

## **ISOM 4880 OM Project Spring 2024**

### **Objective**

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This ISOM 4880 OM Project course offers a unique opportunity for the BBA(OM) students at the HKUST Business School to participate in real business projects and to apply what they have learned in other OM courses in solving business problems. Student teams will work under faculty supervision to solve operations management related problems and identify improvement opportunities for both service and manufacturing businesses. They will also gain practical experience in planning and executing a real business project.

### **Projects**

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Most projects involve an external business or client who provides ideas for the project and access to data and people in the client organization. Projects with a focus on improving operations or creating business impacts will be appropriate for this course. The exact scope and structure of the project must be agreed among all stakeholders for the project to begin. The student team will conduct one to two interviews with the company's representatives to obtain necessary information to work on the project. At the minimum, the team must:

- (1) Define the problem statement and issues during the first phase of the project;
- (2) Make a mid-project presentation to obtain feedbacks and approval from the project sponsor; and
- (3) Submit a final report and make a presentation to the project sponsor.

This is a 3-credit course, which means you are expected to put in 9 hours of work per week toward the completion of the project. The project is typically completed in three major phases:

- Project planning and data collection
- Preliminary analysis, mid-project progress report, and presentation
- Extensive analysis, write-up, and final presentation

### **Intended Learning Outcomes**

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Each project is unique and may have its specific intended learning outcomes. In general, after the students successfully complete the project to the satisfaction of both the instructor and client organizations, they should be able:

- To plan and execute a real business project in the operations management domain
- To apply and extend what they have learned in other operations management or related courses, such as technical, analytical, managerial, and behavioral concepts, skills, and tools
- To gain first-hand experience in project execution, including data collection and analysis and effectively working together as a team
- To provide suggestions, recommendations, and action plans for improvement
- To convince client companies of the cost-benefits of improvement, if applicable
- To create professional presentations and reports

### **Confidentiality and Ethical Code of Conduct**

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Projects of this nature often involve sensitive and confidential data or information. Students and faculty advisors working on these projects must keep project information and outcomes confidential, and will disseminate general information only with the permission from the client company or its project representatives (client manager and/or sponsor). Students and faculty may need to sign a non-disclosure agreement as requested by the sponsoring company.

## **Project Team Selection**

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The student must receive an approval from Prof. Ronald Lau, the BBA(OM) Program Coordinator, before registering for this course. Generally, a student should maintain a CGA (or average OM courses) of B- or above to participate in this course. A faculty and possibly an alumni advisor (who has previous project experience or industry-specific knowledge) will provide assistance and guidance for the project team.

The initial screening is based on the student's academic background, work ethics/attitude, skill/ability, and planned study load. Shortlisted students will be interviewed by faculty members, possibly with the company sponsors. When the team is formed, selected students will meet with the company's contact person(s) or representative(s) to discuss the details and scope of the project. The final project team selection and assignment is based on suitability, student ability and student interest.

## **Project Grading Rubrics**

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The final project grade is determined by the team's as well as individual performance (refer to Appendix 1 if needed) in the following five criteria:

- Project planning and execution (20 points, based on instructor's assessment)
- Analytic rigor and issue complexity (20 points, based on instructor's assessment)
- Project outcome assessment and peer review (20 points, based on instructor's assessment), refer to Appendix 1-3 if needed
- Presentation, report writing, and team work (20 points, based on the client's feedback), refer to Appendix 1-3 if needed
- Overall client satisfaction (20 points, based on the client's feedback)

Assessment rubrics:

- Appendix 1: Peer evaluation
- Appendix 2: Project report writing
- Appendix 3: Project presentation

## **General Information for Interested Candidates**

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Initiative is a must in order to succeed in ISOM4880. Applicants must take initiative and are eager to make a significant contribution to the completion of the project. They should possess strong verbal and written communication skills, creative thinking, and analytical thinking. Selected students will need to work independently and cooperatively with each other, and must communicate periodically with the supervising faculty to track progress and discuss gradual development of the project. Group size for each project is 3 to 5 unless indicated otherwise. Client feedback and peer evaluation will be used for assessing individual student's contribution at the end of the project.

While we do have some connections to initiate projects with client organizations, we strongly encourage students to approach us if they have project ideas that they want to explore. Due to increasing student interest in ISOM 4880, you are encouraged to approach your own source of project sponsors (through your peers, social groups, student clubs, or mentors, etc.) to identify a possible project idea and maximize your chance of securing a project.

## **Faculty in Charge**

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Prof. Ronald Lau (email: rlau@ust.hk)  
UG Programs Coordinator (OM)

## **How to Apply?**

For those who are interested in taking this Project course, please indicate your top choices (use ranking 1 = most interested, 2 = second most interested, etc.) and send your resumes and transcripts to bbaom@ust.hk by **January 19** for consideration. An interview will be arranged for those who are shortlisted. For more info, please visit our OM Project web site (<http://www.bm.ust.hk/isom/programs-n-courses/ug-programs/bba-in-om/om-projects>).

## **General Work Guidelines (for reference only; not applicable for all projects)**

1. Defining the project
  - Interviewing the clients to identify the needs and issues
  - Framing the key questions
  - Determining project scope and criteria for project success
2. Structuring the problems or issues
  - Decomposition of complex problems and issues
  - Applying the "80/20 rule" to prioritize the problems and issues
3. Planning the work
  - Selecting the appropriate analyses
  - Identifying information needs
  - Creating manageable work plans
4. Working the plan
  - Managing complex work plans
  - Dealing with the dynamics of work groups and teams
  - Navigating client interactions
  - Bridging the gap between desired and available data
  - Making sense of messy, real-world data
  - Developing practical assumptions and approximations
  - Avoiding "analysis paralysis": Deciding when "enough is enough"
5. Developing insights and recommendations
  - Validating and verifying results
  - Testing sensitivity to assumptions
  - Asking "so what?": Moving from data to insights to recommendations to plans
  - "Stress-testing" recommendations
6. Presenting the results
  - Preparing a written report and on-site presentation (mid-project and final)
  - Presenting results and incorporating feedbacks to finalize the report
  - Quantifying impact of project if possible

## List of OM Projects – Spring 2024

### Project A

**Sponsoring company:** Theia Innovation Limited (<https://theiainnovation.com/>)

**Topic:** Computer vision-based workplace safety monitoring and hazard detection system

**Project objective:**

- The objective of this project is to perform a workflow analysis for applying a computer vision-based system for workplace safety monitoring. The system will utilize image processing and machine learning algorithms to analyze images and video feeds from surveillance cameras or wearable devices, ensuring a safe working environment and timely identification of potential safety risks.

**Project scope:**

- Workflow analysis and applications in personal protective equipment (PPE) detection, intrusion detection, fall detection, and data logging and analysis.

**Key analyses:**

- Personal protective equipment (PPE) detection: The system will employ computer vision techniques to detect and recognize personal protective equipment such as hard hats, safety goggles, gloves, and high-visibility vests. It will monitor workers' compliance with PPE requirements, ensuring that they are adequately protected.
- Intrusion detection: The system will be capable of detecting unauthorized personnel or objects entering restricted areas or hazardous zones. It will use video analysis techniques to identify anomalous behaviors or objects and notify security personnel, enabling timely intervention and prevention of potential accidents.
- Fall detection: The system will be trained to detect and alert in real-time the occurrence of falls or slips by workers. It will analyze video streams and identify sudden changes or abnormal movements that indicate a fall, triggering immediate notifications to relevant personnel for prompt response.
- Data logging and analysis: The system will maintain a comprehensive database of safety-related events, including timestamps, video recordings, and relevant metadata. This data will facilitate post-incident analysis, trend identification, and continuous improvement in workplace safety practices.

**Remarks:**

- The implementation details, specific computer vision algorithms, hardware requirements, and integration aspects will need to be further researched and customized based on the specific workplace environment and safety requirements. Additionally, privacy considerations and compliance with relevant regulations should be addressed during system development and deployment.

## **Project B**

**Sponsoring company:** GoBuddy Technologies (<https://www.home.gobuddy.asia/>)

**Topic:** Optimizing the booking system of massage and spa centers

### **Project objective:**

- The objective of this project is to identify features that can streamline the company's new booking system, reduce manual workload, and leverage operations management principles to enhance efficiency. We are particularly interested in creative and practical suggestions to optimize processes and improve overall system performance.

### **Project scope:**

- Reducing manual workload: Identify and propose features or process improvements that minimize manual intervention and streamline operations.
- Efficient resource allocation: Explore strategies to optimize resource allocation to maximize booking capacities, ultimately enhancing business sustainability and fostering customer loyalty.
- Enhanced process automation: Investigate opportunities for automating aspects of the booking process.

### **Key analyses:**

- Researching, developing, and delivering data-driven booking system solutions tailored for small and medium-sized businesses within the wellness industry, with a particular emphasis on massage and spa centers.

### **Remarks:**

- Knowledge in operations and process management, optimization techniques.

## **Project C**

**Sponsoring company:** Alpha AI (<https://www.alphaaitech.com/>)

**Topic:** Mathematics Question Bank Generator using Python and GPT

### **Project objective:**

- Designing an algorithm to generate question papers instantly for any math topic based on the primary school syllabus, integrating it with GPT for wording and explanations.
- The project aims to develop an algorithm that generates questions and answers for primary school math based on the syllabus. The platform integrates an algorithm to generate numeric questions and answers for different modules. It utilizes GPT to generate wording for the questions and explanations for the answers. Students can also submit their answers online to receive explanations and feedback. The platform includes an analysis system that assesses students' performance, identifies knowledge gaps, and provides recommendations for skill improvement.

### **Project scope:**

- The project outcome is a web platform with chatbot that could greatly enhance students' math skills and support their learning journey in a structured and interactive manner.

### **Key analyses:**

- Data collection and analysis: Gather the primary school syllabus by web scraping from online sources or inputting the contents from exercise books. Analyze the syllabus to categorize the modules, topics, and question formats in database
- Syllabus-based question generation: Develop algorithms that generate math questions based on the identified modules and topics. Ensure that the questions cover a wide range of concepts and difficulty levels.
- Answer and exercise paper generation: Integrate GPT into the system to generate explanations for the questions. Fine-tune the GPT model using a dataset that includes math questions and their corresponding explanations. This step helps improve the understandability of the generated explanations.
- Collaboration with the team and clients: Work closely with the team to implement the functionalities of the web platform. Collaborate with clients to gather feedback and incorporate their input into the development process.

### **Remarks:**

- Knowledge and programming skills in Python and ChatGPT are needed.

## APPENDIX 1 PEER EVALUATION

Evaluated by: \_\_\_\_\_

**Evaluation criteria (max 20 points each criterion for a total of 100 points)**

Criteria	Significantly below expectation (0-13 points)	Below expectation (14-15 points)	Meet expectation (16-17 points)	Exceed expectation (18-19 points)	Significantly exceed expectation (20 points)
<b>Participation</b>	Miss several team meetings without prior notice; do not participate effectively in team discussion of project issues	Miss one meeting without prior notice; or missed several team meetings with prior notice; participated in team discussions when asked	Miss no more than one team meeting with prior notice and proactively contribute to the team dialogue in most meetings	Attend all team meetings and often is a significant contributor to the team discussions	... plus are proactive in helping the team solve problems outside of meetings / assigned tasks, e.g., lead informal meetings to resolve team issues
<b>Reliability</b>	Work is usually incomplete and/ or late	Deliver most assigned work products on time and address assigned scope adequately in most cases	Deliver all assigned work products on time and consistently address assigned scope fully and appropriately	Consistently complete assignments early and/or often address additional scope beyond assigned	... and, in so doing, add value beyond assignment
<b>Initiative and Sense of Responsibility</b>	Wait until due date to bring up issues with assignment; are often not prepared for meetings	Reach out to other team members at last minute so there is not enough time to fix before due date; sometimes are not prepared for meetings	Verify scope of assigned work; when having difficulty with assigned work, is proactive to reach out to other team members with sufficient time to receive help; usually are prepared	Sought feedback on progress periodically throughout assignment to ensure that he/she was on target and is always prepared	Consistently take initiative to resolve issues through consultation with others, keeping everyone in the loop
<b>Work quality</b>	Work frequently contains mistakes, or is poorly communicated or without supporting backup evidence	Assign work is largely error free, but not always well communicated or with weak supporting rationale and backup	Assigned work is largely error free, clearly communicated verbally and graphically with adequate supporting backup materials	Work consistently error-free, well communicated verbally and graphically, with strong backup materials	... plus evidence of significant ingenuity or creativity or insight for the benefit of the team
<b>Overall contribution to project success</b>	Have almost no contribution	Have little contribution	Have some contribution	Have more contribution	Have significant contribution

Please evaluate each team members including yourself according to the five criteria as shown above. Your own performance evaluation is for reference only. Please refer to the rubrics for description. While using the individual rubrics are optional, you must enter the **total score** in the space below using the following ranges to reflect the overall performance: 96-100 (exceptional team player or leader); 90-95 (very good team player); 80-89 (good team player); 70-79 (acceptable team player); 69 or below (weak and not effective team player).

Name of Student	Participation	Reliability	Initiative	Work Quality	Contribution	Total Score

## APPENDIX 2 ASSESSMENT RUBRICS FOR PROJECT REPORT

*Evaluation criteria (20 points each for each criterion for a total of 100 points)*

<b>Scoring rubrics</b>	<b>Well exceed expectation (19-20)</b>	<b>Exceed expectation (17-18)</b>	<b>Meet expectation (12-16)</b>	<b>Below expectation (0-11)</b>	<b>Score</b>
<b>Identification of the main issues and/or problems</b>	Identify and understand completely all the main issues and problems	Identify and understand most of the main issues and problems	Identify and understand some of the main issues and problems	Identify and understand only few of the main issues and problems	
<b>Quality of questions and research</b>	Ask extremely clear, concise, and relevant questions and perform extensive research on the main issues	Ask very clear, concise, and relevant questions and perform good research on the main issues	Ask clear, concise, and relevant questions and perform just adequate research on the main issues	Fail to ask clear, concise, relevant questions and perform inadequate research on the main issues	
<b>Analysis of the issues</b>	Insightful and thorough analysis of all the issues	Thorough analysis of most of the issues	Superficial analysis of some of the issues	Incomplete analysis of the issues	
<b>Comments on effective solutions or business practices</b>	Well identified, reasoned and appropriate comments or proposal on solutions to all issues	Appropriate, well thought-out comments on solutions or proposal for solutions to most issues	Superficial and/or inappropriate solutions to some of the issues	Little or no action suggested, and/or inappropriate solutions to the issues	
<b>Use of language</b>	Free of any grammatical or spelling error; good choice of words	A few grammatical or spelling errors; should have better choice of words	Some grammatical or spelling errors	Lots of grammatical or spelling errors	
<b>Total:</b> Use the following ranges to reflect the overall performance. 96-100 (exceptional report writing and extremely effective); 90-95 (very good report writing and very effective); 80-89 (good and effective); 70-79 (acceptable and somewhat effective); 69 or below (weak and not effective).					



### APPENDIX 3 ASSESSMENT RUBRICS FOR PRESENTATION

*Evaluation criteria (max 20 points each criterion for a total of 100 points)*

<b>Subject matter:</b> Interesting, relevant topic; well researched materials; clear purpose with a thoughtful conclusion	
<b>Contents:</b> Main points are well organized/developed; informative and accurate content; have a clear focus; clear introduction and conclusions; insightful/practical implications	
<b>Visual effects:</b> Visual aids / slides are creative; clear and easy to read and understand; enhance the effectiveness of the presentation; free of obvious misspellings or typos	
<b>Presentation skills:</b> Professional; comfortable and confident; good verbal and non-verbal communication; flow and pace is consistently appropriate; good command of language; appropriate voice volume and tone	
<b>Audience control:</b> Maintain good eye contact; enthusiastic; use the unexpected to full advantage; hold the audience's attention throughout; finish within the allotted time	
<b>Total:</b> Use the following ranges to reflect the overall performance. 96-100 (exceptional presentation and extremely effective); 90-95 (very good presentation and very effective); 80-89 (good and effective); 70-79 (acceptable and somewhat effective); 69 or below (weak and not effective).	

#### Assessment rubric

	Exemplary	Above expectation	Meet expectation	Below expectation	Not acceptable
<b>Points</b>	19-20	17-18	15-16	13-14	0-12

#### Adjustment for individual student's presentation performance

Student	Performance / Comments