

Department of Biotechnology
Faculty of Science, Mahidol University
First Semester, Academic Year 2016
SCBT 401 Bioinformatics 3(2-3-5) credits

Lecture: Thursday 13.30-15.30 Room: P114

Course - coordinator: Assoc. Prof. Dr. Jarunya Narangajavana

LECTURE

Periods	Date	Lecture topics	Lecturer*
1	Thu, Aug 18	Course Introduction	JN
2	Thu, Aug 25	Lecture 1: Introduction to Bioinformatics Lab 1: Overview of Tools in Bioinformatics	TS/SK JN/SU*
3	Thu, Sep 1	Lecture 3: Molecular Technology II (Gene Expression and Function)	AR
4	Thu, Sep 8	Lecture 5: Bacterial Genome Database and its applications	AR
5	Thu, Sep 15	No class -- พิธีไหว้ครู	-
6	Thu, Sep 22	Lecture 7: Systems Biology for Biotechnologists	VC
7	Thu, Sep 29	Lecture 8: Molecular Technology IV (Application of Yeast Genome Database)	CB
8	Thu, Oct 6	Lecture 9: Molecular Technology V (Plant Molecular Biology & Bioinformatics)	JN
9	Thu, Oct 13	Midterm Examination (Lecture & Lab: TS/SK/NPt/AR/VC/CB/JN)	JN
10	Thu, Oct 20	Lecture 10: Molecular Technology VI (Application of Insect Genome Database)	NA
11	Thu, Oct 27	Lecture 12: Molecular Medicine - Homology based modeling	PO
12	Thu, Nov 3	Lecture 13: Phylogenetics	NO
13	Thu, Nov 10	Lecture 14: Protein analysis techniques	PS
14	Thu, Nov 17	Lecture 16: Functional Genomics and Genome Analyses	VC
15	Thu, Nov 24	Lecture 18 : Proteomics	KY
16	Thu, Dec 1	Lecture 19: Structural Bioinformatics & Drug Discovery	DT
17	Thu, Dec 8	Final examination (Lecture & Lab: NA/AR/PO/NO/ PS/OR/KY/VC/DT)	JN

* Lecture: Mr. Suang Udomvoraphant assists in preparing lecture room

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Lab: Friday 13.30-16.30 Room: P114

Course - coordinator: Assoc. Prof. Dr. Jarunya Narangajavana

LABORATORY

Periods	Date	Lab topics	Lecturer*
1	Fri, Aug 19	<i>Self study - Assignment</i>	-
2	Fri, Aug 26	Lecture 2: Molecular Technology I (Genetic analysis tools for newbie)	NPt
3	Fri, Sep 2	Lecture 4: System Biology I Lab 2: System Biology I	TS/SK JN/SU*
4	Fri, Sep 9	Lecture 6: System Biology II Lab 3: System Biology II	TS/SK JN/SU*
5	Fri, Sep 16	Lab 4: Useful Open-source for Bioinformatics	AR /TA* JN/SU*
6	Fri, Sep 23	Lab 5: Systems Biology for Biotechnologists	VC JN/SU*
7	Fri, Sep 30	Lab 6: Application of Yeast Genome Database	CB/NP JN/SU*
8	Fri, Oct 7	Lab 7: Plant Genome Database / Plant gene promoter & transcription factors analysis	JN SU*
9	Fri, Oct 14	<i>Free for midterm exam week</i>	-
10	Fri, Oct 21	Lecture 11: Genome technologies and next generation sequencing (laboratory visiting)	AR
11	Fri, Oct 28	Lab 8: Molecular Medicine - Homology based modeling	PO JN/SU*
12	Fri, Nov 4	Lab 9: Phylogenetics	NO JN/SU*
13	Fri, Nov 11	Lecture 15: Protein identification and prediction	OR
14	Fri, Nov 18	Lecture 17: Microbiome and Metagenomics	VC
15	Fri, Nov 25	Lab 10: Proteomics	KY JN/SU*
16	Fri, Dec 2	Lab 11: Structural Database	DT JN/SU*
17	Fri, Dec 9	<i>Free for final exam week</i>	-

TA: Dr. Adisak Romsang's team

* Lab: Mr. Suang Udomvoraphant assists in preparing laboratory class

Lecturers/Instructors:

Name	Office	Tel No.	email
AR - Dr. Adisak Romsang	K-610	02-201-5962	adisak.rom@mahidol.ac.th
CB - Dr. Chuenchit Boonchird	BT-111	02-201-5304	chuenchit.boo@mahidol.ac.th
DT – Dr. Duangrudee Tanramluk (สถาบันชีววิทยาศาสตร์โมเลกุล) โทร. 02-441-9003 ต่อ 1211			duangrudee.tan@mahidol.ac.th
JN - Dr. Jarunya Narangajavana	BT-209	02-201-5309	jarunya.nar@mahidol.ac.th
KY- Dr. Kittisak Yokthongwattana	B-317	02-201-5462	kittisak.yok@mahidol.ac.th
NA - Dr. Nidchaya Aketarawong (Room. R3/3, Salaya Campus) โทร. 02-441-9820 Ext 1130			nidchaya.akt@mahidol.ac.th
NO - Dr.Nuttaphon Onparn (ภาควิชาชีววิทยา)	B-408	02-201-5478	nuttaphon.onp@mahidol.ac.th
NP - Dr. Napassorn Punyasuk	BT-203	02-201-5313	napassorn.pun@mahidol.ac.th
NPt - Dr. Nisa Patikarnmonthon	BT-207	02-201-5317	nisa.pat@mahidol.ac.th
OR – Dr. Onrapak Reamtong (ภาควิชาชีวโมเลกุลและพันธุศาสตร์โรคเขตร้อน คณะเวชศาสตร์เขตร้อน)			onrapak.rea@mahidol.ac.th
PO – Dr. Puey Ounjai (ภาควิชาชีววิทยา)	B408	02-201-5478.	puey.oun@mahidol.ac.th
PS - Dr. PUNCHAPAT Sojikul	BT-206	02-201-5316	punchapat.soj@mahidol.ac.th
SK - Dr. Saowaluk Kalapannulak (หลักสูตรชีวสารสนเทศและชีววิทยาระบบ คณะทรัพยากรชีวภาพและเทคโนโลยี มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี) โทร. 02-470-7713			saowalak.kal@kmutt.ac.th
SU - Mr. Suang Udomvoraphant (งานสารสนเทศ)	P-110	02- 201-5727	suang.udo@mahidol.ac.th
TS- Dr. Treenut Saithong (หลักสูตรชีวสารสนเทศและชีววิทยาระบบ คณะทรัพยากรชีวภาพและเทคโนโลยี มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี) โทร. 02-470-7714			treenut.sai@kmutt.ac.th
VC – Dr. Varodom Charoensawan (ภาควิชาชีวเคมี) โทร. 02-201-5454			varodom.cha@mahidol.ac.th varodomc@gmail.com

Midterm Examination Thu, Oct 13 please send exam questions by Oct 7, 2016. (total 130 points)

TS/SK = 30, NPt = 10, AR = 30, VC = 20, CB = 20, JN = 20

Final examination Thu, Dec 8: please send exam questions by Dec 2, 2016. (total 140 points)

NA = 10, AR = 10, PO = 20, NO = 20, PS = 10, OR = 10, KY = 20, VC = 20, DT = 20

Assignment: depend on lecturer, please inform JN (10 points, each) (total 30 points)

Course Assessment and Grading: Student attendance should be not less than 80% of the overall, otherwise students can not take the final exam or pass the course.

Students will be evaluated based on these following criteria:

1. Two examinations (Lecture & Lab)	85 %	(270 points)
2. Assignments	10 %	(30 points)
3. Class attention and participation	<u>5 %</u>	(20 points)
	<u>100 %</u>	(320 points)

Grading will depend on group's performance

A = ≥ 80 %	B ⁺ = 75-79 %	B = 65-74 %	
C ⁺ = 60-64 %	C = 55-59 %	D ⁺ = 50-54 %	F = < 50 %

References:

1. Arthur M. Lesk. Introduction to Bioinformatics. Oxford University Press, 2002, 283 pp.
2. Choudhuri S. Bioinformatics for beginners: Gene, Genome, Molecular Evolution, Databases, and Analytical tools. Elsevier Inc, 2014, 225 pp.
3. David W. Mount. Bioinformatics: Sequence and Genome Analysis, 2nd ed. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2004, 692 pp.
4. Hodgman TC, French A, and Westhead DR. Bioinformatics. Taylor & Francis Group, 2010, 340 pp.
5. Madden T. (2003) The NCBI Handbook [Internet] Chapter 16 The BLAST Sequence Analysis Tool, Available at:<http://www.ncbi.nlm.nih.gov/books/NBK21097/> (Accessed: 2nd July 2015).
6. Morgan XC, Huttenhower C (2012) Chapter 12: Human Microbiome Analysis. PLoS Comput Biol 8(12): e1002808. doi:10.1371/journal.pcbi.1002808
7. NCBI Resource Coordinators. (2015) Database resources of the National Center for Biotechnology Information. Nucleic Acids Res. (Database issue):D6-17. doi: 10.1093/nar/gku1130. Epub 2014 Nov 14.
8. Xiong J. Essential Bioinformatics. Cambridge University Press, 2006, 339 pp.
9. Xu Z, Hansen MA, Hansen LH, Jacquiod S, Sørensen SJ (2014) Bioinformatic Approaches Reveal Metagenomic Characterization of Soil Microbial Community. PLoS ONE 9(4): e93445. doi:10.1371/journal.pone. 0093445
10. Zvelebil, M. & Baum, J.O. Understanding Bioinformatics. (2007)