

ENGG 3960E Robotics Special Project: Development of Robot Design Contest Course

Fall & Winter 2026-2027 (3 credits: 1 credit in Fall & 2 credits in Winter)

Course Description:

This course is designed for developing both soft and hard skills for Robot Design Contest and robotics training. They will also assist in organizing and developing robotics workshops, training workshops, and contest.

Learning Objectives:

Below are the learning goals and objectives for HKUST undergraduate students enrolled in this project:

- To learn the skills of mentoring in workshops and to transfer this skill to UG students who are interested in robotics.
- To participate interactively in team discussions and decision-making
- To strengthen students' robotics skill sets
- To apply design thinking in organizing a competition
- To work and communicate effectively in a multi-disciplinary and multi-national team
- To learn professional and technical knowledge on robot design, research and development processes
- To learn soft skills in team management and working as a team

Course Requirements:

- Students have to submit peer- and self-evaluations during the course period.
- Each student/ group is required to submit a project proposal and the final report to the Project Supervisor(s).
- All students must attend the Robot Design Contest as required
- All students should commit to the agreed due dates and respect the time devotion for all interaction – punctuality and good preparation are expected

Grading Scheme:

This is a 3-credit course (1 credit in the Fall semester and 2 credits in the Winter semester), graded by letter and using criterion-referencing. Each student must complete all tasks on time and meet the course requirements stated above. Also, the required tasks must be satisfied by the Project Supervisor(s).

Assessment weighting:

Assessment Task	Contribution to Overall Course grade (%)	Due Date
Safety Training	0%	Week 1 to Week 5
Tidiness and Safety Awareness	15%	Throughout whole course period
Peer evaluations	15%	Last Week of Winter Term
Progress Report	15%	Week 13 (Fall Term)
Final Report	15%	Last Week of Winter Term
Final Presentation	40%	Last Week of Winter Term

The evaluation of the whole team and train-the-trainer program is based on four key rubrics, which contribute to the final grading scheme:

- Safety Awareness Rubric
- Tidiness Rubric
- Punctuality and Attendance Rubric
- Communication Skills Rubric

In addition to these rubrics, five rubrics are employed to assess students' performance in the course. This includes four rubrics designed for self-evaluation and peer evaluation:

- Punctuality and Attendance Rubric
- Teamwork Rubric
- Communication Skills Rubric
- Technical and Problem-Solving Skills Rubric

Furthermore, a Writing Skills Rubric is utilized to evaluate students' writing abilities.

In the presentation, we will assess students' performance with the use of the following rubrics:

- Communication Skills Rubric
- Technical and Problem-Solving Skills Rubric

Please assess your peers using the Level of Achievement scale (1 to 5). Detailed descriptions of each level are provided on the following pages. You only need to evaluate those students with whom you have worked closely. For any students you will not be evaluating, please mark them as N/A.

5-Level Punctuality and Attendance Rubric

Level	Description	Criteria
5	Exemplary: Consistently demonstrates perfect attendance and punctuality. Always arrives on time and is present for all classes and activities. (100 marks)	- Attends all meetings / activities without absences. - Always arrives on time or early. - Completes all assignments on time. - Actively participates in meeting / activity discussions.
4	Proficient: Generally has excellent attendance and punctuality, with only a few minor issues. (80 marks)	- Attends most meetings / activities with minimal absences. - Usually arrives on time, with occasional lateness. - Rarely misses deadlines for assignments. - Participates actively in meetings / activities.
3	Satisfactory: Shows satisfactory attendance and punctuality but has noticeable issues. (70 marks)	- Has some absences that affect participation. - Occasionally arrives late to meeting / activity. - Sometimes misses deadlines for assignments. - Participates in class but may be less engaged.
2	Needs Improvement: Frequently has issues with attendance and punctuality, requiring significant improvement. (60 marks)	- Often has unexcused absences. - Frequently arrives late to meeting / activity. - Regularly misses deadlines for assignments. - Participation in meeting / activity is inconsistent.
1	Unsatisfactory: Consistently demonstrates poor attendance and punctuality, showing little regard for being present or on time. (35 marks)	- Regularly misses meetings / activities without valid reasons. - Consistently arrives late or not at all. - Frequently misses deadlines for assignments. - Shows little to no participation in meeting / activity.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' punctuality and attendance through attendance records, observations, and assignment submissions.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve their punctuality and attendance.

5-Level Teamwork Rubric

Level	Description	Criteria
5	Exemplary: Consistently demonstrates outstanding teamwork skills. Works collaboratively and effectively, contributing significantly to group success. (100 marks)	- Actively participates in all group activities. - Encourages and supports all team members. - Communicates openly and resolves conflicts constructively. - Takes initiative and leads when appropriate.
4	Proficient: Shows strong teamwork skills and generally collaborates well with peers. (80 marks)	- Participates in most group activities. - Supports team members and fosters a positive environment. - Communicates effectively and resolves minor conflicts. - Contributes ideas and feedback regularly.
3	Satisfactory: Displays satisfactory teamwork skills but may struggle with collaboration at times. (70 marks)	- Participates in group activities but may be passive. - Sometimes supports team members but may need reminders. - Communicates adequately but may avoid conflict resolution. - Contributes ideas but may not engage fully.
2	Needs Improvement: Frequently has issues with teamwork, affecting group dynamics and collaboration. (60 marks)	- Rarely participates in group activities. - Provides minimal support to team members. - Struggles with communication and conflict resolution. - Contributes little to group discussions.
1	Unsatisfactory: Consistently demonstrates poor teamwork skills and lacks effective collaboration with peers. (35 marks)	- Does not participate in group activities. - Fails to support or engage with team members. - Avoids communication and does not resolve conflicts. - Does not contribute to group efforts or discussions.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' teamwork skills through observations during group projects, discussions, and collaborative activities.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve their teamwork skills.

5-Level Communication Skills Rubric

Level	Description	Criteria
5	Exemplary: Consistently demonstrates outstanding communication skills. Effectively engages with peers, actively listens, and contributes to discussions. (100 marks)	- Communicates ideas clearly and confidently. - Actively listens and responds appropriately to others. - Encourages participation from all group members. - Adapts communication style to suit the audience.
4	Proficient: Shows strong communication skills and generally engages well with peers. (80 marks)	- Communicates ideas clearly with minor issues. - Listens to others and responds appropriately. - Facilitates group discussions and encourages input. - Adjusts communication style when necessary.
3	Satisfactory: Displays satisfactory communication skills but may struggle in engaging with peers. (70 marks)	- Communicates ideas adequately but may lack clarity. - Listens but may not always respond appropriately. - Participates in discussions but may not encourage others. - Shows some awareness of audience but needs improvement.
2	Needs Improvement: Frequently has issues with communication, affecting interaction with peers. (60 marks)	- Struggles to communicate ideas clearly. - Rarely listens actively or responds appropriately. - Participates minimally in discussions and does not encourage others. - Shows little awareness of audience needs.
1	Unsatisfactory: Consistently demonstrates poor communication skills and lacks engagement with peers. (35 marks)	- Fails to communicate ideas effectively. - Does not listen to others or respond to their input. - Avoids participation in discussions and does not engage others. - Shows no awareness of audience or context.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' communication skills through observations during group work, presentations, and discussions.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve their communication skills.

5-Level Technical and Problem-Solving Skills Rubric

Level	Description	Criteria
5	Exemplary: Demonstrates exceptional technical skills and problem-solving abilities. Effectively identifies and addresses complex challenges in project design. (100 marks)	- Utilizes advanced technical skills and tools proficiently. - Identifies problems quickly and develops innovative solutions. - Analyzes data and feedback to improve project outcomes. - Collaborates effectively with team members to solve issues.
4	Proficient: Shows strong technical skills and problem solving capabilities, effectively addressing most challenges in project design. (80 marks)	- Utilizes technical skills and tools competently. - Identifies problems and develops practical solutions. - Uses data and feedback to make informed decisions. - Works well with team members to resolve issues.
3	Satisfactory: Displays satisfactory technical skills and problem-solving abilities but may struggle with more complex challenges. (70 marks)	- Utilizes basic technical skills and tools adequately. - Identifies some problems but may take time to find solutions. - Uses data and feedback but may not fully analyze them. - Participates in team problem-solving but may not lead discussions.
2	Needs Improvement: Frequently has issues with technical skills and problem-solving, affecting project design effectiveness. (60 marks)	- Struggles to utilize technical skills and tools. - Has difficulty identifying problems and developing solutions. - Rarely uses data and feedback to inform decisions. - Participates minimally in team problem-solving discussions.
1	Unsatisfactory: Consistently demonstrates poor technical skills and problem-solving abilities, hindering project design. (35 marks)	- Unable to utilize technical skills and tools effectively. - Fails to identify problems or develop solutions. - Does not use data or feedback to inform decisions. - Avoids participation in team problem-solving efforts.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' technical and problem-solving skills during project design assessments, presentations, and group work.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve their technical and problem-solving skills.

5-Level Writing Skills Rubric

Level	Description	Criteria
5	Exemplary: Demonstrates exceptional writing skills. The writing is clear, coherent, and engaging, with no grammatical errors. (100 marks)	- Ideas are well-organized and fully developed. - Uses a rich and varied vocabulary. - Demonstrates a strong command of grammar, punctuation, and spelling. - Engages the reader with a compelling style and voice.
4	Proficiency: Shows strong writing skills with minor errors. The writing is clear and mostly coherent. (80 marks)	- Ideas are organized and developed with minor lapses. - Uses appropriate vocabulary with some variation. - Contains few grammatical, punctuation, or spelling errors. - Maintains a consistent style and voice that engages the reader.
3	Satisfactory: Displays satisfactory writing skills but has noticeable issues. The writing is generally clear but may lack coherence. (70 marks)	- Ideas are somewhat organized but may be underdeveloped. - Uses basic vocabulary with limited variation. - Contains several grammatical, punctuation, or spelling errors that may distract the reader. - Style and voice are present but may not fully engage the reader.
2	Needs Improvement: Frequently has issues with writing skills, affecting clarity and coherence. (60 marks)	- Ideas are poorly organized and underdeveloped. - Uses limited vocabulary with little variation. - Contains numerous grammatical, punctuation, or spelling errors that hinder understanding. - Lacks a consistent style and voice, making it difficult to engage the reader.
1	Unsatisfactory: Consistently demonstrates poor writing skills, making it difficult to understand the content. (35 marks)	- Ideas are disorganized or unclear. - Uses inappropriate or very limited vocabulary. - Contains frequent grammatical, punctuation, or spelling errors that significantly impede understanding. - Lacks style and voice, failing to engage the reader.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' writing skills through essays, reports, creative writing, or other written assignments.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and identify areas for improvement.

5-Level Safety Awareness Rubric

Level	Description	Criteria
5	Exemplary: Demonstrates a comprehensive understanding of safety issues and consistently applies safety measures. (100 marks)	- Identifies all relevant safety issues. - Proactively engages in safety discussions. - Implements safety measures without reminders. - Educates peers about safety practices.
4	Proficient: Shows a strong understanding of safety issues and regularly applies safety measures. (80 marks)	- Identifies most safety issues. - Participates in safety discussions. - Applies safety measures with minimal reminders. - Encourages peers to follow safety practices.
3	Satisfactory: Displays a basic understanding of safety issues and applies some safety measures. (70 marks)	- Identifies some safety issues. - Occasionally participates in safety discussions. - Applies safety measures but may forget occasionally. - Needs reminders to encourage peers.
2	Needs Improvement: Limited understanding of safety issues and rarely applies safety measures. (60 marks)	- Struggles to identify safety issues. - Rarely participates in safety discussions. - Requires frequent reminders to apply safety measures. - Shows little initiative in promoting safety among peers.
1	Unsatisfactory: Lacks understanding of safety issues and does not apply safety measures. (35 marks)	- Unable to identify safety issues. - Does not participate in safety discussions. - Fails to apply safety measures. - Shows no interest in promoting safety.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate student awareness of safety issues through observations, discussions, or specific assignments.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve.

5-Level Tidiness Rubric

Level	Description	Criteria
5	Exemplary: The working area is consistently organized and clean. All materials are properly stored, and there is no clutter. (100 marks)	- All supplies are neatly organized and stored. - Work surfaces are clean and free of clutter. - Follows a routine for maintaining tidiness. - Takes initiative to help others keep their areas tidy.
4	Proficient: The working area is mostly organized and clean, with minor areas for improvement. (80 marks)	- Most supplies are organized and stored properly. - Work surfaces are mostly clean, with minimal clutter. - Occasionally follows routines for maintaining tidiness. - Assists peers in keeping their areas tidy.
3	Satisfactory: The working area is somewhat organized but has noticeable clutter or disorganization. (70 marks)	- Some supplies are organized, but others are misplaced. - Work surfaces have moderate clutter. - Inconsistently follows routines for tidiness. - Needs reminders to help keep the area tidy.
2	Needs Improvement: The working area is often disorganized and cluttered, requiring significant improvement. (60 marks)	- Many supplies are disorganized and scattered. - Work surfaces are frequently cluttered. - Rarely follows routines for maintaining tidiness. - Requires frequent reminders to clean and organize.
1	Unsatisfactory: The working area is consistently messy and disorganized, showing little regard for tidiness. (35 marks)	- Supplies are consistently disorganized and left out. - Work surfaces are cluttered and messy. - Does not follow any routines for tidiness. - Shows no interest in maintaining a clean working area.

N/A

Remarks: Number in bracket shows the corresponding marks for that level of performance.

How to Use the Rubric:

- **Assessment:** Use this rubric to evaluate students' working areas during observations or assessments.
- **Feedback:** Provide specific feedback based on the criteria to help students understand their level and how they can improve their tidiness.

Course AI Policy

The use of Generative AI in project is permitted with proper acknowledgement and will NOT be contributed to the students' work.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST - Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.