What is Microelectronic Engineering?

Microelectronic Engineering is the area of technology associated with the design and fabrication of electronic devices/systems or subsystems using extremely small components. It is a unique multidisciplinary program encompassing Electrical, Computer, and Chemical Engineering; Optics, Material Science, Physics, Chemistry, Statistics, Experimental Design, Computer Aided Design (CAD), and Manufacturing.

Focused on the Future

Since the invention of the transistor in 1947 at AT&T Bell Labs, technologies such as the PC, Internet and cellular phones have become an integrated part of our lives.

At the dawn of the new millennium, the scientific and technological advances in microelectronics over the past 40 years had placed us on the doorstep of nanotechnology. Nanostructures and nano-devices which typically perform electronic functions, are perhaps the most critical subset of nanotechnology which essentially involves the manipulation of materials at the atomic level.

In this forum, an overview of the development of the field of Microelectronics will be given, highlighting the key process steps that enable us to build state-of-the-art chips. We will then show how modification and novel combinations of these process steps can be utilized to produce other types of devices.

We invite you to join us in the challenge of providing the education required of today’s students to drive the innovations of tomorrow.
The Innovation of Tomorrow Begins with The Education of Today

According to the Semiconductor Industry Association seven of the top ten worldwide corporate patent recipients are semiconductor producing companies.

The Microelectronic Engineering Program at RIT is committed to driving innovation in the field of micro- and nano-electronics. To enable that, a partnership must be established between the K-12 community and institutions of higher education.

With support from the National Science Foundation we developed innovative programs that provide K-12 teachers the resources necessary to bring the world of microelectronics and nanotechnology to their classrooms. Through our partnership with HVCC and NEATEC, we continue to share those programs.

It is our goal to help K-12 teachers develop active and engaging learning experiences for their students where the skills required of today’s engineers are synergistically linked with the core curricula of today’s Science, Technology, Engi-

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**Tentative Program Outline**

**Wednesday May 1, 2013**

**Session 1**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Continental Breakfast &amp; Course Registration</td>
</tr>
<tr>
<td>8:30</td>
<td>Origins of Nanoelectronics and the Promise of Nanotechnology</td>
</tr>
<tr>
<td>9:30</td>
<td>Fundamentals of Semiconductor Devices</td>
</tr>
<tr>
<td>10:30</td>
<td>Electronics Lab</td>
</tr>
<tr>
<td>11:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:30</td>
<td>Imaging for Nanofabrication</td>
</tr>
<tr>
<td>1:30</td>
<td>Lithography and Microscopy Laboratory</td>
</tr>
</tbody>
</table>

**Thursday May 2, 2013**

**Session 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Continental Breakfast</td>
</tr>
<tr>
<td>8:30</td>
<td>Microelectronic Engineering Processing Overview</td>
</tr>
<tr>
<td>9:30</td>
<td>Processing Lab in the Cleanroom</td>
</tr>
<tr>
<td>11:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:30</td>
<td>A Snapshot of the programs and current research in the Microelectronic Engineering Department at RIT.</td>
</tr>
<tr>
<td>1:30</td>
<td>Skill set needed for today’s engineers and hi-tech manufacturing</td>
</tr>
<tr>
<td>2:30</td>
<td>Focused discussion on integrating microelectronics and nanotechnology into K-12 classrooms</td>
</tr>
<tr>
<td>3:15</td>
<td>Graduation</td>
</tr>
</tbody>
</table>

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**Course Registration**

This course is open to all K-12 Math, Science, and Technology teachers.

Course Registration must be made by April 19, 2013. To register, please [HVCC/NEATEC info here](#).

Be sure to include the following information while registering:

- Name
- School
- Grade/Subject
- Phone Number

Travel costs will be reimbursed to all attendees. WHATEVER HVCC WANTS TO COVER. Professional development credits, along with a certificate of participation and additional instructional materials will be provided to all attendees.

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**Contacts:**

HVCC ? NEATEC

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SEM Micrograph of MOS connected memory device designed and fabricated by RIT students

SEM Micrograph of MOS connected memory device designed and fabricated by RIT students

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**Presented by:**

**Department of Electrical & Microelectronic Engineering**

*In partnership with HVCC & NEATEC*

**Contacts:**

HVCC ? NEATEC

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**RIT/Microelectronic Engineering**

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