

The Hong Kong University of Science and Technology

[Course Title] Engineering Team Design Experience

[Course Code] ENGG 1200

[No. of Credits] 3 Credits

[Any pre-/co-requisites] No pre-requisites or co-requisites

Name: Prof. Ben CHAN, Mr. Ian CHONG, Mr. Paul Lavigne

Email: ybchan@ust.hk; egian@ust.hk; egpaul@ust.hk

Office Hours: Wednesday 10:00am to 4:00pm

Course Description

The Engineering Team Design Experience course allows students to explore various areas of engineering in order to design and work towards a final demonstration of their projects before the end of the term. Students in this course will be divided into design teams with a common goal in mind, and experience the workflow of creating a new artifact.

This semester will focus on the workflow of incorporating 3D modelling in producing digital media.

There will be three main aspects in ENGG1200 this semester:

Engineering Skills: We will introduce fundamental skills in different engineering fields, such as 3D modelling or hands-on prototyping skills; along with exposure to various kinds of advanced technology available.

Design and Creativity: This course will have sessions focusing on design thinking and creativity. They are key to creating practical and interesting products.

Teamwork: Students will work together in teams to realize their common idea of their final project, to have a real-world experience working with a design team,

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Apply an engineering design approach to: generate ideas, model, analyze, predict and build an innovative object of engineering interest taking into consideration both societal and economic impact
2. Describe appropriate knowledge and behavior for effective and ethical membership on a technical team
3. Communicate effectively with others orally, in writing and by use of sketches/drawings.
4. Develop possible innovative engineering solutions via peer learning and self-initiated learning processes
5. Develop new creativity building techniques and exercises
6. Plan and propose creative solutions for a specific context, informed by engagement with a community group

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage, and due dates; perhaps, add a summary table as below, to precede the details for each assessment.]

Assessment Task	Contribution to Overall Course grade (%)	Due date
Hands-on Practice	15%	31/10/2026
Solution Progress	25%	13/10/2026
Design Pitch	10%	20/10/2026
Visualization of Ideas	15%	24/11/2026
Reflection	15%	30/11/2026
Final Project Showcase	20%	28/11/2026

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

Mapping of Course ILOs to Assessment Tasks

[add to/delete table as appropriate]

Assessed Task	Mapped ILOs	Explanation
Hands-on Practice	#1, #2, #6	The students demonstrate their ability to complete milestones of learning how to implement technology tools to create 3D models of everyday objects
Solution Progress	#3, #5	The student teams demonstrate their progress in addressing the main design challenge in the course.
Design Pitch	#1, #2, #3, #4, #6	The students present their ideas, progress, and plans for further development of their ideas.
Visualization of Ideas	#1, #3, #6	The students demonstrate their ability to present their ideas in a visually appealing and communicative way.
Reflection	#4, #5, #6	The students reflect on their learning during and at the end of their progress towards a final submission
Final Project Showcase	#1, #5	The students demonstrate their design work to other teams, highlighting their own design goals and how they have and haven't achieved them.

Grading Rubrics

[Detailed rubrics for each assignment will be provided. These rubrics clearly outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.]

Final Grade Descriptors:

[As appropriate to the course and aligned with university standards]

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good Performance	Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal Pass	Has some knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.
F	Fail	Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.

Course AI Policy

The students are encouraged to use generative AI tools in the process of creating their own design solution and will be asked for proper acknowledgement to track when and how they used AI.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include [specific details, e.g., strengths, areas for improvement]. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission Policy

Late submissions will be accepted with 20% penalty per day. Beyond the stated submission deadlines in the course, some extensions can be made on a case-by-case basis.

Required Texts and Materials

N/A

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.

1. Hands-on Practice (15%). Evaluates the student's ability to complete hands-on learning milestones using technology tools to construct 3D models of everyday objects.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
3D Modeling & Technical Execution	Models are exceptionally detailed, geometrically accurate, fully functional, and expertly constructed using advanced 3D modeling features.	Models are accurate and functional with minor geometric or dimensional inconsistencies. Demonstrates solid command of core 3D modeling tools.	Models are simplified or contain noticeable structural/geometric errors, but satisfy basic assignment requirements.	Models are incomplete, structurally flawed, or exhibit minimal technical capability in 3D software.
Tool Implementation & Workflow	Flawlessly executes recommended software workflows and digital prototyping toolsets. Shows advanced efficiency and clean file management.	Effectively applies digital tools and software workflows with minor inefficiencies or non-standard practices.	Uses digital tools to a basic degree; workflow is occasionally inefficient or disorganized.	Struggles significantly with basic software tools; unable to complete required digital tasks without extensive intervention.
Milestone Completion &	Completes all scheduled milestone tasks well ahead of deadlines with	Completes all required milestone tasks on time with satisfactory step-	Completes most milestone tasks, but misses minor sub-	Fails to complete key milestone tasks or misses deadline without

Timeliness	thorough documentation of process steps.	by-step documentation.	deliverables or submits slightly late.	valid justification.
-------------------	--	------------------------	--	----------------------

2. Solution Progress (25%). Evaluates the team's ongoing progress in analyzing, modeling, and engineering a solution to address the primary course design challenge.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
Engineering Design Approach	Demonstrates a rigorous engineering design process. Problem definition, constraints, and requirements are comprehensively analyzed and addressed.	Demonstrates a sound design process. Key constraints and requirements are considered, with logical design choices made.	Design process is loosely followed; some engineering constraints or user requirements are overlooked.	Design process lacks structure; solution appears arbitrary without engineering analysis or justification.
Iterative Prototyping & Creativity	Shows outstanding creative problem-solving and rapid iterative testing/refinement of multiple design concepts.	Shows good creative effort with evident iterations based on initial testing or feedback.	Limited iteration performed; settles early on a single concept without adequate exploring alternative solutions.	Minimal or no iteration observed; static design approach with little evidence of creative problem-solving.
Teamwork & Ethical Collaboration	Exemplary team synergy, equitable task distribution, active peer support, and	Effective team collaboration with clear division of labor and	Team functions adequately, but displays minor communication	Significant teamwork issues, unresolved conflict, or unequal contribution

	ethical membership dynamics throughout the progress phase.	constructive peer interactions.	gaps or uneven workload distribution.	among team members.
--	--	---------------------------------	---------------------------------------	---------------------

3. Design Pitch (10%). Evaluates the team's ability to present their design concept, progress, and future project trajectory orally and visually to an audience.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
Pitch Structure & Content Clarity	Pitch is highly engaging, logically structured, and clearly communicates the problem, design concept, and future development plan.	Pitch is clear and structured well; covers all essential aspects of the problem statement and proposed design concept.	Pitch covers basic elements but lacks a strong compelling narrative or clear logical flow between points.	Pitch is disorganized, incomplete, or fails to clearly articulate the problem and proposed design.
Engineering Feasibility & Innovation	Proposed solution exhibits high innovation while remaining practically feasible, with clear societal and economic considerations addressed.	Proposed solution is innovative and practical, with basic consideration of societal or economic factors.	Proposed solution is conventional or marginally feasible; considerations of real-world impact are superficial.	Proposed solution is unfeasible, derivative, or ignores key engineering and contextual constraints.

Oral Delivery & Team Engagement	Professional, persuasive delivery within time limits. All team members contribute seamlessly and respond expertly to questions.	Clear and confident delivery within time limits. Good balance among team presenters during delivery and Q&A.	Delivery is somewhat monotone or slightly exceeds time limits. Presentation dominated by only one team member.	Poor delivery, difficult to follow, or significantly over/under time. Team appears unprepared for Q&A.
--	---	--	--	--

4. Visualization of Ideas (15%). Evaluates the effectiveness, aesthetic quality, and technical precision of visual communication (sketches, digital renders, drawings, animations) used to represent the design artifact.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
Visual Appeal & Graphics Quality	Visual materials (3D renders, diagrams, sketches) are of publication quality, highly creative, visually compelling, and polished.	Visual materials are neat, attractive, and visually clear, demonstrating strong graphic communication skills.	Visual materials are basic or functional, but lack polish, visual interest, or consistent design layout.	Visual materials are poor quality, messy, unappealing, or difficult to interpret visually.
Technical Accuracy & Clarity	Drawings and renders accurately represent geometry, scale, assembly, and materials with explicit annotations	Visuals clearly communicate dimensions, materials, and components with minor labeling errors or	Visuals provide a general overview of the design but lack important technical details, scales,	Visuals are misleading, inaccurate, unannotated, or fail to convey key structural and design

	and callouts.	omissions.	or key annotations.	features.
Digital Media Integration	Expertly integrates 3D media and digital graphics into a coherent, highly communicative presentation package.	Effectively incorporates digital media and 3D assets to enhance understanding of the project.	Includes basic digital renders or media, but integration feels fragmented or poorly aligned with presentation goals.	Minimal or ineffective use of digital media; relies on low-quality or irrelevant visual assets.

5. Reflection (15%). Evaluates the student's individual critical reflection on their learning journey, creativity techniques, self-initiated learning, and use of generative AI tools.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
Critical Self-Observation & Growth	Deeply analyzes personal and team growth, challenges encountered, and key insights gained over the course of the design project.	Thoughtfully reflects on project experiences, highlighting personal growth and lessons learned from challenges.	Description of project activities is mostly narrative; provides limited analytical depth or critical self-reflection.	Reflection is superficial, generic, or purely descriptive with no meaningful personal insights.
Creativity & Self-Initiated Learning	Articulates clear evidence of developing new creativity techniques and	Mentions specific creativity exercises used and identifies key areas	Superficially mentions creative techniques or learning steps without	No evidence of self-initiated learning or application of creativity

	applying self-directed learning to overcome knowledge gaps.	where self-directed learning occurred.	explaining how they affected the outcome.	building techniques.
Transparency & AI Tool Reflection	Rigorously documents when, how, and why generative AI tools were used, critically evaluating AI output quality and personal learnings.	Clear documentation of generative AI tool usage in design processes with appropriate critical commentary.	Mentions AI tool usage briefly, but lacks detailed tracking or reflection on its impact on the design.	Ignores required AI tool usage reporting or fails to document AI assistance transparently.

6. Final Project Showcase (20%). Evaluates the final prototype/artifact demonstration during the showcase event, focusing on achieved design goals, peer interaction, and overall project impact.

Criteria	Excellent (4)	Good (3)	Average (2)	Fair (1)
Artifact Quality & Goal Achievement	Final prototype completely fulfills initial design goals; demonstrates exceptional craftsmanship, functionality, and engineering rigour.	Final prototype satisfies main design goals; fully functional with minor performance or aesthetic flaws.	Final prototype partially works or meets only basic design goals; key features are incomplete or compromised.	Final prototype is non-functional, incomplete, or fails to meet primary design objectives set by the team.

Demonstration & Peer Engagement	Highly interactive, clear, and inspiring demonstration to peer teams; convincingly communicates design goals and tradeoffs.	Clear and effective demonstration to audience; articulates design features and answer questions well.	Basic demonstration provided; struggles to engage peers or explain design details clearly.	Poor demonstration; unable to explain prototype functionality or engage effectively with showcase visitors.
Impact & Post-Project Evaluation	Thoroughly evaluates achieved vs. unachieved goals, articulating profound insights on societal, economic, and technical impacts.	Evaluates goal achievement accurately, with sound understanding of project strengths, limitations, and potential impacts.	Superficial evaluation of achieved/unachieved goals; limited awareness of broader project impact or limitations.	Fails to evaluate design performance, limitations, or lessons learned from the final outcome.