Ain-Shams University

Guide for
Integrated Study Programs

Multidisciplinary

Interdisciplinary

Transdisciplinary

An Operational Framework

(Toward Integrated University Education for a Sustainable Future)

2026

EDUCATION STRATEGIES & RESEARCH CENTER

Ain-Shams University Guide for Integrated Study Programs

(Multidisciplinary – Interdisciplinary – Transdisciplinary)

An Operational Framework
(Toward Integrated University Educationfor a Sustainable Future)

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PREFACE

This guide has been developed in response to the growing need for clear, coherent, and institutionally endorsed guidance on the design, approval, implementation, and management of integrated study programs within Ain Shams University. As higher education systems worldwide increasingly adopt multidisciplinary, interdisciplinary, and transdisciplinary approaches, universities are required to move beyond fragmented practices and toward structured, quality-assured, and sustainable models of integration.

The preparation of this guide is situated within a broader national and international context marked by rapid technological change, complex societal challenges, and evolving labor market demands. These dynamics have highlighted the limitations of isolated disciplinary models and underscored the importance of educational approaches that enable knowledge integration, systems thinking, and real-world problem solving. In alignment with Egypt's National Strategy for Higher Education and Scientific Research 2030 and the Egyptian National Qualifications Framework (NQF), Ain Shams University seeks to institutionalize integrated study programs as a strategic pathway for enhancing graduate employability, academic relevance, and societal impact.

The guide is intended to serve a wide range of academic and administrative users, including:

- Faculty members involved in curriculum and program design
- Program directors and coordinators
- Departmental, faculty, and university-level academic committees
- Quality assurance and curriculum development units
- University leadership and decision-making bodies

For these users, the guide provides a shared institutional reference that promotes consistency, transparency, and informed decision-making across faculties and academic units.

This guide should be used as both a policy reference and a practical operational manual. It translates conceptual principles and national policy directions into clear, step-by-step procedures covering the full lifecycle of integrated study programs–from initial conception and justification, through approval and implementation, to monitoring, evaluation, and continuous improvement. While the guide establishes common standards and procedures, it is designed to allow sufficient flexibility for faculties to adapt integrated program models to their specific academic contexts and disciplinary strengths.

Through this guide, Ain Shams University affirms its commitment to educational innovation grounded in academic rigor, institutional coherence, and societal relevance. The guide is intended to support the development of integrated study programs that are not only academically sound, but also responsive to national priorities, global trends, and the future needs of learners and society.

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LIST OF ABBREVIATIONS

1. **NQF:** National Qualifications Framework
2. **PLOs:** Program Learning Outcomes
3. **NARS:** National Academic Reference Standards
4. **PBL:** Project-Based Learning/ Problem-Based Learning
5. **CBL:** Community-Based Learning

EXECUTIVE SUMMARY

The Ain Shams University Guide for Integrated Study Programs provides a comprehensive institutional framework for the systematic design, approval, implementation, and quality assurance of multidisciplinary, interdisciplinary, and transdisciplinary academic programs. Developed in response to evolving national priorities, global higher education trends, and the growing complexity of societal and labor market challenges, the guide seeks to move beyond fragmented disciplinary models toward coherent, integrated, and future-oriented educational pathways.

The guide is firmly aligned with Egypt's National Strategy for Higher Education and Scientific Research 2030, the Egyptian National Qualifications Framework (NQF), and relevant national regulatory and accreditation requirements. It positions integrated study programs as a strategic mechanism for enhancing graduate employability, fostering innovation, strengthening societal engagement, and supporting sustainable development. By articulating clear conceptual distinctions among different models of integration, the guide establishes a shared institutional understanding that underpins consistent academic practice across faculties and disciplines.

Structured as both a policy reference and an operational manual, the guide translates conceptual principles into clear standards, procedures, and implementation steps covering the full lifecycle of integrated study programs. It addresses needs analysis, program learning outcomes, curriculum design and integration, teaching and learning strategies, assessment methods, governance and management structures, resource and capacity planning, faculty development, quality assurance, and continuous improvement. Particular attention is given to ensuring academic coherence, transparency of decision-making, and sustainability in programs involving multiple academic units and external stakeholders.

Through this guide, Ain Shams University affirms its institutional commitment to educational innovation grounded in academic rigor, quality assurance, and societal relevance. The guide serves as an authoritative reference for academic leaders, faculty members, program developers, and quality assurance units, supporting the development of integrated study programs that are responsive to national priorities, globally benchmarked, and capable of preparing graduates to thrive in complex and rapidly changing professional and societal contexts.

INTRODUCTION

In light of the rapid global transformations and the increasingly complex challenges confronting local and global societies, the traditional educational model based on isolated and monodisciplinary structures is no longer sufficient to prepare graduates capable of addressing the realities of the twenty-first century. While discipline-based programs have historically played a vital role in advancing specialized knowledge and academic depth, international experience demonstrates that such approaches, when applied in isolation, are limited in their ability to respond to interconnected societal, technological, environmental, and economic challenges.

Contemporary issues such as sustainable development, digital transformation, public health, food security, renewable energy, and innovation-driven economic growth are inherently multidimensional. Addressing these challenges requires graduates who possess intellectual flexibility, systems thinking, and the ability to integrate knowledge across multiple fields. Research and practice in higher education further indicate that students educated within narrowly defined disciplinary frameworks often face difficulties in recognizing connections among different domains of knowledge, transferring learning across contexts, and functioning effectively in interdisciplinary and professional environments.

In response to these realities, higher education systems worldwide are undergoing continuous paradigm shifts in curriculum design, teaching and learning approaches, assessment practices, and academic governance. These shifts are driven by changing student needs, expanding stakeholder expectations, and increasing demands for relevance, adaptability, and societal impact. One of the most prominent outcomes of these transformations has been the growing adoption of integrated study programs as a central feature of contemporary higher education reform.

Integrated study programs represent an internationally recognized approach to overcoming fragmentation in traditional curricula. By intentionally connecting knowledge, methods, and perspectives from multiple disciplines, such programs promote holistic learning, reduce rigid disciplinary boundaries, and support deeper intellectual and professional development. Rather than diminishing disciplinary rigor, integrated programs build upon strong disciplinary foundations while enabling learners to develop higher-order thinking, systems thinking, collaboration skills, and the capacity to address complex real-world problems.

Within this spectrum, multidisciplinary, interdisciplinary, and transdisciplinary approaches have emerged as distinct yet complementary models. Multidisciplinary programs coordinate contributions from multiple disciplines, interdisciplinary programs foster deeper integration of concepts and methods across fields, and transdisciplinary programs extend beyond academia to incorporate societal, professional, and community-based knowledge. International best practices demonstrate that these approaches are particularly effective when learning is organized around complex problems, societal challenges, and authentic contexts that require collaborative and team-based efforts.

This global orientation is fully aligned with Egypt's National Strategy for Higher Education and Scientific Research 2030, which constitutes an ambitious roadmap for reforming and developing the higher education system. Within this strategy, integration across disciplines is identified as a core pillar, reflecting a firm conviction that addressing major national challenges necessitates multidimensional approaches and the integration of diverse bodies of knowledge. The strategy further emphasizes enhancing graduate employability, strengthening links between education and development, and ensuring alignment with labor market needs.

Within this national and international context, Ain Shams University, as a comprehensive public university with a long-standing commitment to academic excellence, innovation, and societal engagement, seeks to translate these strategic directions into tangible academic practices. The University's vision and mission emphasize innovation in educational models and the adoption of advanced curricula that respond to contemporary demands. Accordingly, the development of integrated study programs–including multidisciplinary, interdisciplinary, and transdisciplinary models–has become not merely an optional enhancement, but a strategic necessity for ensuring the competitive quality of graduates and aligning learning outcomes with the evolving requirements of local, regional, and international labor markets.

This guide is presented as a comprehensive institutional reference supporting the objectives of the Egyptian National Qualifications Framework (NQF), which aims to ensure the quality, coherence, and relevance of educational outcomes and to strengthen their linkage to development priorities and labor market needs. Through the systematic design of integrated programs, qualification levels–particularly from Level Five and above–can be achieved in innovative ways that extend learning beyond disciplinary depth to encompass breadth of vision, synthesis, and integrative reasoning.

Integrated programs therefore serve as a powerful mechanism for preparing graduates who possess not only academic credentials, but also a comprehensive portfolio of competencies,

including advanced cognitive skills, applied professional abilities, and personal and leadership capacities. Such graduates are well positioned for immediate contribution within complex work environments and are equipped for continuous learning throughout their professional lives.

The philosophy underpinning this guide is grounded in Ain Shams University's strategy for educational innovation and development, which prioritizes strengthening integration and collaboration among its diverse faculties and institutes. This diversity—spanning medical, engineering, scientific, humanities, and administrative disciplines—constitutes a unique institutional asset that positions the University to lead in the design of innovative integrated programs in emerging fields such as artificial intelligence in healthcare, sustainable urban development, digital cultural heritage management, bioeconomics, and other future-oriented domains.

Through this guide, Ain Shams University seeks to activate genuine collaboration among academic departments, dissolve artificial disciplinary boundaries, and establish shared educational and research spaces that enrich the academic environment and foster creativity. In doing so, the University aspires to play a leading role in shaping future-oriented education that responds effectively to societal needs, national priorities, and global transformations.

PURPOSE OF THE GUIDE

In response to the expanding adoption of multidisciplinary, interdisciplinary, and transdisciplinary study programs, Ain Shams University recognizes the need for a unified and institutionally endorsed reference framework to guide their systematic design, implementation, and evaluation. The complexity of integrated programs requires a coherent approach to ensure academic clarity, consistency, and sustainability. Accordingly, this guide serves as an institutional policy and operational reference to support faculties and academic units in developing integrated study programs in a structured, consistent, and contextually adaptable manner. Specifically, the guide seeks to:

- Provide a clear conceptual framework for integrated study programs and their models (multidisciplinary, interdisciplinary, and transdisciplinary), supported by illustrative examples drawn from the Egyptian context and labor market needs.
- Offer detailed, practical, and procedural guidance for the design, approval, implementation, evaluation, and continuous development of integrated study programs within the academic and administrative structures of the University.
- Align program design with the Egyptian National Qualifications Framework (NQF) and intended learning outcomes, with particular emphasis on employability skills, entrepreneurship, and future-oriented competencies.
- Address administrative and academic challenges associated with implementing integrated program models, and propose effective mechanisms for governance, coordination, and shared resource utilization.
- Review and adapt international and regional best practices, ensuring their contextualization within the Egyptian higher education environment and alignment with societal values and national priorities.

Accordingly, this guide serves as an authoritative institutional reference, supporting the University's efforts to develop future-oriented, high-quality academic programs capable of addressing complex challenges and contributing meaningfully to national and global development.

CONCEPTUAL FRAMEWORK

The conceptual framework provides the theoretical and analytical foundation for understanding integrated disciplinary study programs. It clarifies the key concepts, assumptions, and distinctions that underpin multidisciplinary, interdisciplinary, and transdisciplinary approaches in higher education. By establishing a shared conceptual language, this framework supports consistent interpretation, coherent program design, and effective institutional decision-making. It also serves as a reference point for aligning integrated programs with international best practices, quality assurance standards, and the institutional context of Ain Shams University.

1.1 Multidisciplinary Programs

Philosophical and Methodological Foundations

The philosophy of multidisciplinary programs is grounded in the principle of plurality of perspectives; whereby diverse disciplinary viewpoints are brought together to examine a single phenomenon without attempting systematic integration or synthesis among them. This approach is rooted in cumulative epistemology, which assumes that knowledge and truth can be more fully understood through the aggregation of independent bodies of knowledge.

Within this model, each discipline retains its methodological identity and conceptual autonomy, preserving its theoretical frameworks, tools, and modes of inquiry. As a result, multidisciplinary programs are generally perceived as less disruptive to traditional academic structures, making them more readily compatible with established departmental and faculty arrangements.

The term multidisciplinary refers to the concurrent study of a topic from the perspectives of multiple disciplines. While the diversity of viewpoints contributes to a broader and more comprehensive understanding of the subject, each discipline continues to operate independently, without formal integration of concepts or methods. Consequently, this model is considered the closest to the classical disciplinary organization of academic departments within faculties.

Illustrative Example

At the University of California, a multidisciplinary program titled “Health and Society” is structured as follows:

- Epidemiology Course (Department of Public Health): Focuses on measuring disease prevalence and identifying risk factors.
- Medical Sociology Course (Department of Sociology): Examines the social determinants of health and illness.
- Health Economics Course (Department of Economics): Analyzes healthcare costs, resource allocation, and economic efficiency.
- Medical Ethics Course (Department of Philosophy): Explores ethical issues related to medical practice and healthcare decision-making.

1-2 Interdisciplinary Programs

Philosophical and Methodological Foundations

The philosophy of interdisciplinary programs is grounded in the principle of knowledge synthesis, which assumes that interaction among disciplines generates new forms of knowledge that exceed the sum of their individual contributions. In this approach, two or more disciplines are intentionally integrated to create a shared language and a unified conceptual framework, enabling all contributing disciplines to engage with a common set of concepts and analytical tools.

This model draws on systems theory, which views phenomena as interconnected systems that must be understood through analysis at multiple levels rather than through isolated components. Accordingly, interdisciplinary education seeks to transcend fragmented perspectives by fostering coherent and integrative understanding.

The term interdisciplinary refers to a systematic process of linking and integrating disciplines in the study of a given issue. Unlike multidisciplinary approaches, which merely juxtapose different perspectives, interdisciplinary programs actively dissolve traditional disciplinary boundaries in order to produce integrated and novel understanding.

Illustrative Example

An example of a interdisciplinary program is the “bioethics” program at the University of Arizona State university. This interdisciplinary program includes: biology and philosophy are not studied side by side as separate subjects; rather, their methods and conceptual tools are combined to generate new analytical framework that cannot be achieved through either discipline alone. In interdisciplinary programs, disciplines do not retain their classical, isolated identities; instead, they interact and overlap in meaningful ways.

This approach represents an advanced level of integration, aiming to bridge gaps between academic departments and to establish coherent intellectual structures capable of addressing complex and multifaceted issues. The following simplified equation illustrates the core idea of interdisciplinary programs:

Discipline (A) + Discipline (B) — (systematic integration)→ Generation of new knowledge

1-3 Transdisciplinary Programs

Philosophical and Methodological Foundations

The philosophy of transdisciplinary programs is grounded in the principle of "knowledge unification", which goes beyond traditional academic boundaries to incorporate practical knowledge and real-world expertise drawn from professionals, practitioners, and diverse stakeholders. This approach emphasizes the creation of shared spaces for thinking and action between academia and society, with a strong focus on addressing real-world problems within their natural and social contexts.

The transdisciplinary perspective recognizes that many contemporary challenges cannot be effectively addressed through academic disciplines alone. Instead, it calls for deep collaboration between universities, communities, policy makers, industry, and civil society, where academic knowledge is integrated with experiential, professional, and contextual knowledge.

The term transdisciplinary refers to an approach that removes boundaries between disciplines altogether, often integrating knowledge from non-academic stakeholders, such as local communities, policy makers, and industry actors, in order to address complex, real-world challenges. In this model, problem-solving is not confined to academic frameworks, but is co-constructed through continuous interaction between academic and societal actors.

Illustrative Example

An example of a transdisciplinary program is the "Sustainable Urban Transformation" program at the University of Copenhagen. This transdisciplinary program includes:

- Partnership with the Municipality of Copenhagen to address the challenge of transitioning toward a carbon-neutral city
- An integrated working team composed of:
  - Students from multiple disciplines (engineering, urban planning, social sciences, economics)
  - Representatives from the municipality
  - Representatives from local community associations
  - Experts from renewable energy companies

Through this collaborative structure, the program enables students and stakeholders to jointly analyze, design, and implement solutions to real urban sustainability challenges, reflecting the core principles of transdisciplinary education.

Table (1)

Comparison between Integrated Study Programs Models

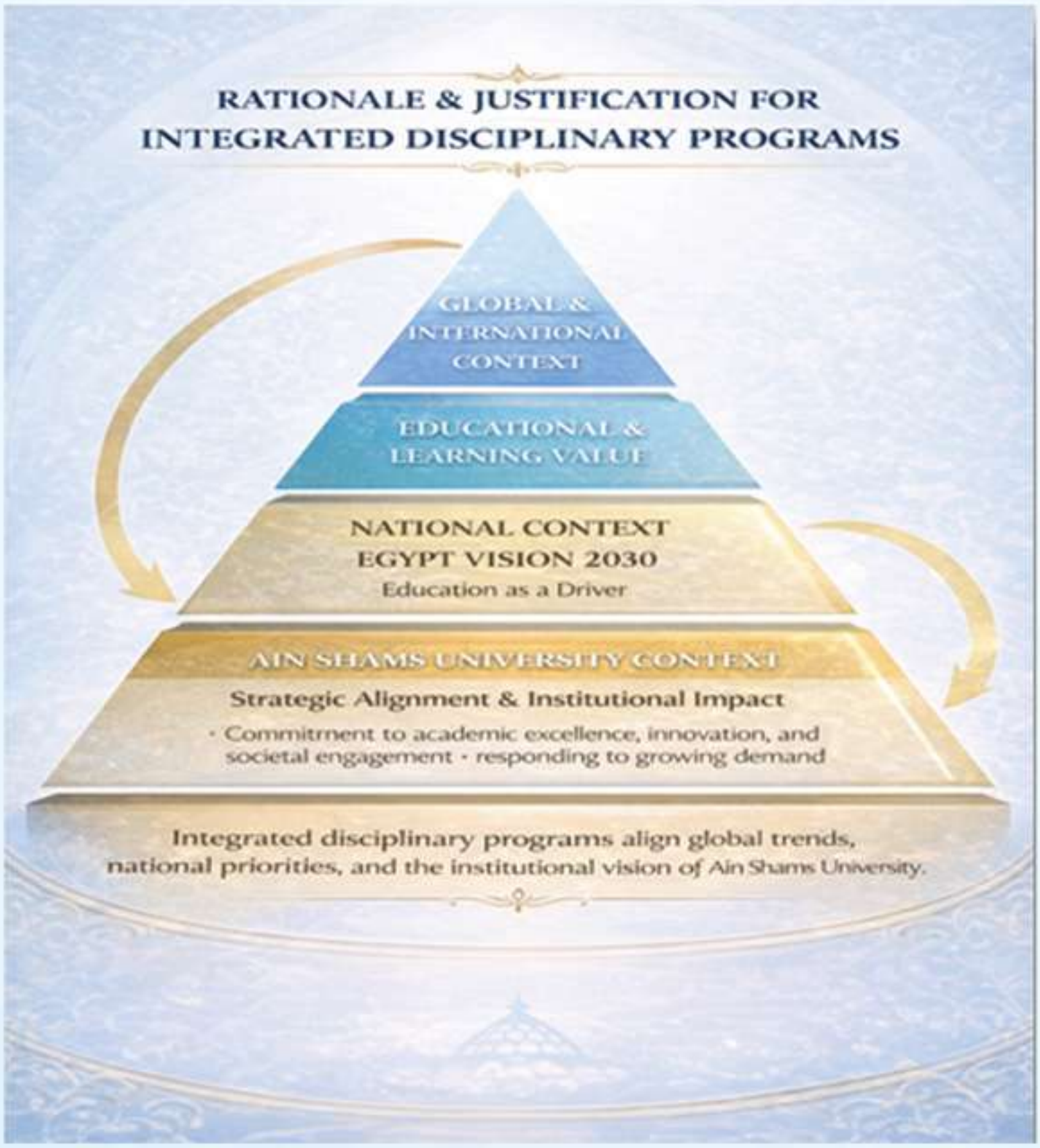
Dimension	Multidisciplinary Programs	Interdisciplinary Programs	Transdisciplinary Programs
Core Principle	Multiple disciplines address a common issue side by side	Systematic integration of two or more disciplines	Addressing complex real-world problems through collaboration between academia and society
Nature of Knowledge	Discipline-based knowledge	Synthesized, integrated knowledge beyond individual disciplines	Co-produced, context-based knowledge
Nature of Integration	Low integration	Medium to high integration	Very high integration
Relationship Between Disciplines	Disciplines remain conceptually and methodologically independent	Disciplines interact to create shared concepts and frameworks	Disciplinary boundaries are transcended or dissolved
Curriculum Structure	Parallel courses from different disciplines	Integrated courses and shared learning modules	Problem- or challenge-driven curriculum
Teaching Approach	Discipline-specific teaching within a common theme	Team teaching and integrated instructional design	Co-teaching with academia and external stakeholders
Assessment Focus	Discipline-based assessment	Assessment of integrative reasoning and synthesis	Assessment of real-world impact and solution effectiveness
Role of External Stakeholders	Minimal or optional	Limited or consultative	Essential and embedded in learning process
Academic Structure	Implemented within existing departments	Crosses or reshapes departmental boundaries in academic and applied contexts	Extends beyond the university to societal partners within real-world, community, or industry settings
Primary Objective	Broaden understanding through diverse disciplinary views	Generate new, integrated knowledge frameworks	Produce actionable solutions embedded in social contexts



Pic (1). Comparison of Integration levels in Academic Programs

2- RATIONALE AND JUSTIFICATION FOR INTEGRATED PROGRAMS

Integrated disciplinary programs have emerged globally as a strategic response to the growing complexity of contemporary societal, economic, and knowledge challenges. These programs enable higher education institutions to move beyond fragmented disciplinary models and provide learners with holistic, relevant, and future-oriented educational experiences. Accordingly, the following section presents the rationale and justification for introducing integrated programs at three interconnected levels: international developments, national priorities and policy directions, and the institutional context and strategic orientation of Ain Shams University:



Pic (2) Rational & Justification For Integrated Disciplinary Programs

• Contemporary societal, economic, technological, and environmental challenges are complex, interconnected, and multidimensional, and therefore cannot be effectively addressed through isolated disciplinary approaches.
• International higher education trends demonstrate a growing shift toward multidisciplinary, interdisciplinary, and transdisciplinary approaches as recognized best practices in programs and curriculum design and educational innovation.
• Integrated programs enhance critical and analytical thinking, as students are required to examine complex issues from multiple disciplinary viewpoints, and supports knowledge transfer, allowing students to apply learning across contexts rather than within isolated subject boundaries, all of these advantages prepare students to labor market.
• Interdisciplinary and transdisciplinary learning environments foster collaboration, communication, and teamwork, which are essential competencies for the twenty-first-century workforce.
• International best practices demonstrate that integrated programs contribute to innovation, creativity, and sustainable development outcomes in higher education.

Rationale in the Context of Ain Shams University

• As a comprehensive public university, Ain Shams University is committed to academic excellence, innovation, and societal engagement within the national and global higher education landscape.
• The University's mission and strategic priorities emphasize quality education, graduate employability, responsiveness to national development needs, and contribution to sustainable development and community engagement
• National strategies, including Egypt Vision 2030, call for educational programs that develop interdisciplinary competencies, innovation capacity, and problem-solving skills aligned with societal and labor market needs.
• Increasing demand from students, employers, and professional sectors highlights the need for programs that integrate knowledge across disciplines rather than offering fragmented learning experiences.
• The expansion of innovation, and community-based initiatives at Ain Shams University necessitates academic programs that reflect similar integrative approaches.
• Integrated disciplinary programs support the University's efforts to enhance graduate readiness for complex professional roles, strengthen links between teaching, research, and societal impact, and promote collaboration across faculties and academic units.

METHODOLOGY OF DEVELOPING THE GUIDE

This section outlines the methodological approach and procedural steps followed in preparing the Ain Shams University Guide for Integrated Study Programs. The methodology was designed to ensure that the guide is evidence-based, best-practice-informed, institutionally coherent, and quality-assured, while remaining fully aligned with national regulatory requirements and the institutional context of Ain Shams University.

The development of the guide followed a structured methodological approach that included the following steps:

- Reviewing literature, policy frameworks, and benchmarking evidence to inform best practices in integrated study programs.
- Analyzing the institutional context of Ain Shams University with respect to:
  - University's mission, vision, strategic priorities, and policies of designing of introducing and eliminating academic programs.
  - National regulatory and accreditation requirements.
- Developing an initial outline and overall structure of the guide.
- Preparing the draft version of the guide.
- Internally reviewing the draft and collecting feedback.
- Developing a refined and authoritative final version of the guide.
- Submitting the guide to the relevant university authorities for formal approval.
- Submitting the approved guide to the Supreme Council of Universities for reviewand formal endorsement, in accordance with national higher education regulations and applicable ministerial frameworks.

METHODOLOGY OF DEVELOPING THE GUIDE



Pic (3) The Methodology of Developing The Guide

APPROACHES OF DEVELOPING INTEGRATED PROGRAMS

Integrated study programs may be developed through different approaches depending on the intended level of integration, program objectives, institutional context, and stakeholder involvement. This section outlines the main approaches adopted in the development of multidisciplinary, interdisciplinary, and transdisciplinary programs, providing a structured framework to guide academic units in selecting and applying the most appropriate development pathway while ensuring coherence, feasibility, and alignment with institutional and national requirements.



Pic (4) Approaches of Developing Integrated Programs

4-1. Competency-Based Design Approach

The competency-based approach to designing integrated study programs begins with the identification of integrated competencies that graduates are expected to demonstrate upon completion of the program. These competencies typically combine disciplinary knowledge, cognitive skills, professional practices, and transferable skills required for professional practice, societal engagement, and future employment.

Procedural Steps:

- Identify core and cross-cutting competencies based on labor market analysis, professional standards, and national development priorities.
- Translate competencies into measurable Program Learning Outcomes (PLOs).
- Map competencies across courses, modules, and learning activities.
- Design integrated learning experiences that develop competencies progressively.
- Align assessment methods to directly measure competency attainment.

Relationship with the Nature of Integrated Study Programs

- **Multidisciplinary Programs:** The competency-based approach supports the identification of distinct competencies for each participating discipline, ensuring that each field contributes a specific, well-defined competency that serves the graduate profile without unintended or unplanned overlap.
- **Interdisciplinary Programs:**The approach emphasizes the formulation of integrated or hybrid competencies–skills that can only be developed through the deliberate integration of two or more disciplines (e.g., Bioinformatics Data Analysis, which integrates statistics and biology).
- **Transdisciplinary Programs:** The approach directs the program toward "grand problem-solving competencies", where competencies focus on the ability to operate in complex societal contexts beyond academia, incorporating leadership, sustainability, stakeholder engagement, and real-world impact.

4-2. Backward Design Approach

The backward design approach begins with the intended graduate profile and works backward to define curriculum content and learning experiences.

Procedural Steps:

- Define the desired graduate attributes and exit-level learning outcomes.
- Determine acceptable evidence of learning (assessment tasks and performance criteria).
- Design integrated courses and learning activities that prepare students to meet assessment requirements.
- Ensure vertical and horizontal alignment across program levels.
- Review coherence between outcomes, teaching strategies, and assessment.

Relationship with the Nature of Integrated Study Programs

- **Multidisciplinary Programs:**The Backward Design approach functions as an organizational mechanism that prevents unnecessary duplication. By clearly defining what is required from each contributing discipline, it ensures that courses (e.g., physics in a medical program) deliver only the content that directly supports the final graduate profile.
- **Interdisciplinary Programs:** This approach ensures that final assessments explicitly measure students' ability to integrate and connect knowledge across disciplines. Consequently, program designers are compelled to create interdisciplinary courses and learning experiences that support integrative assessment tasks.
- **Transdisciplinary Programs:** Backward Design begins with a real-world problem as the ultimate outcome (e.g., climate change or urban sustainability). The curriculum is then designed in reverse to mobilize academic knowledge from multiple disciplines, alongside societal and community inputs, providing students with the tools necessary to address complex, real-life challenges.

4-3. Project-Based Integration Approach

In the project-based integration approach, projects function as the primary vehicle for integration across disciplines. Students engage in extended, authentic projects that require the application of knowledge and skills from multiple fields.

Procedural Steps:

1. Identify authentic projects linked to real-world or professional contexts.
2. Define disciplinary contributions required for each project.
3. Design courses and modules that support project development.
4. Implement team-based learning with interdisciplinary supervision.
5. Assess student performance using integrated project outputs and rubrics.

Relationship with the Nature of Integrated Study Programs

- **Multidisciplinary Programs:** Each student contributes from within their own disciplinary perspective (e.g., an engineering student handles technical design, while a management student prepares the budget). Disciplinary boundaries remain clear, but the final product is unified.
- **Interdisciplinary Programs:** The project requires genuine integration of knowledge and skills, where solutions cannot be achieved without interaction among disciplines (e.g., developing prosthetic limbs through the integration of mechanical engineering and medical sciences).
- **Transdisciplinary Programs:** Projects are conducted in collaboration with external partners (industry, government, or community organizations) to address comprehensive real-world challenges. Examples include sustainability projects that extend beyond the university and involve societal stakeholders.

4.4 Problem-Based Integration Approach

The problem-based integration approach centers learning around real-world problems that cannot be addressed through a single disciplinary lens.

Procedural Steps:

1. Select real or simulated complex problems aligned with program objectives.
2. Identify relevant disciplinary perspectives required to address each problem.
3. Structure learning units around inquiry, investigation, and solution development.
4. Facilitate collaborative learning and guided inquiry.
5. Evaluate solutions based on integrative reasoning and problem-solving effectiveness.

Relationship with the Nature of Integrated Study Programs

- **Multidisciplinary Programs:** A shared problem (e.g., an economic crisis) is analyzed from distinct disciplinary perspectives–legal, financial, social–where each discipline contributes independently to understanding different dimensions of the issue.
- **Interdisciplinary Programs:** Problems are intentionally designed to require the integration of theories, methods, and tools from two or more disciplines in order to arrive at a solution (e.g., clinical genetics problems combining biology and statistics).
- **Transdisciplinary Programs:** Students address complex real-world challenges, such as disaster management or earthquake response, where academic knowledge is integrated with field expertise, public policy considerations, and community engagement to develop innovative response models.

4.5 Theme-Based Integration Approach

The theme-based integration approach structures the program around overarching themes that cut across disciplines. It organizes the curriculum around broad, unifying themes such as sustainability, innovation, digital transformation, health, or social development.

Procedural Steps:

1. Identify central themes aligned with national priorities, global challenges, or emerging fields.
2. Organize courses and modules around these themes rather than disciplines.
3. Define how each discipline contributes to understanding the theme.
4. Design integrative learning activities and assessments.
5. Ensure progression from introductory to advanced thematic integration.

Relationship with the Nature of Integrated Study Programs

- **Multidisciplinary Programs:** The same theme (e.g., nutrition) is addressed across different courses–such as chemistry, biology, and home economics–each from its own disciplinary perspective, with temporal coordination but without deep conceptual integration.
- **Interdisciplinary Programs:** A new integrated course or module is developed around the theme (e.g., artificial intelligence), organically combining concepts from computer science, logic, psychology, and related fields to produce a unified learning experience.
- **Transdisciplinary Programs:** Broad themes (e.g., global citizenship) serve as the organizing framework for the entire program, dissolving traditional disciplinary boundaries and integrating academic learning with societal, ethical, and civic dimensions.

INTEGRATED PROGRAM DESIGN STANDARDS

The design of integrated study programs at Ain Shams University should be guided by a systematic and structured design framework that ensures academic coherence, purposeful integration across disciplines, and alignment with institutional, national, and international reference frameworks. This framework operationalizes the principles of integrated education by translating them into clearly defined design stages, each governed by specific standards and criteria to support consistency, quality, and accountability.

6-1. Program Learning Outcomes standards

Based on the identified needs, Program Learning Outcomes (PLOs) should be formulated to define what graduates of the integrated program are expected to know, understand, and be able to do upon completion. Generally, Program Learning Outcomes should:

- Be aligned with the program's mission and objectives.
- Be aligned with the Egyptian National Qualifications Framework (NQF) and the relevant qualification level
- Be consistent with National Academic Reference Standards (NARS), where applicable.
- Be Clear, measurable, and assessable through appropriate assessment tools.
- Be Systematically mapped to Course Learning Outcomes across the curriculum.
- Be aligned with teaching and learning strategies that support integration.
- Be aligned with assessment methods
- Demonstrate Progressive development from foundational understanding to advanced integration.
- Involve academic representatives from all contributing disciplines.

6-1-1 Multidisciplinary Program Learning Outcomes (PLOs) Standards

Multidisciplinary PLOs should:

- Demonstrate breadth of knowledge across the contributing disciplines.
- Demonstrate Clear recognition of each discipline's concepts, methods, and perspectives.
- Ensure that graduates are able to Understand and apply foundational knowledge from more than one discipline.
- Ensure that graduates are able to recognize relationships and complementarities between disciplines without necessarily merging them.
- Ensure balance development of discipline-specific knowledge and skills.
- Ensure development of transferable skills such as communication, teamwork, ethical awareness, and information literacy.
- Emphasize application of knowledge and skills from different disciplines to a common theme, field, or professional context.
- Emphasize addressing problems or tasks through the selection of appropriate disciplinary perspectives.

6-1-2. Interdisciplinary Program Learning Outcomes (PLOs) Standards

Interdisciplinary PLOs should:

- Demonstrate intentional integration through synthesis of concepts, theories, and methods drawn from multiple disciplines.
- Demonstrate intentional integration through the development of shared conceptual frameworks or integrated analytical perspectives.
- Demonstrate intentional integration through movement beyond parallel disciplinary learning toward combined and coherent understanding.
- Emphasize Higher-Order Cognitive Skills.
- Enable graduates to apply integrated knowledge and skills to address complex, real-world problems.
- Enable graduates to adapt and transfer interdisciplinary learning across varied contexts.

6-1-3. Transdisciplinary Program Learning Outcomes (PLOs) Standards

Transdisciplinary PLOs should:

- Demonstrate the learner's ability to integrate academic, professional, community, and experiential knowledge.
- Demonstrate the learner's ability to address problems where disciplinary boundaries are insufficient or irrelevant.
- Demonstrate Graduates' ability to engage with complex and authentic societal challenges.
- Include the ability to Collaborate effectively with non-academic stakeholders.
- Include the ability to Facilitate dialogue, negotiation, and shared decision-making.
- Reflect ethical awareness and social responsibility.
- Emphasize the ability to Generate innovative and creative responses to complex problems.

6-2. Program Curriculum Structure and Credit Distribution standards

6-2-1. Multidisciplinary Program Curriculum Structure and Credit Distribution Standards

- **Major Discipline** should account for 30%–35% of the total program courses.
- **Minor Discipline (Minor 1)** should account for 30%–35% of the total program courses.
- **Minor Discipline (Minor 2)** should account for 20%–25% of the total program courses.
- No single discipline should exceed 40% of the total program credit hours, in order to ensure that the program remains multidisciplinary rather than a major–minor program structure.
- The representation of any participating discipline should not be less than 15% of the total program credit hours, to ensure that students receive sufficient academic exposure to understand the methodological foundations of that discipline.

• The curriculum should be designed around multiple contributing disciplines that collectively serve a common program purpose while preserving the identity and methodological integrity of each discipline.
• The curriculum structure and credit distribution should be clearly aligned with the Program Learning Outcomes.
• The program content should ensure that each participating discipline contributes a distinct and complementary perspective on the subject matter, and that unnecessary duplication or repetition across disciplines is avoided.

6-2-2. Interdisciplinary Program Curriculum Structure and Credit Distribution Standards

• Interdisciplinary core coursesshould constitute 40%–50% of the total program courses.
• Interdisciplinary core courses explicitly integrate the contributing disciplines and represent the central integrative component of the program.
• First Discipline (A) should account for 25%–30% of the total program courses.
• Second Discipline (B) should account for 25%–30% of the total program courses.
• The largest relative weight within the curriculum should be allocated to hybrid (integrated) courses that combine methodologies from the contributing disciplines, ensuring that the program's identity is genuinely interdisciplinary rather than a parallel study of separate disciplines.
• All discipline-specific courses (A and B) should include applications, case studies, or learning activities that explicitly link course content to the other discipline, in order to prevent the emergence of isolated or fragmented "knowledge silos" within the program.
• Program content should be systematically reviewed to ensure a clear focus on areas of integration between the participating disciplines.
• The program should be built around the dynamic interaction of two or more disciplines (e.g., Artificial Intelligence in Medicine), where the disciplines cannot be studied in isolation but are addressed as a single integrated academic entity.
• The program design should be grounded in the principle that interaction between disciplines generates a "third form of knowledge" that does not belong exclusively to any single discipline but emerges from their integration.

6-2-3. Transdisciplinary Program Curriculum Structure and Credit Distribution Standards

- The Challenge-Based Core should constitute 50%–60% of the total program.
- These units are based on real-world field projects implemented in collaboration with community partners and societal stakeholders.
- The Academic Toolkit should account for 20%–25% of the program.It consists of selected academic disciplines and learning units chosen by the student according to the knowledge and tools required to address the identified challenge.
- Field-based, leadership, and professional skills should constitute 15%–20% of the total program.
- Integrated and project-based learning components should carry the largest relative weight within the curriculum.
- All learning units should include inputs from external practitioner experts from outside the university, ensuring alignment between academic learning, labor-market realities, and societal needs.
- The program should be structured around Grand Challenges that cannot be solved by any single discipline and require the integration of scientific knowledge, public policy, law, and civil society engagement.
- The program design should intentionally transcend traditional academic boundaries, based on the principle that meaningful knowledge emerges at the intersection of science and real life.

6-3. Teaching and LearningStandards

Teaching and learning strategies are selected to support integrated learning and active student engagementthrough active, collaborative, and experiential approaches. The design framework prioritizes approaches such as project-based learning, problem-based learning, inquiry-based learning, and collaborative learning.Learning activities are designed to reflect authentic academic, professional, and societal contexts, enabling students to apply integrated knowledge and skills in meaningful ways. Programs' Teaching and learning strategies should be:

- Clearly aligned with Program and courses Learning Outcomes and assessment methods used to evaluate student achievement.
- Inclusive and supportive of diverse learners
- Regularly reviewed through course and program evaluation processes.
- Informedby student feedback, peer review, and performance data.

6-3-1. Multidisciplinary Programs Teaching and Learning standards

- Teaching strategies should respect the integrity of each contributing discipline.
- A variety of teaching strategies should be employed to support effective understanding of each discipline's perspective and accommodate diverse learner needs and learning styles.
- Teaching strategies should enable students to apply disciplinary knowledge and skills to shared themes, issues, or professional contexts.
- Each discipline should be delivered by a qualified specialist, with course content explicitly contextualized within the program's common issue or thematic focus (e.g., sustainable energy examined from engineering, economic, and environmental perspectives).
- Competency-Based Learning should be implemented through activities targeting clearly defined, discipline-specific competencies (e.g., economic analysis, environmental evaluation, engineering modeling), with a designated component devoted to related employability skills.
- Interactive cross-disciplinary workshops and multi-dimensional case studies should be used to examine shared issues from multiple disciplinary perspectives while preserving the distinct identity of each discipline.
- Self-directed learning should be promoted through independent disciplinary inquiry, structured sharing and discussion via common academic platforms, and the use of digital self-learning toolkits representing each contributing discipline.

6-3-2. Interdisciplinary Programs Teaching and Learning standards

- Teaching and learning strategies should emphasize the integration and synthesis of knowledge, concepts, and methods across contributing disciplines.
- Interdisciplinary programs should employ active and experiential learning strategies, such as project-based, problem-based learning, case-based, inquiry-based learning, Collaborative and applied learning activities.
- Interdisciplinary core courses should be delivered through team teaching by faculty from different disciplines, modeling interdisciplinary dialogue and integration (e.g., a physician and a software engineer co-teaching Medical Artificial Intelligence).
- Integrated project-based learning should be implemented through applied projects requiring combined disciplinary tools and methods, jointly supervised by faculty and supported through interactive workshops.
- Labor-market–linked integrated learning should be promoted through partnerships with interdisciplinary organizations, providing training in integrated solutions and simulated professional environments through interdisciplinary laboratories and work-based learning settings.

6-3-3. Transdisciplinary Programs Teaching and Learning standards

- Teaching and learning strategies emphasize knowledge co-creation, societal relevance, and engagement with complex real-world challenges.
- Teaching and learning strategies should be organized around real-world problems and grand societal challenges rather than disciplinary content.
- Learning activities should be driven by authentic challenges (such as desertification, pollution, or climate change adaptation), that require the integration of academic, professional, and community-based knowledge.
- Teaching and learning strategies should promote high levels of learner autonomy, enabling students to define learning pathways in response to evolving challenges, take responsibility for inquiry, decision-making, and engage in reflective and adaptive learning processes.
- The program should be governed and delivered by a team of academic staff, professional practitioners, and community representatives, ensuring the integration of theory, practice, and societal engagement within teaching and learning activities.
- Community-oriented learning strategies should be extensively employed by engaging local communities, associations, governmental bodies, and civil society organizations in the process of problem-solving and challenge response.
- Competency-Based Learning should be implemented with a focus on developing key transdisciplinary competencies, including community negotiation, participatory project management, social innovation, and strategic planning and public policy tools
- Field-based learning should be applied by integrating students into mixed academic–practical teams that gain both field and academic experience through collaboration with community institutions as an integral part of the study plan.
- Self-directed learning strategies in real-world contexts should be employed by enabling students to identify specific aspects of the societal challenge they wish to address and to develop personalized learning plans in collaboration with community-based mentors.
- Labor-market–linked learning through societal impact should be promoted by establishing partnerships with development organizations, social entrepreneurship incubators, and relevant ministries, in order to expose students to transdisciplinary career pathways and to train them in designing initiatives with both economic and social viability.

6-4. Assessment Methods and Tools Standards

Assessment tools should be designed to evaluate integration, synthesis, application, and professional judgment, rather than isolated content recall. A balanced combination of formative and summative assessments should be employed, supported by clear rubrics and performance criteria. Assessment Methods and Tools Standards should be:

6-4-1. Multidisciplinary programs Assessment Methods and Tools standards

- Assessment methods and tools shall reflect coordinated contributions from multiple disciplines while preserving the integrity of each discipline's learning objectives.
- Discipline-specific competencies shall be assessed through examinations that measure mastery of the core competencies of each discipline independently, in addition to evaluating student performance in practical activities that demonstrate proficiency in these specific disciplinary competencies.
- A range of assessment methods shall be employed to ensure valid and reliable measurement of student achievement. Assessment methods may include examinations, assignments, case analyses, reports, presentations, and applied tasks appropriate to each discipline.
- A group project shall be implemented in which each student applies the perspective of their own discipline to a shared societal problem. Assessment shall evaluate both individual contribution and collective performance within the project.
- A self-directed learning portfolio shall be submitted, compiling the student's research and applied work that demonstrates development within each discipline, accompanied by reflective commentary and peer evaluation.

6-4-2. Interdisciplinary programs Assessment Methods and Tools standards

- Assessment methods and tools shall measure the integration and synthesis of knowledge, methods, and perspectives across contributing disciplines.
- Integrative competencies shall be assessed by evaluating the student's ability to combine concepts, theories, and methodologies from multiple disciplines and develop integrated solutions that go beyond parallel disciplinary application (e.g., designing a medical data analysis algorithm). Performance rubrics shall be used to assess the level of integrative competence achieved.
- Interdisciplinary programsshould employ authentic and applied assessment tools that reflect real-world complexity, such as problem-based, project-based assessments, research-oriented, and applied assignments.
- A range of assessment tools should be employed, such as written examinations,
- Practical or applied tasks, reports and case analyses, presentations and professional simulations, Portfolios. The choice of tools shall be appropriate to the nature of each discipline and learning outcome.

• Interdisciplinary research projects shall be implemented to generate new knowledge emerging from disciplinary interaction. Projects shall be assessed based on the originality of integration and feasibility of application, using structured observation checklists and evaluation questionnaires.

• Assessment methods should evaluate students' ability to demonstrate how different disciplines contribute to addressing the same problem.

• A self-directed learning portfolio shall be submitted, compiling the student's research and applied work that demonstrates development within each discipline, accompanied by reflective commentary and peer evaluation.

6-7-3. Transdisciplinary programs Assessment Methods and Tools standards

• Assessment methods and tools shall capture knowledge co-creation, societal engagement, systems thinking, and transformative action beyond disciplinary or interdisciplinary achievement.

• Assessment practices shall evaluate the real-world impact of student work using measurable indicators such as number and type of beneficiaries and improvement of services or practices.

• Assessment methods shall incorporate active participation of non-academic stakeholders, including community partners, practitioners, policymakers, and civil society representatives. Stakeholders may contribute through feedback, joint evaluation, validation of outcomes, or participation in assessment panels.

• transdisciplinaryprogramsshould employ authentic assessment tools aligned with real-world challenges. Assessment shall prioritize problem framing, solution relevance, and contextual responsiveness.

• Assessment practices shall reflect complexity and uncertainty inherent in transdisciplinary contexts.

• Students shall be required to develop Transdisciplinary or Societal Impact Portfolios compiling evidence of learning and impact.

• Assessment shall include continuous evaluation in real-world contexts, conducted by field supervisors, practitioners, or community mentors.This assessment shall focus on professionalism, adaptability, ethical conduct, and effectiveness in practice.

• Assessment practices shall provide ongoing, constructive feedback from academic and non-academic assessors.

• Assessment practices shall uphold ethical standards, transparency, and fairness in assessment procedures.

6-5. Delivery Model Standards

- The model shall support the intended learning outcomes and the nature of knowledge, skills, and competencies targeted by the program.
- The delivery model shall employ a blended and flexible approach, integrating face-to-face learning, digital and online learning environments, synchronous and asynchronous learning activities.
- The delivery model shall incorporate experiential and practice-based learning as Learning shall extend beyond the classroom to authentic academic, professional, or societal contexts.
- The delivery model should utilize digital platforms and learning technologies to:
  - Support communication, collaboration, and resource sharing
  - Facilitate self-directed and personalized learning
  - Enable documentation of learning processes and outcomes
  - Digital delivery shall complement, not replace, pedagogical intent.

This Integrated Program Design Framework provides a coherent and systematic basis for the planning, implementation, and evaluation of integrated academic programs. By aligning needs analysis, learning outcomes, curriculum structure, teaching and learning strategies, assessment methods, and delivery models, the framework ensures academic rigor, purposeful integration, and societal relevance. It supports flexibility across multidisciplinary, interdisciplinary, and transdisciplinary models while maintaining clear standards for quality and accountability. The framework also facilitates transparency, consistency, and continuous improvement in line with institutional priorities and national and international accreditation requirements.

DETERMINING THE LEVEL OF INTEGRATION OF INTEGRATED STUDY PROGRAMS

Determining the appropriate level of integration is a critical decis*ion-making step in the development of integrated study programs. The selected level of integration should be explicitly justified, academically coherent, and consistent across program design, governance, and delivery. It requires a systematic assessment of the institution's academic capacity, resource readiness, and governance environment. The following criteria should be applied systematically to determine whether a proposed program is multidisciplinary, interdisciplinary, or transdisciplinary.

Criteria for Determining the Level of Integration

The proposing academic unit(s) should determine the level of integration based on the following criteria:

1. Nature of the Academic Problem or Focus Area

• Programs addressing parallel disciplinary contributions typically align with a multidisciplinary model, also addressing shared conceptual problems requiring synthesis align with an interdisciplinary model, finally addressing open-ended societal challenges involving non-academic knowledge align with a transdisciplinary model.

2. Degree of Knowledge Integration

• The level to which disciplinary knowledge is placed side by side (coordination without synthesis), Integrated into shared concepts, methods, or frameworks, and transcended to generate new, practice-oriented knowledge

3. Faculty-Related Criteria: The level of integration should be determined in light of faculty expertise, readiness, and collaborative capacity, which based on

- Disciplinary Expertise and Diversity
- Experience in Collaborative Teaching
- Academic Workload and Sustainability

4. Resource and Infrastructure Criteria

a. Physical and Digital Infrastructure

- Availability of shared teaching spaces, laboratories, studios, or learning hubs.
- Access to digital platforms that support collaboration across disciplines.
- Capacity for blended, experiential, and field-based learning.

b. Learning and Support Resources

- Availability of interdisciplinary learning materials and databases.
- Access to external expertise, field sites, or community settings.
- Administrative support for coordination across units.

c. Financial and Operational Capacity

• Availability of funding to support coordination, joint activities, and external engagement.Long-term financial sustainability of the proposed integration level.

5. Institutional and Governance Criteria

Institutional structures and policies are decisive for determining the feasible level of integration, based on key criteria including Governance Flexibility—requiring mechanisms for shared academic ownership, joint decision-making, and cross-faculty readiness; Policy and Regulatory Compatibility—ensuring alignment with university bylaws, national frameworks, and feasible approval procedures; and Strategic Alignment—demanding consistency with the university's mission and strategic priorities while contributing added value through goals like innovation, employability, and sustainability compared to single-discipline programs.

Any change in integration level should be subject to formal approval through established academic channels.

The selected level of integration should reflect institutional readiness rather than aspirational intent alone, ensuring that integrated study programs are academically coherent, operationally viable, and sustainable over time.

GOVERNANCE AND MANAGEMENT STRUCTURE OF INTEGRATED STUDY PROGRAMS

Effective governance and management are critical to the success and sustainability of integrated study programs, particularly those involving multiple disciplines, departments, faculties, and external stakeholders. Given the shared academic ownership and complexity inherent in multidisciplinary, interdisciplinary, and transdisciplinary programs, integrated programs require clear governance arrangements, defined roles, and coordinated decision-making mechanisms to ensure academic coherence, quality assurance, and accountability.

This section sets out a proposal for the governance and management structure required for the design, implementation, monitoring, and continuous improvement of integrated study programs at Ain Shams University.

Governance arrangements for integrated programs should be guided by the following principles:

- Shared academic ownership across contributing departments and faculties
- Clarity of roles and responsibilities at all institutional levels
- Transparency in decision-making and accountability
- Alignment with university bylaws, quality assurance systems, and accreditation requirements
- Effective coordination between academic, administrative, and external stakeholders

General Governance Models for Integrated Study Programs

Integrated study programs may adopt different governance models depending on their academic scope, level of disciplinary integration, and institutional structure. The selection of an appropriate governance model is essential to ensure clarity of authority, shared academic ownership, and effective coordination among participating units. The following governance models represent internationally recognized and institutionally applicable approaches for managing integrated study programs.

1. Single-Faculty Governance Model

In this model, one faculty serves as the hosting faculty and assumes primary academic and administrative responsibility for the integrated program, while receiving academic contributions from other departments or faculties.

2. Joint-Faculty Governance Model: This model involves shared academic ownership between two or more faculties, with joint responsibility for program management and decision-making.

3- Centralized Governance Model: In this model, the integrated program is administered directly at the university level, rather than being housed within a single faculty.

4- Consortium or Partnership-Based Governance Model: This model applies to integrated programs delivered in collaboration with external partners, such as other universities, industry partners, or community organizations.

5. Hybrid Governance Model: A hybrid model combines elements from more than one governance model, for instance, combines elements of faculty-based and centralized governance, allowing flexibility in management while maintaining academic accountability.

Selection of the Appropriate Governance Model

The choice of governance model should be determined based on: Level of disciplinary integration, Number of participating faculties or departments, Program size and complexity, Degree of external stakeholder involvement, Institutional capacity and strategic priorities

Note: The selected governance model should be formally approved and documented prior to program implementation.

Procedures for Establishing the Governance and Management Structure of Integrated Study Programs

The governance structure of integrated study programs should be established through the following step-by-step procedures to ensure clarity of authority, effective coordination, and shared academic ownership across participating units.

1. University-Level Governance (Strategic and Institutional Oversight)

At the university level, governance provides the institutional framework and strategic oversight for integrated study programs, without engaging in day-to-day management, this includes the following steps:

- The establishment of any integrated study program should be operated under the authority of the University.
- University-level governance bodies should:
  - Endorse the institutional framework governing integrated study programs.
  - Ensure alignment with the University's mission, strategic plan, and national regulations.
  - Approve the establishment, modification, or termination of integrated study programs.
- University-level oversight should be exercised through:
  - The University Council
  - The University Curriculum Committee
  - Permanent Committee of learning and students' affairs

2- Program - level Governance

Step 1: Determination of the Governance Model: The governance model for the integrated study program should be determined at the outset., The selected model should reflect the nature, scope, and level of disciplinary integration of the program.

Step 2: Identification of Participating Academic Units: Participating units may include departments, faculties, institutes, or other academic entities.Formal participation should be confirmed through official endorsement by the relevant departmental or faculty authority.

For each participating unit, the nature of contribution should be clearly specified, including:

- Teaching and course delivery
- Academic supervision
- Provision of resources or facilities
- Field training or external partnerships

Step 3: Determinate of the Program Director

• A Program Director should be nominated based on relevant academic expertise and managerial competence in integrated or interdisciplinary education.

• The Program Director should be responsible foroverall academic coordination of the program, administrative oversight of program operations, coordination among participating academic units, representation of the program before faculty and university authorities

Step 4: Formation of the Program Management Committee

• Committee membership should include:

- One academic representative from each participating department or discipline
- A representative of the hosting faculty's administration
- A representative from the Central Unit for Curriculum Development and Learning Methods

• The Committee should be responsible for coordinating curriculum implementation across units, managing scheduling and shared resources, and addressing operational and academic coordination matters

Step 5: Appointment of Course Coordinators

• A Course Coordinator should be appointed for each course or module within the program.

• For courses jointly delivered by multiple disciplines:

- A lead Course Coordinator should be designated.
- Co-coordinators from contributing disciplines may be appointed, where necessary.

• Course Coordinators should oversee course delivery, coordination among teaching staff, and smooth implementation.

Step 6: Documentation and Formal Approval

• All elements of the governance and management structure should be compiled into a Governance Structure Document.

• The document should include:

- Selected governance model
- Organizational chart
- Roles and responsibilities
- Committee composition
- Decision-making procedures

• The document should be submitted for approval through relevant faculty and university authorities.

Step 7: Periodic Review of Governance Effectiveness

- The governance and management structure should be subject to periodic internal review.
- Reviews should assess:
  - Clarity of roles and responsibilities
  - Effectiveness of coordination mechanisms
  - Smooth functioning across participating units
- Proposed modifications should be submitted through formal academic channels for approval.

RESOURCE AND CAPACITY PLANNING

Integrated study programs require deliberate and coordinated planning of human, physical, financial, and institutional resources to ensure effective implementation and sustainability. Resource and capacity planning shall be conducted prior to program approval and reviewed periodically during program operation.

Human Resource Planning

Integrated study programs must secure qualified faculty from all relevant disciplines along with sufficient administrative support to enable team teaching and cross-disciplinary collaboration. Specifically, institutions should identify and define the roles of academic staff for each program component and ensure balanced disciplinary representation across all program levels.

Physical Infrastructure and Facilities

Integrated study programs must secure a variety of suitable facilities, including lecture rooms, specialized labs, and flexible learning spaces for collaboration. Key actions include identifying all necessary spaces across disciplines and establishing coordination and scheduling systems to support their shared use among different departments.

Digital and Technological Resources

Programs shall ensure availability of:

- Learning management systems and digital collaboration platforms
- Access to discipline-specific databases, software, and digital tools
- Technological support for blended or innovative learning models

8-3. Financial Resource Planning

Integrated programs must be financially viable and sustainablewith A clear budget framework shall be developed to cover teaching and coordination costs, faculty development and training needs, equipment, materials, and learning resources, and field training or partnership-related expenses, where applicable. Also resource planning shall consider:

- Long-term financial sustainability
- Efficient use of shared resources across faculties
- Scalability of the program as enrollment grows

CAPACITY BUILDING FOR FACULTY MEMBERS

The effective design, delivery, and sustainability of integrated study programs require systematic and continuous capacity building for faculty members. Given the interdisciplinary, cross-boundary, and problem-oriented nature of integrated programs, traditional disciplinary expertise alone is not sufficient. Faculty members must be equipped with additional competencies that enable them to engage in curriculum integration, collaborative teaching, innovative pedagogies, and applied learning environments.

Accordingly, Ain Shams University shall adopt a structured and institutionalized approach to faculty capacity building, ensuring that academic staff are adequately prepared to contribute effectively to multidisciplinary, interdisciplinary, and transdisciplinary study programs.

Competency Domains for Faculty Development

Capacity building initiatives shall focus on developing faculty competencies in: Interdisciplinary and transdisciplinary curriculum design, Collaborative and team-based teaching, Innovative teaching and learning strategies (e.g., problem-based and project-based learning), Integrated and authentic assessment methods, Use of educational technologies supporting integration

Monitoring and Evaluation of Faculty Capacity

Faculty capacity building shall be viewed as an ongoing process. Accordingly:

- Faculty development needs shall be periodically reviewed at the program and faculty levels
- Feedback from faculty members involved in integrated programs shall inform future training initiatives
- Capacity building activities shall be updated to reflect emerging educational trends and institutional priorities

QUALITY ASSURANCE AND CONTINUOUS IMPROVEMENT

Quality assurance and continuous improvement are essential to ensuring that integrated study programs maintain academic rigor, coherence across disciplines, and sustained relevance to societal and labor market needs. Given the complexity of multidisciplinary, interdisciplinary, and transdisciplinary programs, quality assurance processes must explicitly address integration effectiveness, not only individual course performance. This section outlines the institutional approach to quality assurance and continuous improvement of integrated study programs across their full lifecycle.

Quality Assurance Scope

Quality assurance processes for integrated study programs should cover:

- Program design and structure
- Curriculum integration and coherence
- Teaching, learning, and assessment implementation
- Student progression and achievement of learning outcomes
- Graduate outcomes and program relevance
- Effectiveness of coordination among participating units

Quality Assurance Mechanisms

The following internal mechanisms should be applied to all integrated study programs:

1.Program-Level Self-Evaluation: Each integrated program should conduct periodic self-evaluation focusing on achievement of program learning outcomes, effectiveness of interdisciplinary integration, alignment between courses, assessments, and intended competencies, challenges arising from multi-unit delivery

2. Monitoring of Integration Effectiveness

Integrated programs should include specific indicators to monitor the quality of integration, such as:

- Alignment between program learning outcomes and course outcomes
- Evidence of horizontal and vertical curriculum integration
- Performance in integrative assessments (projects, capstones, portfolios)
- Student ability to synthesize knowledge across disciplines

Monitoring results should inform program improvement actions.

3.Student Feedback

Student feedback should be systematically collected regarding:

- Clarity of program structure
- Integration across courses and disciplines
- Workload balance and coordination
- Learning experience in integrative projects or capstone components

4. External Input and Stakeholder Feedback

To ensure relevance and responsiveness, integrated programs should periodically incorporate feedback from:

- Employers and professional bodies
- Community or industry partners involved in program delivery
- Alumni and graduates

Feedback should be used to assess the program's alignment with external needs and emerging trends.

Continuous Improvement Processes

Action Planning: Based on evaluation findings, each program should develop a Program Improvement Action Plan, specifying identified issues or gaps, proposed corrective or enhancement actions, Implementation timelines

Implementation and Follow-Up: Approved improvement actions should be implemented through formal academic channels. And progress should be monitored and documented.

Periodic Program Review: Integrated study programs should undergo comprehensive periodic review at defined intervals, and recommendations arising from periodic reviews should be submitted through faculty and university procedures.

Through systematic quality assurance and continuous improvement processes, integrated study programs at Ain Shams University are ensured to remain academically coherent, effectively integrated, and responsive to evolving educational and societal needs. These processes reinforce the sustainability and credibility of integrated programs as a core component of the University's academic portfolio.

PROCEDURES FOR INTRODUCING INTEGRATED PROGRAM

Step 1: Formation of the Program Design and Management Body

Step 2: Preparation of the Integrated Program Proposal: The Program Development Committee should prepare a comprehensive Program Proposal File which constitutes the official document submitted for approval. The proposal should include the following components:

2-1 Program's Feasibility Study

- A comprehensive feasibility study should be prepared, including:
  - Justification for establishing the integrated program.
  - Evidence of societal, environmental, national development, and labor-market needs.
  - Stakeholder consultation, including employers and relevant professional sectors.
  - Gaps in existing academic provision.
  - Employment opportunities and future career pathways for graduates
  - Alignment with Ain Shams University's mission and strategic priorities.
  - Alignment with Egypt vision 2030, The Guiding Reference Framework for Higher Education.
- The feasibility study should clearly demonstrate the program's Expected Added Value and its relevance to Future employment and emerging fields, labor market needs, and Complex societal or professional challenges.
- The study should be formally approved by the participating departments and faculties.

2-2 Program Identity and Type

- Clear specification of the program type (Multidisciplinary/ Interdisciplinary/ transdisciplinary).
- Statement of the program's distinct academic identity, demonstrating how it differs from existing programs.

2-3 Benchmarking and Reference Standards

- Reference to comparable national and international programs.
- Identification of the program's distinctive features and competitive advantages.
- Reference standards used in program design

2-4 Program Regulations (Bylaw)

- A comprehensive Program Regulation Document (Bylaw), should be prepared, including
  - Program vision and mission
  - Degree awarded
  - Program duration and credit structure
  - Admission requirements
  - Academic advising and registration system
  - Graduation requirements

- The document should clearly specify:
  - Participating Academic Units
  - Percentage and nature of contribution of each academic unit
  - Nature of integration across courses and modules
- The regulation should comply with university bylaws and national regulations.

2-5 Program Specification

The program specification should include:

- Specification of core and subsidiary competencies to be developed.
- Complete list of courses and modules.
- Course titles, descriptions, and credit distribution
- Distribution of courses across levels of study.
- Percentage of integrative courses
- Description of teaching strategies that support integration
- Assessment methods demonstrating measurement of integrated competencies
- Alignment between learning outcomes, teaching strategies, and assessment methods.

2-6 Governance and Management Structure

The proposed Governance and management structure should be documented and submitted as part of the program file, specifying:

- Description of the program governance model.
- Composition and responsibilities of the Program Governance and management structure.
- Decision-making and Coordination mechanisms among participating departments.
- Reporting lines within faculty and university structures.

2-7 Resource and Budget Plan

A detailed resource plan should be prepared, covering:

- Human resource requirements, including faculty expertise and teaching load.
- Physical, learning, and technological resources.
- Laboratories, learning spaces, and field-training sites.
- Estimated program budget and sustainability considerations.

Step 3: Departmental and Faculty-Level Approvals
Step 4: University-Level Review and Authorization
Step 5: Supreme council of universities Approval
Step 6: Formal Adoption, Announcement, and Operational Preparation
Step 7: Implementation and Program Launch
Step 8: Initial Implementation Monitoring

- During the first cycle of implementation, the Program Management Body should:
  - Monitor program launch
  - Address coordination challenges
  - Document implementation issues
- Initial feedback should be used to support early-stage refinement.

IMPLEMENTATION OF INTEGRATED STUDY PROGRAMS

The implementation of integrated study programs at Ain Shams University shall follow a structured and coordinated process to ensure effective translation of approved program designs into operational academic practice. This stage focuses on operational readiness, coordinated delivery, and sustained functionality of the program in accordance with approved governance arrangements, curriculum structures, and institutional regulations.

1. Pre-Implementation Readiness

Prior to program launch, the following preparatory actions shall be completed:

- Confirmation of all institutional approvals and formal authorizations
- Verification of assigned governance and management structures
- Allocation of approved human, financial, and physical resources
- Finalization of course specifications, teaching assignments, and academic schedules
- Preparation of program documentation, including student handbooks and operational guidelines

2. Curriculum Deployment

The approved integrated curriculum must be implemented using its designated framework, with clear distinctions and delivery of core, elective, and integrative components. Essential actions include designing the academic structure and credit allocation while maintaining both horizontal and vertical alignment across courses to ensure a balance between disciplinary depth and interdisciplinary breadth.

3. Student Support and Academic advising

Integrated study programs shall provide appropriate student support mechanisms, including:

- Academic advising tailored to the integrated nature of the program
- Clear communication of program structure, learning pathways, and graduation requirements
- Guidance on interdisciplinary learning expectations and assessment methods
- Support for project-based, problem-based, or community-engaged learning activities

4. Monitoring of Program Delivery

During implementation, program delivery shall be continuously monitored to ensure:

- Adherence to the approved curriculum and teaching plans
- Effective coordination among participating departments and faculties
- Timely identification of operational or academic challenges

Through this structured implementation approach, Ain Shams University ensures that integrated study programs are translated from design into effective educational practice with clarity, coordination, and institutional coherence.

CONCLUSION

This guide represents Ain Shams University's institutional commitment to advancing integrated study programs as a strategic pathway for academic innovation, quality assurance, and societal engagement. By providing a coherent conceptual framework, clear standards, and practical procedures, the guide supports the systematic design, implementation, and continuous improvement of multidisciplinary, interdisciplinary, and transdisciplinary programs in alignment with national priorities and international best practices.

Through the adoption of this guide, the University affirms its dedication to preparing future-ready graduates, strengthening cross-disciplinary collaboration, and contributing meaningfully to sustainable development. The guide is intended to remain a living reference, subject to periodic review and enhancement, ensuring its continued relevance within an evolving higher education landscape.

GLOSSARY

Integrated programs in academia refer to educational or training programs that deliberately combine and coordinate multiple disciplines, courses, or experiences to create a cohesive and interconnected learning environment. Integration can occur at various levels, including curriculum design, teaching methods, and organizational structures, with the aim of fostering deeper understanding, practical application, and the development of critical thinking skills across traditional subject boundaries.

Multidisciplinary learning involves people from different disciplines working together, with each drawing on their own disciplinary knowledge. The disciplines remain distinct and the boundaries are maintained. For example, a team of a sociologist, an economist, and a geographer might each provide their unique perspective on a water management problem. Interdisciplinary learning goes a step further by integrating knowledge and methods from two or more disciplines to create a synthesized whole. It is not about the separate study of disciplines, but about the integration of knowledge and the creation of a "common ground" to achieve a more comprehensive understanding of a topic.

Transdisciplinary learning builds upon this by also involving the integration of knowledge from academia with wider society, including non-academic stakeholders such as communities, industry, and government. This approach is crucial for jointly framing and co-creating new solutions to complex societal challenges.

Horizontal integration in educational curricula refers to the integration of knowledge, skills, or content across different disciplines, subjects, or courses within the same level or year of study. This approach aims to create meaningful connections and reinforce learning by linking related topics taught concurrently, often within a finite period of time such as a semester or academic year.

Vertical integration involves connecting content, skills, or experiences across different years or stages of a program, typically bridging foundational (basic) sciences with applied (clinical or professional) sciences. This approach aims to break down the traditional separation between preclinical and clinical phases, allowing students to revisit and build upon earlier knowledge as they progress through their studies.

Student-centered approaches refer to teaching practices that place students at the core of the educational process, emphasizing their autonomy, diversity, and active participation in learning. These approaches are grounded in constructivist paradigms, where learners are responsible for constructing their own knowledge, often through inquiry, collaboration, and real-world problem-solving. The focus shifts from what the teacher does to how the student learns, with the teacher acting as a facilitator or designer of learning environments rather than a sole transmitter of knowledge.

The competency-based approach is a structured, learner-centered, and outcomes-driven educational framework that focuses on the development and demonstration of clearly defined competencies–encompassing values, knowledge, skills, and behaviors–required for effective performance in specific professional roles. Rather than emphasizing time-based instruction or knowledge acquisition alone, this approach prioritizes the practical application of learning to real-world contexts and problems, assesses learners based on their demonstrated mastery of competencies, and often allows flexible, self-paced progression aligned with workforce and societal needs.

Competency-Based Assessment: This method evaluates the ability to apply theory, demonstrate critical thinking, and attain knowledge over time, often using a variety of assessment methods to ensure comprehensive coverage of required competencies.

Project-Based Learning (PBL), also referred to as the Project-Based Approach, is a student-centered instructional strategy where learners actively engage in real-world projects, inquiry, and problem-solving over an extended period. This approach contrasts with traditional methods that emphasize rote memorization, instead fostering deep learning through exploration and collaboration. PBL is grounded in constructivist theories, such as those of Piaget and Vygotsky, which emphasize learning as an active, social process where students construct knowledge through experience and interaction with peers and teachers. The approach is characterized by:

- Engagement in authentic, open-ended problems or questions
- Collaboration and teamwork
- Integration of multiple academic subjects (interdisciplinary learning)
- Creation of tangible artifacts or products as outcomes
- Teacher as facilitator rather than direct instructor
- Emphasis on critical thinking, creativity, and self-regulation

Problem-Based Learning (PBL) is a student-centered instructional approach where learning is initiated by presenting learners with complex, real-world problems or scenarios that serve as the catalyst for acquiring new knowledge and skills. In PBL, students work collaboratively–often in small groups–guided by a facilitator or teacher, to analyze the problem, identify their knowledge gaps, research and apply information, and develop practical solutions. This approach is rooted in constructivist principles, emphasizing active participation, self-directed learning, and the social construction of knowledge through group interaction and reflection.

Backward design is a curriculum and instructional design methodology that begins with the identification of intended learning outcomes or goals and then works backward to develop assessments and instructional activities that align with those outcomes. This approach contrasts with traditional or "forward" design, where content and teaching methods are selected first, and learning outcomes are considered later. In backward design, the process is student-centered, transparent, and explicit, ensuring that all aspects of the curriculum flow from the intended outcomes and are aligned to support student achievement of those outcomes.

Theme-Based Approach in education refers to organizing curriculum, instruction, or learning activities around central themes or topics that connect various concepts, facts, and skills. In this approach, content is segmented into logically coherent and thematically distinct sections, each representing a complete knowledge theme consisting of core concepts, facts, and key ideas. This segmentation helps students connect related knowledge elements and facilitates more effective review and recall of specific sections based on individual needs. Research indicates that using a theme-based learning approach creates focal points that enhance connections between knowledge elements, making it easier for learners to comprehend and assimilate large amounts of information efficiently.

Community-oriented learning strategies—often referred to as community-based learning (CBL), community-based education, or community education—are educational approaches that integrate learning experiences within community settings. These strategies are designed to engage students in real-world contexts, foster civic engagement, and promote the transformation of values, beliefs, and attitudes through direct participation and reflection in community activities. CBL is fundamentally a form of experiential learning with a strong emphasis on civic engagement and community empowerment, aiming to bridge the gap between theoretical teaching and practical application by matching educational activities to community interests and needs. Students typically earn academic credit by participating in and reflecting on community experiences, with academic staff supporting them through discussion, group work, and structured reflective activities. The overarching goal is to expand students' understanding of community issues—such as health problems—through learning, service, and research in the community setting. This approach is practiced across various disciplines, including health sciences, nursing, and midwifery.

Governance refers to the systems, processes, structures, and relationships through which individuals, groups, and institutions–across the public, private, and civil society sectors–organize and manage collective affairs, make and implement decisions, and exercise authority, power, and accountability. It encompasses both formal and informal rules, roles, and interactions that shape how actions are defined, power is granted and used, responsibilities are allocated, and performance is monitored and verified. Governance extends beyond the institutions of government alone, focusing fundamentally on the processes of rule and coordination through which collective goals are pursued across diverse actors and contexts.

Capacity building is widely defined as the process of developing and strengthening the skills, abilities, processes, and resources that individuals, organizations, and communities need to survive, adapt, and thrive in a fast-changing world. It encompasses both individual and institutional development, leading to higher levels of skills and greater ability to perform useful research or achieve organizational goals. The United Nations describes capacity building as the process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world. Similarly, it is described as any action that improves the effectiveness of individuals, organizations, networks, or systems–including organizational and financial stability, program service delivery, program quality, and growth.

REFERENCES

- Alashwal H., Barham A. (2025). Sustaining problem-based learning: A mixed-methods exploration of its long-term effects on primary students' mathematical problem solving. Social Sciences & Humanities Open, 12. https://doi.org/10.1016/j.ssaho.2025.101717
- Allouch S., Ali R., Al-Wattary N., Nomikos M., Abu-Hijleh M. (2024). Tools for measuring curriculum integration in health professions' education: a systematic review. BMC Medical Education, 24. https://doi.org/10.1186/s12909-024-05618-5
- Alsmadi H., Kandasamy G., Al Kafri A., Zahirah K. (2024). Empowering computing students through multidisciplinary project-based learning (PBL): Creating meaningful differences in the real world. Social Sciences & Humanities Open, 10. https://doi.org/10.1016/j.ssaho.2024.101180
- Aref H., Wright B., Davis B., Fowlin J. (2021). High-level curricular integration in pharmacy schools: A systematic literature review. Currents in Pharmacy Teaching and Learning, 13. https://doi.org/10.1016/j.cptl.2021.09.046
- Barak M., Yuan S. (2021). A cultural perspective to project-based learning and the cultivation of innovative thinking. Thinking Skills and Creativity, 39. https://doi.org/10.1016/j.tsc.2020.100766
- Bourke M., Haddara A., Loh A., Saravanamuttoo K., Bruijns B., Tucker P. (2024). Effect of capacity building interventions on classroom teacher and early childhood educator perceived capabilities, knowledge, and attitudes relating to physical activity and fundamental movement skills: a systematic review and meta-analysis. BMC Public Health, 24. https://doi.org/10.1186/s12889-024-18907-x
- Brownie, S., Blanchard, D., Amankwaa, I., Broman, P., Haggie, M., Logan, C., Pearce, A., Sampath, K., Yan, A. R., & Andersen, P. (2023). Tools for faculty assessment of interdisciplinary competencies of healthcare students: an integrative review. *Frontiers in medicine*, *10*, 1124264. https://doi.org/10.3389/fmed.2023.1124264
- Camicia S. (2023). Curriculum and social studies education. International Encyclopedia of Education. https://doi.org/10.1016/B978-0-12-818630-5.03058-X
- Centre for Quality Support and Development (2023), PROGRAMME LIFECYCLE POLICIES Policy and guidelines covering the Approval of New Programmes, Amendments to Programmes, and Withdrawal and Suspension of Programmes, University of Reading.
- Cline K., Winhoven M., Williams V., Kelley K., Porter B. (2023). Backward Design to Combat Curricular Expansion in a Large, Interdisciplinary, Team-Taught Course. American Journal of Pharmaceutical Education, 87. https://doi.org/10.1016/j.ajpe.2022.12.009

- Corbacho A., Minini L., Pereyra M., González-Fernández A., Echániz R., Repetto L., Cruz P., Fernández-Damonte V., Lorieto A., Basile M. (2021). Interdisciplinary higher education with a focus on academic motivation and teamwork diversity. International Journal of Educational Research Open, 2. https://doi.org/10.1016/j.ijedro.2021.100062
- Crelinsten L. (2019). Governance and Administration of Simulation Programs: Providing the Structure and Strategic Foundation for Excellence. Clinical Simulation. https://doi.org/10.1016/B978-0-12-815657-5.00052-8
- Farrow J., Kavanagh S., Samudra P., Pupik Dean C. (2024). The promise of the project to student-centered learning: Connections between elements, curricular design, and practices of project-based learning. Teaching and Teacher Education, 152. https://doi.org/10.1016/j.tate.2024.104776
- Ford A. (2025). Competency-Based Education in Information Literacy. Encyclopedia of Libraries, Librarianship, and Information Science. https://doi.org/10.1016/B978-0-323-95689-5.00204-2
- G Vasanti (2024), Ensuring Multidisciplinary and Interdisciplinary Higher Education in the Nation (NEP 2020): A Comprehensive Analysis, International Journal of Science, Engineering and Technology, 12:5.
- Husband A., Todd A., Fulton J. (2014). Integrating Science and Practice in Pharmacy Curricula. American Journal of Pharmaceutical Education, 78. https://doi.org/10.5688/ajpe78363
- Iryna Ashby, Marisa Exter (2019), Designing for Interdisciplinarity in Higher Education: Considerations for Instructional Designers, TechTrends 63:202–208 https://doi.org/10.1007/s11528-018-0352-
- Jakavonytė-Staškuvienė D., Mereckaitė-Kušleikė I. (2023). Conditions for Successful Learning of Primary School Pupils in the Context of Integrated Education: A Case Study. Interchange, 54. https://doi.org/10.1007/s10780-023-09489-5
- Khayat W., Almalki M., Alqahtani M., Taher S. (2023). Evaluation of the level of integration of the dental curriculum in Umm Al-Qura University. Journal of Taibah University Medical Sciences, 18. https://doi.org/10.1016/j.jtumed.2023.05.019
- Khayat W., Almalki M., Alqahtani M., Taher S. (2023). Evaluation of the level of integration of the dental curriculum in Umm Al-Qura University. Journal of Taibah University Medical Sciences, 18. https://doi.org/10.1016/j.jtumed.2023.05.019
- Krushna Chandra Patra, Tapan Kumar Basantia (2021), Integrated Programmes in Education: Development and Current Status, Higher Education for the Future 1 –17, DOI: 10.1177/2347631211010018

- Alashwal H., Barham A. (2025). Sustaining problem-based learning: A mixed-methods exploration of its long-term effects on primary students' mathematical problem solving. Social Sciences & Humanities Open, 12. https://doi.org/10.1016/j.ssaho.2025.101717
- Allouch S., Ali R., Al-Wattary N., Nomikos M., Abu-Hijleh M. (2024). Tools for measuring curriculum integration in health professions' education: a systematic review. BMC Medical Education, 24. https://doi.org/10.1186/s12909-024-05618-5
- Alsmadi H., Kandasamy G., Al Kafri A., Zahirah K. (2024). Empowering computing students through multidisciplinary project-based learning (PBL): Creating meaningful differences in the real world. Social Sciences & Humanities Open, 10. https://doi.org/10.1016/j.ssaho.2024.101180
- Aref H., Wright B., Davis B., Fowlin J. (2021). High-level curricular integration in pharmacy schools: A systematic literature review. Currents in Pharmacy Teaching and Learning, 13. https://doi.org/10.1016/j.cptl.2021.09.046
- Barak M., Yuan S. (2021). A cultural perspective to project-based learning and the cultivation of innovative thinking. Thinking Skills and Creativity, 39. https://doi.org/10.1016/j.tsc.2020.100766
- Bourke M., Haddara A., Loh A., Saravanamuttoo K., Bruijns B., Tucker P. (2024). Effect of capacity building interventions on classroom teacher and early childhood educator perceived capabilities, knowledge, and attitudes relating to physical activity and fundamental movement skills: a systematic review and meta-analysis. BMC Public Health, 24. https://doi.org/10.1186/s12889-024-18907-x
- Brownie, S., Blanchard, D., Amankwaa, I., Broman, P., Haggie, M., Logan, C., Pearce, A., Sampath, K., Yan, A. R., & Andersen, P. (2023). Tools for faculty assessment of interdisciplinary competencies of healthcare students: an integrative review. *Frontiers in medicine*, *10*, 1124264. https://doi.org/10.3389/fmed.2023.1124264
- Camicia S. (2023). Curriculum and social studies education. International Encyclopedia of Education. https://doi.org/10.1016/B978-0-12-818630-5.03058-X
- Centre for Quality Support and Development (2023), PROGRAMME LIFECYCLE POLICIES Policy and guidelines covering the Approval of New Programmes, Amendments to Programmes, and Withdrawal and Suspension of Programmes, University of Reading.
- Cline K., Winhoven M., Williams V., Kelley K., Porter B. (2023). Backward Design to Combat Curricular Expansion in a Large, Interdisciplinary, Team-Taught Course. American Journal of Pharmaceutical Education, 87. https://doi.org/10.1016/j.ajpe.2022.12.009

- Saifi A., Khlaif Z., Affouneh S. (2024). The effect of using community-based learning program in science students' achievement according to Kolb's learning styles. Social Sciences & Humanities Open, 10. https://doi.org/10.1016/j.ssaho.2024.101125
- Tegzes J., King S., Blue A., Langlois S. (2023). A Proposed Framework for Interprofessional Curriculum Integration. Journal of Interprofessional Education & Practice, 31. https://doi.org/10.1016/j.xjep.2023.100626
- Thi My Ngoc NGUYEN, Johnson Chee Bin ONG (2021), Framework of Good Practices in Designing Integrated Curriculum, Proceedings of the 14th International Conference on Educational Research. Thailand: Faculty of Education, KhonKaen University.
- University of Bolton (2023), A Best Practice Guide to Curriculum Design 2022-23, University of Bolton.
- Viglione C., Stadnick N., Birenbaum B., Fang O., Cakici J., Aarons G., Brookman-Frazee L., Rabin B. (2023). A systematic review of dissemination and implementation science capacity building programs around the globe. Implementation Science Communications, https://doi.org/10.1186/s43058-023-00405-7
- Wever, Mark &Romera, Alvaro & Shah, Munir&Wognum, Nel. (2023). Managing and Governing Integrated Research Programmes: Lessons from Theory and Practice. Sustainability. 15. 8833. 10.3390/su15118833
- Zelner J., Broen K., August E. (2022). A guide to backward paper writing for the data sciences. Patterns, https://doi.org/10.1016/j.patter.2021.100423

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