German Jordanian University

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QRTA

School of Applied Humanities and Social Sciences

Department of Basic Education

Higher Diploma in Integrated Education (STEAM)

Study Plan 2025

I. Program Objectives

The HD program "*STEAM*" aims at graduating teachers who:

- Design and implement interdisciplinary STEAM units that integrate science, technology, engineering, the arts, and mathematics in alignment with curriculum standards and real-world challenges.
- Apply design thinking principles and project-based learning methodologies to develop engaging, student-centered learning experiences.
- Integrate digital tools and educational technologies to enhance creativity, inquiry, problem-solving, and collaboration in STEAM classrooms.
- Leverage emerging technologies such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) to enrich STEAM instruction and expand opportunities for experiential learning.
- Incorporate artistic processes and creative expression as essential elements in STEAM learning environments.
- Develop and use a variety of formative and performance-based assessment strategies tailored to STEAM-specific learning outcomes.
- Reflect critically on their instructional practices to continuously improve the quality and coherence of interdisciplinary STEAM instruction.

II. Program Learning Outcomes

Upon completion of a Higher Diploma in STEAM, graduates will be able to:

a. Design and implement interdisciplinary STEAM units that integrate science, technology, engineering, the arts, and mathematics in alignment with curriculum standards and real-world challenges.

b. Apply design thinking principles and project-based learning methodologies to develop engaging, student-centered learning experiences.

c. Integrate digital tools and educational technologies to enhance creativity, inquiry, problem-solving, and collaboration in STEAM classrooms.

d. Leverage emerging technologies such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) to enrich STEAM instruction and expand opportunities for experiential learning.

e. Incorporate artistic processes and creative expression as essential elements in STEAM learning environments.

f. Develop and use a variety of formative and performance-based assessment strategies tailored to STEAM-specific learning outcomes.

g. Reflect critically on their instructional practices to continuously improve the quality and coherence of interdisciplinary STEAM instruction.

h. Demonstrate positive attitudes toward STEAM education and actively promote awareness of its importance in fostering creativity, innovation, and 21st-century skills across learning environments.

Course Delivery Methods

Courses are in one of the following three methods:

- **Face-to-Face (F2F) Method**
  Courses that are taught through face-to-face learning and are delivered at the university campus.
- **Blended (BLD) Method**
  Courses in which teaching consists of face-to-face learning and asynchronous E-learning. The face-to-face learning takes place at the university campus. Asynchronous E-learning takes place through activities, tasks, educational duties, and assignments through the virtual E-learning platforms (Moodle and MyGJU) without direct meetings with course instructors.
- **Online (OL) Method**
  Courses in which teaching consists of synchronous E-learning and asynchronous E-learning. The synchronous E-learning takes place through interactive virtual meetings between instructors and students directly through the virtual E-learning platform (MS Teams). The asynchronous E-learning takes place through activities, tasks, educational duties, and assignments through the virtual E-learning platforms (Moodle and MyGJU) without direct meetings with course instructors.

III. Admission Requirements

To apply for admission, the following minimum requirements must be met:

- Hold a recognized bachelor's degree from an accredited university in education or any related field (e.g., science, mathematics, technology, engineering, arts, early childhood education, or social sciences).
- The Minimum required average for admission in the STEAM program is 60%.

IV. Degree Requirements

The requirements to obtain a Higher Diploma in STEAM Education
are the following:

a. 23 credit hours are compulsory courses
b. 2 credit hours are elective courses
c. 11 credit hours are Practicum.

V. Framework for H.D Degree (25 Credit hours)

Classification	Credit Hours			ECTS		
	Compulsory	Elective	Total	Compulsory	Elective	Total
University Requirements	-	-	-	-	-	-
School Requirements	-	-	-	-	-	-
Program Requirements	23	2	25	-	-	-
Total	**23**	**2**	**25**	**-**	**-**	**-**

Course Delivery Method	Credit Hours	Percentage
Online Courses	2	8%
Blended Courses	15	60%
Face-to-Face Courses	8	32%
Total	25	**100**%

1. University Requirements: (25 credit hours)

1.1. Compulsory: (23 credit hours)

Course ID	Course Name	Credit Hours	ECTS	Contact Hours		Type	Prerequisites / Corequisites
				Lect.	Prac.		
STEAM1101	Foundations of STEAM Education	2	-			BLD	-
STEAM1201	Interdisciplinary Curriculum Design	2	-			F2F	-
STEAM1202	STEAM Pedagogies and Assessment	2	-			F2F	-
STEAM2203	Innovative Thinking and Design Approaches in Education	2	-			F2F	STEAM1101
STEAM3302	Educational Technology, AI, and Immersive Tools in STEAM	2	-			BLD	STEAM2203
STEAM3301	STEAM and the Role of Art, Creativity, and Innovation	2	-			F2F	STEAM2203
STEAM1303	Practicum in STEAM Education 1	4	-			BLD	-
STEAM2303	Practicum in STEAM Education 2	7	-			BLD	STEAM1303
Total		**23**	-	**12**	**28**		

1.2. Elective: (2 credit hours) (Two courses out of the following)

Course ID	Course Name	Credit Hours	ECTS	Contact Hours		Type	Prerequisites / Corequisites
				Lect.	Prac.		
STEAM2102	STEAM and Environmental Education.	1	-	1	1	OL	STEAM1101
STEAM2103	STEAM for Early Childhood and Primary Education	1	-	1	1	OL	STEAM1101
STEAM3204	Social Emotional Learning in the STEAM Classroom	1	-	1	1	OL	STEAM2203
STEAM3104	Policy, Advocacy, and the Future of STEAM Education	1	-	1	1	OL	STEAM2203
Minimum required		**2**	**-**	**2**	**2**		

Study Plan Guide for a H.D Degree in STEAM

First Year							
First Semester							
Course ID	**Course Name**	**Credit Hours**	**ECTS**	**Contact Hours**		**Type**	**Prerequisites / Corequisites**
				Lect.	**Prac.**		
STEAM1101	Foundations of STEAM Education	2	-	2	1	BLD	-
STEAM1201	Interdisciplinary Curriculum Design	2	-	2	1	F2F	-
STEAM1202	STEAM Pedagogies and Assessment	2	-	2	1	F2F	-
STEAM1303	Practicum in STEAM Education 1	4	-	-	8	BLD	-
	Total	**10**	-	**6**	**11**		

First Year							
Second Semester							
Course ID	**Course Name**	**Credit Hours**	**ECTS**	**Contact Hours**		**Type**	**Prerequisites / Corequisites**
				Lect.	**Prac.**		
STEAM2102 Or STEAM2103	STEAM and Environmental Education. Or STEAM for Early Childhood and Primary Education	1	-	1	1	OL	STEAM1101
STEAM2303	Practicum in STEAM Education 2	7	-	0	14	BLD	STEAM1303
STEAM2203	Innovative Thinking and Design Approaches in Education	2	-	2	1	F2F	STEAM1101
	Total	**10**	**-**	**3**	**16**		

First Year							
Summer Semester							
Course ID	**Course Name**	**Credit Hours**	**ECTS**	**Contact Hours**		**Type**	**Prerequisites / Corequisites**
				Lect.	**Prac.**		
STEAM3204 Or STEAM3104	Social Emotional Learning in the STEAM Classroom Or Policy, Advocacy, and the Future of STEAM Education	1	-	1	1	OL	STEAM2203
STEAM3302	Educational Technology, AI, and Immersive Tools in STEAM	2	-	2	1	BLD	STEAM2203
STEAM3301	STEAM and the Role of Art, Creativity, and Innovation	2	-	2	1	F2F	STEAM2203
		5	-	**5**	**3**		

[c] The following study plan guide does not take into account possible remedial courses.

VI. Program Courses

STEAM1303 :Practicum in STEAM Education1 **4 Cr Hr (1,0)**

This introductory practicum provides participants with a structured field-based experience that bridges the theoretical foundations of STEAM education with early classroom application. Throughout the course, participants engage in guided observations of innovative teaching practices, analyze strategies for integrating science, technology, engineering, the arts, and mathematics, and begin designing small-scale STEAM learning activities that respond to students' needs and the school context.

The course emphasizes professional identity development, reflective practice, instructional planning, and documentation of teaching experiences. Through individual and group mentoring sessions, peer presentations, and structured feedback cycles, participants learn to translate theory into classroom practice, identify classroom challenges, and recognize opportunities for innovation. By the end of the practicum, learners will have developed foundational competencies that prepare them for more advanced implementation work in Practicum in STEAM Education 2.

Prerequisites: -

STEAM2303 :Practicum in STEAM Education2 **7 Cr Hr (1,0)**

This advanced practicum builds on the foundational experiences gained in Practicum in STEAM Education 1 and focuses on the full implementation of integrated STEAM projects within partner schools or educational settings. Participants design and deliver a comprehensive, real-world problem–based STEAM project that connects multiple disciplines and engages students in inquiry, experimentation, creativity, and collaborative problem-solving.

The practicum follows a developmental cycle that includes detailed planning, implementation, evaluation, and redesign of the project. Participants receive specialized mentoring aimed at enhancing instructional quality and are actively involved in communities of practice that promote peer learning and professional exchange. Emphasis is placed on analyzing the impact of instruction on student learning and on utilizing alternative assessment tools, such as performance tasks and portfolios.

By the end of the course, participants will have gained substantial field experience in designing and implementing complex STEAM initiatives and will be equipped to lead innovative educational practices that enrich learning environments and advance contemporary teaching standards

Prerequisites STEAM1303

STEAM3104 :Policy, Advocacy, and the Future of STEAM Education **1 Cr Hr (1,0)**

In this course, participants will explore the wider educational landscape shaping STEAM teaching and learning. Topics include national and international STEAM policies, frameworks for curriculum reform, and strategies for advocating STEAM at school and system levels. Educators will examine the role of policy in enabling innovation, equity, and future-ready learning environments, and develop action plans to promote STEAM education within their local contexts.

Prerequisites: STEAM2203

STEAM3204: Social Emotional Learning in the STEAM Classroom **1 Cr Hr (1,0)**

This course explores the vital role of Social Emotional Learning (SEL) in fostering a supportive and collaborative environment within STEAM education. Participants will examine research-based SEL frameworks and their application in helping students take intellectual risks, engage in

interdisciplinary thinking, and work productively with peers. The course provides practical strategies and tools for both teachers and students to integrate SEL into STEAM instruction, highlighting its impact on creativity, resilience, and teamwork. Through case studies and reflective activities, educators will design STEAM projects that embed SEL practices, promoting both academic and emotional growth.

Prerequisites: STEAM2203

STEAM2103: STEAM for Early Childhood and Primary Education **1 Cr Hr (1,0)**

This course focuses on developmentally appropriate approaches for implementing STEAM in early childhood and primary classrooms. Participants will explore playful, inquiry-based strategies that integrate science, math, technology, and the arts through storytelling, hands-on exploration, and basic coding. Emphasis is placed on supporting foundational literacy and numeracy while fostering creativity, curiosity, and cross-disciplinary thinking in young learners.

Prerequisites: STEAM1101

STEAM2102: STEAM and Environmental Education: **1 Cr Hr (1,0)**

This course explores how STEAM can be leveraged to address environmental challenges and promote sustainability education. Educators will engage in interdisciplinary projects that incorporate climate science, data analysis, eco-design, and environmental art. Emphasis is placed on cultivating students' ecological awareness, systems thinking, and active citizenship through project-based learning rooted in real-world environmental contexts.

Prerequisites: STEAM1101

STEAM3301: STEAM and the Role of Art, Creativity, and Innovation: **1 Cr Hr (1,0)**

This course explores the critical role of the arts in enriching STEAM education by fostering creativity, innovation, and cultural relevance. Participants will examine how integrating visual arts, music, drama, and media enhances student engagement, supports identity development, and promotes 21st-century competencies such as collaboration, critical thinking, and communication. The course highlights the value of creative expression as a driver of interdisciplinary thinking and real-world problem solving. Through hands-on projects and reflective practice, educators will learn to design and implement STEAM experiences that position the arts as central—not supplementary—to student learning and innovation.

Prerequisites: STEAM2203

STEAM3302: Educational Technology, AI, and Immersive Tools in STEAM: **1 Cr Hr (1,0)**

This course empowers educators to purposefully integrate emerging technologies—such as Artificial Intelligence (AI), Augmented and Virtual Reality (AR/VR), digital fabrication tools, and web-based applications—into STEAM teaching and learning. Participants will explore how technology can enhance inquiry-based instruction, support real-world problem solving, and promote collaboration across disciplines. The course also addresses the ethical and equitable use of digital tools, including blended and flipped learning models, mobile platforms, and collaborative applications like Google Workspace. Teachers will examine how to foster inclusive participation and data-informed practices while building a digital presence and engaging in professional learning communities to extend the impact of STEAM beyond the classroom.

Prerequisites: STEAM2203

STEAM2203: Innovative Thinking and Design Approaches in Education: **1 Cr Hr (1,0)**

This course introduces educators to a range of creative and systematic approaches for fostering innovation in teaching and learning. Moving beyond traditional design thinking, participants will explore multiple frameworks such as Human-Centered Design, Systems Thinking, Creative Problem Solving, and TRIZ, alongside practical tools for ideation and prototyping. The course emphasizes how these approaches can be applied to plan interdisciplinary activities, adapt existing curricula, and design engaging, student-centered STEAM experiences. Through case studies, collaborative projects, and studio-style activities, educators will develop strategies to cultivate a culture of innovation that enhances problem-solving, creativity, and 21st-century skills for both teachers and learners

Prerequisites: STEAM1101

STEAM1202: STEAM Pedagogies and Assessment **1 Cr Hr (1,0)**

This course explores how educators can design and facilitate interdisciplinary, student-centered learning experiences using signature STEAM pedagogies such as inquiry-based learning, project-based learning, problem-solving, and maker-centered approaches. Participants will examine how these pedagogical models promote creativity, critical thinking, and collaboration across disciplines. In parallel, the course introduces assessment strategies that authentically capture a wide range of learning outcomes in STEAM contexts—including conceptual understanding, creative processes, and collaborative skills. Emphasis is placed on aligning assessment tools with instructional goals, using formative and performance-based assessment methods, and incorporating peer review, self-assessment, and continuous feedback to support equitable and inclusive learning for all students.

Prerequisites:

STEAM1201: Interdisciplinary Curriculum Design: **1 Cr Hr (1,0)**

This course equips participants with the theoretical foundations and practical tools to design interdisciplinary curricula grounded in STEAM principles. Educators will explore how to map conceptual connections across disciplines, subject-matter alignment, integrate real-world problems, and construct learning experiences that reflect the interconnected nature of knowledge. The course emphasizes curriculum alignment with national and international standards, and the application of Universal Design for Learning (UDL) principles to ensure accessibility, engagement, and challenge for all learners.

Prerequisites:

STEAM1101: Foundations of STEAM Education: **1 Cr Hr (1,0)**

This foundational course introduces educators to the theoretical and conceptual underpinnings of STEAM education. It explores the historical development, philosophical roots, and global rationales behind the integration of Science, Technology, Engineering, Arts, and Mathematics. Participants will examine key theories such as constructivism, socio-cultural learning, and inquiry-based education as they relate to STEAM. The course emphasizes understanding the nature of interdisciplinary education, the rationale for including the Arts, and the social and economic relevance of STEAM in 21st-century learning. This grounding will enable educators to engage with the advanced pedagogical, design, and assessment concepts explored in later courses.

Prerequisites: