

**HRD 6355 – Multivariate Statistics  
Course Syllabus (Rev A)**

**Contact Information**

Instructor:	Kim Nimon, Ph.D.
Office Address:	UT Tyler Soules College of Business Department of Human Resource Development 3900 University Blvd. – COB 315.314 Tyler, TX 75799
Office Hours:	profnimon.com/schedule or by appointment <i>Feel free to schedule more than one appointment on profnimon.com/schedule. If the times on profnimon.com/schedule don't work for you, please call or text me on my cell to make an appointment.</i>
Open Office Hours:	TBD Thursdays in weeks that assignments are due <a href="https://uttyler.zoom.us/my/knimon">https://uttyler.zoom.us/my/knimon</a>
Office Phone:	(903) 565-5833
Cell Phone:	(214) 675-4872
Email:	knimon@uttyler.edu
Zoom:	<a href="https://uttyler.zoom.us/my/knimon">https://uttyler.zoom.us/my/knimon</a>
Skype:	Knimon1
Preferred Contact Method:	Canvas Email for personal issues Canvas Discussion Board for non-personal issues

**Credit Hours**

3 semester hours

**Course Description**

This course covers an advanced set of quantitative statistical analyses that are key to creating new knowledge in human resource development. Students will learn how to interpret, conduct, and report select quantitative statistical techniques that answer research questions or hypotheses that involve multiple dependent variables.

**Course Philosophy**

Learning quantitative statistical analyses is similar to learning a new language. There are often words that are hard to pronounce, difficult to remember, and may have similar meanings. However, by continually practicing the new language through observation, reading, and writing, learners have the opportunity to pick up the language quickly and sound like a native speaker. Therefore, this course has weekly assignments that culminate around five scheduled class meetings to give learners the opportunity to regularly practice the new language of quantitative statistical analyses. Learners will be expected to work individually and in teams to facilitate both individual and peer learning. To facilitate a safe learning environment, learners will have opportunities to build from their mistakes as they practice the new language through a variety of means.

**Grading Philosophy**

I understand that the process of receiving grades can inhibit the learning process. I endeavor to create a safe learning environment. As part of that environment, you have several opportunities to maintain a high grade in the course, including:

- Two attempts at each module quiz, where you receive the highest grade of the attempts made

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- Opportunity to resubmit attempted module assignments
- Bonus points opportunity for each module
- Opportunity to submit a draft version of your final paper
- Feedback provided on assignments turned in late
- End of semester provisions to replace grades assigned 0 because work was not turned in or late

It is possible to get to the end of the semester with a very high grade that can be drastically reduced based on your performance on the final project. The idea is that by the end of the semester, you should have the requisite knowledge and skills to perform at a higher level than when you were first learning the material. Therefore, the grading of the final project is less lenient than the grading of the module assignments.

### Course Design

The course was designed according to the 4MAT method. According to Bernice McCarthy, developer of the 4MAT system, there are four major learning styles, each of which asks different questions and displays different strengths during the learning process. The course has 9 learning modules, each with four sections except for the last modules that contain three sections. Learning modules begin with a “getting started” activity to answer *why*. To answer *what*, learners will read a chapter from the required text and/or published articles and test their knowledge over the required reading via quizzes. To answer *how*, learners will complete the necessary steps to conduct, interpret, and/or report on a particular statistical analysis. To answer *if*, learners will be asked to conduct peer reviews and provide constructive feedback on module activities.

### Course Objectives

At the conclusion of the course, learners will be able to:

1. Critically evaluate the psychometric properties of data from published instrumentation.
2. Select appropriate instrumentation to test HRD related models.
3. Collect, clean, and analyze multivariate data.
4. Conduct, interpret, and write-up the results of reliability analysis, exploratory factor analysis, multivariate analysis of variance, descriptive discriminant analyses, canonical correlation analysis, repeated measures analysis of variance, and predictive discriminant analysis.
5. Compare and contrast univariate statistical analyses to relevant multivariate statistical analyses.
6. Effectively communicate the results of multivariate analyses for human resource development scholars and practitioners using text and graphics.

### Required Software

- IBM® SPSS® Statistics Standard GradPack 26 or higher (6 and 12 month licenses available at <http://www.onthehub.com/spss/>)
- R (v. 3.6.2 or later) (Available for free at <http://cran.rstudio.com/>)

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**Required Texts**

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6<sup>th</sup> ed.). Washington, DC : Author.

Field, A. (2018). *Discovering Statistics Using IBM SPSS* (5<sup>th</sup> ed.). Thousand Oaks, CA: Sage.

Field, Miles, & Field (2012). *Discovering Statistics Using R*. Thousand Oaks, CA: Sage.

Grimm, L. G., & Yarnold, P. R. (1995). *Reading and understanding multivariate statistics*. Washington, DC: American Psychological Association.

Grimm, L. G., & Yarnold, P. R. (2000). *Reading and understanding MORE multivariate statistics*. Washington, DC: American Psychological Association.

Hair, J. E., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis*. (8th ed.). Upper Saddle River, NJ: Prentice-Hall.

Huck, S. W. (2012). *Reading statistics and research* (6<sup>th</sup> ed.). Boston, MA: Allyn & Bacon.

Schumacker, R. E. (2016). *Using R with multivariate statistics*. Thousand Oaks, CA: Sage.

**Recommended Texts**

Boyle, G. J., Saklofske, D. H., & Matthews, G. (Eds.) (2015). *Measures of personality and social psychological constructs*. London: Academic Press.

Crawley, M. J. (2013). *The R Book* (2<sup>nd</sup> ed.). West Sussex, England: John Wiley and Sons.

Creswell, J. W. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5<sup>th</sup> ed.). Thousand Oaks, CA: Sage.

Fields, D. L. (2013). *Taking the measure of work: A guide to validated scales for organizational research and diagnosis*. Thousand Oaks, CA: Sage.

Fowler, F. J. Jr. (2014). *Survey Research Methods* (5<sup>th</sup> ed.). Thousand Oaks, CA: Sage.

Sansone, C., Morf, C. C., & Panter, A. T. (Eds.). (2003). *The Sage handbook of methods in social psychology*. Sage Publications.

Tabachnick, B., G., & Fidell, L. S. (2013). *Using multivariate statistics* (6<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson.

Thompson, B. (2002). *Score reliability: Contemporary thinking on reliability issues*. Thousand Oaks, CA: Sage.

Thompson (2004). *Exploratory and confirmatory factor analysis*. Washington, DC: APA.

**Class Meeting Schedule**

#	Date	Topics	
1	1/17	Facilitator Presentations <ul style="list-style-type: none"> <li>• Course Overview</li> </ul>	Student Presentations <ul style="list-style-type: none"> <li>• Project Proposals</li> </ul>
2	2/07	Facilitator Presentation <ul style="list-style-type: none"> <li>• Data Collection through Qualtrics &amp; MTurk</li> <li>• IRB</li> </ul>	Student Presentations <ul style="list-style-type: none"> <li>• Purpose Statement</li> <li>• SEM Models (optional)</li> </ul>
3	3/06	Facilitator Presentation <ul style="list-style-type: none"> <li>• Construct Validity</li> </ul>	Student Presentations <ul style="list-style-type: none"> <li>• Survey Deployment</li> </ul>
4	4/03	Facilitator Presentation <ul style="list-style-type: none"> <li>• Final Project</li> </ul>	Student Presentations <ul style="list-style-type: none"> <li>• Construct Validity</li> <li>• MANOVA/DDA/CCA</li> </ul>
5	4/24	Facilitator Presentation <ul style="list-style-type: none"> <li>• Next Semester</li> </ul>	Student Presentations <ul style="list-style-type: none"> <li>• Final Project</li> </ul>

*Note.* Class meetings held from 5:00 to 9:00 in COB 251. Topics may flex in order to meet learner needs.

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**Course Schedule**

Week	Module	Getting Started <sup>a</sup>	Quiz	Assignment	Peer Review <sup>b</sup>
1	Orientation Class Meeting 1 (1/17)				
2	Introduction to Multivariate Statistics	<b>1</b> (1/26)	<b>10</b> (1/26)	<b>10</b> (1/26)	<b>1</b> (2/02)
3	Validity of Data Reliability of Data	<b>1</b> (2/02)	<b>10</b> (2/02)	<b>10</b> (2/02)	<b>1</b> (2/09)
4	Class Meeting 2 (2/07)				
5	Survey Development	<b>1</b> (2/16)	<b>10</b> (2/16)	<b>10</b> (2/16)	<b>1</b> (2/23)
6	Survey Deployment	<b>1</b> (2/23)	<b>10</b> (2/23)	<b>10</b> (2/23)	<b>1</b> (3/01)
7	AHRD				
8	Class Meeting 3 (3/07)				
9	Spring Break				
10	Construct Validity	<b>1</b> (3/22)	<b>10</b> (3/22)	<b>10</b> (3/22)	<b>1</b> (3/29)
11	Multivariate Analysis of Variance Descriptive Discriminant Analysis Canonical Correlation	<b>1</b> (3/29)	<b>10</b> (3/29)	<b>10</b> (3/29)	<b>1</b> (4/05)
12	Class Meeting 4 (4/04)				
13	Final Project Draft			<b>10</b> (4/12)	<b>1</b> (4/19)
14	Repeated Measures Analysis of Variance	<b>1</b> (4/19)	<b>10</b> (4/19)	<b>10</b> (4/19)	<b>1</b> (4/26)
15	Final Project Class Meeting (4/25)			<b>20</b> (4/26) <b>170</b> (4/28)	
16	Predictive Discriminant Analysis	<b>1</b> (5/02)	<b>10</b> (5/02)	<b>10</b> (5/02)	
	Total	<i>8 bonus</i>	<b>80</b>	<b>280</b>	<i>9 bonus</i>

*Note.* Course schedule may be adapted during the semester to meet learner needs. Bolded numbers indicate maximum possible point value. Work due on Sundays will not be counted late if submitted within 24 hours of due date/time. <sup>a</sup>Participation in getting started is worth 1 bonus point if substantive post and reply is posted by the due date. <sup>b</sup>Participation in peer review is worth 1 bonus point if post of student's own work and review of peer's work is posted by due date. Bonus points are only awarded if all other module work (e.g., quiz, assignments) has been completed and/or submitted and is not late.

**Course Evaluation**

Component	Points
Entrance Exam	40 (1 at 40 points)
Module Quizzes	80 (9 @ 10 points each)
Module Activities	80 (9 @ 10 points each)
Final Project	200
Total	400

A = 90% – 100% B = 80% – 89% C = 70% – 79% D = 60% – 69% F = < 60%

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### Course Policies:

#### **Assignment Resubmission**

Assignments that receive less than 70% may be resubmitted and reevaluated pending the following conditions: (a) Original submission was not assigned a grade of 0. (b) Resubmissions are submitted within one week of the date that the original grade was assigned. (c) Resubmission includes all files identified on assignment directions. (d) Resubmissions clearly indicate what has changed since the original submission (e.g., tracked changes in MS Word). (e) Resubmission includes a separate file that provides the graded rubric as well as an additional column that indicates how the assignment was changed based on the feedback provided. Resubmitted assignments may only receive a maximum of 70% credit.

#### **Class Meeting Attendance**

Attendance at all five class sessions is expected and required for the accomplishment of course objectives. It is expected that learners will attend all class meetings in light of the condensed executive format. The facilitator recognizes that learners may have special issues and responsibilities that may impact attendance, however regular attendance is expected. If absences occur, the learner is responsible for contacting the facilitator in advance so that adjustments can be made to the instructional activities planned for a specific session. The learner is also responsible for all work that is missed due to the absence from any class meeting, or portion thereof.

#### **Late Work**

No credit will be given for late assignments unless the learner's provider and/or UT Tyler's system prevents the student from submitting a discussion post, assignment, or quiz. The student is responsible for contacting the instructor, providing evidence of the outage and submitting any missed work within 24 hours of resolution of any system outage. **Students may request to take a comprehensive exam to replace grades of 0 for quizzes and/or to use their final project draft grade to replace grades of 0 for assignments, other than peer reviews and getting started activities, up to 70%. Such requests must be made by the Thursday of the 15<sup>th</sup> week of class.**

#### **Academic Dishonesty Statement**

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment of the award of a degree, and/or the submission, as one's own work of material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

University regulations require the instructor to report all suspected cases of academic dishonesty to the Dean of Students for disciplinary action. In the event disciplinary measures are imposed on the student, it becomes part of the students' official school records. Also, please note that the handbook obligates you to report all observed cases of academic dishonesty to the instructor.

Plagiarism will not be tolerated and learners should be aware that all written course assignments will be checked by Plagiarism detection software. Violations of academic integrity will be reported and processed according the guidelines established by the University.

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### University Policies:

#### **The University of Texas at Tyler Honor Code**

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

#### **Students Rights and Responsibilities**

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <https://www.uttyler.edu/wellness/rightsresponsibilities.php>

#### **Campus Carry**

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

#### **UT Tyler a Tobacco-Free University**

- All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.
- Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.
- There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit [www.uttyler.edu/tobacco-free](http://www.uttyler.edu/tobacco-free).

#### **Grade Replacement/Forgiveness**

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. (For Spring, the Census Date is Jan. 28.) Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

#### **Census Date Policies**

The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail, or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

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### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

### **Disability Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible disabilities such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director for Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.utt Tyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

### **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

### **Student Absence for University-Sponsored Events and Activities**

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

### **Social Security and FERPA Statement**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

### **Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

### **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. "Cheating" includes, but is not limited to:
  - copying from another student's test paper;

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- using, during a test, materials not authorized by the person giving the test;
  - failure to comply with instructions given by the person administering the test;
  - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
  - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
  - collaborating with or seeking aid from another student during a test or other assignment without authority;
  - discussing the contents of an examination with another student who will take the examination;
  - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
  - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
  - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
  - falsifying research data, laboratory reports, and/or other academic work offered for credit;
  - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
  - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
- iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- iv. All written work that is submitted will be subject to review by plagiarism software.

**UT Tyler Resources for Students**

- [UT Tyler Writing Center](mailto:writingcenter@uttyler.edu) (903.565.5995), writingcenter@uttyler.edu
- [UT Tyler Tutoring Center](mailto:tutoring@uttyler.edu) (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- [UT Tyler Counseling Center](tel:903.566.7254) (903.566.7254)



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**Soules College of Business Statement of Ethics:**

The ethical problems facing local, national and global business communities are an ever-increasing challenge. It is essential the Soules College of Business help students prepare for lives of personal integrity, responsible citizenship, and public service. In order to accomplish these goals, both students and faculty of the Soules College of Business at The University of Texas at Tyler will:

- Ensure honesty in all behavior, never cheating or knowingly giving false information.
- Create an atmosphere of mutual respect for all students and faculty regardless of race, creed, gender, age or religion.
- Develop an environment conducive to learning.
- Encourage and support student organizations and activities.
- Protect property and personal information from theft, damage and misuse.
- Conduct yourself in a professional manner both on and off campus.