

## SEMESTER I & II

### LSM3247 PRACTICAL SYNTHETIC BIOLOGY

**Prerequisite:** LSM2191 Laboratory Techniques in Life Sciences or LSM3246 Synthetic Biology

**Workload: 30 Practical Hours + 10 lecture hours + 10 tutorial hours.**

Synthetic biology is the science of engineering biology, and is very much an experimental science. Building on the basic principles of synthetic biology introduced in the theoretical module LSM3246, this module aims to emphasize on the experimental techniques required for the design and construction of synthetic metabolic pathways and genetic circuits in living cells. The module also introduces advanced experimental protocols including CRISPR-Cas genome editing tools that are revolutionizing fields in life and biomedical sciences.

S/N	Topics	Lecture hours
1	Introduction to Practical Synthetic Biology	1 A/P Matthew Chang & A/P Yew Wen Shan
2	DNA Reading and Writing	1 Dr Maybelle Go
3	Standardisation in Synthetic Biology	1 A/P Matthew Chang & A/P Yew Wen Shan
4	Cell-Free Systems in Synthetic Biology	1 Dr Wen Ke Yan
5	Analytics in Synthetic Biology	1 A/P Matthew Chang & A/P Yew Wen Shan
6	High-throughput Genome Engineering in Synthetic Biology	1 Dr Samuel Lo
7	Genome Editing Tools in Synthetic Biology	1 Dr Ling Hua
8	Biosafety and Synthetic Biology	1 Dr Ling Hua
9	Industrial Applications of Synthetic Biology	1 A/P Matthew Chang & A/P Yew Wen Shan
10	Cell Factories in Synthetic Biology	1 Dr Choi Won Jae
<b>Total lectures :</b>		<b>10 h</b>
<b>Tutorials :</b>		<b>10 h</b>
<b>Practicals:</b>		<b>30 h</b>
<b>Total hours:</b>		<b>50 h</b>

#### TEXT BOOK (Reference books):

"Synthetic Biology". Karen Polizzi (Editor), Cleo Kontoravdi (Editor), Methods in Molecular Biology 2013.

"Synthetic Biology: A Primer", Paul Freemont and Richard Kitney (Editors), Imperial College Press, 2012

#### Supplementary reading:

"Molecular Cloning: A Laboratory Manual", 4th Ed. Michael Green (Editor), Joseph Sambrook (Editor), Cold Spring Harbor Laboratory Press, 2012.

#### MODE OF ASSESSMENT:

Laboratory Reports, Continual Assessments and Quizzes.

#### MODULE CO-ORDINATOR:

A/P Matthew Chang Wook

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#### LECTURERS:

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3. A/P Choi Won Jae (Tel: 67963808, Email: [choiwj@ices.a-star.edu.sg](mailto:choiwj@ices.a-star.edu.sg))
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