DSCI 5180.501– Spring 2020 – Syllabus
Introduction to the Business Decision Process

CLASS (DAY/TIME/LOCATION):	Th 6:30PM - 9:20PM (Frisco Campus: Room : 132)
INSTRUCTOR:	**Dr. Arunachalam (Chalam) Narayanan**
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E-MAIL:	Arunachalam.narayanan@unt.edu
OFFICE HRS:	**W 12:00 – 1:30 pm**
	TH 5 – 6:15 pm (Frisco Campus)
	T 6 – 8pm (Online) , or by appointment

SOFTWARE AND TEXT/s:
Required Software 1): Hawkes Learning: Discovering Business Statistics by Nottingham. This software is REQUIRED to complete the assigned work (organized in Modules) for the class. Your personal access code to the software will enable you complete the lesson certifications and Web-based tests, (called HLS lessons and Module Quizzes). The software may be purchased online at http://www.hawkeslearning.com. Once you have purchased the access-rights to the software, you may complete any/all class-work using HLS Network version accessed through their portal: https://learn.hawkeslearning.com/Portal/User/Login?ReturnUrl=%2fPortal. When registering for the course, be sure to enter your name as the registrar at UNT has it; and our Course ID is "UNTDBS". The software includes access to the eBook. **So, hard copy of the Text shown below is NOT required, unless you want it (for whatever reasons).** The Text/ eBook used is: Discovering Business Statistics, 2013, Nottingham and Hawkes, Hawkes Learning Systems (HLS).

Mac-versions of the software have not been available; but please check with HLS for any availability of Mac versions and/or ISBN numbers, if you wish to.

Required Software 2: **Microsoft Excel with Data Analysis**, and Solver -options activated. You may be familiar with Excel; but its essential use for this course is illustrated in the Text (under "discovering technology" segments).

If you already had purchased/used this version of the HLS software for some other course at UNT, you may be able to use the same access code to update the software via the update option within your software and/or download the current version (Consult HLS student help for details). However, Individual copies of the software are required to obtain the Lesson certifications, and to take the compartmentalized online Module Quizzes. Additional "Student Getting Started Directions" are provided at the end of this syllabus.

HLS Main Website: http://www.hawkeslearning.com
HLS Student Portal access: https://learn.hawkeslearning.com/Portal
HLS training video: http://tv.hawkeslearning.com/Video.htm?PlayerID=2956123671001

Again, the Course ID for all our (i.e., UNT's) courses is "**UNTDBS**". (Choose your course thereafter).

IMPORTANT: When you purchase the access code directly from Hawkes Learning at http://www.hawkeslearning.com/Support/GetYourAccessCode/OnlinePurchase_SelectSchool.aspx **for $85, you also get free access to the digital version of the textbook. This is probably cheaper than buying the digital textbook through the bookstore. Unless you want the hard copy of the textbook, I'd recommend simply purchasing the Hawkes code.**

SOME COURSE-SPECIFIC POLICIES:

I understand many of you will be working, therefore at least 6 weeks of material will be made online immediately and will be updated accordingly. At any point of time – you will see 6 weeks of material online. Hence, the content delivery, due dates etc. will not be deemed affected by any problem (including any possibly weather-related ones). Therefore, necessities of making any changes in the lesson/Module due-dates appearing in this syllabus are not foreseen.

The target completion dates indicated herein for the different parts (alternatively called HLS Lessons or Modules) are the latest dates when the work is due. These will also show up in the student progress reports on the HLS Link. The due dates for the tutorials using **HLS** software are assigned in this syllabus. These form a significant part of the course grade and **must be registered onto the HLS Web database by the due date** to receive full credit as well as bonus points (one extra credit point per module). On completion of a module in a COB lab, or at home, you should **save the HLS certification code to your disk**. **If you are connected to the internet** the module will register automatically **but always double check that you have received credit by going to your progress report**. If there is any problem, exit HLS and then go to your course HLS Web site at https://course.hawkeslearning.com/untbstat/default.asp.

Late submissions still receive full credit, provided they are registered by **the end of day on May 8, 2020;** however, no bonus points are earned. No credit is awarded for any tutorial exercise completed after this date.

Module Quizzes, equivalent of the compartmentalized mid-terms, are set periodically within HLS. **For each Module Quiz, you will get two attempts and the highest one will count.** Note: If you miss any Module Quizzes or get a low score in one, I may replace that low or zero score with 50% of the maximum quiz score.

Online help is available through the Zoom- server, for those seeking it. Shall post/mail the schedule and availabilities of TA's for this effort in due course. Needless, but I add that this is a new endeavor on our part.

NOTE THE POSTED DUE DATES FOR EACH MODULE WORK. IT IS IMPORTANT TO STAY ON SCHEDULE AND TO COMPLETE ALL WORK BY THE POSTED DUE DATES. Clumping of the Lesson due dates within Modules is done only to give you the maximum flexibility in this shortened semester.

Additional policy information:

1. Students with Disabilities: The College of Business Administration complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disability. If you have an established disability as defined in the "Act" and would like to request accommodation, please contact the ODA and your instructor (Dr. Chalam) as soon as possible: the instructor's office hours and phone number are shown at the top of this syllabus.

2. Withdrawal and refund of the course fee: Withdrawal and/or refund of course fee etc. is at the discretion of the students, subject to meeting the deadlines posted in the current Graduate Catalog and/or semester schedules.

3. I will respond to e-mails promptly (in most cases within at most 48 hours).

THE LEARNING OBJECTIVES:

All business decisions require valid data and applicable analytical techniques. This is a core course for most business disciplines and the aim of this course is to provide basic statistical skillsets to perform advanced analysis. The goals of this course include:

1. Developing an appreciation for the role of statistics (now known as data analytics in some circles) in making decisions,

2. Reviewing the central concepts of the statistics commonly used,

3. Understanding Simple Regression/ Correlation as a data analysis technique,

4. Building models using Simple and Multiple Regressions,

5. Understanding the role of ANOVA in experimental designs, and finally

6. Developing the capability to analyze data in business context.

End of Semester teaching evaluations: The Student Perceptions Of Teaching (SPOT) evaluations is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on this class. I consider this survey to be an important part of your participation in this class. (The survey will be enabled by the University Administration toward the end of the semester; and will be accessible through your myunt.edu link.) Please complete it in the time-window provided.

The Module-wise coverage given here is general in nature. Should there be any conflict between this and what is laid out in detail in the assignment of the lessons in HLS, the latter takes precedence; so, please be mindful of checking the due dates within the HLS Progress reports.

COMPONENTS OF GRADES:

There are 5 modules. Each Module-work will involve completion of the constituent lessons (HLS quizzes/certification), followed by a Module Quiz (summary quiz as WebTest).

The following will be utilized to assess students' learning/grading:

Component #1: HLS Lessons and certifications (20 out of 25)

The primary resource of instruction apart from class lecture is the Hawkes Learning Systems (HLS): Business Statistics, which consists of a series of lessons. For ease, selected lessons are set in sequential Modules. In all, the course has 5 modules, which all require the completion of 4 to 6 lessons within each, for a total of 25 lessons/Hawkes assignments. (However, we count only 20 of them, if you complete additional ones – that is considered as bonus and you receive 5 points for each).

Each lesson should be completed by (1) first following the demonstration provided therein, (2) reading the lecture material, (3) doing a few practice exercises, and then (4) finally, completing its certification. Note that the lesson numbers mostly match the chapter and section numbers in the Text and e-Book. The questions in the certification segment require you to answer (input them) sequentially, as you move forward. The certification in specific lessons recognizes your proficiency in the material covered therein. When you use the HLS Web-portal, your certification is automatically entered in the Grade book. But before exiting HLS, please ensure proper recording of your work in the grade book. As mentioned earlier, if you complete the Hawkes assignments on time, not only do you receive the full 10 points but you also are awarded **1 extra credit point**. **Late completion of the Hawkes lessons only gives you the full credit of 10 points.** Timely certification is of the essence in aiding learning, and getting you maximum credits and a good grade in the course. **Please DO NOT plan on doing several certifications in one sitting (never more than two)**. The key is in getting an early head-start on the modules. Further details on due dates are provided elsewhere in this syllabus.

The tutorials in HLS are intended to instruct and train you in the certification procedure. The assigned readings of the sections from the Text present a supplement to these tutorials. These sections may be read with the matching study/reading material before attempting each HLS lesson. The end-of-the-chapter exercises are meant to further reinforce the material. Many such exercises have answers at the back of the text, for verification.

Reading of the material that is not directly assigned for any reason (but is presented in the Text) also may help develop better appreciation for the methodologies. (For example: read up Lessons 1 through 7 (Chapters 1 through 7 of the Text) if you need a quick review of the course pre-requisite material; or Chapter sections 13. 6, 7 and 9 before moving to Chapter 14 in the assigned segments etc.). But such reading is not considered essential for the course (else it would be assigned too). Such reading is recommended specially for the students that plan on taking another follow-up course, and/or have a little more time and inclination. You should also make note of the concepts that underlie the repetitive arithmetic of the HLS, as you would in a face-to-face class.

Component #2: Module Quizzes (4 out of 5 modules)

After the completion of the lessons in each Module of the course you should complete a Module Quiz (covering the lessons that constituted the part, like the mid-terms, in face to face classes). Module Quizzes will be provided in class. This is done, to ensure that we follow a general timeline. **If for some reason you can't be in class, an online option will be given to you.**

Statistics is easier absorbed in smaller doses; so please spread your consumption over longer time. Plan on having a few alternative time slots for the HLS work; that way you may afford a break if/when the material appears hard.

For each Module Quiz, you will get two attempts (one in class and one online (if needed) and the highest one will count. Note: If you miss any Module Quizzes or get a low score in one, I

may replace that low or zero score with 50% of the maximum quiz score.

Each module quiz has about 15 questions and has an assigned time of one hour from the time you start.

Component #3: Final Exam

This last Comprehensive Quiz will be over the 25 HLS lessons.

The final exam has about 18 questions (some with many parts) and has an assigned time of two hours from the time you start.

Grading Summary: The 20 HLS lessons are worth a total of 200 points (@ 10 points each); the 4 module quizzes are worth a total of 120 points (@30 pts. each); the final exam is worth 100 points.

Point Allocation:

HLS Tutorials/Lessons (20*10 pts)	200
Module quizzes (4 * 30 pts)	120
Final Exam	100
Course objective/Introducing yourselves/Getting Access to HLS in first week class*	20
Project (Midterm report/Final)**	60
TOTAL:	500

Extra Credit (Max possible : 60 points)

Extra Credit: Each HLS Tutorial that you finish on time earns you 1 extra credit point. That means a student who finishes all tutorials on time will receive 20 points in addition to the 200 points for homework. These extra credit points are added to your total but the maximum score is still out of 500 points. If you finish additional HLS assignments, it will be considered bonus and you can receive 5 points for each. (so in theory if you finish all 25 HLS and 20 of them in time, you can receive **45 additional points!**)

Similarly if you finish additional module quiz – you can receive that as a bonus credit (15 points).

In all there is opportunity to get 60 additional points (12% of the grade) by completing all assignments in time. I encourage you to use all the available opportunities to be successful in this course.

Course Objectives, Introducing Yourselves and Getting access to HLS in first week of class:
We want you to get an head start as soon as possible and I want to give you an incentive for doing this (that is why we are giving 20 points for this effort)

5 points : For posting a brief introduction about yourself in the discussion board (unt.instructure.com) - I have started with my introduction. I feel graduate studies is more of peer to peer learning rather than instructor-student learning, so knowing your batch mates is

important. I want to initiate/cultivate that in my class, we will discuss that further during our in-class conversations.

5 points : For turning in the ethics statement (signed ethics statement). I will bring a copy of it to the first class.

10 points : Register in HLS website for this course and complete at least two HLS assignments by Jan 20th

Project (Midterm and Final report)
You can appreciate the subject only when you apply it yourself to your environment (either work or something you are familiar with). This course covers topics such as Normal distribution, confidence intervals, comparison of means and statistical regression. These are important fundamental topics, but it gets lost in the details. I want you to appreciate the importance of it. The aim of the project is to achieve that.

Midterm report (No more than 1.5 to 2 pages) : Your source of data and what you want to accomplish based on the topics you learnt (learning from this course) – Due Mar 12th. You are welcome to discuss with me by email before doing it. Points : 20 points

Final report (No more than 1.5 to 2 pages, along with analysis and dataset) : Present the findings using the skillset acquired (topics covered) in class. Include the dataset along with the analysis (could be excel or any statistical package). Points : 40 points – Due Apr 30th.

Letter Grades: If you achieve the following thresholds below, you are **guaranteed** to receive the letter grade listed next to them:

≥ 450 points (or ≥ 90%) → A
≥ 400 points (or ≥ 80%) → B
≥ 350 points (or ≥ 70%) → C
≥ 300 points (or ≥ 60%) → D
< 300 points (or below 60%) → F

It is assumed that students taking this course have already had an introductory statistics course. In case you need to refresh your memory in Basics, please go through the earlier HLS Chapters/Lessons (or the skipped intermediate lessons from the assigned parts, as said before), as you deem fit. The extra time you spend in that process may reward you handsomely in going forward with this course. Please note that being an applied course, DSCI 5180 does not impose high degree of mathematical rigor, but only aims to impart a good functional understanding of statistical analysis leading to Regression.

Any unresolved issue (affecting grade/ standing etc.) remaining at the end of the semester may be followed up with me ASAP. This may save initiation of any appeals procedures (though time-consuming, those options are always available to students).

OUTLINE OF THE COURSE-WORK

Being an online course, changes from the following outline are NOT anticipated. All Modules MUST be completed by their due date/s, for full credits.

Descriptive Statistics – Setting a Context

Module 1- Review

		HLS No.
Week 1 **Jan 16**	Course policies & Discussion of Course, Projects and Deliverables	
	Introduction to the Normal Curve	**7.2**
	Reading the Normal Curve	**7.3a**
Week 2 **Jan 23**	The Normal Distribution	**7.3b**
	Z – Transformations	**7.3c**
Week 3 **Jan 30**	The distribution of Sample Means	**8.3**
	Module – Quiz 1 (in class)	

Module 2- Confidence Intervals Estimation

Week 4 **Feb 6**	Interval Estimation of the population Mean	**9.1-9.3**
	Project Discussion	
Week 5 **Feb 13**	Students t-distribution	**9.4a**
	Interval Estimation with Small Samples (σ unknown)	**9.4b**
Week 6 **Feb 20**	Precision and Sample size determination	**9.5**
	Module – Quiz 2 (in class)	

Module 3 – Inference from data (Hypothesis Testing)

Week 7 **Feb 27**	Developing a Testable hypothesis	**10.1-10.3**
	Hypothesis test for Population Mean (z-value)	**10.4a**
Week 8 **Mar 5**	Hypothesis test for Population Mean (t-value)	**10.4b**
	Hypothesis test for Population Mean (p-value)	**10.4c**
Week 9 **Mar 12**	Estimation of Variance	**10.8a**
	Hypothesis Testing of Variance	**10.8b**
	Mid-Term Project due	

SPRING BREAK – Week 10

Module 4 – Inferences on Multiple Means

Week 11 **Mar 26**	**Module – Quiz 3**	
	Comparing Two Population Means	**11.1**
	Comparing Two Small Sample Means (σ unknown)	**11.2**
Week 12 **Apr 2**		
	Paired Difference Tests	**11.3**
	Comparing Two Proportions	**11.4**
Week 13 **Apr 9**		
	ANOVA, Comparison of Multiple Means	**12.2-12.4**
	Module Quiz 4	
	Chi-square Test of Association (if possible)	**15.3** **(no HLS)**

Module 5 – Inferences with Regression

Week 14 **Apr 16**		
	Fitting a Linear Model	**13.1-13.5**
	Regression Analysis	**13.8**
Week 14 **Apr 23**		
	Multiple Regression and Inference on Coefficients	**14.5a**
	ANOVA Regression	**14.5b**
Week 16 **Apr 30**		
	Models with Qualitative Independent Variables	**14.7**
	Module Quiz 5	
	Final Project report due	
Week 17 **Finals**	May 7 (In class- 6:30 – 8:30 PM)	

Module 1: Review. (80 points)

You may complete some exercises given at the end of the sections/chapters in the Text, as you feel necessary. A better, and more efficient option will be to use the e-book access and/or the "instruct/ practice/ certify" routines provided within the Hawkes Software.

The Five Review Lessons (50 points) from the Hawkes, and their due dates:

HLS1 7.2: Introduction to Normal Curve – Due Jan. 20th

HLS2 7.3a: Reading a Normal Curve - Table - Due Jan. 20th

HLS3 7.3b: The Normal Distribution – Due Jan. 27th

HLS4 7.3c: z-transformations – Due Jan. 27th

HLS5 8.3: The distribution of Sample Means – Due Feb 3rd

Module Quiz 1 (30 points) – In class on Jan 30th (Second attempt if needed – due Feb 3rd)

Module 2: Confidence Intervals (Estimation). (70 points)

The Four CI Lessons (40 points) from the Hawkes, and their due dates:

HLS6 9.1 – 9.3: Interval Estimation of the Population Mean – Due Feb 10th

HLS7 9.4a: Students t- distribution – Due Feb 17th

HLS8 9.4b: Interval Estimation with Small Samples (σ unknown) – Due Feb 17th

HLS9 9.5: Precision and Sample size determination – Due Feb 24th

Module Quiz 2 (30 points) – In class on Feb 20th (Second attempt if needed – due Feb 3rd)

Module 3: Hypothesis Testing (Inference). (90 points)
The Six HT (Inference) Lessons (60 points) from the Hawkes, and their due dates:

HLS10 10.1 – 10.3: Developing a Testable Hypothesis – Due Mar 2nd

HLS11 10.4a: Hypothesis Test for Population Mean (z-value) – Due Mar 2nd

HLS12 10.4b: Hypothesis Test for Population Mean (t-value) – Due Mar 9th

HLS13 10.4c: Hypothesis Test for Population Mean (p-value) – Due Mar 9th

HLS14 10.8a: Estimation of Variance – Due Mar 23rd

HLS15 10.8b: Hypothesis Testing of Variance – Due Mar 23rd
Module Quiz 3 (30 points) – In class on March 26th (Second attempt if needed due on March 28th)

Module 4: Inferences on Multiple Means. (80 points)

The Five Two-Population Inference Lessons (50 points) from the Hawkes, and their due dates:

HLS16 11.1: Comparing Two Population Means – Due Mar 30th

HLS17 11.2: Comparing Two Small Sample Means (σ unknown) – Due Mar 30th

HLS18 11.3: Paired Difference tests – Due Apr 8th

HLS19 11.4: Comparing Two Proportions – Due Apr 8th

HLS20 12.2-12.4: ANOVA, Comparison of Multiple Means – Due Apr 13th

Module Quiz 4 (30 points) – In class on Apr 9th (Second attempt if needed due on Apr 13th)

Module 5: Inferences with Regressions. (80 points)

The Five Regression Lessons (50 points) from the Hawkes, and their due dates:

HLS21 13.1 – 13.5: Fitting a Linear Model – Due Apr 20th

HLS22 13.8: Regression Analysis – Due Apr 20th

HLS23 14.5a: Multiple Regression and Inference on Coefficients – Due Apr 27th

HLS24 14.5b: ANOVA Regression – Due Apr 27th

HLS25 14.7 Models with Qualitative Independent Variables - Due May 4th

Module Quiz 5 (30 points) – In class on Apr 30th (Second attempt if needed due on May 4th)

Final Examination (100 points): - May 7th – 6:30pm to 8:30 pm (Same room in Firsco)

Review the concepts using Modules #1 through #5. This comprehensive Summary quiz, covers Modules 1 thru 5.
(Please also complete the SPOT evaluations for the course when enabled.)

Student Getting Started Directions – see http://www.hawkeslearning.com/ for help

TO GET THE ACCESS CODE FOR YOUR COURSE:

1. Go to http://www.hawkeslearning.com/Support/GetYourAccessCode.htm. Phone HLS at 843-571-2825 for help
2. There will be three options on the above link and each option is explained clearly.
3. Choose the appropriate option that is applicable to you (for example "Purchase an access code")
4. If you are purchasing the access code anew, you will be taken to a secure site, where you will be asked to enter your credit card information. Please note that the address information MUST match the billing address of the credit card.
5. After your credit card information has been verified, you will be taken to a page where you will request an Access Code by entering your name, school, and email address.

Upon submitting the Access Code request, your Access Code will be emailed to you as well as displayed on the screen.