Annex A

TEMPLATE FOR NEW COURSE CONTENT

New Course Code and Title	**MS6001 Materials Evolution and Innovation**
Details of Course	**Summary of course content** *(please note that this information provided will also be uploaded to the web for viewing at large)* This course will be presented by a series of topics (case studies) from the materials used in habitat, energy generation, storage, saving, information communication, food and water and entertainment. With adequate technical background is provided to understand the subject matter, emphasis will be laid on the innovations in materials and process technologies. At the end of the course, student will develop a better understanding of how materials advances have drastically changed our way of life and how to design new generation of materials to suit the high speed society development.
	Rationale for introducing this course This course aims to motivate students to be creative and original to generate new strategist for materials design by understanding the materials evolution in the human civilization. By explaining the importance of materials and how their development is intimately linked to human civilization, students could elaborate the evolution of material usage in major areas of human progress. Key materials will be understood with sufficient technical details and the students will be able to state and evaluate how material properties shape our accepted outlook of our environment and relate the key material advances needed to maintain the current rate of societal progress.
	Aims and objectives The main objective of the course is to assist students learn from the wisdom of nature and be able to propose design strategies for emerging new materials. Students will start to appreciate the significance of materials on human civilization. It will be presented by a series of topics from the materials harnessed by human being since the beginning of the civilization to the new materials that are needed for a sustainable growth in the future. The impacts brought by innovations in materials and materials technologies will be explained with focus on the technical details. At the end of the course, you will develop a better understanding of how materials advances have drastically changed our way of life and how you can generate new ideas for the materials design strategies to address some increasingly serious issues in renewable energy, clean water and environment.

	Syllabus **Module 1： Materials in Energy** Fossil fuels and the chemistry of electrical energy generation, wind, Nuclear and solar power, superconductor, battery materials **Module 2: Materials in Information and Entertainment** Principals in communications. Paper, Copper wire, optical fiber. Materials innovation in modern communications. Material advances in sound image, and video capture, recording, storage, and projection. Future materials in data storage. **Module 3: Materials in livelihood neccessities** The evolution of water treatment materials. Modern desalination plants and material technology. Materials innovation in food packaging and vertical farming. Building materials requirement Visibility, thermal comfort, habitat. Building materials from wood to concrete, glass and steel. Energy saving, conservation and generation in buildings
Assessment Please specify if components are individually assessed or group assessed	*Final Examination* *Individual* *40%* *Interactive questions* *Individual* *10%* *Presentation* *Individual* *25%* *Term Paper* *Individual* *25%*
	Total: 100 %
Hours of Contact/Academic Units	*39 hours / 3 AU*
Proposed Date of Offer	*Semester 1, AY2021-22*
Instructor and Co-instructor (if any)	Long Yi
Class size	50
Any duplication of course School is advised to coordinate/check with the School offering the course to avoid duplication.	Nil