

## **Fundamentals of Biometric Identification**

EEE-6561 Sections 13G6, 13G3, 13G4, 159C

**Class Periods:** Mon., Weds, and Fri., Period 7, 1:55 PM-2:45 PM

**Location:** NEB 201

**Academic Term:** Spring 2018

### **Instructor:**

- Name: Dr. Damon L. Woodard
- Email Address: [dwoodard@ece.ufl.edu](mailto:dwoodard@ece.ufl.edu)
- Office Phone Number: 352-273-2130
- Office Hours: Mon., Wed., 8:00 AM – 9:30 AM or by appointment, 226E Materials Engineering Bldg.

### **Teaching Assistants:**

Please contact through the Canvas website

- Name: Sumaiya Shomaji
- Email Address: [shomaji@ufl.edu](mailto:shomaji@ufl.edu)
- Office Hours: Mon.: 3:00 PM – 4:00 PM and Fri.: 11:00 AM – 12:00 PM, 126 Materials Engineering Bldg.
  
- Name: Miao He
- Email Address: [tonyhe@ufl.edu](mailto:tonyhe@ufl.edu)
- Office Hours: TBD

### **Course Description**

Methods and principles for the automatic identification/authentication of individuals. Technologies include fingerprint, face, and iris biometrics. Additional topics include biometric system design, performance evaluation, multi-modal biometric systems, and biometric system security.

Credits: 3

### **Course Pre-Requisites / Co-Requisites**

EEE-6512 Image Processing and Computer Vision is a prerequisite for the course or instructor approval.

### **Course Objectives**

This course introduces students to the fundamental principles and methods used for biometric identification. The goals of this course are to understand the process of biometric recognition as well as the challenges it poses as means of establishing identity. The objective of the course is to provide students with the scientific foundations needed to design, implement, and evaluate large-scale biometric identification systems. This objective will be met by the completion of multiple homework assignments which require the application of methods of biometric identification and system evaluation discussed during lecture. Also, the students' understanding of the main concepts will be assessed using multiple exams including a final.

### **Materials and Supply Fees**

None

### **Required Textbooks and Software**

- Title: Introduction to Biometrics
- Author: Anil K. Jain, Arun Ross, and Karthik Nandakumar
- Publication date, edition, and publisher: 2011, First Edition, Springer
- ISBN number: 978-0-387-77326-1

Software: Mathematical solver software such as MATLAB(available at UF ECE terminal server available by remote login)

## **Recommended Materials**

None

## **Course Schedule**

Week 1:	Course Overview, History of Biometrics, Applications
Week 2:	Overview of Biometric System Operation / <b>Homework #1 Due</b>
Week 3:	Biometric System Evaluation
Week 4:	Face Detection / <b>Homework #2 Due</b>
Week 5:	Face Recognition /
Week 6:	Fingerprint Recognition Pt. I / <b>Exam #1</b>
Week 7:	Fingerprint Recognition Pt. II / <b>Homework #3 Due</b>
Week 8:	Iris Recognition
Week 9:	Spring Break (No Classes)
Week 10:	Behavioral Biometrics / <b>Homework #4 Due</b>
Week 11:	Multi-modal Biometrics & Biometric Fusion / <b>Homework #5 Due</b>
Week 12:	Biometric System Security and Spoofing Pt. I
Week 13:	Biometric System Security and Spoofing Pt. II / <b>Exam #2</b>
Week 14:	Biometric Template Protection / <b>Homework #6 Due</b>
Week 15:	Privacy and Ethics

## **Attendance Policy, Class Expectations, and Make-Up Policy**

Although attendance will not be recorded, it is expected that students attend all lectures. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Students are expected to take measures to minimize distractions for everyone (i.e. no newspapers, cell phone, PDA, laptops, etc. unless instructed to use them for class.

Makeup exams are contingent on appropriate justifications and legal documents (UF Dean of Students, certified physician, military active duty, judge for jury duty, etc.) Late assignments and projects will not be accepted

## **Evaluation of Grades**

<b>Assignment</b>	<b>Percentage of Final Grade</b>
Homework Sets (6)	50%
Exams (2)	25%
Final Exam	25%
<b>TOTAL</b>	<b>100%</b>

## **Grading Policy**

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
94 - 100	A	4.00
90 - 93	A-	3.67
88 - 89	B+	3.33
82 - 87	B	3.00
80 - 81	B-	2.67
78 - 79	C+	2.33
72 - 77	C	2.00
70 - 72	C-	1.67
62 - 69	D	1.00
0 - 61	E	0.00

### ***Students Requiring Accommodations***

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Software Use***

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Campus Resources:***

#### *Health and Wellness*

#### **U Matter, We Care:**

If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352-392-1575 so that a team member can reach out to the student.

**Counseling and Wellness Center:** <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

#### **Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

#### *Academic Resources*

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.  
<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.  
<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers.  
<https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus**: [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints**: <http://www.distance.ufl.edu/student-complaint-process>.