

This is an open-book exam, meaning you can use the course material and other sources. However, you still need to adhere to good academic practice. In particular, presenting someone else's text or images as your own or copying text directly from sources – even from your own work – is not allowed.

Return your answers to each of the following essay questions as a PDF file by 16:00.

1. Long-term potentiation (6 p)

- Describe the roles of NMDA and AMPA receptors in long-term potentiation.
- Describe the role of long-term potentiation in learning.

2. Anxiety and depression (6 p)

- Describe anxiety and major depressive disorders and their common treatments.
- Present the stress response and its physiological mechanisms.
- Characterize the role that the HPA axis may play in anxiety and depression.

3. Seeing a familiar face (6 p)

- Assume you see a familiar face. What happens in such a situation in the cells and molecules in the retina?
- Briefly describe the different anatomical structures and their function involved in transforming the visual signal from the retina to the face areas of the brain.

4. Executing a motor programme (6 p)

- Briefly describe what drives the upper motor neurons during the execution of a specific movement (such as lifting your hand up to greet the familiar face you just saw).
- Describe the role of the muscle spindle in executing the motor commands lower motor neurons receive from the upper motor neurons.