TEMPLATE FOR ELECTIVE COURSES AT PSYCHOLOGY

☐ New elective - **yes** **(All fields in the template must be completed)** The completed course description should be sent to Undervisning@psy.ku.dk The course description must be approved by the Study Board. See the bottom of the document for further guidance on each point.	
1. Contact information *Name and UCPH username (alternative email and phone number, if you are not employed at UCPH)* *If you co-teach a course, please provide all names and indicate the distribution of the workload.*	Oliver Hulme gvd111
2. Course title	Bayesian models of mind brain and behavior
3. Language	☐ English
4. Level *Please specify which level the elective is available for.*	☐ Bachelor
5. Course period(s)	☐ Spring semester 2026 = FXX
6. Course content *Describe the purpose of the course and provide a brief introduction to the course content, e.g., which topics, methods, and theories will be covered and worked on.*	Understanding how minds, brains, and behaviors work and why is one of the most perplexing challenges in modern science. Bayesian methods offer a simple, principled, flexible and unified framework for addressing this challenge, allowing us to model uncertainty, make predictions, and infer underlying mechanisms from a diversity of types of data. Bayesian models are uniquely suited to understanding mental, behavioral and neural processes because they naturally account for uncertainty in both human cognition and experimental data. They provide a principled and unified framework for comparing models, allowing scientific questions about brain, mind, and behavior to be formally tested. In this course, students will learn to apply Bayesian models to questions in cognitive science and neuroscience, gaining practical experience in formalizing hypotheses about mental and neural processes and testing

	them against experimental data. The course is designed to be highly interactive and hands-on, providing students with opportunities to engage in group work, solve problems collaboratively, and develop practical skills that can be applied to their own research. Through a combination of lectures, exercises, and project work, students will learn how to implement and interpret Bayesian models in a variety of contexts, ranging from basic psychological processes to complex neural data integration. The course is divided into four progressive phases, each building on the previous one, culminating in a student-led project presentation. The course is designed to accommodate students from interdisciplinary backgrounds, and each phase will introduce new concepts and tools that will prepare students to apply Bayesian methods to their ow research interests. This course is designed to give students not just theoretical knowledge, but practical skills they can apply to cognitive science, neuroscience, psychology, and related fields. By the end of the course, students will have developed a basic foundation in Bayesian modeling, including the ability to implement models, interpret results, and communicate their findings effectively. Topics will include: Basic concepts in Bayes, Probabilistic reasoning, Generative processes, Hypothesis testing, Bayes factors, Model selection, Parameter and Model recovery, Integration of cognitive models with neural and behavioral data.
7. Learning outcome *Describe the learning outcomes after completing the course. Learning outcomes are defined in terms of knowledge, skills, and competencies.* *The learning outcomes should be divided into:* ● *Knowledge* ● *Skills* ● *Competencies* *The level of the learning objectives must be aligned with the primary target level (Bachelor's or Master's) of the course.*	After completing the course, the student is expected to be able to: Knowledge: Students will be expected to describe the basic concepts of Bayesian modelling, to define them mathematically, to mention their importance in how they apply to modelling mental, behavioral and neural processes, their philosophical interpretations, and describe their limits and advantages over other approaches. Competences: Students will be expected to analyse and evaluate Bayesian graphical models and judge what they are modelling and evaluate whether this is suited to the research question. Students will flexibly design new models for novel research questions. Students will have the competence to evaluate and diagnose whether models are performing adequately in their purpose by designing model and parameter recovery methods. Students will be

	expected to justify and explain the choice of priors and likelihoods in the context of the experimental question. Skills: Students will be expected to apply Bayesian concepts to express experimental designs via Bayesian graphical models. They will be able to write down graphical models that test particular theories, and reformulate them according to new constraints.
8. Literature *Indicate the teaching materials to be used, including the main literature. The complete syllabus must be provided in the course room on Absalon.* *Elective courses worth 7.5 ECTS at the Bachelor's level are usually based on a syllabus of approximately 600 standard pages, while elective courses worth 15 ECTS are typically based on a syllabus of about 1200 standard pages.* *Elective courses worth 7.5 ECTS at the Master's level are generally based on a syllabus of around 800 standard pages.* *The syllabus can be mandatory or a combination of mandatory and self-selected.*	Main Literature: Bayesian cogntive modelling: A practical course by Michael D Lee & EJ Wagenmakers ☐ Mandatory -
9. Teaching and learning methods *Describe the teaching formats to be used, e.g., lectures and exercise classes*	The teaching will be a mixture of lectures and in class exercises.
10. Feedback form *Tick the box(es) for how peer feedback will be integrated into the teaching.*	☐Oral ☐ Individual ☐Collective ☐ Continuous feedback during the semester ☐ Feedback by final exam (In addition to the grade) ☐ Peer feedback (Students give each other feedback)
11. Recommended academic qualifications *Here you can specify any competencies or completed courses that would be advantageous for following the course.*	Programming skills (python, matlab) are advantageous but not essential. Basic statistical training and familiarity with high school mathematics is essential.
12. Exam registration requirements *For all elective courses, there is a 75% attendance requirement for classes, but the teaching is based on full participation.* *Are there any other exam prerequisites in the course that the student must meet to*	☐ There are no other exam prerequisites that the student must meet to participate in the exam.

be eligible to take the exam? Preparation of presentations, participation in mid-term seminars, or other requirements.	
13. Type of exam. *Elective courses usually conclude with a home assignment, which can be set, set with options, or free. The assignment is set/prepared from the beginning of the course.* *BA Elective courses worth 7.5 ECTS usually conclude with an assignment of a maximum of 8 standard pages for 1 student, a maximum of 12 standard pages for 2 students, and a maximum of 14 standard pages for 3 students.* *BA Elective courses worth 15 ECTS usually conclude with an assignment of a maximum of 12 standard pages for 1 student, 15 standard pages for 2 students, and 18 standard pages for 3 students.* *MA Elective courses worth 7.5 ECTS usually conclude with an assignment of a maximum of 12 standard pages for 1 student, 15 standard pages for 2 students, and 18 standard pages for 3 students.* *Tick the desired exam form and indicate duration and aids, as well as any other information about the exam. Indicate whether it is possible to submit a home assignment in groups and specify the group size.* *In the next field, the exam form can be elaborated.*	For home assignments ☐ free Individual or in groups (does not apply to on-site exams) ☐ Individual or in groups up to: ____3____ (specify number up to 3) Aid ☐ all aids allowed
14. Details of the exam form *Here you can elaborate on the exam form.*	Students will derive a novel experimental research question in the domain of cognitive, neural or behavioral sciences. They will present the background motivation and literature, the experimental design, the proposed Bayesian model for analysing the data, and how it addresses the theoretical research question. They will justify the chosen priors and model structure and evaluate how they will assess model quality.
15. Type of re-examination *Tick the box for the desired re-exam form and indicate the duration. Only one box should be ticked.*	☐ Same as the ordinary exam
16. Teaching schedule *Indicate the number of weeks and teaching hours.* *A semester is generally 14 weeks.* *If there is class teaching in a course, both the "Lecture" and "Class teaching" fields*	Lecture: ☐ 14 x 2

must be ticked.	
17. Workload *Tick only the relevant categories.* *The student workload for a course worth 7.5 ECTS must total 206 hours, including teaching, supervision, and exams.* *The students' workload for a 15 ECTS course should total 412 hours, including teaching, supervision, and exams.*	☐ Lectures Enter the number of teaching hours: ___28____ ☐ Class teaching Enter the number of teaching hours: __0_____ ☐ Preparation Enter the number of hours: _____112__ ☐ Exam Enter the duration of the exam: ____66___ ---------- **A total of 206 hours** ☐ Lectures Enter the number of teaching hours: _____ ☐ Class teaching Enter the number of teaching hours: _____ ☐ Preparation Enter the number of hours: _____ ☐ Exam Enter the duration of the exam: _____ ---------- **A total of 412 hours**
18. Remarks *Here you can provide information in relation to the course.*	
19. Criteria for exam assessment	*Students are assessed on the extent to which they master the learning outcome for the course.* *To obtain the top grade "12", the student must with no or only a few minor weaknesses be able to demonstrate an excellent performance displaying a high level of command of all aspects of the relevant material and can make use of the knowledge, skills and competencies listed in the learning outcomes.*

	To obtain the passing grade "02", the student must in a satisfactory way be able to demonstrate a minimal acceptable level of the knowledge, skills and competencies listed in the learning outcomes.

Guidance to completing the course description

Ad 2.
The title will be stated on the graduate's certificate. If the course is offered in Danish, we need an English title for the English version of the certificate. If the course is offered in English, only the English title is used.

Ad 3.
If you offer your course in Danish, you must fill in all text fields in Danish or use the Danish template.

Ad 4.
You must write in which semester(s) your course will be offered. If, for example, you want to offer your course in both spring and autumn, you do not need to submit your form twice; you should just remember to add the information to the form.

Ad 6.
Write down what students can expect to learn on the course (e.g. which subjects, methods, theories). This field is particularly important in relation to students' choice of course. The course registration is binding, so students will not be able to deregister and are obliged to pass the course chosen. It must therefore be possible for the students to make decisions which are as informed as possible, and the description under this item must therefore provide the students with a good and realistic impression of the overall course content.

Ad 7.
The learning outcome should be formulated in such a way that the underlying premise in the description is knowledge, skills, and competencies. The level of the learning outcome must be aligned with the course's primary target level (bachelor /master).

They should be divided into knowledge, skills, and competencies (in that order) and are best formulated using active verbs. Remember to look at the curriculum(s) where there is a generic description of knowledge, skills, and competencies. The knowledge, skills, and competencies for this course must meet the generic description.
Competencies are what the student should be able to do independently after the course and in what context. Competency typically involves a component of independent judgment. Verbs used to describe competencies include: *assess, judge,*

grade, select, estimate, critique, evaluate, compose, conclude, design, construct, combine, integrate, analyse, diagnose, categorise, compare, relate, determine, explain, contextualise, discuss, reason…

What skills are necessary to exercise the above-mentioned competencies? Verbs used to describe skills include: *apply, translate, use, calculate, illustrate, practise, solve, express, point out, identify, classify, rewrite, reformulate, write down, reproduce, structure, perform, name…*

What areas of knowledge should be included considering the above-mentioned competencies and skills? Verbs used to describe knowledge include: *account for, refer to, list, define, enumerate, describe, set up, mention…*

Ad. 8.
An exhaustive reading list should not be included here but can be provided in the course room in Absalon. Use this field to specify the main literature.

Ad 13.
All electives in Psychology are characterized by having a final examination after the teaching period.

If you cannot find the desired exam format, please contact the head of studies or the administration

Please remember that individual assessments must be made for group exams. It must be clearly stated how students are assessed, depending on whether they have written individually or in groups.

Link til curriculas:

https://psy.ku.dk/uddannelser/studieordninger/