

The background features a hand holding a complex gear mechanism. The gears are rendered in a sketchy, hand-drawn style with black outlines and some shading. The hand is positioned on the left side, with fingers gripping a large gear. The overall color palette is a gradient of purple and pink, with small white dots scattered across the background, suggesting a technical or creative theme.

# TWINNING CREATIVITY AND INNOVATION

## Humanities in Engineering

by

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# Abstract





Creativity fuels innovation in more ways one could ever imagine. The creative process possibly crossing over to the sciences is fraught with challenges attendant to the rather antithetical notion of the relationship between the humanities and sciences.

Innovation thrives in an atmosphere of interdisciplinarity, wherein students are given some leeway in choosing elective courses outside their degree programs. Interdisciplinary centers would further explore areas of research collaboration. Collaborative efforts are continually enhanced in so-called creative commons such as interactive learning centers, design and art spaces.



# Talking Points

1. On Humanities and Engineering
2. Imagination: Point of Convergence
3. The Creative Process
4. Creativity Fuels Innovation
5. Twinning Creativity and Innovation
  - 5.1 Curricular Reforms
  - 5.2 Interdisciplinary Centers
  - 5.3 Creative Commons
6. Summing Up



# On Humanities and Engineering

“Humanities and the arts transform and intensify human experience through a special language, the result of which is an act of estrangement or defamiliarization.”

- Jerry R. Yapo

“Engineering is the profession in which a knowledge of the mathematical and natural resources gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind.”

- Edgar E. Devera, *Engineering Economics*, 2018



# Imagination: Point of Convergence

# Imagination: Point of Convergence

Arts and Humanities

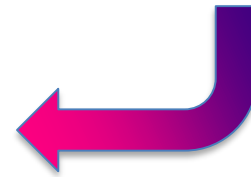
intuitive  
subjective  
ambiguity

STEM

logical  
objective  
certainty



Discovery  
Wonderment  
Imagination



“unsettled joy”  
“creative tension”



Further Reading: Alan Lightman, “A Tale of Two Loves,” *Nature*, Vol. 434, 17 March 2005, pp. 299-300

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A close-up portrait of Albert Einstein, showing his characteristic wild white hair and mustache. He is looking slightly to the left of the camera with a thoughtful expression. His hands are clasped together in front of him. The background is a dark, neutral color.

*“Imagination is more important than knowledge.  
Knowledge is limited.  
Imagination encircles the world.”*

- Albert Einstein

Photo courtesy of sciBRIGHT  
<https://i.ytimg.com/vi/lxTUmgAPPq4/maxresdefault.jpg>



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# The Creative Process

Video

# Creativity and its Nuances

- Thinking out of the box
- Creativity breeds originality
- Originality: concept, skill, technique



Photo courtesy of Statue King

[https://cdn.shopify.com/s/files/1/1874/4769/products/thor\\_18166b01-c30e-4734-b8c9-dd779a27ad68\\_1024x1024.jpg?v=1496274989](https://cdn.shopify.com/s/files/1/1874/4769/products/thor_18166b01-c30e-4734-b8c9-dd779a27ad68_1024x1024.jpg?v=1496274989)



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Creativity Fuels Innovation

# Creativity Fuels Innovation



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Video

Video



# Innovation Has Come

“An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption.”

- Everett M. Rogers, *Diffusion of Innovations*, 1983



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# Characteristics of Innovations

(Related to rate of adoption)

1. Relative advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability

Rogers, *Diffusion of Innovations*, 1983



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Video

# Speaking of Possibilities...



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Video



# Twinning Creativity and Innovation

# Twinning Creativity and Innovation

- Curricular Reforms
- Interdisciplinary Centers
- Creative Commons



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# Curricular Reforms

A General Education (GE) program that loops in knowledge domains in the arts and humanities, social sciences and philosophy, mathematics and the sciences forms the bedrock of university education.



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# Curricular Reforms

A good GE program provides the base on which core courses in various curricula may spring from.

New GE courses need an interdisciplinary perspective.



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# Curricular Reforms

## New UP GE courses

- Critical Perspectives in Communication
- Critical Perspectives in the Arts
- Ethics and Moral Reasoning in Everyday Life
- Self and Society
- Wika, Kultura at Lipunan

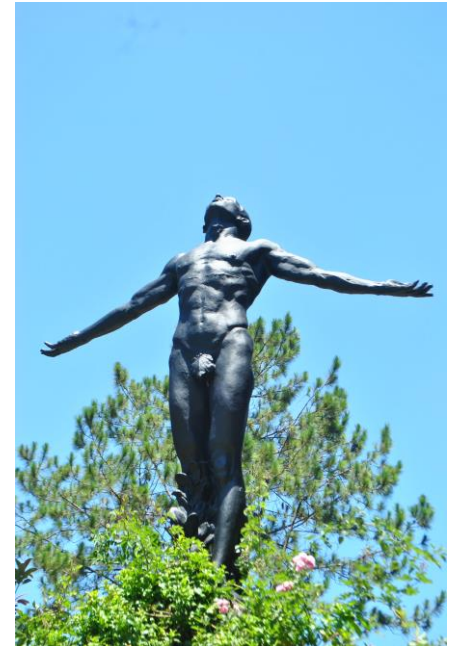


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# Curricular Reforms

## New UP GE courses

- Philippine Arts and Culture
- Mathematics, Culture and Society
- Probing the Physical World
- Living Systems: Concepts and Dynamics
- Science, Technology, and Society

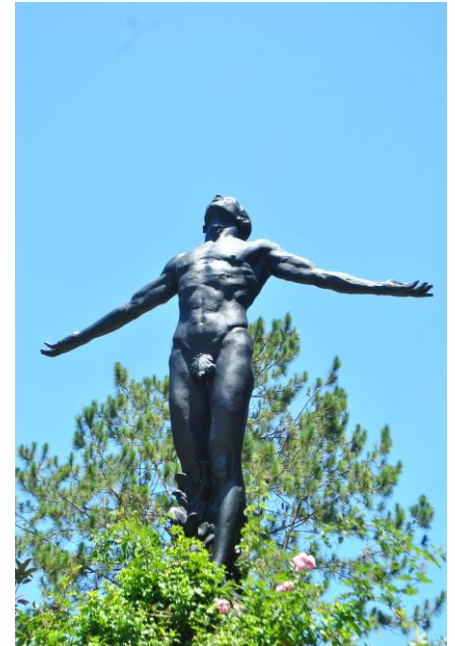


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# Curricular Reforms

Elective courses from various university units provide a different perspective and enrich the knowledge base of STEM students.



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# Curricular Reforms

For UPLB students, at least 6-9 units of electives may be chosen from this list of courses:

- **Introduction to Organic Agriculture**

Principles, policies and practices in organic agriculture

- **Furniture and Handicraft Production**

Designs and processes in the production of furniture and handicrafts using forest products

- **Philosophy of Aesthetics**

Theories of aesthetics experience and values

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# Curricular Reforms

For UPLB students, at least 6-9 units of electives may be chosen from this list of courses:

- **Cultivating the Entrepreneurial Mindset**

An introduction to entrepreneurship

- **Product Ideation and Creation**

Principles, tools and techniques in product development

- **New Media Art**

Digital, multimedia and interactive art in contemporary visual culture

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# Curricular Reforms

For UPLB students, at least 6-9 units of electives may be chosen from this list of courses:

- **Workplace Communication**

Communication competencies in the workplace

- **Innovationeering**

As an alternative to the research-based thesis, it will train students to become innovators and entrepreneurs through project designs

Photo courtesy of Denise Gamboa

<https://www.facebook.com/photo.php?fbid=2015587385131674&set=pb.100000412956812.-2207520000.1531114409.&type=3&theater>



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# Interdisciplinary Centers

Complementing curricular reforms are interdisciplinary research centers that provide the platform for collaboration among the sciences (eg. engineering) and other disciplinary areas.



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# Interdisciplinary Centers

Some university units have pioneered cross-cutting researches on various national issues and concerns

- Ateneo Interdisciplinary Studies Program
- Emerging Interdisciplinary Research Program (EIDR) of UP
- Center for Integrative and Development Studies
- UP Resilience Institute
- Cordillera Studies Center
- Cebuano Studies Center
- UPLB Interdisciplinary Biofuels Research Studies Center
- UPLB Center for Technology Transfer and Entrepreneurship



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# Creative Commons

Providing support to curricular reforms and interdisciplinary research thrusts are so-called creative commons.

- Interactive learning centers
- Design and art spaces (exhibit spaces, museums, galleries, lounges)







Video

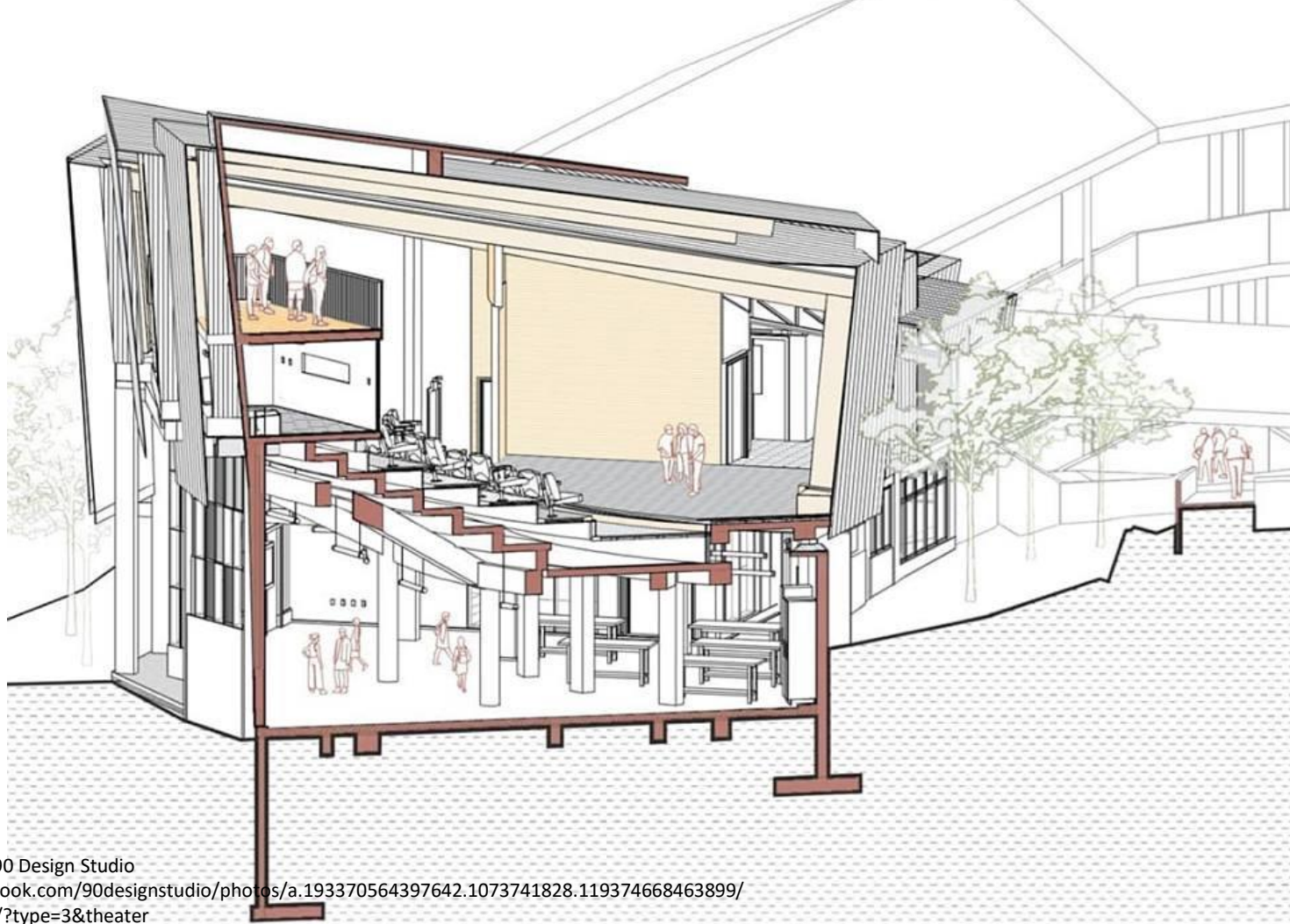


Photo courtesy of 90 Design Studio  
<https://www.facebook.com/90designstudio/photos/a.193370564397642.1073741828.119374668463899/561491857585509/?type=3&theater>

# Summing Up

## Creativity and Innovation

Course Offerings

+

Interdisciplinary Research

+

Creative Commons

=

Creativity and Innovation

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