1. **COURSE TITLE\*: Semiconductor 101**
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: ADMF 1102**
3. **PREREQUISITE(S)\*: COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 3 LECTURE HOURS\*: 2**

**LABORATORY HOURS\*: 2 (contact hours) OBSERVATION HOURS\*:**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

In this course, a student will explore career opportunities within the

semiconductor industry and learn how people effectively work in a

cleanroom environment and adhere to chemical safety best

practices. Students will be introduced to how semiconductor wafers are

manufactured and processed to become an integrated circuit used in a

variety of industries. Students will demonstrate problem-solving, critical

thinking and communication skills while learning how the microelectronic

manufacturing environment focuses on punctual delivery of products and

tasks, according to the Standard Operating Procedure (SOP)/checklist.

1. **LEARNING OUTCOMES\*:**

Upon completion of this course, students can:

1. Demonstrate the capability of working safely in a cleanroom environment by donning, wearing, and doffing a cleanroom suit (bunny suit).

2. Articulate how a semiconductor wafer is manufactured and processed to become an integrated circuit.

3. Explore career opportunities in the semiconductor industry and work efficiently and safely in a microelectronic manufacturing environment with a focus on on-time delivery of products and completion of tasks in a digital checklist or procedure.

4. Articulate chemistry and safety awareness in semiconductor manufacturing including gases used in plasma, gases used in thin film deposition, and chemistry used to clean silicon wafers.

1. **ADOPTED TEXT(S)\*:***No text required for purchase; material provided in the course.*

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

Computer and Internet access with most recent release of Firefox or Chrome

Adobe Reader or other PDF reader for PDF documents

Microsoft Word (free to SSCC students)

HTML 5-compliant browser/tablet for video playback

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

% Points

A: 90 – 100 (900-1000)

B: 80 – 89 (800-899)

C: 70 – 79 (700-799)

D: 60 – 69 (600-699)

F: 0 – 59 (0-599)

**Note: The OACC Semiconductor Certificate requires a grade of “C” or better ≥70% (700 points) to receive credit towards the certificate.**

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

|  |  |  |
| --- | --- | --- |
| *Category* | ***EXAMPLE ONLY***  *Total Points* | *% of Grade* |
| Quizzes (Weekly) | 410 | 41% |
| Discussion Board | 120 | 12% |
| Assignments/Labs | 260 | 26% |
| Final Retrospective | 210 | 21% |
| Total | 1000 | 100% |

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

May include but not limited to lecture and problem solving, independent and group projects, in-class and home assignments, quizzes, and tests. Problem solving will use both graphical and mathematical methods.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

|  |  |  |
| --- | --- | --- |
| Week # | Topic Covered | Learning Outcomes |
| 1 | Introduction to Semiconductor Industry | 1, 2, 3, 4 |
| 2 | Introduction to Clean Rooms Part A | 1, 2, 3, 4 |
| 3 | Introduction to Clean Rooms Part B | 1, 2, 3, 4 |
| 4 | Nanotechnology, Semiconductor History and Fabrication Process Overview, Part A | 2, 3, 4 |
| 5 | Nanotechnology, Semiconductor History and Fabrication Process Overview, Part B | 2, 3, 4 |
| 6 | Semiconductor Materials Science | 2, 3, 4 |
| 7 | Semiconductor Devices- Ingot and Wafer Fabrication | 2, 3, 4 |
| 8 | Wafer Cleaning and Thin Film Sputtering Part A | 1, 2, 3, 4 |
| 9 | Wafer Cleaning and Thin Film Sputtering Part B | 1, 2, 3, 4 |
| 10 | Lithography | 2, 3, 4 |
| 11 | Wet Etching | 2, 3, 4 |
| 12 | Dry Etching | 2, 3, 4 |
| 13 | Diffusion Process | 2, 3, 4 |
| 14 | Thin Film Deposition-PVD and CVD | 2, 3, 4 |
| 15 | Multi-Layer IC and Backend Process | 2, 3, 4 |
| 16 | Final Presentations | 1, 2, 3, 4 |

1. **SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**
   * All assignments, quizzes, and tests must be turned in on time.
     + Late work in not acceptable and will not be graded.
   * APA format will be used in this and all Engineering classes.
   * All written responses (except Math problems) must be in a Microsoft Word document.
     + Handwritten documents will not be accepted.
   * Name must be in the top right corner of every page to be graded.
     + Make the header in Word your friend.
   * Students may work on their own time to complete the assignments.
   * Some group work is encouraged on exercises and assignments.
   * The group projects are not optional; make sure you are a team player.
   * Examinations will include written and graphical components.

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see students’ work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that their work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at [rhall21@sscc.edu](mailto:rhall21@sscc.edu) or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

You have access to many great free resources at SSCC. For example, open computer labs in the 300 hallway, several printing locations when you need to print, library services (they can help with many things and often have equipment available for you to use when you forget or break yours), tutoring, career counseling and much more. Just ask if you need help or assistance, we want you to be successful and are here to help if we can.

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.