Course Syllabus

1. Program of Study Bachelor of Science (Biological Sciences)
Faculty/Institute/College Mahidol University International College

2. Course Code ICBI 406
Course Title Ergonomics

3. Number of Credits 2 (2-0-4) (Lecture/Lab/self-study)

4. Prerequisite *(s)* none

5. Type of Course Elective

6. Trimester/ Academic Year
1st or 2nd trimester/ every academic year

7. Course Condition
Number of students is 20-30.

8. Course Description
Physiological and psychological aspects in the workplace emphasizing the interfacing of man, machine and environment; work station design; work posture; manual materials handling; work-rest cycle, and seating.

9. Course Objective *(s)*
This course is intended to provide the basic knowledge for the students by selection only the essential topics presented in the course. These topic are arranged from simple to the complex interaction between human and work environment. This subject is aimed:
1. To provide the students with the fundamental models of the interaction between human and machine in the work environment.
2. To create ideas and concepts of how to design the appropriate equipment in different workplace.
3. To assist the students to develop the capacity to apply the new knowledge of human facters and limitations with work environment to achieve the optimal health and productivity.

10. Course Outline

week	Topics/Seminar	Hours			Instructor
		Lecture	Lab	Self-study	
1	Introduction to Ergonomics	2	0	4	Dr. Rungchai
2	Musculo-skeletal systems and human locomotion	2	0	4	Dr. Rungchai
3	Neural control of human movement	2	0	4	Dr. Thyon
4	Basic anthropometry, measurements, body fat, body surface area, body segments, use of anthropometric data in design	2	0	4	Dr. Thyon
5	Energy and energy sources,	2	0	4	Dr. Rungchai

	categories of work, exercise physiology, Metabolism, physiological responses				
6	Mid-term examination	2	0	4	Staff
7	Heart and lung adaptations to physical workload	2	0	4	Dr. Rungchai
8	Biomechanical analysis of human motion, guidelines for hand-tool design, task, postures, safety guidelines for tool use, health risks in office	2	0	4	Dr. Wattana
9	Human Thermoregulatory Control I: Heat stress, heat tolerance, and indices.	2	0	4	Dr. Waree
10	Human Thermoregulatory Control II: Factors limiting heat exchange, physiological responses, heat disorders	2	0	4	Dr. Waree
11	Musculo-skeletal disordes: back and neck (detection, prevention and treatment)	2	0	4	Dr. Panya
Final Examintion					
	Total	22	0	44	

11. Teaching Method *(s)*

1. Lectures: There are 8 lectures which are conducted in English. Each staff member is responsible for particular area such as Anthropometry, Biomechanical basis of Ergonomics, Neuromuscular and Thermal Physiology, Risks and Trauma in Workplaces, and Work Tool Designs.
2. Demonstrations: Certain important topics will be demonstrated. Thus, the students have the opportunity to learn and understand fundamental facts and principles of the human and interrelationships among various factors.

12. Teaching Media

1. Powerpoint Presentations
2. Texts and teaching materials

13. Measurement and Evaluation of Student Achievement

Student achievement is measured and evaluated by

13.1 The ability to describe the fundamental models of the interaction between human and machine in the work environment.

13.2 The ability to create ideas and concepts of how to design the appropriate equipment in different workplace.

13.3 The ability to apply the new knowledge of human factors and limitations with work environment to achieve the optimal health and productivity.

Student's achievement will be graded according to the college and university standard using the symbols: A, B+, B, C+, C, D+, D and F. Minimal passing level is 60%. Student who earns 85% up will have Grade A, 80-84% Grade B+ , 75-79% Grade B, 70-74% Grade C+, 65-69% Grade C,

60-64% Grade D+, 55-59% D, less than 55 Grade F. Students must attend at least 80% of the total class hours of this course.

Ratio of mark	
1. Quizzes, assignments and student's performance	20%
2. Final examination	80%
Total	100%

14. Course evaluation

14.1 Students' achievement as indicated in number 13 above.

14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. Reference *(s)*

1. Tayyari, F. and Smith, J.L. (Editors). Occupational ergonomics: Principles and applications. USA. Springer. 1997.
2. Dul, J. and Weermeester, B. Ergonomics for the beginners: A quick reference guides. USA. Taylor & Francis Publishers, 1997.
3. Grandijean, E. Fitting the task to the man: A textbook of occupational ergonomics. USA. Taylor & Francis Publishers. 1991.
4. Astrand, P.O., Rodahl, K. Textbook of work physiology. USA. McGraw Hill. 1977.

16. Instructor *(s)*

Dr. Rungchai Chaunchaiyakul
Assoc. Prof. Dr. Thyon Chentanez
Asst. Prof. Dr. Panya Kaimuk
Asst. Prof. Dr. Wattana Jalayondecha
Dr. Waree Widjaja

17. Course Coordinator

Dr. Rungchai Chaunchaiyakul

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