Special Topics in Functional English　木２酒井

副題/Subtitle
Cognitive Neuroscience — An Introduction Focusing on Human Language

授業概要/Course Outline
認知神経科学と呼ばれる研究分野について、「認知科学」が成立した１９５０年度に立ち戻って背景を説明し、中核となる概念と方法論について述べます。人間の言語処理を例として、それぞれの説明のレベルに応じた研究の実際を紹介します。

This course introduces core concepts and methodologies of cognitive neuroscience with some retrospective review of its formative background in1950s. It also provides a brief introduction to theoretical, psychological, and neuro-physiological studies on human language processing -- as concrete examples of actual research performed at each levels of explanation.

授業の後半では、神経活動データ分析の手法を体験的に学びます。MATLAB上で使用するSPM (Statistical Parametric Mapping)と言うツールを使用した脳磁気データの分析方法を紹介します。

In the second half of the course. Participants will learn analysis methods for neurophysiological data using a tool called SPM (Statistical Parametric Mapping) on MATLAB environment.

英語教育の観点では、予備知識のない分野について英語で講義を聞き、英語で資料を読み、英語で質問するという、学びのプロセスを一から体験する機会になることを想定しています。

From the point of view of English language education, this course provides an opportunity to experience a series of learning processes, listening to lectures, reading course materials, and asking questions, about a new research area using English.

各回の授業内容について復習し、確実に理解して次回に進むことが必要です。毎回の予習時間は１時間〜２時間程度を想定しています。

The participants are expected to work home and make sure they understand the contents of each class before the next class. The expected study time is one to two hours a lesson.

授業の到達目標/Objectives
1. to improve skills for comprehend academic lectures and learn research areas in English (英語を使って大学の講義を聞き、専門分野を学ぶ能力を養う)
2. to understand core concepts of cognitive neuroscience and psycholinguistics (認知神経科学及び心理言語学の基本概念と研究方法を理解する)

事前・事後学習の内容/Assigned work before/after class
• Students are expected to study 90 minutes before each class.
• The participants are asked to read materials related to the topic of lecture.
• The student should make one presentation about an academic journal

article the area of cognitive neuroscience.

授業計画/Course Schedule

Part I (Lesson 1 – Lesson 5): Cognitive neuroscience
Lesson 1: The cognitive revolution
Lesson 2: Three levels of explanation in cognitive science
Lesson 3: Theoretical linguistics as a part of cognitive science
Lesson 4: Psycholinguistics
Lesson 5: Neurolinguistics

Part II (Lesson 6 – Lesson 8): Language in the human mind
Lesson 6: Sentence comprehension 1, reading time measure
Lesson 7: Sentence comprehension 2, eye-tracking studies
Lesson 8: Sentence production

Part III (Lesson 9 – Lesson 11): Language in the human brain
Lesson 9: Electrophysiology of Language 1, electroencephalography
Lesson 10: Electrophysiology of Language 2, electrocorticogram and magnetoenchphalography
Lesson 11: Brain Imaging study of language

Part IV (Lesson 12 – Lesson 15): Tutorial in Neural Data Analysis
Lesson 12: Preparing MATLAB and SPM (Statistical Parametric Mapping)
Lesson 13: Pre-Processing of neurophysiological data
Lesson 14: Analyzing neurophysiological data

Lesson 15: Review and future perspective

教科書/Textbooks

Waseda Moodleを利用してリーディング資料を配布します。

Reading materials will be provided in the course page on Waseda Moodle.

参考文献/Reference

各回の授業で参考文献を紹介します。

Reference will be given at each class.

成績評価方法/Evaluation

60% Oral presentation
40% Participation in class discussion and data analysis tutorial

関連資料/Note / URL