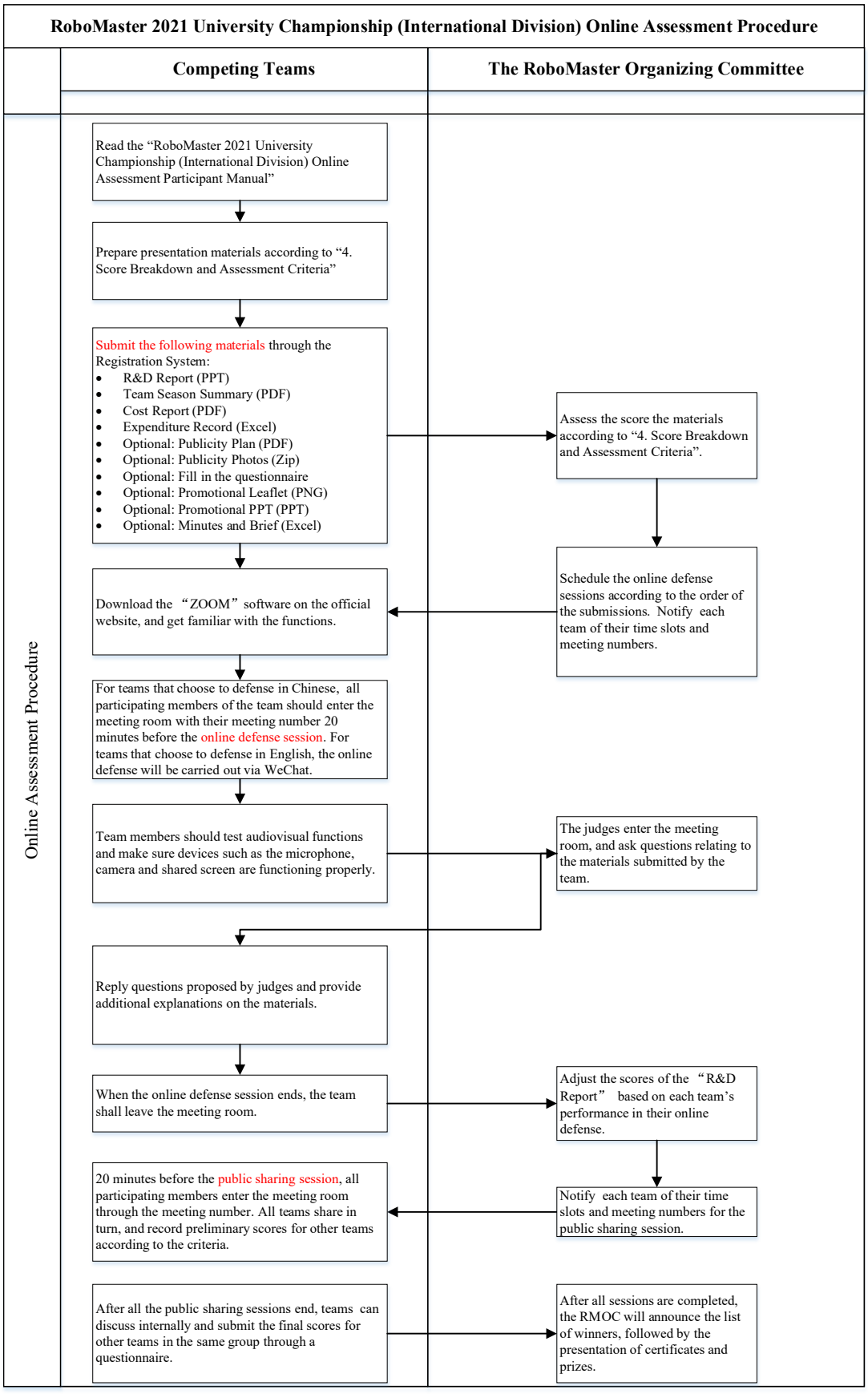
2.3 Participating Procedures



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3. Online Assessment Schedule

The actual schedule may be adjusted. Please refer to the latest announcement.

Table 3-1 Online assessment schedule

Schedule (Beijing time)	Item	Remarks
June 22, 2021 - June 24, 2021	Confirm team information and member list	Log into the registration system and confirm the team information and member list on the "RoboMaster 2021 University Championship" page.
12:00 p.m., June 25, 2021 - 12:00 p.m., June 28, 2021	Submit relevant materials	Log into the registration system and confirm the team information and member list on the RoboMaster 2021 University Championship page. For the publicity section, teams need to fill in the questionnaire as required to report their publicity and resource development results. See "4 Score Breakdown and Assessment Criteria"
June 29, 2021	Online defense	The actual defense time allocated for each team shall be as announced individually by the RMOC. If the participating teams choose to defense in Chinese, ZOOM video conference will be adopted. If the participating teams choose to defense in English, it will be carried out via WeChat.
June 30, 2021	Public sharing	The actual defense time allocated for each team shall be as announced individually by the RMOC.
After July 5, 2021	Announce the assessment results	The assessment results will be announced on the registration system and the RoboMaster official website.

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4. Score Breakdown and Assessment Criteria

Table 4-1 Delivery formats and assessment criteria for each online assessment section

Section	Category	Delivery format	Assessment criteria	Score
R&D Report	Compulsory	PPT	Refer to "4.1Assessment Criteria for R&D Report"	60
Team Season Summary	Compulsory	Summary Document: PDF Cost Report: PDF Expenditure Record: Excel	Refer to "4.2Assessment Criteria for Team Season Summary"	25
Publicity Report	Optional	Publicity summary and resource development: Questionnaire Activity Planning: PDF Activity Photos: Zip	Refer to "4.3Assessment Criteria for Publicity Report"	5
Sponsorship Report	Optional	Promotional Leaflet: PNG Promotional PPT: PPT Minutes and Brief: Excel	Refer to "4.4Assessment Criteria for Sponsorship Report"	5
Online defense	Compulsory	Defense	The RMOC will adjust the scores of the "R&D Report" according to teams' performance in the online defense.	-
Public Sharing	Compulsory	Speech	Refer to "4.5Assessment Criteria for Public Sharing"	15

4.1 Assessment Criteria for R&D Report

Table 4-2 Assessment criteria for the cost report

Module	Content and Requirements	Weight (%)
Mechanical/Whole robots	Display the Standard, Hero, Sentry in the stated order from the following perspectives: 1. **Requirements analysis:** Confirm strategic positioning, divide robot functions and tasks, and set robot solutions and target performance parameters.	50

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	2. **Demonstration of three-dimensional models and functions:** Demonstrate robot module functions using animation, and explain how the functions are achieved. If simulation is used, the outcome should be presented, and the parameter optimization process should be explained. 3. **Demonstration of actual robot operation and performance parameters:** Demonstrate the robots in actual operation and explain the actual performance parameters. If the actual robots are not ready, updates on the current progress of their development should be provided. For the requirements of robot display, refer to: https://www.robomaster.com/en-US/resource/pages/announcement/1207	
Embedded system	Demonstrate part of the functions of the embedded system through the following aspects. Only the full demonstration of one robot is required. ● Software and hardware resource allocation. ● Hardware block diagrams, and designs of key hardware. ● Software architecture and flow diagrams. ● Special functions of the embedded system (e.g. customized UI, human-computer interaction optimization, control algorithms, and super capacitors).	20
Algorithm	Demonstrate the relevant algorithmic functions for the automatic tracking armor, striking the Power Rune, radar detection, etc., through the following aspects: ● Program block diagrams. ● Explanation of the algorithmic principles. ● Demonstrate the actual outcomes (the demonstration must be clear and straightforward; display of parameters, notations, graphs, etc., is allowed).	20
Others	Additional points may be given for the presentation of any functional innovation or theoretical research that is helpful for accelerating R&D and advancing technological development in the competition. For example:	10

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	● Developing a highly efficient and low-cost solution for setting up battlefield components. ● Optimizing designs and improving performance using tools such as theoretical calculation, emulators or simulation. ● Developing a commissioning tool, annotation software or algorithm assistance software.	

4.2 Assessment Criteria for Team Season Summary

Table 4-3 Assessment criteria for team season summary

Content	Area	Content and Requirements	Weight (%)
Summary Document	Academic Innovation	List the academic references used for the competition, including patents, papers, open-source technical literature, etc. The amount of references provided will be taken into consideration in the assessment	15
	Competition Analysis	Analyze in detail the issues encountered by the team during the competition, including the reasons of the issues as well as the solutions	10
	Team Development	Summary of the problems and challenges encountered throughout the season, plans to improve and develop the team	15
	R&D Management	Analyze the investments and the return in R&D management to conclude the strengths as well as the room for improvement	20
Cost Report		● Introduce in detail the budget status, budget amount, and budget already spent for the current season. ● Analyze in depth the reasons of irregular budget status (overrun/surplus) based on the references including the Expenditure Statement and "Team Budget" in the Competition Planning section. Put forward solutions based on the analysis. ● Analyze in depth the cases of cost control and management to conclude the lessons to be learned. ● Report the progress of cost control capability development and put forward a reasonable plan for the	25

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Content	Area	Content and Requirements	Weight (%)
		next season.	
Expenditure Statement		Make a record of the team's expenditures for this season, including detailed information such as the types and amount of the expenses. The record should be thorough and clear, in which the costs are traceable, and should be analyzed.	15

Click to download the relevant templates:

RoboMaster 2021 University Series Cost Report Template

RoboMaster 2021 University Series Expenditure Record Template

4.3 Assessment Criteria for Publicity Report

The Public Relations (PR) Manager is responsible for increasing the influence of the team by producing promotional content and holding promotional activities. He/she needs to have a basic understanding of promotion, be familiar with online communication techniques, and be able to independently plan and execute offline activities. Promotion can increase the influence of the team on and off the campus, thereby accelerating the growth of the team, including but not limited to obtaining campus resources to help attract excellent students during the recruitment period; obtaining investment resources and gaining funds and materials for the team; other resources, such as documentary shooting, shows invited by TV stations, etc.

Promotion is the soft power of the team, which can promote the internal cultural construction and performance of the team, so as to facilitate the healthy and sustainable development of the team.

The assessment criteria for publicity are as follows:

Table 4-4 Assessment criteria for the publicity report

Module	Content	Weight (%)
Publicity	1. Publicity data summary 2. Provide screenshots to prove the authenticity of the data, such as the number of followers in the official account, tweets, Weibo followers, and Weibo exposures.	70
Resource development	List the internal and external publicity resources that you have successfully obtained, such as influential school official media, corporate media, local media, radio and television stations.	15

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Module	Content	Weight (%)
Offline activities	1. Activity planning: Clear activity goals, activity plans, activity forms, activity publicity, personnel arrangements and activity summaries, etc. 2. Activity photos: 10-20 activity photos	15

4.4 Assessment Criteria for Sponsorship Report

The Business Manager is responsible for bringing resource supports to the team through business development, and needs to have basic planning and management capabilities in terms of business development awareness, action refinement, business development materials, and business development goals. The team can obtain various resource supports such as working capital, production and processing, and battlefield components transportation through business development. The introduction of external resources can facilitate the R&D, including but not limited to reducing R&D costs (such as obtaining 3D printing support), and more funds for technology iteration. The abundance of resources will lead to technological progress, and the improvement of performance will bring more school support.

The assessment criteria for sponsorship are as follows:

Table 4-5 Assessment criteria for the sponsorship report

Module	Content	Weight (%)
Promotional Leaflet	Content: Clearly introduce the actual situation of the competition and the participating team, highlighting the advantages of the competition and the team ability Format: Concise and clear, aesthetic	20
Promotional PPT		20
Minutes and Brief	● The more the companies visited, the higher the score of this item. Only one point is counted for multiple meetings of the same company, and the upper limit is 7 companies. ● Each meeting minutes must include 3 of the following 6 points to get scores: 1. What did the company think about the competition and the team? 2. What was the company's development strategy? Was it consistent with the development of the team? 3. Has the company sponsored similar activities? How about the results and their comments about the cooperation?	60

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Module	Content	Weight (%)
	4. Why did the company sponsor such activities? 5. What benefits did the company care most in the cooperation? What concerns did they have, and why? How did you solve these concerns? 6. (If any) Introduce the rights and interests confirmed by both parties or provide the contract signed (with screenshots) ● Deliver a brief of the cooperation, including the meeting minutes and follow-ups	

Click to download the relevant templates:

RoboMaster 2021 University Series Promotional PPT and Leaflet Design Reference

RoboMaster 2021 University Series Meeting Minutes and Brief Template

Except for meeting minutes and brief template, the rest are only in Chinese, which are for reference only in style. Please produce the content on your own.

4.5 Assessment Criteria for Public Sharing

The following assessment criteria apply to the RMOC's scoring of participating teams and the mutual evaluation between participating teams in the public sharing session. According to "2.3Participating Procedures", in the public sharing session, the RMOC will divide the participating teams in group, and each participating team will have 20 minutes for sharing. The participating teams must score the public sharing of other teams in the same group according to the following table, and fill in the questionnaire provided by the RMOC to submit the final score after the session. The final score for the public sharing of the participating teams is the average of the scores provided by all other participating teams in the same group and the score provided by the RMOC. Teams will be scored in five grades: very poor, poor, average, good, excellence.

Table 4-6 Assessment criteria for the public sharing

Module	Content and Requirements
Content	● The theme and content should be closely related to RoboMaster Competitions, including one or more related directions (not limited to technology or operation) ● The theme and content should have important reference value for other participating teams, and can significantly improve the audience's understanding and awareness of the event

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Module	Content and Requirements
	● Introduce the team's experience in detail. The materials used should be real, typical, and vivid, reflecting the objective situation of the participating teams.
Language	The speech should be clear and the voice loud; the language should be accurate, smooth and natural.

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5. Awards

- The names of the awards are subject to further adjustments and the actual certificates issued shall prevail.
- The minimum award criteria for the RMUC International Online Assessment is at least 30% score for the R&D Report section. Participating teams can only be awarded if they meet the minimum award criteria. The following numbers of awards are based on the total number of teams that meet the minimum award criteria.
- The RMOC will allocate the prizes based on the total score of the participating teams that meet the minimum criteria.

The awards are as follows:

Table 5-1 Awards Settings for the RMUC International Online Assessment

Prize	Quantity	Awards
Online Assessment First Prize	30%	● Online assessment achievement certificate (team) ● Online assessment achievement certificate (individual)
Online Assessment Second Prize	100%	

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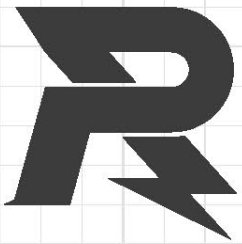

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