

Course orientation

MD627710 Bioinformatics and Big Data Analysis

ชีวสารสนเทศศาสตร์และการวิเคราะห์ข้อมูลขนาดใหญ่

2 credits (1-3-4)

**Department of Microbiology,
Faculty of Medicine,
Khon Kaen University**

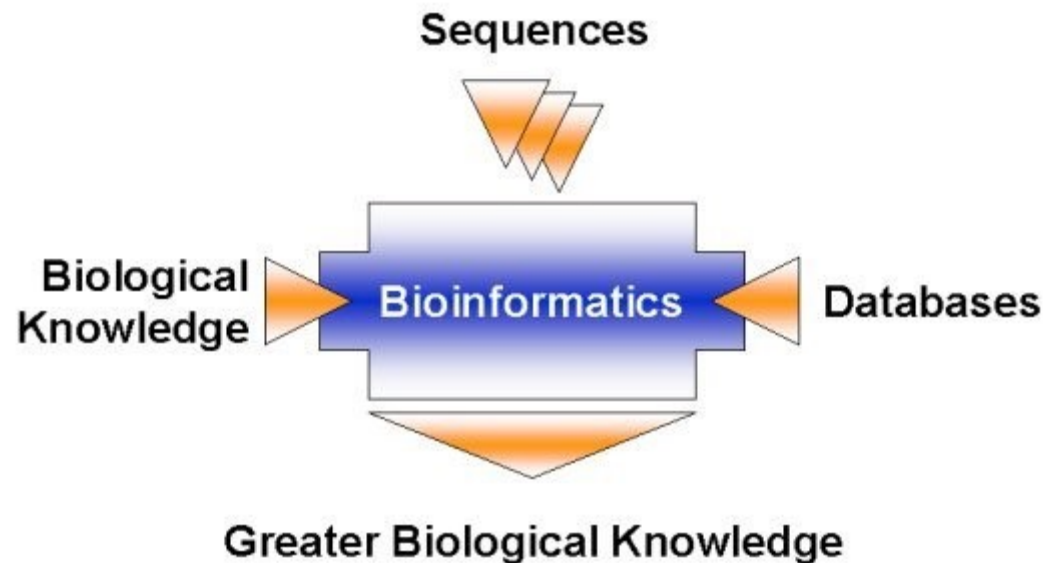


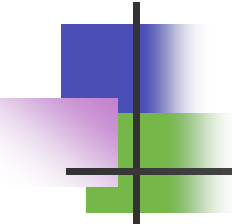
binf123

NUCLEIC ACID SEQUENCE

What is Bioinformatics?

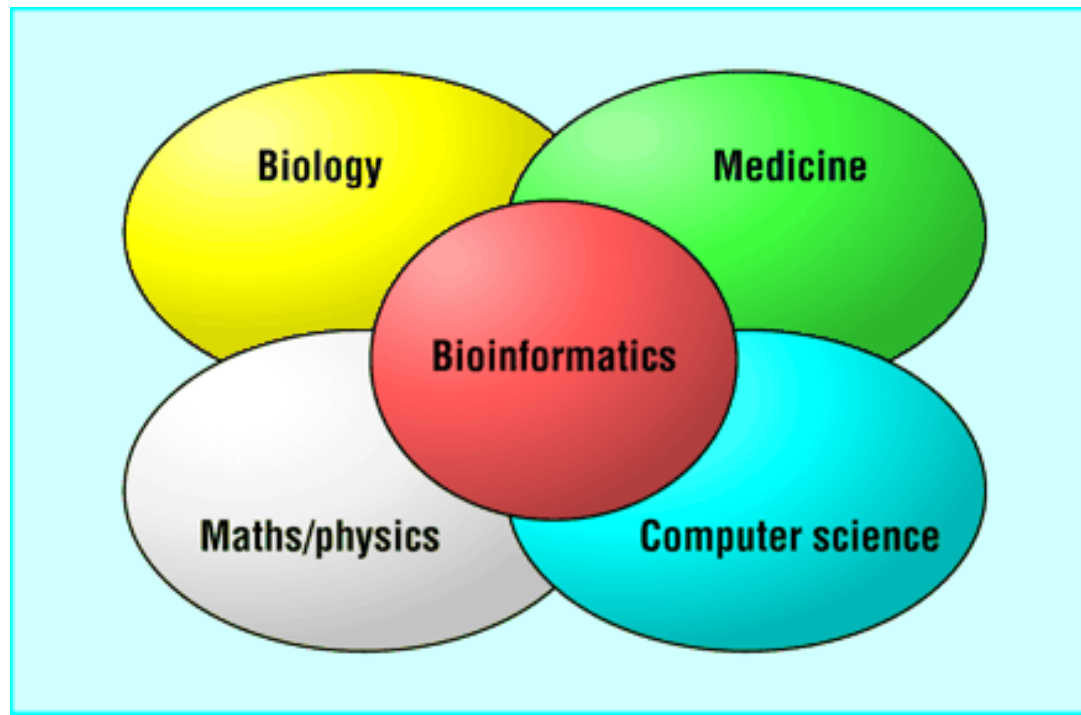
Information (computers) technology as applied to the life sciences, used for the collection, storage, retrieval and analyze of biological data and assist in understanding biological information





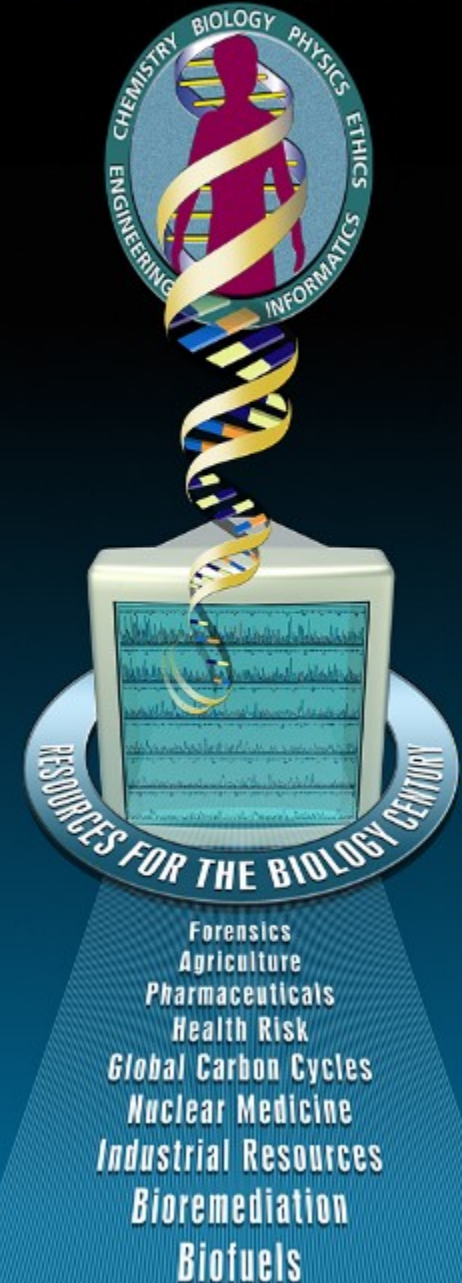
Bioinformatics is a multidisciplinary field

require in-depth knowledge of algorithms, statistics, data mining, molecular biology, and software programming.



Application of Bioinformatics

- basic biological process in the living things
- New information gained from database
- malfunction to cause diseases.
- Medicine, biotechnology, agriculture
- improved drug design and development process.

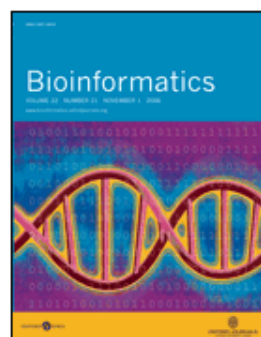


Bioinformatics

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Articles

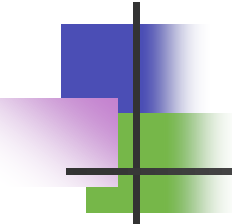
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Scope

BMC Bioinformatics is an open access, peer-reviewed journal that considers articles on all aspects of the development, testing and novel application of computational and statistical methods for the modeling and analysis of all kinds of biological data, as well as other areas of computational biology.

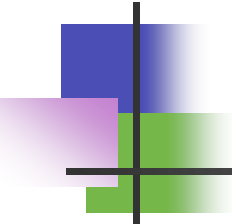
It is journal policy to publish work deemed by peer reviewers to be a coherent and sound addition to scientific knowledge and to put less emphasis on interest levels, provided that the research constitutes a useful contribution to the field.

Call for papers



Course Description

- Human genome project and bioinformatics in post genomic era,
- nucleic acid and protein databases, searching and retrieval of data from various public databases,
- analysis of DNA and amino acid sequence data,
- analysis of the structure and function of genes and proteins,
- microarray data analysis,
- phylogenetic analysis, and
- Pharmacogenome,
- System biology
- Genome-wide association study
- Next Gen. Sequencing data analysis
- RNA seq. analysis
- Proteom
- Microbiom
- Denovo DNA seq. assembly

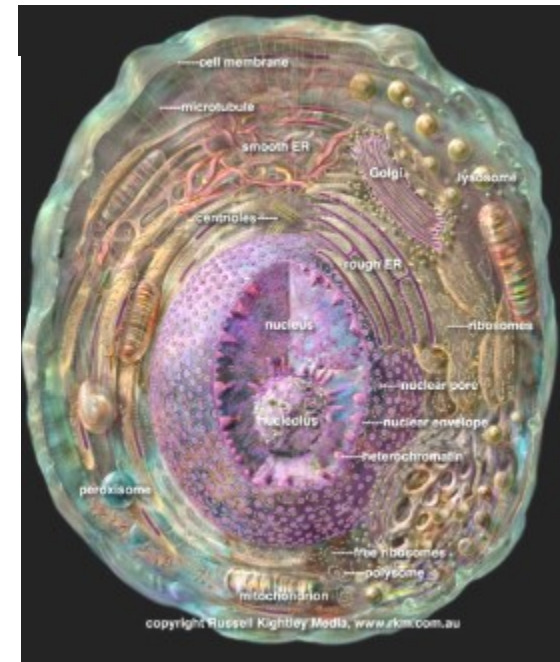
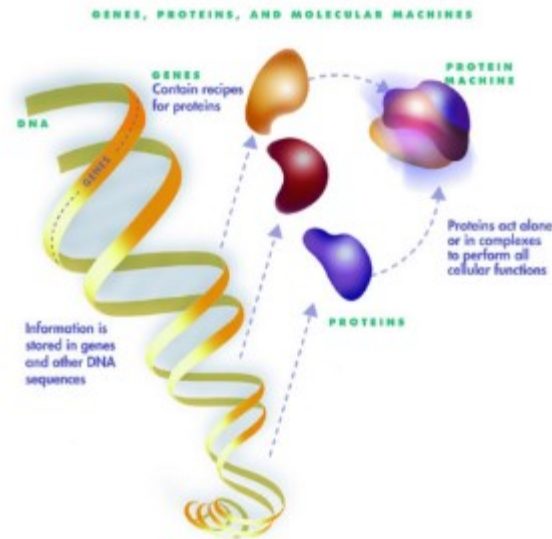


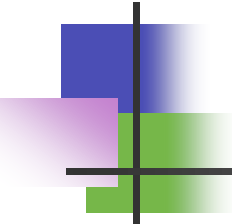
Course objectives

1. To provide an opportunity in **self education** utilizing WWW resources so as to assist students in **understanding the principles** and **concept** of *Bioinformatics*.
2. **To apply** knowledge of *Bioinformatics* (information and automation) to various research problems e.g., gene analysis etc.

Prerequisites

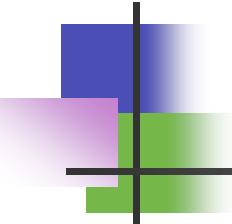
- students should be able to use **Internet** and
- pass at least one course in biological sciences e.g., cell biology or cell and **molecular biology** or biochemistry or biological sciences.





Course format-1

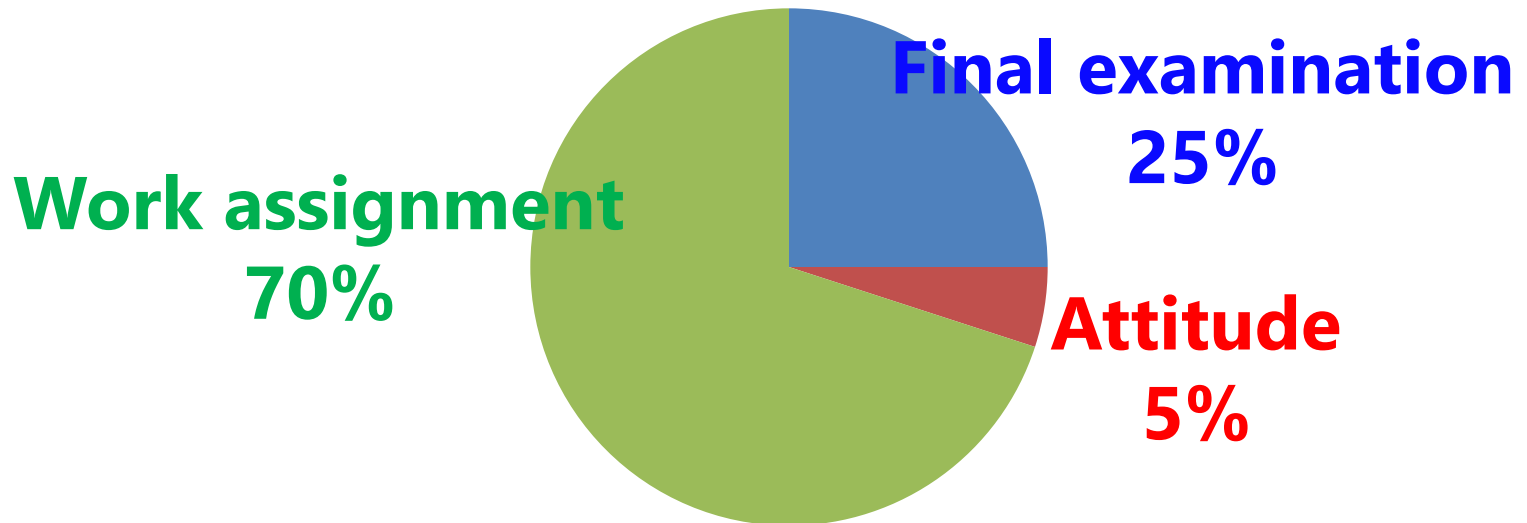
- The lectures with some hand-on practice for 1+3 hour/week, 15 weeks, **as an overview.**
- Every Wednesday from 13.00-17.00 p.m.
- In addition, the students have to study by themselves.
- Students have to do work assignments by yourself
- Communication will be made through E-mail, phone, website
- **Students must attend the classes at least 80% of the lectures.**
- No lecture sheet available, download form e-learning
- Practice part, personal Notebook computers are essential tools.

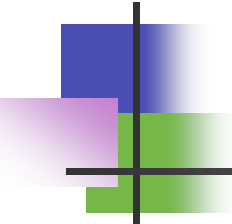


Course format-2

Only the students who take credit on this course will

- Paper final examination some subjects: 25 %
- Carry out the work assignment: 70 %
- Attitude 5 %

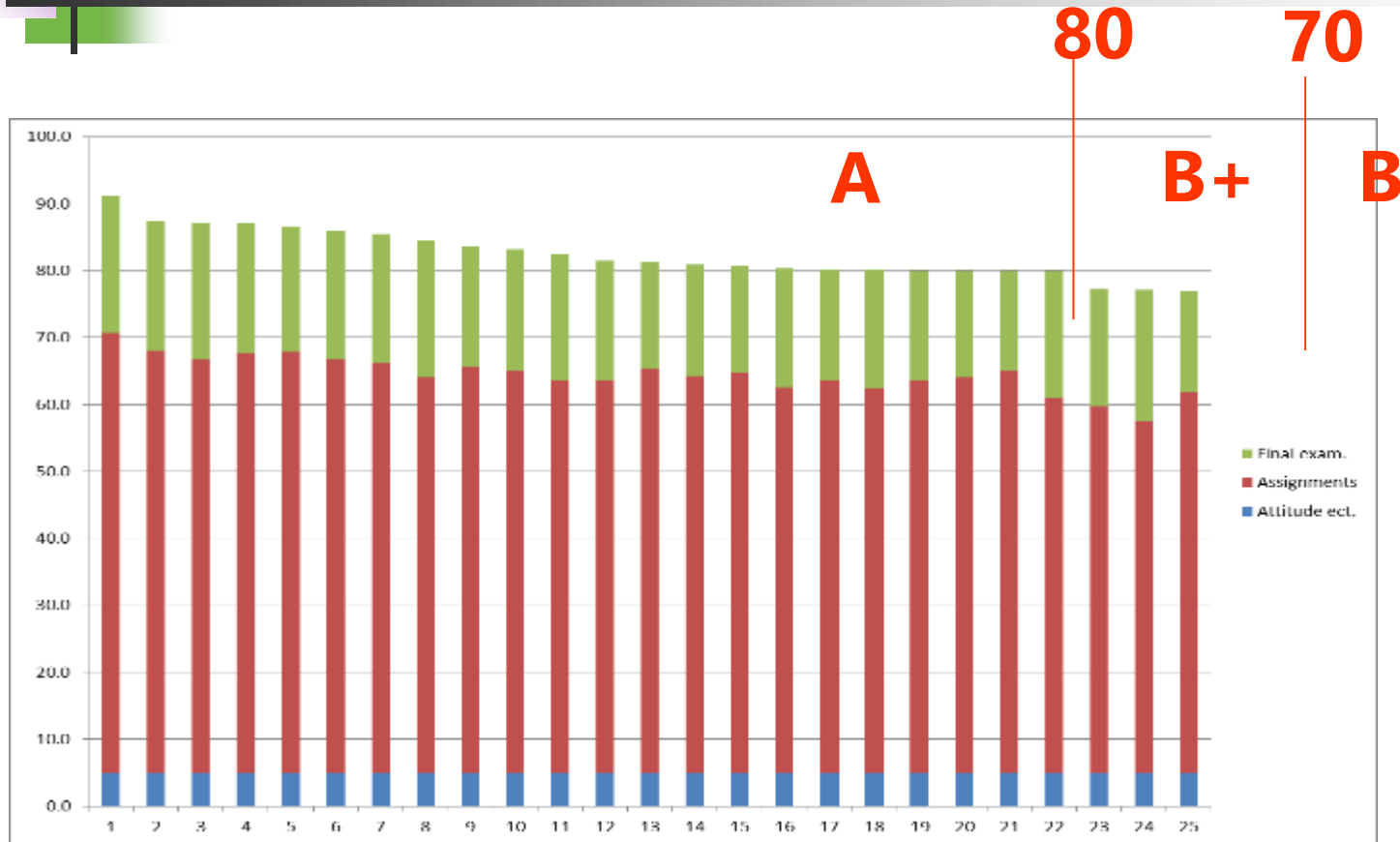




Assignments

- Base on previous semester, 7 assignments
 1. SW: DNA & aa sequence analysis
 2. WN: primer design
 3. WN: free software in bioinformatics
 4. SC: Structural genomic
 5. KF: phylogenetic. NGS analysis
 6. KF: NGS analysis
- Be honest, do not copy and paste

Grading in Second semester, 2006



80-100 % = A,

70 – 79 % = B+,

60 – 69% = B,

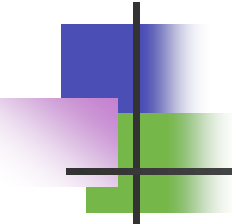
57.5 – 59 % = C+

55-57% = c,

52.5-54.5% = D+,

50-52% = D,

0-49% = F

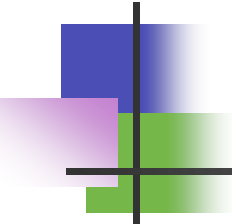


Duration and schedule

- The course is arranged as a provided schedule.
- Lecture and Lab are on Wednesday, 13.00-17.00
- Please take your **notebook computer** to laboratory hour
- Venue:
 - #Post Grad lecture room, 2th floor, Building #3, Faculty of Medicine

MD 627 710 Bioinformatics, 2 credits (1-3-4), Second semester, 2022 (2565)

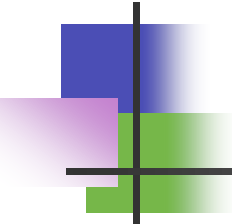
WK	Date	Time	No.	Topics	Lecturers	Hr
1	30 Nov 22	13.00-13.30	Orientat	Course orientation	Wises	1
		13.30-14.30	Binf 1	Data retrieval from public database	Sakawrat	1
		14.30-17.00	Lab 1	Searching and retrieval of biological data	Sakawrat	3
2	7-Dec-22	1300-1400	Binf 2	Primers and probes design	Wises	1
		15.00-17.00	Lab 2	PCR primer and probe design	WN	3
3	14-Dec-22	14.00-15.00	Binf 3	Bioinformatics in Post-Genomics Era	Viraphong	1
		13.00-15.00	Binf 4	Functional genomics	Viraphong	1
4	21-Dec-22	13.00-14.00	Binf 5	Analysis of DNA-Protein sequences	Surasak	1
		14.00-17.00	Lab 3	Analysis of DNA & protein sequences	Surasak	3
5	28-Dec-22	13.00-14.00	Binf 6	Free software in bioinformatics	Wises	1
		15.00-17.00	Lab 4	Free software available in internet	Wises	3
6	4-Jan-23	13.00-14.00	Binf 7	Structural genomics	Sorujisiri	1
		14.00-17.00	Lab 5	Practice in Structural genomics	Sorujisiri	3
7	11-Jan-23	13.00-14.00	Binf 8	Phylogenetic analysis	Kiatchai	1
		14.00-17.00	Lab 6	Practice in Phylogenetic analysis	Kiatchai	3
8	18-Jan-23	13.00-14.00	Binf 9	whole genome analysis analysis I	Kiatchai	1
		14.00-17.00	Lab 7	Practice in whole genome analysis I	Kiatchai	3
9	25-Jan-23	13.00-14.00	Binf 10	whole genome analysis analysis II	Kiatchai	1
		14.00-17.00	Lab 8	Practice in whole genome analysis II	Kiatchai	3
10	1-Feb-23	13.00-14.00	Binf 11	RNA sequencing analysis	A.Arpon	1
		14.00-17.00	Lab 9	Practice in RNA sequencing analysis	A.Arpon	3
11	8-Feb-23	13.00-15.00	Binf 12	Microarrays Analysis	Yaovalux	2
		15.00-17.00				
12	15-Feb-23	13.00-15.00	Binf 13	Genome-wide-associate study	Umaporn	2
13	22-Feb-23	13.00-14.00	Binf 14	Microbiome analysis	Attawit	1
		14.00-17.00	Lab 11	Practice in Microbiome analysis	Attawit/team	3
14	1-Mar-23	13.00-15.00	Binf 15	Pharmacogenomics	Wichitra	2
		15.00-17.00				
15	8-Mar-23	13.00-14.00	Binf 16	proteomic analysis	Marut	1
		14.00-17.00	Lab 10	Practice in proteomic analysis	Marut/Ple	3
16	15-Mar-23	13.00-15.00	Binf 17	System biology	Wises	2
		15.00-17.00				
17	22-Mar-23	13.00-15.30	Exam	Final examination	Wises	2.5
Lecture and final examination room is at Post Grad Lecture room, 2th floor อาคารเรียน					Lecture	18
WN=Wises, KS=Kittipan, KF= Kiatchai, SK=Sakaorat, UY=Umaporn,					Lab	36
SC=Sorujisiri, ST=Supranee, KaS=Kanin, SA=Sirinart, CP=Chonlatip, ML=Marut,					Orientation	1
WP=Wisitsak					Total class hr.	55.5



List of instructors

- Viraphong Lulitanond, Ph.D.,
- Surasakdi Wongratanacheewin, Ph.D.,
- Soruksiri Chareonsudjai, Ph.D.,
- Wiset Namwat, Ph.D.,
- Wichitra Tassaneeyakul, Ph.D.,
- Yaowaluk Chamkramol, Ph.D.
- Kiaticchai Faksri, Ph.D.,
- Umaporn Yordpratum, Ph.D.,
- Sakawrat Khanthawong, Ph.D.





Further contact

- Dr. Wises Namwat (wisnam@kku.ac.th), 089-688-5321
Department of Microbiology, Faculty of Medicine,
Khon Kaen University 40002.
- Tel. & Fax. 0-4336-3808
- Internal line of KKU: 63808

Students are asked to prepare and check an audio-visual system in lecture room before 13.00 p.m.

**Have a nice journey on
Bioinformatics Study**

