UAB
Universitat Autònoma de Barcelona

Study Abroad Programmes
Universitat Autònoma de Barcelona

GAP YEAR PROGRAMME
UNDERSTANDING YOUR BRAIN FOR A BETTER LIFE

Course contact hours: 45
Recommended credits: 6 ECTS – 3 US
Language: English

Prerequisites

The course doesn't require any specialized knowledge, only curiosity and a strong motivation to improve your life.

Objectives and Contextualisation

The human brain is an amazing structure — a universe of infinite possibilities and mystery. Your brain is involved in everything you do, including how you think, how you feel, how you act, how you decide and how well you get along with other people, etc.

The course has 3 main objectives:

1. Explain the basics of how the brain works to help you have a better life with increased productivity, creativity, memory, learning skills and general well-being.
2. Help you create a new life. Research shows how bad programming from your past can affect your brain. The good news? You are not doomed by your genes and hard-wired to be a certain person for the rest of your life. Neuroscience empowers all human beings to create the reality they choose. Thanks to its neuroplasticity, your brain is constantly rewriting its own circuitry. All the experiences in your life shape your brain. Because your experiences are unique, so are your neural networks and because they continue to change your whole life, your identity never reaches an endpoint.
3. Recommend healthy life habits for a better brain and a better life with a healthier brain, you are happier, physically healthier, wealthier, wiser, and just make better decisions, which helps you be more successful and live longer.

Competences

As a consequence of a better understanding of the basics of how the brain works you will know how to:

1. Use your brain more effectively.
2. Be more creative.
3. Optimize your work results.
4. Make better decisions.
5. Improve your learning skills.
6. Change habits and your life.
7. Increase your well-being and happiness.
8. Adopt healthy habits for a better brain.

Learning Outcomes

After completing the course, students will be able to:

1. Explain the evolution of the nervous system (from baby to adult)
2. Describe the main brain structures and neurochemical systems.
3. Explain how neurons communicate.
4. Identify the major neurotransmitters and discuss the impact of each on behaviour.
5. Describe the neural basis of emotions, aggression, stress, anxiety and affective disorders.
6. Describe the neurobiological basis of learning, memory, decision making and creativity.
7. Demonstrate knowledge of the impact of healthy and unhealthy habits on their brain.
8. Describe the concepts of complex neuronal processes (the changing brain).
9. Demonstrate knowledge of the concepts of neuroplasticity and neurogenesis.
10. Evaluate the impact of techniques to increase the power of their mind.
11. Explain how damage to the central nervous system affects function and behaviour.
12. Apply their knowledge to improve the health of their brain, their well-being and productivity.

Contents

1. Why you should understand your brain and how it works.
   - The brain is what makes you!
2. The birth of neuroscience.
   - What we knew about the brain in the past.
   - What is “Neuroscience”?
   - Technology at the service of neuroscience: EEG, fMRI, etc.
3. Animal & human brains.
   - From primates to Homo Sapiens: neocortex, limbic & reptilian systems.
   - Brain size and intelligence.
4. Anatomy of the human brain. Structure.
   - Central and peripherical nervous system.
   - Parts of the Brain.
5. Physiology. Functions of the brain.
   - Lateralization.
   - Gender.
6. Brain chemistry.
   - Communication between cells: Neurons, dendrites, axons, synapses, etc.
   - Neurotransmitters: Dopamine, Serotonin, etc.

- Homeostasis: hunger, thirst, sleep, etc.

7. Neuroplasticity & neurogenesis.
   - Changes in the brain: babies / teens / adults.
   - Changing habits and your life.
8. Intelligence.
   - What is intelligence?
   - Why are there differences? Do we inherit intelligence?
   - Multiple intelligences.
9. Our senses.
   - How we see, hear, talk, taste, smell, feel, etc.
   - Can we trust our senses? Reality & perception.
10. Emotions & feelings.
    - Emotions and the decision-making process.
    - Positive & negative emotions.
    - The neuroscience of friendship, of love, etc.
    - Pain.
11. Memory.
    - How the brain remembers.
    - Kinds of memory.
    - Can we trust our memories?
    - Why we forget.
    - How to improve it? Mnemotechnics.
    - Why we need memories.
12. Learning.
    - How the brain learns.
    - Bouncing back from failure.
    - The bilingual brain.
    - How to learn better.
13. Making decisions.
    - Conscious vs unconscious.
    - Does free will exist?
    - Perception & cognition.
14. Creativity.
    - Neurobiology of creativity.
    - Left / Right Brain.
    - Unconscious / Daydreaming / Boredom.
    - Brain waves. Sleep. Dreams and their interpretation.
    - Concepts of “zone”, “flow”.
15. Neuroscience in Business.
    - Neuromarketing.
16. Using the power of your mind.
    - Autosuggestion.
    - Visualization.

- Hypnosis.
- Meditation, mindfulness, yoga, etc.

17. What is good for the brain.
    - Healthy food.
    - Gut microbiota: the « second brain».
    - Breathing.
    - Physical exercises.
    - Sleep.
    - Arts & Music.
    - Environment.
    - Social relationships.
18. What is bad for the brain.
    - Coffee, alcohol, drugs, etc.
    - Stress.
    - Social media.
    - Lack of concentration. Multitasking.
19. When the brain goes wrong.
    - Schizophrenia / Parkinson / Alzheimer's / Autism / Dyslexia / Stroke.
20. Future of the brain.
21. Brain vs machines.
    - Differences Brain vs machines.
    - Can machines be creative?
    - Limits of AI.

Methodology

Classes will be conducted in a seminar format promoting student participation. The course is divided into theoretical lectures and practical application of the knowledge acquired during the lectures. Students will have to read documents provided by the professor and make presentations about the theoretical concepts introduced in class.

Visual materials will be used (Ted Talks, Netflix, BBC programs…) to supplement the reading materials.

Activities

DIRECTED ACTIVITY (45 hours)

a) Theory: 30 hours
Master Classes (18 sessions of 1h40 = 30 hours) to introduce the key concepts.

b) Practice: 10 hours
Workshops. Individual and group activities based on:

- Presentation and discussion of group work. Students will be divided into small groups. Each group will present on a research article. The grade will take into account the content accuracy and the visual and communication clarity.
- Presentation and discussion of an individual work about a document provided by the professor. The grade will take into account the content accuracy and the visual and communication clarity.
- Readings to achieve a better understanding of the course content. There will be random quizzes on readings throughout the semester.
- Viewing and discussing short videos.

c) Assessment activity: 5 hours
(2 exams of 1h40 + 5 quizzes on readings / videos of 20 minutes = 5h).
Individual written tests (open questions).

SUPERVISED ACTIVITY (15 hours)

a) Tutorials. Follow-up with the teacher. Among others:

- Answers to key questions of the syllabus.
- Resolution of doubts.
- Guidance for individual or group works.

b) Individual Project Development. The students will use the knowledge gained throughout the course in a personal project to determine how they will improve the health of their brain, their well-being and productivity

AUTONOMOUS ACTIVITY (90 hours)

- Preparation of individual and group presentations.
- Preparation of the individual Project.
- Search for information in specialized neuroscience groups.
- Reading of basic materials (recommended books, articles…).
- Study and memorization of basic concepts of the subject.

Directed (45 hours):

Class sessions (theory)	30 hours
Class sessions (practice)	10 hours
Assessment (exams & quizzes)	5 hours

Supervised (15 hours):

Tutorials & Personal Project development	15 hours

Autonomous (90 hours):

Preparation of individual and group presentations.	20 hours
Preparation of the individual Project.	20 hours
Search for information in specialized neuroscience Groups on LinkedIn.	10 hours
Reading of basic materials of the subject	10 hours
Study and memorization of basic concepts.	30 hours

Assessment

You will be graded on 6 different activities. Your final grade will reflect your effort and understanding at the end of the course. There will be no extra work to boost your grade.

	Weighting	Learning outcomes
Individual Presentation:	10 %	1,2,3,4,5
Group Presentation:	10 %	6,7,8,9,10,11
Personal Project:	20 %	1,2,3,4,5,6, 7,8,9,10,11,12
Midterm Exam:	20 %	1,2,3,4,5,6,
Final Exam:	20%	6,7,8,9,10,11
Participation:	20 %	1,2,3,4,5,6, 7,8,9,10,11,12

Bibliography

Required:

Eagleman, D. (2015) *The Brain – The Story of You*. (1st ed.). Canongate books

Dispenza, J. (2012) *Breaking the Habit of Being Yourself*. Hay House

Sousa, D. (2011) *How the Brain Learns* (4th ed.). Corwin

Magsamen, S. & Ross, I. (2023) *Your Brain on Art* (1st ed.). Canongate

Bear, Connors, Paradiso (2007) *Neuroscience. Exploring the Brain* (3rd ed.). Lippincott Williams & Wilkins

Recommended:

Wiest, B. (2017) *101 Essays That Will Change The Way You Think* (1st ed.). Thought Catalogue

Feldman Barrett, L. (2018) *How Emotions are Made*. (1st ed.). Harper Collins

Pang, C. (2020) *Explaining Humans* (1st ed.). Penguin Random House

Carter, R. (2021). *The Brain Fitness Book* (1st ed.). Penguin Random House

Raj, R. (2022). *Gut Renovation* (1st ed.). Harper Collins.