האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Pedagogical Innovation in Science Education-Theory and Practice in the Educational Field - 34014

Last update 26-09-2024

HU Credits: *4*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Teaching Training - Diploma*

Academic year: *0*

Semester: *Yearly*

Teaching Languages: *Hebrew*

Campus: *Mt. Scopus*

Course/Module Coordinator: *Dr. Adi Ben-David*

Coordinator Email: *adi.ben-david@mail.huji.ac.il*

Coordinator Office Hours: *By Appointment*

Teaching Staff:
Dr. Adi Ben-David

Course/Module description:
Science is the greatest achievement of the human spirit" (John Gribbin)
Indeed, science is a product of "human spirit": his thinking, curiosity, beliefs, tendencies, desires, and values. Science is a dynamic and ongoing process of exploration and discovery, carried out by the human through the processes of critical and creative thinking, which is subjective and contextual depending (time, place, culture, social conventions, technological capability, etc.). In the global-digital era, that subjected to constant changes and characterized by scientific-technological orientation based on artificial intelligence, the scientific knowledge accumulates in vast quantities and are in the process of constant change.
Therefore, the emphasis should be transferred from the acquisition of scientific knowledge to constructing meaningful knowledge and to developing cognitive, interpersonal and intrapersonal skills - 21st Century Skills (21 stCS), that enable independent lifewide and Lifelong learning.
Pedagogical Innovation based on applied neuropedagogy puts the learner's needs at the center and aims to develop independent lifewide and Lifelong learner.

The course includes theoretical and practical aspects of Pedagogical Innovation, in line with the rationale and objectives of the natural sciences and mathematical curriculum.

The main goal of the course is to develop a pedagogical Innovation approach and teaching-learning-assessment practices in natural sciences and mathematics education.

Course/Module aims:
1. To construct in-depth knowledge on pedagogical innovation, aimed at developing 21st century skills (21stCS)

2. To delve into basic concepts in cognition and learning: constructivism; higher order thinking (HOT); metacognition; neuropedagogy; Growth/Fixed mindset; in the context of pedagogical innovation and its application in teaching-learning-evaluation processes in a digital environment.

3. to experience the development and implementation of learning activities based on pedagogical innovation and applied neuropedagogy.

4. To experience collaborative learning with advanced digital tools (including AI) and the processes of researching practice in the field of education

Learning outcomes - On successful completion of this module, students should be able to:

1. Demonstrate pedagogical knowledge about pedagogical innovation aimed at developing 21st century skills (21stCS)

2. Understand basic concepts in cognition and learning: knowledge construction; higher order thinking (HOT); metacognition; neuropedagogy; Growth/Fixed mindset; in the context of pedagogical innovation and its application in teaching-learning-evaluation processes in a digital environment.

3. To develop learning activities based on pedagogical innovation and applied neuropedagogy.

Attendance requirements(%):

80

Teaching arrangement and method of instruction: Online performance assignments in the Moodle-Huji website. The course includes experiences in reflective peer-reviewed E-workshops and researching educational practice in the format of "Professional Learning Community"

Course/Module Content:

Constructivism;
Higher order thinking (HOT);
Metacognition;
Neuropedagogy;
Growth/Fixed mindset;
Pedagogical Innovation; Applied Neuropedagogy

Required Reading:

איגר, ע. (2009). חשיבה מסדר גבוה: מבוא - תיחום, אפיון ומהות. בתוך: גלסנר, א. בן-דוד, ע. איגר, ע. (2009). פיתוח חשיבה מסדר גבוה – סקירת ספרות. האוניברסיטה הפתוחה, עמ' 27-7.

בן-דוד, ע. (2009). מטה-קוגניציה בהוראה ובלמידה. אאוריקה, 27, 1-14.

קארי, ס. וסמית, ק. (2004). על הבנת טבעו של ידע מדעי. אאוריקה, 19. המרכז לחינוך מדעי טכנולוגי, אוניברסיטת ת"א.

רמיאל, ח' (2023). בינה מלאכותית בחינוך – היבטים של הוגנות ושוויון. סקירת ספרות שהוגשה ללשכת המדען הראשי, משרד החינוך, ירושלים, פרק א עמודים 5-8.

Costa, A. L. (2008). The Thought-Filled Curriculum. Teaching Students to Think. Educational Leadership, 65(5), 20-24
McTighe, J. (1997). What Happens Between Assessments? Educational Leadership, Vol 54(4), 6-12.

Additional Reading Material:

Grading Scheme:
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 100 %

Additional information:
An online course conducted in an asynchronous format using the Moodle-Huji. Personal and group guidance is provided by appointment,as needed.