



香港城市大學  
City University of Hong Kong

## Enriching Inquisitive and Problem-oriented Thinking and Learning on Chemistry Laboratory Course

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**Principal Investigator:** Dr. Zonglong ZHU

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### **Abstract:**

Laboratory course is to teach hand skills and to illustrate theory and concepts from lecture course, and widely accept as essential components for training chemists or experiments scientists. However, the conventional style of laboratory instruction is the explanatory pattern that instructor usually uses textbook or lecture notes and little emphasis on thinking and learning. In this proposal, we plan to modify the conventional expository inorganic chemistry laboratory to accommodate an inquisitive and problem-oriented learning-based component. Firstly, the instructor will raise significant questions or problems and inspire them how to further investigate them through recognizing related publications. Then students will be divided into small groups and together propose a research objective and outline the strategy for each project under the instructor and teaching assistants help. Each group independently performs their laboratory work, analyses and discusses experimental results, solves the problems and difficulties. Through the performance of the project experiments, the laboratory skills will be well trained, and the students would gain confidence and be dedicated, patient, and enthusiastic either to enter graduate school or to move on to industry career in the future.