

Category (科目区分)	Cluster of Biofunctional Systems		
Course Title (授業科目名)	Biomechanics/ Experimental practice		
Instructors (担当者名)	Naohisa Miyakoshi	Academic Year (配当年次)	1,2
Required course / Elective Course (必修/選択)	Elective course	Credits (単位数)	1
Class Format (授業形態)	Lecture		
Schedule (開講期間)	Year-round		
Class Date/Period (開講曜日・時間)	Every Monday 18:00-21:30 (Details of the schedule are negotiable)		
Course Outline/ Course Objectives (授業の概要・到達目標)			
Purpose of class: To learn about the structure and biomechanics of the musculoskeletal system responsible for biomechanics of the human body.			
Achievement goal of class: To understand the basics of the structure of bones and joints of the musculoskeletal system, and biomechanics of the spine and joints (hip and shoulder joints).			
Class outline:			
1,2. Bone and joint structure foundations: Bones and joints have important functions such as maintaining body shape and maintaining fluid electrolyte balance. In this lecture, we will outline this basic structure and introduce the process of the basic reaction of bone to external force and trauma and the findings obtained from the viewpoint of molecular biology. (Responsible:Miyakoshi)			
3,4. Biomechanics of the spine: The spine has a complex structure consisting of vertebral bodies, intervertebral discs, facet joints, vertebral laminae, and many ligamentous tissues. In addition, the spine has an important role in protecting the spinal cord. This course outlines the relationship between these structures and low back pain. (Responsible: Hongo)			
5,6. Hip biomechanics: The hip is a maximal loading joint in the human body, the disorder of the hip leads to a significant reduction in activities of daily living. Although the joint structure itself is relatively simple, there are many points to be understood in actual medical care, such as the relationship with surrounding tissues and adjacent joints. In this lecture, we will describe the biomechanics of the entire lower limbs, centering on the hip joint. (Responsible: Nozaka)			
7,8. Biomechanics of the shoulder joint: The upper limbs are composed of many joints and perform complicated motion. Among them, the shoulder joint has the largest range of motion in the human body, and understanding its special structure is useful for understanding shoulder joint diseases. In this lecture, we will outline the relationship between the structure of the shoulder joint and the disease, including novel findings. (Responsible: Kasukawa)			
Course Planning (授業計画)			
	Course Outline/ Course Objectives (授業の概要及び到達目標) (Contents of Class) ((授業内容))	Instructor (担当教員名)	Department (講座名) Class Room [実施場所]
1	Basics of bone / joint structure	Professor Naohisa Miyakoshi	Orthopedic Surgery, Conference room, 2nd floor, North Clinical Building,
2			
3	Biomechanics of spine	Associate professor Michio Hongo	
4			
5	Biomechanics of hip	Lecture Koji Nozaka	
6			
7	Biomechanics of shoulder	Associate professor Yuji Kasukawa	
8			

Grading Criteria (成績評価の基準と方法)

30 hours of lectures in the lecture room + 15 hours of self-study, 45 hours in total, 1 credit. The evaluation will be performed by the evaluation of attendance status and the results of oral examination, written examination, and the contents of the submitted report will be taken into consideration.

Contact Information (問い合わせ先(氏名, メールアドレス等))

Name: **Department of Orthopedic Surgery** / E-mail: seikei@doc.med.akita-u.ac.jp

Coment (その他特記事項)

Information about courses: If you cannot attend the training due to work, such as a graduate student who is a member of society, we will adjust the schedule.

Textbooks / References: Distribute materials as needed. Alternatively, specify the document.

Self-study content during self-study time: It is desirable to carry out preparatory learning according to the goals to be achieved and the content of the lesson.