

APPLIED DATA SCIENCE & ANALYTICS IN HP

PET4936 – 29729 & 29311 ~ 3 Credit Hours ~ SPRING 2022

INSTRUCTOR: Garrett Beatty, Ph.D.
Office: Information provided in UF e-Learning course site.
Email: Utilize the UF E-Learning Inbox for course related correspondence.
Individual phone / video meetings available upon request.

OFFICE HOURS: Zoom meeting room links available in Course Syllabus Page
Mondays: 4 – 5pm
Wednesdays: 9 – 10am

ACCESS: Access course through Canvas on **UF e-Learning** (<https://elearning.ufl.edu/>) & the **Canvas** mobile app by **Instructure**

COURSE DESCRIPTION: Examines fundamental concepts related to the acquisition, analysis, and interpretation of data relevant to the outcome of human performance across myriad physical and cognitive domains including sport, exercise, tactical operations, and medical professions. Addresses the use of statistics and broader fields of data science, artificial intelligence, analytics, and technology management necessary to evaluate performance and strategically adjust training methods to enhance human performance, health, and well-being. Content will aid students preparing to sit for the National Strength and Conditioning (NSCA) Certified Performance and Sport Scientist (CPSS) exam.

PREREQUISITE KNOWLEDGE AND SKILLS: Undergraduate degree. Some background in math and science. Introductory statistics is not required but is helpful. Students enrolling in this course must have sufficient technical skills access and navigate the Canvas learning management system, e-mail with attachments, Microsoft Office, Zoom videoconferencing, downloading, installing, and updating software to Google Chrome.

REQUIRED AND RECOMMENDED MATERIALS:

Textbook: Textbook: French, D. and Ronda, L.T. (Eds). *NSCA's Essentials of Sport Science*. Human Kinetics. 2022. ISBN: 9781492593355

- Additional materials from the UF Library and web sources will be assigned and available through the UF E-Learning course shell.

COURSE FORMAT: The course is organized into 12 modules. Within each module, students will have the opportunity to engage in course content and graded learning activities. The learning activities are designed to catalyze student achievement of the following course goals and objectives.

COURSE GOALS & LEARNING OBJECTIVES:

1. Identify the aspects of sports improved with technological implementation
2. Describe principles of good data hygiene
3. Explain the characteristics of tracking and load monitoring systems
4. Describe the protocols used to collect data with relevant sport science technology
5. Analyze data collected with relevant sport science technology
6. Interpret the results of data analyzed from relevant sport science technology
7. Recommend strategies to improve athlete health, well-being, or performance based on the interpretation of data analyses.
8. Develop material to disseminate data analyses and subsequent recommendation

COURSE AND UNIVERSITY POLICIES:

ATTENDANCE POLICY: Requirements for class attendance (participation) and make-up exams, assignments, and other work in this course are consistent with university policies <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

PERSONAL CONDUCT POLICY: Students are expected to exhibit behaviors that reflect highly upon themselves and the University. 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 (<http://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. Students are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult the instructor, graduate assistant, or teaching assistant in this class.

EXAM & ASSIGNMENT MAKE-UP POLICY: Unless excused based on University policies (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>), missed examinations and non-submitted or late assignments will not be evaluated and will be assigned a grade of 0.

Obtaining approval for make-up exams or make-up assignments is the responsibility of the student. Students with medically or emergency related circumstances should utilize the UF Care Team's Contact My Instructor service (<https://care.dso.ufl.edu/instructor-notifications/>) provided by the UF Dean of Students Office.

Any non-medical or emergency related circumstances require students to submit a written request explaining why an exception is being requested. The written request must include official documentation that provides proof that the missed coursework was due to acceptable reasons outlined by University policy.

COPYRIGHT STATEMENT: The materials used in this course are copyrighted. Course content is the intellectual property of Garrett Beatty, and property of the University of Florida. Course content may not be duplicated in any format without explicit permission from the College of Health and Human Performance and UF. Course content may not be used for any commercial

purposes. Individuals violating this policy may be subject to disciplinary action or legal litigation from the University.

ACCOMMODATING STUDENTS WITH DISABILITIES: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting their Get Started page at <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

COURSE EVALUATIONS: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

PRIVACY: Students enrolled in this course are agreeing to have their video or audio content accessible to the members of this course, enrolled in this semester. All class meetings will be recorded and provided to the class for asynchronous access. Students engaging in this course will also develop multimedia content including audio and video presentations that will be accessible to all members of the class. Recordings will not be available to members outside of this course.

Per the State of Florida's House Bill 233, students are also permitted to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is defined as an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

GETTING HELP:

Health and Wellness

- U Matter, We Care (<https://care.dso.ufl.edu/>): If you or a friend is in distress, please contact umatter@ufl.edu or call 352-392-1575
- Contact My Instructor Service: <https://care.dso.ufl.edu/instructor-notifications/>
- Counseling and Wellness Center: <https://counseling.ufl.edu/>, 352-392-1575
- Sexual Assault Recovery Services (SARS) - Student Health Care Center, 392-1161
- University Police Department, 392-1111 (or 9-1-1 for emergencies)
<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 Connections Center, Reitz Union, 392-1601. Career assistance and counseling. <https://career.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. <http://teachingcenter.ufl.edu/>
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>
- Student Complaints:
 - On-Campus Students: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
 - On-Line Students: <http://distance.ufl.edu/student-complaint-process/>

INCLUSION, DIVERSITY, EQUITY, AND ACCESSIBILITY RESOURCES

For suggestions or concerns related to IDEA, please reach out to any of the following:

- Dr. Rachael Seidler, APK Graduate Coordinator, rachaelseidler@ufl.edu
- Dr. Joslyn Ahlgren, APK Undergraduate Coordinator, jahlgren@ufl.edu

GRADING:

Student learning will be evaluated through module quizzes, assignments, and two exams. Specific assignment details and grading rubrics will be provided on the course website <https://lss.at.ufl.edu/>.

- **Quizzes:** Each course module includes a multiple choice quiz aimed at guiding and enhancing engagement in learning opportunities.
- **Assignments:** Each student will be graded on assignments throughout the course in which students will apply course concepts to actual human performance related data sets. Assignment tasks will include the acquisition, processing, cleaning, statistical analysis, interpretation, and presentation of relevant data sets.
- **Exams:** Exams consist of 50 – 100 objective questions (multiple choice, matching, true/false). Questions will require the application of course material or knowledge of basic scientific principles covered throughout the course. Exam questions are generated by the course instructor and are randomly selected from a test bank. Students should prepare for the exam by completing all weekly course readings, watching all course lectures, consuming all course media, and completing and module quizzes prior to the exam.

Final grade composition:

- Quizzes: 20%
- Assignments: 30%
- Exams: 50%
 - Exam 1 = 25%
 - Exam 2 = 25%

Notes:

- Grades will not be rounded
 - e.g. a 92.99% will not be rounded to a 93.00%.
- Grades of "I", "X", "H", or "N" will not be given except in cases of a documented, catastrophic occurrence.

Course letter grades based on cumulative grade percentages:

<u>Grade</u>	<u>Percentage</u>	<u>Grade Points</u>
A	93 - 100 %	4.00
A-	90 - 92.99 %	3.67
B+	87 - 89.99 %	3.33
B	83 - 86.99 %	3.00
B-	80 - 82.99 %	2.67
C+	77 - 79.99 %	2.33
C	73 - 76.99 %	2.00
C-	70 - 72.99 %	1.67
D+	67 - 69.99 %	1.33
D	63 - 66.99 %	1.00
D-	60 - 62.99 %	0.67
E	0 - 59.99 %	0.00

More detailed information regarding current UF grading policies can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

WEEKLY COURSE SCHEDULE:

Critical Semester Dates & UF Observed Holidays:

- January 17: Martin Luther King, Jr. Day (Monday)
- March 7 – 11: UF Spring Break (Monday - Friday)
- April 21 – 22: UF Spring Semester Reading Days (Thursday – Friday)
- Complete list available here: <https://catalog.ufl.edu/UGRD/dates-deadlines/2021-2022/#spring22text>

Week	Dates	Assigned Module & Schedule Notes	Assessments Due
1	January 5 – 14	Module 1 – Technology & Data in Human Performance Textbook Chapters: 7, 8	
2	January 17 – 21	Module 2 – Athlete Tracking Systems and Load Monitoring Textbook Chapters: 9, 10 <i>Monday, January 17 – MLK Jr. Day – UF Holiday</i>	
3	January 24 – 28	Module 3 – Kinematics, Kinetics, & Gait Analysis Textbook Chapters: 11, 12	January 25 AI Project Assignment 1
4	January 31 – Feb 4	Module 4 – Strength Tracking & Analysis; HR & HRv Textbook Chapters: 13, 14	
5	February 7 – 11	Module 5 – EEG, EMG, & Biomarkers Textbook Chapters: 15, 16	February 8 AI Project Assignment 2
6	February 14 – 18	Module 6 – Perception of Effort and Subjective Monitoring Textbook Chapters: 17	
7	February 21 – 25	Exam 1 Week Exam 2: Completed on Canvas with Honorlock Exam 1 Window: February 19 – 27	February 22 Project Assignment 3 February 27 Modules 1 – 6 Quizzes
8	February 28 – Mar 4	Module 7 – Statistical Modeling Textbook Chapters: 18	
9	March 7 – 11	UF Spring Break	
10	March 14 – 18	Module 8 – Injury Risk Model Textbook Chapters: 19	March 15 AI Project Assignment 4
11	March 21 – 25	Module 9 – Operationalizing Data Textbook Chapters: 22	
12	March 28 – Apr 1	Module 10 – Data Mining & Nonlinear Data Analysis Textbook Chapters: 20	March 29 AI Project Assignment 5

13	April 4 – 8	Module 11 - Data Delivery & Reporting Textbook Chapters: 21	
14	April 11 – 15	Module 12 – Information Dissemination Textbook Chapters: 31	April 12 AI Project Assignment 6
15-16	April 18 – 29	Exam 2 Weeks Exam 2: Completed on Canvas with Honorlock Exam 2 Window: April 16 – 20; 23 – 26	April 26 Modules 6 – 12 Quizzes AI Project Assignment 7

SUCCESS AND STUDY TIPS:

Quizzes & Optional Assignments are designed as preparation tools for the course exams. Learning is a process that requires sustained incremental advancements that occur over time following neural adaptation. More simply stated, cramming may yield short-term results, but this strategy does not induce meaningful or lasting learning.

Assignments are designed to facilitate skill development in retrieving, consuming, and communicating scientific evidence supporting chosen approaches to improve human performance.