SEMESTER I
LSM3246 SYNTHETIC BIOLOGY

Prerequisite: LSM2211 Metabolism and Regulation OR LSM2232 Molecular Biology OR LSM2233 Cell Biology
Workload: 38 lecture hours + 8 tutorial hours.
The ability to rationally engineer living cells has been a long anticipated goal dating back for more than half a century. With the advent of DNA synthesis and genome engineering tools, biological systems can now be systematically designed for a myriad of industrial applications including disease prevention, biochemicals production and drug development. This module aims to provide basic principles to the engineering of biology with emphasis on the design and construction of synthetic gene circuits in living cells. The module also discusses current and emerging applications driven by synthetic biology, and the socio-ethical responsibilities that are required of synthetic biologists.

S/N	Topics	Lecture hours
1	Introduction to Synthetic Biology	2 A/P Matthew Chang
2	Principles of Synthetic Biology: Biological, Engineering and Design	6 A/P Matthew Chang
3	Principles and Applications of Synthetic Enzymology	6 A/P Yew Wen Shan
4	Systems and Synthetic Biology	4 A/P Sanjay Swarup
5	Computational Modelling for Synthetic Biology	2 A/P Poh Chueh Loo
6	Computational Genome Analysis for Synthetic Biology	2 Dr. Lee Dong-Yup
7	Synthetic Microbial Cell Factories and the Industrialization of Synthetic Biology	4 Dr. Choi Won Jae
8	Bioprocess Engineering for Synthetic Biology	4 A/P Susanna Leong
9	Current Applications of Synthetic Biology	4 Dr. Ling Hua
10	Current Issues and Future Direction of Synthetic Biology	4 A/P Matthew Chang
	Total lectures : **Tutorials :**	**38 h** **8 h**
	Total hours:	**46 h**

TEXT BOOK (Reference books):
1. Synthetic Biology: A Primer / Paul Freemont and Richard Kitney (Editors) / Paperback Edition.
2. Synthetic Biology, Tools and Applications/ Huimin Zhao (Editor) / Paperback Edition.
3. Fundamentals of Systems Biology: From Synthetic Circuits to Whole-cell Models / Markus W. Covert / Paperback Edition.

MODE OF ASSESSMENT:
Continual assessments and Final Examination

MODULE CO-ORDINATOR:

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LECTURERS:

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