MicroCredentials to Promote STEM Professional Learning

Connecting the Residential Academy & Educator Outreach

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Illinois Mathematics and Science Academy
The Illinois Mathematics and Science Academy® (IMSA) develops creative, ethical leaders in science, technology, engineering and mathematics. As a teaching and learning laboratory created by the State of Illinois, IMSA enrolls academically talented Illinois students (grades 10-12), in its advanced residential academic program.

IMSA is both a public residential Academy and a catalyst and laboratory for the advancement of STEM teaching and learning statewide, with responsibility to stimulate further excellence for all Illinois schools in mathematics and science through student and educator outreach, teacher training and turnkey STEM curricula, student enrichment and entrepreneurship and makerspace education.
Residential Academy

The primary role of the Academy shall be to offer a uniquely challenging education for students talented in the areas of mathematics and science.

Outreach & Development Center for Teaching and Learning

The Academy shall also carry a responsibility to stimulate further excellence for all Illinois schools in mathematics and science.
IMSA Mission: “ignite and nurture creative, ethical and scientific minds to advance the human condition”
Inquiry-based teaching promotes analytic thinking, knowledge generation and application, and construction of meaning through mindful investigation driven by compelling questions that engage the learner’s curiosity.

Problem-centered learning provides experiences in which learners grapple with complex, meaningful, open-ended problems of our world. Learners provide potential evidence-based solutions or responses to these problems.

Competency-driven experiences are those which enable students (1) to acquire strong bases of disciplinary content knowledge and skills; (2) to use the ideas, processes, and tools of the disciplines for acquisition and generation of new knowledge; and (3) to apply knowledge when addressing issues and solving real-world problems.

Integrative learning experiences are those which forge meaningful connections of concepts, constructs, and principles within and across academic subjects and real-world situations.
Educator Development – Identity transformation

Program-Driven

IMSA Fusion -- STEM on Demand -- NGSS training -- Shifting Science PD -- State & National conferences -- Teacher Institute Days -- Illinois Math Science Partnerships -- School STEM fairs -- Teacher workshops -- POP (Pedagogy of Practice) -- Educator Externships -- ISBE speciality contracts --and -- and --

Mission Driven

We provide professional development to educators rooted in IMSA’s 4 core competencies (inquiry-based, problem-centered, competency-driven, integrative) which further our mission of, “Igniting and nurturing creative, ethical, scientific minds that advance the human condition”
IMSA Educator Micro-Credentials

**Inquiry-Based Teaching**
- Introduction
- Learning Experience #1
- Learning Experience #2
- Learning Experience #3
- Learning Experience #4
- Learning Experience #5
- Portfolio

**Problem-Centered Learning**
- Introduction
- Learning Experience #1
- Learning Experience #2
- Learning Experience #3
- Learning Experience #4
- Learning Experience #5
- Portfolio

**Competency-Driven Curriculum**
- Introduction
- Learning Experience #1
- Learning Experience #2
- Learning Experience #3
- Learning Experience #4
- Learning Experience #5
- Portfolio

**Integrated STEM**
- Introduction
- Learning Experience #1
- Learning Experience #2
- Learning Experience #3
- Learning Experience #4
- Learning Experience #5
- Portfolio

IMSA MICRO-CREDENTIAL
- Inquiry-Based Teaching
- Problem-Centered Learning
- Competency-Driven Curriculum
- Integrated STEM

NCSSE
National Consortium of Secondary STEM Schools
What is a micro-credential:
A micro-credential is described as being a set of “competency-based, personalized, small-scale professional development modules that are suited for anytime/anywhere learning and allow teachers to show what they can do, not only what they know.” (Berry, 2017).

These professional development systems are often designed as courses, or a set of online or blended modules offering bite-sized methods to acquire new knowledge or skills (ALA TechSource, 2019).

With micro-credentials being offered at a variety of levels across multiple disciplines and areas of study within those disciplines (ALA TechSource, 2019).

This form of continuing education presents a personalized route for professional development.
### Micro-C Learning Experience examples

<table>
<thead>
<tr>
<th>Learning Experience</th>
<th>Grade Level</th>
<th>Core competency Strand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale and Size: Modeling Powers of 10</td>
<td>4th-8th</td>
<td>Competency-Driven</td>
</tr>
<tr>
<td>Code of the Wild</td>
<td>K-2nd</td>
<td>Integrated STEM</td>
</tr>
<tr>
<td>Build a Better Recycling Truck</td>
<td>6th-8th</td>
<td>Problem Centered</td>
</tr>
<tr>
<td>Not Just a Story: Genetics and Probability</td>
<td>6th-12th</td>
<td>Integrated STEM</td>
</tr>
<tr>
<td>Perfecting the Teaching Of Parabolas Using Technology</td>
<td>9th-12th</td>
<td>Competency Driven</td>
</tr>
<tr>
<td>PBL (Formal Problem Based Learning) Course 1,2,3</td>
<td>K-12</td>
<td>Problem Centered</td>
</tr>
<tr>
<td>Breaking the Mold of Traditional Chemistry Labs</td>
<td>9th-12th</td>
<td>Inquiry Based</td>
</tr>
<tr>
<td>Teaching with a Full Deck of Cards</td>
<td>PreK-8</td>
<td>Inquiry Based</td>
</tr>
</tbody>
</table>

[https://www.imsa.edu/centers/educator-development/available-courses/](https://www.imsa.edu/centers/educator-development/available-courses/)

Google: IMSA educator development
IMSA Educator MicroCertification and Micro-Credentials Program

- Inquiry-Based Teaching
  - Introduction
  - Learning Experience #1
  - Learning Experience #2
  - Learning Experience #3
  - Learning Experience #4
  - Learning Experience #5
  - Portfolio

- Problem-Centered Learning
  - Introduction
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= IMSA Educator MicroCertification
Educators who complete all four micro-credentials are awarded the MicroCertification as an IMSA Educator. This MicroCertification qualifies an educator to be trained in and present IMSA Professional Development throughout their area.

Advance IMSA mission and core competencies

+ Promote reach and impact throughout the state, country, world
+ Create STEM Teacher Leaders, really, all discipline teacher leaders
+ Local/Regional connections promote partnerships for relevant curricula development
+ Summer Institute for Community of Learners & Programmatic updates

Schools that have more than 50% of their staff complete the full Micro Certification are awarded an “IMSA Outreach School” certification.
Questions? Potential Partners?

THANK YOU!

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