

SYLLABUS

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|--|--|---|-------|----------|-------|------------|----------------|
| Classification | | Course No. | 24502 | Cr. Hrs. | 3:0:3 | Instructor | Lim, Choon Hak |
| Course Title | Korean | 생리학의 기초 | | | | | |
| | English | Fundamentals of Physiology | | | | | |
| Course Outline The beauty of Physiology is that it attempts to integrate the individual functions of all the body's different cells and organs into a total functional whole, the human or animal body. Physiologists call this high level of internal bodily control <i>homeostasis</i> . In disease conditions, more often than not the functional balances become seriously disturbed. One of the principal goals of this physiology lecture is to explain and emphasize the effectiveness and beauty of the body's homeostasis mechanisms, and the other goal is to encourage the students to feel that he/she can grasp and understand the whole subject and get the fundamental idea for their project in Bioengineering. | | | | | | | |
| Prerequisite | | Anatomy (Preferred) | | | | | |
| Textbook and References | | 1. Most course materials will be distributed to students 2. "Textbook of Medical Physiology" 11 th edition, Guyton AC, published by W.B. Saunders Company | | | | | |
| Grading | | Attendance (30%), Pop Quiz (20%), Final Exam (50%) | | | | | |
| Weekly Course Schedule | | | | | | | |
| Calendar | Description | | | | | Remarks | |
| 1st week | Introduction to Anatomy and Physiology | | | | | | |
| 2nd week | Cardiovascular physiology (I) | | | | | | |
| 3rd week | Cardiovascular physiology (II) | | | | | | |
| 4th week | Cardiovascular physiology (III) | | | | | | |
| 5th week | Respiratory physiology (I) | | | | | | |
| 6th week | Respiratory physiology (II) | | | | | | |
| 7th week | Respiratory physiology (III) | | | | | | |
| 8th week | Renal physiology (I) | | | | | | |
| 9th week | Renal physiology (II) | | | | | | |
| 10th week | Neurophysiology (I) | | | | | | |
| 11th week | Neurophysiology (II) | | | | | | |
| 12th week | Neurophysiology (III) | | | | | | |
| 13th week | Miscellaneous (I) | | | | | | |
| 14th week | Miscellaneous (II) | | | | | | |
| 15th week | Cardiopulmonary Resuscitation (CPR) | | | | | Experiment | |
| 16th week | Final Exam | | | | | | |

* If there will be experiments, mark it in the "Remarks".

Instructor Lim Choon Hak (seal)

Dept. Chair Lee Jong-hyun (seal)

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SYLLABUS

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|--|---|----------------------------------|-------|----------|-------|--|------------|
| Classification | Requirement | Course No. | 24503 | Cr. Hrs. | 1:0:1 | Instructor | Yang, Sung |
| Course Title | Korean | 콜로퀴움 I | | | | | |
| | English | Medical Engineering Colloquium I | | | | | |
| <u>Course Outline</u> Series of seminars by speakers from outside and within GIST on new and developing research areas in medical engineering, and presentations by registered students on their thesis research. <u>All students are required to attend; M.S. degree and PhD students must register at least once during their thesis research.</u> All students registered must present their research achievements at the end of semester according to the schedule designated at the beginning of the semester. The total presentation time for each presentation should be no longer than 15 min. including Q&A. | | | | | | | |
| Prerequisite | | None | | | | | |
| Textbook and References | | None | | | | | |
| Weekly Course Schedule | | | | | | | |
| Calendar | Description | | | | | Remarks | |
| 1st week | Seminar schedule will be regularly announced through a board in http://smse.gist.ac.kr . | | | | | All registered students are supposed to submit an abstract for their presentations 4 weeks in advance of their presentation day. | |
| 2nd week | | | | | | | |
| 3rd week | | | | | | | |
| 4th week | | | | | | | |
| 5th week | | | | | | | |
| 6th week | | | | | | | |
| 7th week | | | | | | | |
| 8th week | | | | | | | |
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| 10th week | | | | | | | |
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| 14th week | | | | | | | |
| 15th week | | | | | | | |
| 16th week | | | | | | | |

* If there will be experiments, mark it in the "Remarks".

Instructor Yang, Sung

Dept. Chair Lee Jong-hyun

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|--|---|-----------------------------------|-------|----------|-------|--|------------|
| Classification | Requirement | Course No. | 24504 | Cr. Hrs. | 1:0:1 | Instructor | Yang, Sung |
| Course Title | Korean | 콜로퀴움 II | | | | | |
| | English | Medical Engineering Colloquium II | | | | | |
| Course Outline Series of seminars by speakers from outside and within GIST on new and developing research areas in medical engineering, and presentations by registered students on their thesis research. <u>All students are required to attend; PhD students must register at least once during their thesis research.</u> All students registered must present their research achievements at the end of semester according to the schedule designated at the beginning of the semester. The total presentation time for each presentation should be no longer than 15 min. including Q&A. | | | | | | | |
| Prerequisite | | Medical Engineering Colloquium I | | | | | |
| Textbook and References | | None | | | | | |
| Weekly Course Schedule | | | | | | | |
| Calendar | Description | | | | | Remarks | |
| 1st week | Seminar schedule will be regularly announced through a board in http://smse.gist.ac.kr . | | | | | All registered students are supposed to submit an abstract for their presentations 4 weeks in advance of their presentation day. | |
| 2nd week | | | | | | | |
| 3rd week | | | | | | | |
| 4th week | | | | | | | |
| 5th week | | | | | | | |
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| 13th week | | | | | | | |
| 14th week | | | | | | | |
| 15th week | | | | | | | |
| 16th week | | | | | | | |

* If there will be experiments, mark it in the "Remarks".

Instructor Yang, Sung

Dept. Chair Lee Jong-hyun

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|---|--|--|-------|---------|-------|------------|------------|
| Classification | Optional | Course no. | 24601 | Cr. Hr. | 3:0:3 | Instructor | 양 성 |
| Course Title | Korean | 혈액흐름의 기초 | | | | | |
| | English | Fundamentals of Blood Flow | | | | | |
| Course Outlines In most clinical applications, it is crucial to understand blood as not only clinical subject but also engineering subject. Especially, to understand the behavior of blood flow within the body in both clinical and engineering point of views is a starting point for clinical diagnostics and therapeutics in many clinical problems. In this lecture, fundamentals of engineering mathematics will be covered as a basis of blood flow dynamics in first few weeks. Then, fundamental hemodynamics, which is the study of the deformation and flow of blood under the influence of an applied stress, is discussed as main topics throughout the semester. As following subjects, characteristic properties of macro/micro circulations will be also discussed. In addition, this lecture includes term project. Potential term project topics related with blood flow discussed in the lecture may include cardiovascular prosthetics, clinical devices, surgical applications and so on. | | | | | | | |
| Prerequisite | | Engineering Mathematics (Preferred) | | | | | |
| Textbook and References | | Text and Reference Books 1. Most course material will be distributed to students 2. Supplementary material will be also distributed when it is necessary. 3. "Transport Phenomena in Biological Systems", George A. Truskey, Fan Yuan, and David F. Katz, Pearson Prentice Hall Bioengineering, 2004 Grading Pop Quiz (20%), Attendance (10%), Final Exam (20%), Term Project (50%) | | | | | |
| Weekly Course Schedule | | | | | | | |
| Calendar | Description | | | | | | Remarks |
| 1st week | Review on Engineering Mathematics | | | | | | |
| 2nd week | Review on Engineering Mathematics | | | | | | |
| 3rd week | Review on Engineering Mathematics | | | | | | |
| 4th week | Review on Engineering Mathematics | | | | | | |
| 5th week | Biomedical applications of fluid mechanics | | | | | | |
| 6th week | Introduction to the CVS/ Equations of Motion | | | | | | |
| 7th week | Steady Flow Applications-Poiseuille flow | | | | | | |
| 8th week | Blood Rheology Steady Flow Applications-Rheometry | | | | | | Experiment |
| 9th week | Steady Flow Applications-non-Newtonian effect | | | | | | Experiment |
| 10th week | Steady Flow Applications-Fahraeus effect | | | | | | Experiment |
| 11th week | Steady Flow Applications-Boundary Layer Theory Unsteady Flows-Waveform Analysis | | | | | | |
| 12th week | Unsteady Flows-Linear Systems | | | | | | |
| 13th week | Unsteady Flows-Viscoelasticity | | | | | | Experiment |
| 14th week | Unsteady Flows-Oscillatory Flow | | | | | | Experiment |
| 15th week | Term Paper Presentation | | | | | | |
| 16th week | Final Exam | | | | | | |

* If there will be experiments, mark it in the "Remarks".

Instructor
Dept. Chair


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|---|--|-------------------|-------|-----------------|---|-------------------|---------------|
| Classification | Elective | Course No. | 24603 | Cr. Hrs. | 3 | Instructor | Kim, Young Ha |
| Course Title | Korean | 생체적합성 | | | | | |
| | English | Biocompatibility | | | | | |
| Course Outline This course covers the basic biochemistry and the physiological reactions between implanted materials and physiological environments such as proteins, bloods, cells, or tissues. The materials/body interactions including blood coagulation, inflammation, immune reaction, or wound healing will also be discussed. | | | | | | | |
| Prerequisite | | None | | | | | |
| Textbook and References | | | | | | | |
| Weekly Course Schedule | | | | | | | |
| Calendar | Description | | | | | *Remarks | |
| 1st week | Introduction for biomaterials and biocompatibility | | | | | | |
| 2nd week | Proteins | | | | | | |
| 3rd week | Proteins-surface interactions | | | | | | |
| 4th week | Blood | | | | | | |
| 5th week | Blood coagulation | | | | | | |
| 6th week | Blood coagulation | | | | | | |
| 7th week | Inflammation | | | | | | |
| 8th week | infection | | | | | Mid-term Exam | |
| 9th week | Immune reaction | | | | | | |
| 10th week | Immune reaction | | | | | | |
| 11th week | Complement activation | | | | | | |
| 12th week | Wound healing | | | | | | |
| 13th week | Tissue response | | | | | | |
| 14th week | Cellular response to polymers | | | | | | |
| 15th week | Surface and Physiological Environment | | | | | | |
| 16th week | Final Exam | | | | | | |

* If there will be experiments, mark it in the "Remarks".

Instructor Kim, Young Ha



Dept. Chair Jong Hyun Lee

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