

## Summary

1. College of Business – Department of Accounting, Finance & Economics
  - a. Add the Accelerated Bachelor of Science in Business Administration in Accounting to Master of Business Administration; and
  - b. Add the Accelerated Bachelor of Science in Business Administration in Finance to Master of Business Administration.
  
2. College of Business – Department of Management & Marketing
  - a. Add the Accelerated Bachelor of Science in Business Administration in Business Data Analytics to Master of Business Administration;
  - b. Add the Accelerated Bachelor of Science in Business Administration in Management to Master of Business Administration; and
  - c. Add the Accelerated Bachelor of Science in Business Administration in Marketing to Master of Business Administration.
  
3. College of Arts & Humanities – Department of History & Political Science
  - a. Modify the Accelerated Bachelor of Arts in History to Master of Art in History, as follows: modify Footnote 7, FROM: Students can take up to 6 credit hours at the 5000-level and 6000-level that can count as 4000-level courses. Two graduate-level courses, HIST 6033 Readings in US History and HIST 6543 Readings in World History, can be used to replace two upper-division undergraduate electives, either US history, or world history, to fulfill the requirements for a BA degree in history, TO: Students admitted to the Accelerated Bachelor of Arts in History to the Master of Art in History may take any graduate HIST course at the 5000 and 6000 level to be used to substitute for any 4000-level HIST undergraduate course.
  
4. College of Engineering & Applied Sciences – Department of Electrical Engineering
  - a. Add the Accelerated Bachelor of Science in Electrical Engineering -Electrical Engineering and Electrical Engineering Biomedical Option, and Computer Engineering to Master of Engineering in Electrical Engineering.

5. College of Engineering & Applied Sciences – Department of Emergency Management
  - a. Add the Accelerated Bachelor of Science in Emergency Administration and Management to Master of Science in Emergency Management and Homeland Security.
  
6. College of Engineering & Applied Sciences – Department of Mechanical Engineering
  - a. Add the Accelerated Bachelor of Science in Mechanical Engineering - Mechanical Engineering to Master of Engineering in Mechanical Engineering.
  
7. College of Natural & Health Sciences – Department of Mathematics
  - a. Add STAT 4383: Machine Learning, to the course descriptions, and cross-list with STAT 5383;
  - b. Cross-list STAT 4113: Categorical Data Analysis, with STAT 5113; and modify the Prerequisite FROM: Prerequisite: STAT 3113: Regression Analysis, TO: Prerequisite: STAT 3113: Regression Analysis, or permission of the instructor;
  - c. Cross-list STAT 4153: Experimental Design and Analysis, with STAT 5153; and
  - d. Cross-list STAT 4393: Statistical Learning, with STAT 5393; and modify the Prerequisite FROM: Prerequisite: STAT 3113, TO: Prerequisite: STAT 3113: Regression Analysis, or permission of the instructor.



# ARKANSAS TECH UNIVERSITY

**RECEIVED**

SEP 16 2021

## REQUEST FOR PROGRAM CHANGE

Registrar's Office

Department Initiating Proposal	Date
BSBA – Accounting Accelerated Bachelor's Plus MBA Degree	7/15/2021

Title	Signature	Date
Department Head		
Dean	<i>Kirk Russell Jones</i>	7/14/2021
Assessment Christine Austin	<i>Christine Austin</i>	7.19.21
Registrar	<i>Yammy Lueaue</i>	9/23/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:

**BSBA – Accounting Accelerated Bachelor’s Plus MBA Degree**

Outline change in program:

1. This program partners the BSBA undergraduate degree with the MBA degree.
2. A maximum of 12 graduate level credit hours can be counted towards both the BSBA degree in Accounting and the MBA degree.
3. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:
  - ACCT 5013 can replace ACCT 4013
  - MKT 6103 can replace MKT 3043
  - Any 2 core MBA course (other than ACCT 6103, MKT 6103, and MGMT 6903) can be used to replace general electives
4. Students may apply in their junior year for admission into the Accounting Accelerated Bachelor’s Plus MBA Degree; however, they must have completed a minimum of 90 credit hours towards the Bachelor degree and have earned a minimum GPA of 3.0 or higher in those undergraduate courses to be eligible. Once approved, the student will be conditionally admitted into the MBA program.
5. Only courses with the grade of B or better will be eligible for graduate credit
6. All other general requirements for both the BSBA-Accounting and the MBA must be satisfied
7. Upon completion of the BSBA-Accounting degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines.
8. Students must meet all of the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their MBA degree.
9. Students in this program will apply for graduation with the BSBA-Accounting degree on the schedule delineated in the Undergraduate Catalog and will receive their bachelor’s degree upon completion of all of the requirements for the undergraduate degree. The MBA degree will be awarded when the student has completed the remaining requirements for the graduate degree.

What impact will the change have on staffing, on other programs and space allocation?

No additional staffing will be required and there will be no impact on other programs or space allocation.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program contributes to student success by offering more opportunities for students to access an MBA degree. By providing students the opportunity to have completed 40% of the MBA requirements upon graduation with their undergraduate degree, this increases the “stackability” of degrees in the College of Business and strongly encourages students to complete the remainder of their MBA.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable

c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

For students who are contemplating graduate studies, this program provides them the opportunity to receive 12 hours of graduate credit without delaying their undergraduate studies. This program also provides the student the opportunity to receive graduate credit while utilizing their current undergraduate financial aid.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

As this is a new type of program at ATU, no assessment evidence currently exists.

b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University-Jonesboro (ASUJ) currently offers a similar program within the Neil Griffin College of Business. ASUJ allows students to receive up to 12 hours of graduate credit toward the Master of Accountancy degree while completing their BS – Accounting. In addition, AACSB has seen a tremendous growth in accelerated programs across colleges of business in the United States. It has proven to be successful in recruiting students into their respective graduate programs.

c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

The program goals for the BSBA degree and the MBA degree have tremendous overlap. Both programs have the following goals: Oral Communication, Written Communication, Problem Solving, Ethics, and Business Acumen. The difference between the undergraduate and graduate programs is the level of Bloom's Taxonomy which is expected. Since the MBA program expects a 'higher' level and the artifacts in this program will be assessed at the graduate level, students in this program will be expected to meet the higher performance standard.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog Curriculum in <u>Accounting</u> (enter title for program changing )	
<p>Freshman Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Freshman Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Sophomore Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Sophomore Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Junior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Junior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Senior Fall Semester</p> <p>Add/Change: <i>Add the Accelerated BSBA Accounting to MBA Footnote to:</i></p> <p>Delete: <i>ACCT 4013 MKT 3043 Elective 3hrs</i></p> <p>Total Hours:</p>	<p>Senior Spring Semester</p> <p>Add/Change: <i>Add the Accelerated BSBA Accounting to MBA Footnote to:</i></p> <p>Delete: <i>Elective 3hrs</i></p> <p>Total Hours:</p>



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
BSBA – Finance Accelerated Bachelor’s Plus MBA Degree	7/15/2021

Title	Signature	Date
Department Head		
Dean	<i>Kirk Russell Jones</i>	7/14/2021
Assessment	<i>Christi Austin</i>	7.19.21
Registrar	<i>Sammy Jean</i>	8/30/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:

**BSBA – Finance Accelerated Bachelor’s Plus MBA Degree**

Outline change in program:

1. This program partners the BSBA undergraduate degree with the MBA degree.
2. A maximum of 12 graduate level credit hours can be counted towards both the BSBA degree in Finance and the MBA degree.
3. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:
  - FIN 6103 can replace FIN 4093
  - BDA 6203 can replace MGMT 4013
  - ECON 6103 can replace Finance Elective
  - ACCT 6103 can replace Finance Elective
4. Students may apply in their junior year for admission into the Finance Accelerated Bachelor’s Plus MBA Degree; however, they must have completed a minimum of 90 credit hours towards the Bachelor degree and have earned a minimum GPA of 3.0 or higher in those undergraduate courses to be eligible. Once approved, the student will be conditionally admitted into the MBA program.
5. Only courses with the grade of B or better will be eligible for graduate credit
6. All other general requirements for both the BSBA-Finance and the MBA must be satisfied
7. Upon completion of the BSBA-Finance degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines.
8. Students must meet all of the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their MBA degree.
9. Students in this program will apply for graduation with the BSBA-Finance degree on the schedule delineated in the Undergraduate Catalog and will receive their bachelor’s degree upon completion of all of the requirements for the undergraduate degree. The MBA degree will be awarded when the student has completed the remaining requirements for the graduate degree.

What impact will the change have on staffing, on other programs and space allocation?

No additional staffing will be required and there will be no impact on other programs or space allocation.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program contributes to student success by offering more opportunities for students to access an MBA degree. By providing students the opportunity to have completed 40% of the MBA requirements upon graduation with their undergraduate degree, this increases the “stackability” of degrees in the College of Business and strongly encourages students to complete the remainder of their MBA.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable



c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

For students who are contemplating graduate studies, this program provides them the opportunity to receive 12 hours of graduate credit without delaying their undergraduate studies. This program also provides the student the opportunity to receive graduate credit while utilizing their current undergraduate financial aid.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

As this is a new type of program at ATU, no assessment evidence currently exists.

b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University-Jonesboro (ASUJ) currently offers a similar program within the Neil Griffin College of Business. ASUJ allows students to receive up to 12 hours of graduate credit toward the Master of Accountancy degree while completing their BS – Accounting. In addition, AACSB has seen a tremendous growth in accelerated programs across colleges of business in the United States. It has proven to be successful in recruiting students into their respective graduate programs.

c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

The program goals for the BSBA degree and the MBA degree have tremendous overlap. Both programs have the following goals: Oral Communication, Written Communication, Problem Solving, Ethics, and Business Acumen. The difference between the undergraduate and graduate programs is the level of Bloom's Taxonomy which is expected. Since the MBA program expects a 'higher' level and the artifacts in this program will be assessed at the graduate level, students in this program will be expected to meet the higher performance standard.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog Curriculum in <u>Finance</u> (enter title for program changing )	
<p>Freshman Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Freshman Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Sophomore Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Sophomore Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Junior Fall Semester</p> <p>Add/Change: Add Footnote 5 to Finance Major Elective</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Junior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Senior Fall Semester</p> <p>Add/Change: Add Footnote 5 to MGMT 4013</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Senior Spring Semester</p> <p>Add/Change: Add Footnote 5 to FIN 4093 and Finance Major Elective</p> <p>Delete:</p> <p>Total Hours:</p>



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
BSBA – Business Data Analytics Accelerated Bachelor’s Plus MBA Degree	7/15/2021

Title	Signature	Date
Department Head		
Dean	<i>Kirk Russell Jones</i>	7/14/2021
Assessment	<i>Christ Austin</i>	7.19.21
Registrar	<i>Tammy Weaver</i>	9/23/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:

**BSBA – Business Data Analytics Accelerated Bachelor’s Plus MBA Degree**

Outline change in program:

1. This program partners the BSBA undergraduate degree with the MBA degree.
2. A maximum of 12 graduate level credit hours can be counted towards both the BSBA degree in Business Data Analytics and the MBA degree.
3. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:
  - BDA 6203 can replace MKT 3153
  - MGMT 6203 can replace MGMT 4103
  - MKT 6103 can replace MKT 4013
  - BDA 6323 can replace BDA 4003
4. Students may apply in their junior year for admission into the Business Data Analytics Accelerated Bachelor’s Plus MBA Degree; however, they must have completed a minimum of 90 credit hours towards the Bachelor degree and have earned a minimum GPA of 3.0 or higher in those undergraduate courses to be eligible. Once approved, the student will be conditionally admitted into the MBA program.
5. Only courses with the grade of B or better will be eligible for graduate credit
6. All other general requirements for both the BSBA-Business Data Analytics and the MBA must be satisfied
7. Upon completion of the BSBA-Business Data Analytics degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines.
8. Students must meet all of the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their MBA degree.
9. Students in this program will apply for graduation with the BSBA-Business Data Analytics degree on the schedule delineated in the Undergraduate Catalog and will receive their bachelor’s degree upon completion of all of the requirements for the undergraduate degree. The MBA degree will be awarded when the student has completed the remaining requirements for the graduate degree.

What impact will the change have on staffing, on other programs and space allocation?

No additional staffing will be required and there will be no impact on other programs or space allocation.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program contributes to student success by offering more opportunities for students to access an MBA degree. By providing students the opportunity to have completed 40% of the MBA requirements upon graduation with their undergraduate degree, this increases the “stackability” of degrees in the College of Business and strongly encourages students to complete the remainder of their MBA.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable

- c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

For students who are contemplating graduate studies, this program provides them the opportunity to receive 12 hours of graduate credit without delaying their undergraduate studies. This program also provides the student the opportunity to receive graduate credit while utilizing their current undergraduate financial aid.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

As this is a new type of program at ATU, no assessment evidence currently exists.

- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University-Jonesboro (ASUJ) currently offers a similar program within the Neil Griffin College of Business. ASUJ allows students to receive up to 12 hours of graduate credit toward the Master of Accountancy degree while completing their BS – Accounting. In addition, AACSB has seen a tremendous growth in accelerated programs across colleges of business in the United States. It has proven to be successful in recruiting students into their respective graduate programs.

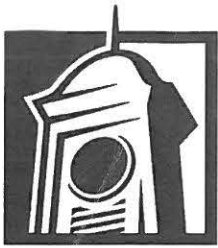
- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

The program goals for the BSBA degree and the MBA degree have tremendous overlap. Both programs have the following goals: Oral Communication, Written Communication, Problem Solving, Ethics, and Business Acumen. The difference between the undergraduate and graduate programs is the level of Bloom's Taxonomy which is expected. Since the MBA program expects a 'higher' level and the artifacts in this program will be assessed at the graduate level, students in this program will be expected to meet the higher performance standard.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog	
Curriculum in _____ (enter title for program changing )	
<p>Freshman Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Freshman Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Sophomore Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Sophomore Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Junior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Junior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Senior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Senior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>



# ARKANSAS TECH UNIVERSITY

**RECEIVED**

SEP 16 2021

## REQUEST FOR PROGRAM CHANGE

**Registrar's Office**

Department Initiating Proposal	Date
BSBA – Management Accelerated Bachelor’s Plus MBA Degree	7/15/2021

Title	Signature	Date
Department Head		
Dean	<i>Kirk Russell Jones</i>	7/14/2021
Assessment	<i>Christ Austin</i>	7.19.21
Registrar	<i>Gammy Walker</i>	9/26/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:

**BSBA – Management Accelerated Bachelor’s Plus MBA Degree**

Outline change in program:

1. This program partners the BSBA undergraduate degree with the MBA degree.
2. A maximum of 12 graduate level credit hours can be counted towards both the BSBA degree in Management and the MBA degree.
3. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:
  - BDA 6203 can replace MGMT 4073
  - MGMT 6203 can replace MGMT 4103
  - MGMT 6103 can replace MGMT 4213
  - MKT 6113 can replace MKT 4103
4. Students may apply in their junior year for admission into the Management Accelerated Bachelor’s Plus MBA Degree; however, they must have completed a minimum of 90 credit hours towards the Bachelor degree and have earned a minimum GPA of 3.0 or higher in those undergraduate courses to be eligible. Once approved, the student will be conditionally admitted into the MBA program.
5. Only courses with the grade of B or better will be eligible for graduate credit
6. All other general requirements for both the BSBA-Management and the MBA must be satisfied
7. Upon completion of the BSBA-Management degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines.
8. Students must meet all of the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their MBA degree.
9. Students in this program will apply for graduation with the BSBA-Management degree on the schedule delineated in the Undergraduate Catalog and will receive their bachelor’s degree upon completion of all of the requirements for the undergraduate degree. The MBA degree will be awarded when the student has completed the remaining requirements for the graduate degree.

What impact will the change have on staffing, on other programs and space allocation?

No additional staffing will be required and there will be no impact on other programs or space allocation.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program contributes to student success by offering more opportunities for students to access an MBA degree. By providing students the opportunity to have completed 40% of the MBA requirements upon graduation with their undergraduate degree, this increases the “stackability” of degrees in the College of Business and strongly encourages students to complete the remainder of their MBA.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable



c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

For students who are contemplating graduate studies, this program provides them the opportunity to receive 12 hours of graduate credit without delaying their undergraduate studies. This program also provides the student the opportunity to receive graduate credit while utilizing their current undergraduate financial aid.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

As this is a new type of program at ATU, no assessment evidence currently exists.

b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University-Jonesboro (ASUJ) currently offers a similar program within the Neil Griffin College of Business. ASUJ allows students to receive up to 12 hours of graduate credit toward the Master of Accountancy degree while completing their BS – Accounting. In addition, AACSB has seen a tremendous growth in accelerated programs across colleges of business in the United States. It has proven to be successful in recruiting students into their respective graduate programs.

c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

The program goals for the BSBA degree and the MBA degree have tremendous overlap. Both programs have the following goals: Oral Communication, Written Communication, Problem Solving, Ethics, and Business Acumen. The difference between the undergraduate and graduate programs is the level of Bloom's Taxonomy which is expected. Since the MBA program expects a 'higher' level and the artifacts in this program will be assessed at the graduate level, students in this program will be expected to meet the higher performance standard.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog	
Curriculum in _____ (enter title for program changing )	
<p>Freshman Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Freshman Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Sophomore Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Sophomore Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Junior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Junior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Senior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Senior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>



# ARKANSAS TECH UNIVERSITY

RECEIVED

SEP 16 2021

## REQUEST FOR PROGRAM CHANGE

Registrar's Office

Department Initiating Proposal	Date
BSBA – Digital Marketing Accelerated Bachelor’s Plus MBA Degree	7/15/2021

Title	Signature	Date
Department Head		
Dean	<i>Kirk Russell Jones</i>	7/14/2021
Assessment	<i>Christ Austin</i>	7.19.21
Registrar	<i>Jammy Weaaver</i>	9/26/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:

**BSBA – Digital Marketing Accelerated Bachelor’s Plus MBA Degree**

Outline change in program:

1. This program partners the BSBA undergraduate degree with the MBA degree.
2. A maximum of 12 graduate level credit hours can be counted towards both the BSBA degree in Digital Marketing and the MBA degree.
3. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:
  - BDA 6203 can replace MGMT 4073
  - MGMT 6203 can replace MGMT 4103
  - MKT 6103 can replace MKT 4013
  - MKT 6113 can replace MKT 4103
4. Students may apply in their junior year for admission into the Digital Marketing Accelerated Bachelor’s Plus MBA Degree; however, they must have completed a minimum of 90 credit hours towards the Bachelor degree and have earned a minimum GPA of 3.0 or higher in those undergraduate courses to be eligible. Once approved, the student will be conditionally admitted into the MBA program.
5. Only courses with the grade of B or better will be eligible for graduate credit
6. All other general requirements for both the BSBA-Digital Marketing and the MBA must be satisfied
7. Upon completion of the BSBA-Digital Marketing degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines.
8. Students must meet all of the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their MBA degree.
9. Students in this program will apply for graduation with the BSBA-Digital Marketing degree on the schedule delineated in the Undergraduate Catalog and will receive their bachelor’s degree upon completion of all of the requirements for the undergraduate degree. The MBA degree will be awarded when the student has completed the remaining requirements for the graduate degree.

What impact will the change have on staffing, on other programs and space allocation?

No additional staffing will be required and there will be no impact on other programs or space allocation.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program contributes to student success by offering more opportunities for students to access an MBA degree. By providing students the opportunity to have completed 40% of the MBA requirements upon graduation with their undergraduate degree, this increases the “stackability” of degrees in the College of Business and strongly encourages students to complete the remainder of their MBA.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable

- c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

For students who are contemplating graduate studies, this program provides them the opportunity to receive 12 hours of graduate credit without delaying their undergraduate studies. This program also provides the student the opportunity to receive graduate credit while utilizing their current undergraduate financial aid.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

As this is a new type of program at ATU, no assessment evidence currently exists.

- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University-Jonesboro (ASUJ) currently offers a similar program within the Neil Griffin College of Business. ASUJ allows students to receive up to 12 hours of graduate credit toward the Master of Accountancy degree while completing their BS – Accounting. In addition, AACSB has seen a tremendous growth in accelerated programs across colleges of business in the United States. It has proven to be successful in recruiting students into their respective graduate programs.

- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

The program goals for the BSBA degree and the MBA degree have tremendous overlap. Both programs have the following goals: Oral Communication, Written Communication, Problem Solving, Ethics, and Business Acumen. The difference between the undergraduate and graduate programs is the level of Bloom's Taxonomy which is expected. Since the MBA program expects a 'higher' level and the artifacts in this program will be assessed at the graduate level, students in this program will be expected to meet the higher performance standard.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog	
Curriculum in _____ (enter title for program changing )	
<p>Freshman Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Freshman Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Sophomore Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Sophomore Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Junior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Junior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>
<p>Senior Fall Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>	<p>Senior Spring Semester</p> <p>Add/Change:</p> <p>Delete:</p> <p>Total Hours:</p>



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
History and Political Science	3/30/2021

Title	Signature	Date
Department Head David Blanks		5/12/21
Dean		5/12/2021
Assessment Dr. Christine Austin		5.13.2021
Registrar		9/15/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:  
Change in the Catalogue of BA History related to the Accelerated BA/MA degree in history

Outline change in program: (e.g., list changes in program such as (1) delete three hours of elective and (2) add three hours of approved major electives)

Change Footnote 7 in the Curriculum Matrix for Catalog of BA in History from

“Students can take up to 6 credit hours at the 5000-level and 6000-level that can count as 4000-level courses. Two graduate-level courses, HIST 6033 Readings in US History and HIST 6543 Readings in World History, can be used to replace two upper-division undergraduate electives, either US history, or world history, to fulfill the requirements for a BA degree in history.”

to

“Any graduate courses at the 5000 and 6000 level can be used to substitute any 4000-level undergraduate course.”

What impact will the change have on staffing, on other programs and space allocation?

No

Answer the following Assessment questions:

- a. How does the program change align with the university mission?
- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.
- c. What is the rationale for this program change?
  1. How will the program change impact learning for students enrolled in this program?
  2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.
- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.
- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

~~Please see the original accelerated BA/MA program in history approved on November 17, 2020~~

See attached portion of previous BA/MA program change form addressing assessment questions as attached by Office of Assessment & IE.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).



~~catalog and will receive their bachelor's degree upon completion of all the requirements for the undergraduate degree. The Master's degree will be awarded when the student has completed the remaining requirements for the graduate degree.~~

~~What impact will the change have on staffing, on other programs and space allocation?~~

~~None.~~

Answer the following Assessment questions:

- a. How does the program change align with the university mission?  
This program contributes to Tech's dedication to "student success." By offering more opportunities for students to access an MA degree, this program "inspires and empowers members of the community." Training more people with advanced degrees also serves for the betterment of "Arkansas, the nation, and the world"
- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.  
Not applicable.
- c. What is the rationale for this program change?
  1. How will the program change impact learning for students enrolled in this program?  
For undergraduate students who plan to go to the graduate program at Tech, having six credit hours that count toward both BA and MA degrees would save them one semester of study time and a portion of their tuition. It also gives senior-level undergraduate students access to the graduate study without delaying their graduation schedule.
  2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.  
This is a new program. We do not have any learning assessment evidence yet.
- d. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Arkansas State University Jonesboro (ASUJ) offers many accelerated Masters programs and the History MA program is one of them. ASUJ allows up to 12 hours of graduate credit that can also apply toward completion of the undergraduate degree requirements. Under their accelerated master's degree option, a student will be fully admitted to the graduate program upon completion of the baccalaureate degree. This dual counting of a course for both undergraduate and graduate credit will occur only after the student completes the baccalaureate degree. Only courses with grades B or better will be eligible to count toward graduate credit.

ASUJ's MA history program requires 33 hours of graduate history credit, has no foreign language requirement, relies heavily on 6000-level "readings" and "seminar" courses, offers both a thesis option (27 hours of coursework and 6 hours of thesis) and a non-thesis option (33 hours of coursework and comprehensive exams), and offers

three areas of study: United States, global, and public history. ATU's History MA program is similar to ASUJ's in size, role, and scope. We can introduce this program to increase our own competitiveness in graduate recruiting.

- e. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

We will make the following changes to the Undergraduate Catalogue

1. To the existing 6 footnotes, no. 7 is added with the following wording:  
"Students can take up to 6 credit hours at the 5000-level and 6000-level that can count as 4000-level courses."
2. In the degree matrix of the senior year, footnote no.2 that goes with "elective" in both spring and fall semesters would be changed to "2.7."

Students who enrolled in the BA/MA accelerated program will get their BA and MA degrees at the same time. This change will not substantially affect the graduation rate of the BA degree because starting from the third year, the number of students who get both degrees will be counted into the BA degree graduation rate, which will stabilize after that. Also, we are expecting 2-3 undergraduate students per year to choose the BA/MA accelerated program, which is less than 5% of our 70 total BA graduates annually. Moreover, since students who choose this track would be among the strongest, they would have no problem graduating.

We will continue to assess the two programs separately because their requirements are different.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog Curriculum in <u>Accelerated BA History to MA History</u> (enter title for program changing )	
Freshman Fall Semester  Add/Change:  Delete:  Total Hours:	Freshman Spring Semester  Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester  Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester  Add/Change:  Delete:  Total Hours:
Junior Fall Semester  Add/Change:  Delete:  Total Hours:	Junior Spring Semester  Add/Change:  Delete:  Total Hours:
Senior Fall Semester  Add/Change:  Delete:  Total Hours:	Senior Spring Semester  Add/Change:  Delete:  Total Hours:



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
Electrical Engineering	07/01/2020

Title	Signature	Date
Department Head Carl Greco	<i>Carl Greco</i>	07/01/2020
Dean Judy Cezeaux	<i>Judy Cezeaux</i>	06/29/2021
Assessment Christine Austin	<i>Christine Austin</i>	7.7.2021
Registrar	<i>Sammy Wallace</i>	11/5/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:  
Accelerated BS/MS for Electrical Engineering

Outline change in program: (e.g., list changes in program such as (1) delete three hours of elective and (2) add three hours of approved major electives)

The Department of Electrical Engineering plans to adopt the new Accelerated Bachelor's Plus Master's Degree Program. Under this new university policy, qualified undergraduate students can register for graduate level credit hours as undergraduates and receive dual credit toward both undergraduate and graduate degrees within Electrical Engineering.

In accordance with the university policy, the Electrical Engineering program will allow qualified undergraduates to claim up to 12 graduate level credits while they are still enrolled in their undergraduate program. The target undergraduate courses for which double counting will be allowed are ELEG 4313 Modern Control Systems, ELEG 4113 Digital Signal Processing, ELEG 4153 Communication Systems II, ELEG 4133 Advanced Digital Design, and ELEG 4993 Special Problems in Engineering. These first four courses, representing 12 hours, are also all already cross listed as ELEG 5313 (Modern Control Systems), ELEG 5113 (Digital Signal Processing), ELEG 5153 (Communication Systems II), and ELEG 5133 (Advanced Digital Design). The ELEG 5993 Special Problems in Engineering could be taken in place of ELEG 4993.

A qualified electrical engineering undergraduate will be a student who has completed 90 credit hours at the undergraduate level with a cumulative 3.00 GPA or higher in alignment with the policy adopted by the Arkansas Tech Board of Trustees (see attachment to this document) approved on 12/08/2020 and released by email from the Graduate Dean Dr. Schoepfoerster.

What impact will the change have on staffing, on other programs and space allocation?

There will be no changes to staffing or space allocation because of this program change. We already offer ELEG 4313, ELEG 4113, ELEG 4153, ELEG 4133, and ELEG 499x (x in the range [1 to 4]) as undergraduate courses that are either electives or required in the current curriculums. This program will allow those qualified students to obtain graduate credit while still finishing their undergraduate degree, however, this will require no additional staff or space by the Electrical Engineering department or the College of Engineering and Applied Science.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program change will retain academic talent within the Electrical Engineering program and contribute to empowering students to be productive members of the community while expanding upon the university's technological traditions.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable.

- c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

This program change will allow students to pursue graduate level credit while they are still enrolled in their undergraduate courses. This will assist undergraduate students in completing their graduate degree at ATU in less time.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

The Master of Engineering at ATU is currently not accredited by an outside agency. The undergraduate program in Electrical Engineering is accredited by ABET. ABET does provide guidelines for Master's

Level programs. Those guidelines are available at: <https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2020-2021/>

A document is attached that details the assessment planning, along with key goals, that the Master of Engineering in Electrical Engineering plans to pursue to develop student learning assessment evidence that supports these changes.

Some definite evidence that will be collected will be to monitor and record the number of ATU undergraduates that pursue a Master's degree, especially those that have taken advantage of the accelerated option. In referring to the attachment, this will help the Master's programs on its long-term goals 1. and 3. Increasing the number of degrees produced and increasing enrollment.

- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

There are 2 other institutions in the state of Arkansas that offer advanced degrees in engineering disciplines. These institutions are the University of Arkansas and Arkansas State University. Only the University of Arkansas offers an advanced degree format in engineering.

The University of Arkansas has a "Retroactive Graduate Credit" program that newly admitted graduate students may elect to take part in. Under this program, fully admitted graduate students can claim up to 12 hours in their final 12-month undergraduate curriculum to be used as graduate credit. The courses cannot have been used by the undergraduate degree program and they must be at the 5000 level or above. There is also an option that the students advisory committee, by petition to the Graduate School, can accept courses at the 4000 level above if those courses were taken in the last semester of the students' undergraduate degree. For more information: [Retroactive Graduate Credit](#).

Arkansas State University offers a policy that is called an "Accelerated Master's degree option", where "outstanding" students can begin to take graduate courses as an undergraduate, in their junior or senior year. ASU provides this option in Accounting, Agriculture, Chemistry, Computer Science, Disaster Preparedness and Emergency Management, Political Science, Special Education-Instructional Specialist Grades P-4, and Special Education-Instructional Specialist Grades 4-12, but it appears that they do not list an accelerated option for any engineering degrees. For the available programs, they do allow students to apply up to 12 graduate credit hours toward completion of the undergraduate degree. The dual counting only counts after the student has completed their undergraduate degree program. In addition, only courses where the student earned a "B" or better are counted. For more information: [Undergrad Admission into the Accelerated Master's Program Arkansas State University](#)

- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

Please see attached document outlining the assessment planning for the Master of Engineering in Electrical Engineering. Before assessment of student learning outcomes can be obtained, it will be necessary to have required ELEG courses that all graduate students take. With the current curriculum, students can choose any of up to 18 hours of ELEG courses at the 6000 level and up to 6 hours at the

5000 level, but the current program does not require any specific courses. Therefore, it is difficult to take meaningful assessment data. It is a near-term goal of the Master's program to restructure itself to perform assessment based on student learning outcomes.

For those undergraduate courses that will be double counted, the undergraduate program already has an assessment process in place for measuring and collecting data. Data can be collected on those select courses that are to be included in the Accelerated BS/ME plan. See the attached document for further details.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

**Mission Statement:**

The Master of Engineering in Electrical Engineering at Arkansas Tech University seeks to further the education of the students of Arkansas and beyond. We seek to provide a comprehensive addition to a student's undergraduate education. We do so by focusing on the collaboration between faculty and student to provide excellence in mentorship.

**Goals:**

The near-term goals of the Master of Engineering in Electrical Engineering at ATU are:

1. Reduce total required semester hours to 30 from 36.
2. Implement an Accelerated Bachelors/Masters program to aid students in completing their graduate studies in a timelier manner.
3. Implement an option to allow for thesis-based research and or advance projects as part of the students' curriculum including either thesis hours or project hours that students can register for.
4. Determine an applicable project and/or research-based focus of the curriculum.

The longer-term goals for the Master of Engineering in Electrical Engineering at ATU are:

1. Obtain an average graduation numbers of 5 degrees per year.
2. Increase facilities to encourage faculty projects and research

**Program Educational Objectives**

- Obtained employment in an engineering or closely-related field, or entered a terminal degree program (Ph.D. or other professional terminal degree) in engineering or a related field.
- Solved problems aided by practicing advanced engineering skills they learned in their graduate program.
- Recognized a pathway to make positive contributions to society using their engineering talents and skills by practicing their profession in an ethical and responsible manner.
- Engaged in continuing education and pursuit of membership in professional societies as well as FE/PE certification, or other certifications relevant to their chosen occupational field.
- Demonstrated accountability and worked effectively in a team environment with strong emphasis on multidisciplinary membership, inclusion, and communication

**Student Outcomes**



1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### **Performance Indicators**

We need to change the curriculum to allow for at least two required EE courses that must be taken. In addition, we should reduce the credit hour load to 30 hours. The justification for reducing to 30 hours is that ABET specifically states that at least 30 hours are required for an accredited Master's program. Though the Master's program is not accredited, we want to be prepared to accredit it in the future, but also the ABET criteria provides a good framework for a functional program with assessment

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog Curriculum in <u>BSEE Electrical Engineering</u> (enter title for program changing )	
Freshman Fall Semester Add/Change:  Delete:  Total Hours:	Freshman Spring Semester Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester Add/Change:  Delete:  Total Hours:
Junior Fall Semester Add/Change: Technical Elective <sup>3</sup> and Electrical Engineering Elective <sup>4</sup>  Delete:  Total Hours:	Junior Spring Semester Add/Change: Technical Elective <sup>3</sup> and Electrical Engineering Elective <sup>4</sup>  Delete:  Total Hours:
Senior Fall Semester Add/Change: ELEG 4113 (ELEG 5113) <sup>4</sup>  Delete:  Total Hours:	Senior Spring Semester Add/Change: Technical Elective <sup>3</sup> and Electrical Engineering Elective <sup>4</sup>  Delete:  Total Hours:

3 & 4 – 5000 level courses for Accelerated BS/ME for Electrical Engineering

Curriculum Matrix for Catalog Curriculum in <u>BSEE Electrical Engineering Biomedical Option</u> (enter title for program changing )	
Freshman Fall Semester Add/Change:  Delete:  Total Hours:	Freshman Spring Semester Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester Add/Change:  Delete:  Total Hours:
Junior Fall Semester Add/Change:  Delete:  Total Hours:	Junior Spring Semester Add/Change:  Delete:  Total Hours:
Senior Fall Semester Add/Change: ELEG 4113 (ELEG 5113) <sup>4</sup>  Delete:  Total Hours:	Senior Spring Semester Add/Change:  Delete:  Total Hours:

3 & 4 – 5000 level courses for Accelerated BS/ME for Electrical Engineering

Curriculum Matrix for Catalog Curriculum in <u>BSCMPE – Computer Engineering</u> (enter title for program changing )	
Freshman Fall Semester Add/Change:  Delete:  Total Hours:	Freshman Spring Semester Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester Add/Change:  Delete:  Total Hours:
Junior Fall Semester Add/Change:  Delete:  Total Hours:	Junior Spring Semester Add/Change:  Delete:  Total Hours:
Senior Fall Semester Add/Change: ELEG 4133 (ELEG 5133) <sup>4</sup> , ELEG 4113 (ELEG 5113) <sup>4</sup>  Delete:  Total Hours:	Senior Spring Semester Add/Change: Electrical Engineering Electives  Delete:  Total Hours:

3 & 4 – 5000 level courses for Accelerated BS/ME for Electrical Engineering



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
Department of Behavioral Sciences	7-1-21

Title	Signature	Date
Department Head	<i>David Ward</i>	7/1/21
Dean	<i>Jeffrey Cass</i>	7/2/21
Assessment Dr. Christine Austin	<i>Christ Austin</i>	9.1.21
Registrar	<i>Yucca</i>	11/1/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:  
Accelerated Bachelor's Plus EMHS Master's Degree

*Outline change in program: Accelerated Bachelor's + EMHS Master's Degree Program*

1. This program partners with a BS degree in Emergency Administration and Management.
2. A maximum of twelve graduate level credit hours can be double counted towards the Bachelor's Plus EMHS Master's Degree.
3. Four EMHS courses (EMHS 6063, EMHS 6103, EMHS 5003, and an EMHS 3 hr elective) can be used to replace 12 hours of upper-division undergraduate electives to fulfill the requirements for a BS degree in EAM. (Courses noted below.)
4. Students will take no more than 6 hours of graduate courses per semester.
5. Students may apply in their Junior year for admission into the Accelerated Bachelor's Plus EMHS Master's Degree Program; however, the student must complete a minimum of 90 credit hours towards the Bachelor's degree and have earned a minimum grade point average of 3.25 or better in those undergraduate courses to be eligible for admission into the Accelerated Bachelor's Plus EMHS Master's Degree Program. Once approved the student will be conditionally admitted into the EMHS graduate program.
6. A course used toward an undergraduate degree cannot be counted or used later for graduate credit, except in the case of enrollment in an approved accelerated master's program. Graduate tuition will be charged for all graduate courses.
7. Only courses with grades B or better will be eligible to count toward graduate credit.
8. The curriculum will follow the existing curriculum in the undergraduate and graduate degree programs comprising the Accelerated Bachelor's Plus EMHS Master's Degree Program.
9. All other general requirements for the Bachelor's and Master's degree programs that comprise the Accelerated Bachelor's Plus EMHS Master's Degree Program apply and must be satisfied.
10. Upon completion of the Bachelor's degree requirements, students will be accepted into the Graduate College at a status consistent with the Graduate College and individual program guidelines. Students must meet all the graduate requirements for dual credit courses to receive graduate credit for these courses to contribute toward their Master's degree.
11. Students in the Accelerated Bachelor's Plus EMHS Master's Degree Program will apply for graduation with the Bachelor's degree on the schedule delineated in the undergraduate catalog and will receive their bachelor's degree upon completion of all the requirements for the undergraduate degree. The Master's degree will be awarded when the student has completed the remaining requirements for the EMHS degree.

Graduate Core courses – 6 hours total.

EMHS 6063: Principles of Emergency Management

EMHS 6103: Research Design & Methods

Electives – 6 hours total.

EMHS 5003: Disaster Relief & Recovery (as an elective instead of EAM 4003;  
students may not get credit for EMHS 5003 after taking EAM 4003)

One graduate elective as listed below (3 hours):

EMHS 5043: Ethics

EMHS 5053: HazMat

EMHS 5093: Grants

EMHS 5103: Critical Infrastructure

EMHS 5993: Disasters & Public Health

EMHS 5993: Planning

EMHS 5993: Disaster Fieldwork Research

EMHS 6003: Design & Management of Preparedness & Mitigation Systems

EMHS 6023: Risk & Vulnerability Assessment  
EMHS 6043: Contemporary Issues  
EMHS 6053: Legal  
EMHS 6070: Terrorism  
EMHS 6143: Social Vulnerability  
EMHS 6193: International Emergency Management  
EMHS 6203: Crisis Communication  
EMHS 6233: Epidemics & Pandemics  
EMHS 6243: Intelligence  
EMHS 6253: Info Sec  
EMHS 6543: GIS in EMHS

*New wording for Course Catalog:*

Students seeking admission into the Accelerated Bachelor's Plus EMHS Master's Degree Program must have completed a minimum of 90 credit hours towards their Bachelor's degree and have earned a minimum grade point average of 3.25 or better in those undergraduate courses to be eligible for admission into the Accelerated Bachelor's Plus EMHS Master's Degree Program.

What impact will the change have on staffing, on other programs and space allocation?

NONE

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

The university's mission includes "student success, access, and excellence" which this program change directly addresses by encouraging high-achieving undergraduate students to continue their pursuit of academic excellence with taking accessible emergency management and homeland security graduate courses that will encourage their success. Also, providing a more economical (& accessible) path for an EMHS Master's degree serves for the benefit of "Arkansas, the nation, and the world."

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

NOT APPLICABLE.

- c. What is the rationale for this program change?

It is the University's policy that allows qualified undergraduate students to register for graduate level credit hours as undergraduates and receive dual credit toward both undergraduate and graduate degrees within the designated programs that comprise the Accelerated Bachelor's Plus EMHS Master's Degree Program.

1. How will the program change impact learning for students enrolled in this program?

For students pursuing the Accelerated Bachelor's Plus EMHS Master's Degree Program, this program change will impact their learning by encouraging deeper engagement in the required EAM 4003 course by having accelerated students take EMHS 5003 instead. As well, allowing accelerated students to take EMHS courses (6063, 6103, & one EMHS elective) instead of EAM or general electives will enhance accelerated undergraduate students' knowledge. As a benefit, this program change will accelerate the graduation date for the EMHS degree for accelerated students.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

This is a new program. We do not have any learning assessment evidence for this change. However, the Department of Emergency Management had an exceptional undergraduate student, Clayton Frazier, who took EMHS 6043 while he was still an undergraduate student. He completed both his EAM and EMHS degrees with a 4.0. This anecdotal evidence indicates that student learning assessment would support this change.

- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

Several universities in the United States offer accelerated BS + MS degree programs. Some examples of these universities are: University of Arkansas, Little Rock (Department of Information Science), Arkansas State University, Jonesboro (Accounting, Agriculture, Chemistry, Computer Science, Disaster Preparedness & EM, History, Political Science, and Special Education), University of Central Florida, Orlando (College of Engineering & Computer Science), Stony Brook University, Stony Brook, NY (Department of Technology and Society), University of Houston, Houston (Department of Computer Science), and Texas Tech University, Lubbock (College of Engineering). This program change will allow ATU's EMHS program to be competitive with ASU-J.

- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

EMHS Assessment plan for required graduate core courses (EMHS 6063 & 6103) is attached.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).



In the attached matrix, include requested changes in the matrix and include course number and title.

\*\*Additionally, we request the following changes to the Undergraduate Catalog:

1. To the existing 2 footnotes, add number 3 with the following wording: "Students admitted to the Accelerated Bachelor's Plus EMHS Master's Degree Program can take up to 9 credit hours at the 5000-level and 6000-level that can count towards elective hours."
2. In the curriculum matrix add a footnote to EAM 4003 Principles of Disaster Relief and Recovery: "Students admitted to the Accelerated Bachelor's Plus EMHS Master's Degree Program may take EMHS 5003 instead of EAM 4003."

Curriculum Matrix for Catalog Curriculum in <u>BS-EAM to MS-EMHS</u> (enter title for program changing )	
Freshman Fall Semester  Add/Change:  Delete:  Total Hours:	Freshman Spring Semester  Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester  Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester  Add/Change:  Delete:  Total Hours:
Junior Fall Semester Add/Change: <b>Add Accelerated Program Footnote<sup>4</sup> to Electives<sup>4</sup> - 6 hrs</b> <del>Add 3 hrs of EAM electives</del> Delete: EAM 4003 Total Hours: 15	Junior Spring Semester  Add/Change:  Delete:  Total Hours:
Senior Fall Semester  Add/Change: <b>Add Accelerated program footnote<sup>4</sup> to EAM 4003 Principles of Disaster Relief and Recovery and Electives<sup>4</sup> - 3 hrs</b>	Senior Spring Semester  Add/Change:

Delete:

3 hrs of EAM electives

Total Hours: 15

Delete:

Total Hours:

<b>Course</b>	<b>Learning Objective</b>	<b>Competency</b>	<b>Assessment Measure</b>	<b>Result</b>
<b>EMHS 6063</b>				
Principles of Emergency Management	Apply appropriate theories, concepts, policies, and emergency management measures to multiple emergency and disaster context.	Sociocultural Literacy (I) (R) Leadership (I) Operates in the EM Framework/Principles/Body of Knowledge (I)	Exam Reflection Assignment  Written Assignment	
	Differentiate and interpret emergency management policies, the types of hazards that threaten the United States, and the measures to mitigate, prepare, respond, and recover from such hazards.	Systems Literacy (I)	Written Assignment	
	Distinguish among the many organizations and communities involved in the multiple aspects of emergency management.	Introduce Community Engagement (I)	Case Study	
	Examine the future challenges and opportunities pertaining to the emergency management field	Introduce Disaster Risk Management (I)	Written Assignment	

<b>Course</b>	<b>Learning Objective</b>	<b>Competency</b>	<b>Assessment Measure</b>
<b>EMHS 6103</b>			
Research Methods and Design	Apply the systematic process of scientific research to a personal research project	Disaster/ Risk Management (R)	Research Question/Focus Statement 75% of students earn 80%
	Analyze and evaluate quality peer-reviewed research articles. Differentiate scientific research from other forms of publications	Scientific Literacy (I/R)	Article Overview 75% of students earn 80%
	Identify a research topic area and develop a feasible research question	Operates within the EM framework, principles, and body of knowledge (R)	Research Question/Focus Statement 75% of students earn 80%
	Analyze and evaluate quality peer-reviewed research articles. Differentiate scientific research from other forms of publications	Possess Critical Thinking. (I)	Article Overview Assignment 75% of students earn 80%
	Apply research ethics to research process and the use of human subjects	Abide by Professional Ethics (I)	CITI Training 90% of students complete successfully
	Demonstrate graduate collegiate writing skills and apply APA 6 formatting to all written work with appropriate in-text citations, empirical support, and no plagiarism	Continual Learning (I)	Final Paper 75% of students earn 80%



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR PROGRAM CHANGE

Department Initiating Proposal	Date
Mechanical Engineering	07/01/2020

Title	Signature	Date
Department Head John Krohn	<i>John L. Krohn</i>	07/01/2020
Dean Judy Cezeaux	<i>Judy L. Cezeaux</i>	7/1/2021
Assessment Christine Austin	<i>Christine Austin</i>	7.7.2021
Registrar	<i>Jammye Weaver</i>	9/1/2021
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Program Title:  
Accelerated BS/MS for Mechanical  
Engineering

Outline change in program: (e.g., list changes in program such as (1) delete three hours of elective and (2) add three hours of approved major electives)

The Department of Mechanical Engineering would like to adopt the new Accelerated Bachelor's Plus Master's Degree Program. Under this new university policy, qualified undergraduate students can register for graduate level credit hours as undergraduates and receive dual credit toward both undergraduate and graduate degrees within Mechanical Engineering.

In accordance with the university policy, the Mechanical Engineering program will allow qualified undergraduates to claim up to 12 graduate level credits while they are still enrolled in their undergraduate program. The target undergraduate courses for which double counting will be allowed are MCEG 4043 Physical Metallurgy, MCEG 4053 Corrosion Principles, MCEG 4323 Power Plant Systems, MCEG 4343 Internal Combustion Engines, MCEG 4413 Finite Element Analysis, MCEG 4463 Heating, Ventilating and Air Conditioning Design, MCEG 4473 Mechanical Vibrations, MCEG 4503 Nuclear Power Plants, and MCEG 4993 Special Problems in Engineering. All of these courses are elective courses for the BSME program and all are linked to 5000 level courses.

A qualified mechanical engineering undergraduate will be a student who has completed 90 credit hours at the undergraduate level with a cumulative 3.25 GPA or higher.

What impact will the change have on staffing, on other programs and space allocation?

There will be no changes to staffing or space allocation because of this program change.

Answer the following Assessment questions:

- a. How does the program change align with the university mission?

This program change will retain academic talent within the Mechanical Engineering program and contribute to empowering students to be productive members of the community while expanding upon the university's technological traditions.

- b. If this change in the program is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable.

- c. What is the rationale for this program change?

1. How will the program change impact learning for students enrolled in this program?

This program change will allow students to pursue graduate level credit while they are still enrolled in their undergraduate courses. This will assist undergraduate students in completing their graduate degree at ATU in less time.

2. Provide an example or examples of student learning assessment evidence which supports the changes in the program.

The Master of Engineering at ATU is currently not accredited by an outside agency. The undergraduate program in Mechanical Engineering is accredited by ABET. ABET does provide guidelines for Master's Level programs. Those guidelines are available at: <https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2020-2021/>

A document is attached that details the assessment planning, along with key goals, that the Masters of Engineering in Mechanical Engineering plans to pursue in order to develop student learning assessment

evidence that supports these changes.

Some definite evidence that will be collected will be to monitor and record the number of ATU undergraduates that pursue a Master's degree, especially those that taken advantage of the accelerated option. In referring to the attachment, this will help the Master's programs on its long-term goals 1. and 3. Increasing the number of degrees produced and increasing enrollment.

- b. How does this program fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions.

University of Arkansas - Fayetteville - BS to MS in Computer Engineering

[<https://computer-science-and-computer-engineering.uark.edu/academics/graduate/index.php>]

University of Central Arkansas - BS to MS in Computer Science

[<https://uca.edu/computerscience/bs-ms-computer-science-5-year-program/>]

Arizona State University - BS to MS Engineering

[<https://poly.engineering.asu.edu/accelerated-4-1-degree-programs/>]

- c. Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.)

Please see attached document outlining the assessment planning for the Master of Engineering in Mechanical Engineering. Before assessment on student learning outcomes can be obtained, it will be necessary to have required MCEG courses that all graduate students take. With the current curriculum, students can choose any of up to 18 hours of MCEG courses at the 6000 level and up to 6 hours at the 5000 level, but the current program does not require any specific courses. Therefore, it is difficult to take meaningful assessment data. It is a near-term goal of the Masters program to restructure itself to perform assessment based on student learning outcomes.

For those undergraduate courses that will be double counted, the undergraduate program already has an assessment process in place for measuring and collecting data. Data can be collected on those select courses that are to be included in the Accelerated BS/MS plan. See attached document for further details.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

For the Accelerated MECH proposal:

<sup>6</sup>BS Mechanical Engineering – Seniors ~~enrolled in~~ <sup>admitted to</sup> the Accelerated BSME to Masters of Engineering in Mechanical Engineering Program are able take up to 12 credit hours at the 5000-level that can count as 4000-level courses. The following courses may be used to fulfill the engineering and technical elective requirements in the BSME program: MCEG 5043, MCEG 5053, MCEG 5323, MCEG 5343, MCEG 5413, MCEG 5463, MCEG 5473, MCEG 5503, and MCEG 5993.



~~No changes necessary in the existing curricula.~~

In the attached matrix, include requested changes in the matrix and include course number and title.

Curriculum Matrix for Catalog Curriculum in <u>BSME Mechanical Engineering</u> (enter title for program changing )	
Freshman Fall Semester Add/Change:  Delete:  Total Hours:	Freshman Spring Semester Add/Change:  Delete:  Total Hours:
Sophomore Fall Semester Add/Change:  Delete:  Total Hours:	Sophomore Spring Semester Add/Change:  Delete:  Total Hours:
Junior Fall Semester <b>ENGR Elective<sup>3</sup></b> Add/Change: <b>Add Footnote<sup>6</sup> for Accelerated BS/MS for Mechanical Engineering</b> Delete:  Total Hours:	Junior Spring Semester <b>ENGR Elective<sup>3</sup></b> Add/Change: <b>Add Footnote<sup>6</sup> for Accelerated BS/MS for Mechanical Engineering</b> Delete: <b>Mechanical Engineering</b>  Total Hours:
Senior Fall Semester <b>Technical Elective<sup>4</sup></b> Add/Change: <b>Add Footnote<sup>6</sup> for Accelerated BS/MS for Mechanical Engineering</b> Delete: <b>Mechanical Engineering</b>  Total Hours:	Senior Spring Semester <b>ENGR Elective<sup>3</sup></b> Add/Change: <b>Add Footnote<sup>6</sup> for Accelerated BS/MS for Mechanical Engineering</b> Delete: <b>Mechanical Engineering</b>  Total Hours:

**Mission Statement:**

The Master of Engineering in Mechanical Engineering at Arkansas Tech University seeks to further the education of the students of Arkansas and beyond. The program in Mechanical Engineering takes an interdisciplinary approach to maximize the students success through a mixture of cutting-edge research, diversified coursework, and world class faculty. We seek to provide a comprehensive addition to a student's undergraduate education.

**Goals:**

The near-term goals of the Master of Engineering in Mechanical Engineering at ATU are:

1. Reduce total required semester hours to 30 from 36.
2. Implement an Accelerated Bachelors/Masters program to aid students in completing their graduate studies in a timelier manner.
3. Implement an option to allow for thesis-based research and or advance projects as part of the students' curriculum including either thesis hours or project hours that students can register for.
4. Determine an applicable project and/or research-based focus of the curriculum.

The longer-term goals for the Master of Engineering in Mechanical Engineering at ATU are:

1. Obtain an average graduation number of 5 degrees per year.
2. Increase facilities to encourage faculty projects and research

**Program Educational Objectives**

- Obtained employment in an engineering or closely-related field, or entered a terminal degree program (Ph.D. or other professional terminal degree) in engineering or a related field.
- Solved problems aided by practicing advanced engineering skills they learned in their graduate program.
- Recognized a pathway to make positive contributions to society using their engineering talents and skills by practicing their profession in an ethical and responsible manner.
- Engaged in continuing education and pursuit of membership in professional societies as well as FE/PE certification, or other certifications relevant to their chosen occupational field.
- Demonstrated accountability and worked effectively in a team environment with strong emphasis on multidisciplinary membership, inclusion, and communication

**Student Outcomes**

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### **Performance Indicators**

We need to change the curriculum to allow for at least two required ME courses that must be taken. In addition, we should reduce the credit hour load to 30 hours. The justification for reducing to 30 hours is that ABET specifically states that at least 30 hours are required for an accredited Master's program. Though the Master's program is not accredited, we want to be prepared to accredit it in the future, but also the ABET criteria provides a good framework for a functional program with assessment

- 4.) **[Creating Functions]** build a function ‘from scratch’ that is able to calculate a trig function (e.g.,  $\sin(x)$ ) to a specified level of accuracy.
- 5.) **[Collaborative Coding]** interact with and contribute to online code repositories using git.
- 6.) **[Data Visualization]** produce effective, ‘eye-catching’ figures using sample data sets.

**Grades:** Your grade in this class will be based off the following items:

- **Homework:** Each week will have a homework assignment posted to the course github page. The assignments will largely consist of Jupyter notebooks with code snippets related to what was discussed in class. To complete the assignments simply ‘fill in’ the missing blanks in such a way that the code will run as intended without errors.
- **Quiz:** There will be periodic quizzes on topics throughout the semester. Quizzes will be available on blackboard and will largely follow from content in the homework assignments.
- **Individual Projects:** There will be ~3-4 planned individual coding projects that will be assigned over the course of the semester. In many ways these projects can be thought of as being similar to the homework assignments where you will be asked to complete a coding task however, you will be given more freedom in how you choose to accomplish said task. Grades will be assigned based on the functionality of the submitted code as it relates to the specified requirements.
- **Group Projects:** There will be ~3-4 planned group projects that will be carried out over the semester. Groups will consist of 2-3 members and grades will be assigned on the basis of individual efforts contributed (tracked via git submissions) and the functionality of the final code.

Letter grades will be assigned based off a total percentage between 0 and 100% as follows

A	$\geq 89.5\%$
B	$\geq 79.5\%$
C	$\geq 69.5\%$
D	$\geq 59.5\%$
F	$< 59.5\%$

Final grades are determined by the following breakdown:

Homework	25%
Quizzes	25%
Individual Projects	25%
Group Projects	25%

Please note that while I am happy to discuss grades (particularly if you feel something is miscalculated), I will not negotiate grades.

**Academic Integrity:** All homework and quizzes must be your own work. Any cases of academic dishonesty will be handled as dictated in the ATU student handbook.

- 1.) Homework: I encourage everyone to make an honest attempt to do homework assignments on their own. If you are ‘stuck’ on a problem I would suggest reviewing notes or searching online for help (here the phrase ‘google is your friend’ is very true). If you cannot find the solution using either of these methods, then you can reach out to myself or another student in the class for assistance. However, if you use any resources other than yourself to complete the homework, I

would strongly caution against 'blindly' copying without trying to understand what the code does. Keep in mind that the quizzes will test how well you actually understood the homework assignments!

- 2.) Quizzes: Quizzes should be your own work. No external resources are allowed unless otherwise specified. I am planning for quizzes to be done outside of our regular class time and I am expecting everyone to abide by an honor system while taking quizzes.
- 3.) Individual Projects: Individual projects will ask you to complete a coding task with relatively few constraints. I expect that many students will look for code examples online which is encouraged, but I would strongly caution against verbatim copying of someone else's code and passing it off as your own. That being said, I realize that a lot of code shares similarities and that you may choose to base what you do off of someone else's work. If you do this, be sure to 1) cite the code as part of your submission and 2) make edits to the code such that it is not a verbatim copy and paste job. Do what you can to make it your own.
- 4.) Group Projects: Group projects will be very similar in flavor to the individual projects but allow you to work with group members. Much of the discussion above for individual projects also applies here. Verbatim copying of someone else's code is tantamount to plagiarism. Make sure your group's submission adheres to the points listed above.

**University Policies:** This course will follow all the policies stipulated by the ATU student handbook 2020-2021. These policies include Code of Academic integrity, Academic misconduct, Failure for excessive absence policy, Disability services, Non-discrimination policy, Inclement weather policy. The student handbook can be found at <https://www.atu.edu/studenthandbook/StudentHandbook-2020.pdf>. I will follow all the rules and regulations outlined in the Student handbook and Faculty handbook to address any grievances in this class.

**Title IX Statement:** Arkansas Tech University does not discriminate on the basis of color, sex, sexual orientation, gender identity, race, age, national origin, religion, veteran status, genetic information, or disability in any of our practices, policies, or procedures. If you have experienced any form of discrimination or harassment, including sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the institution. If you report such an incident of misconduct to a faculty or staff member, they are required by law to notify Arkansas Tech University's Title IX Coordinator and share the basic fact of your experience. The Title IX Coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off-campus. For more information please visit: <http://www.atu.edu/titleix/index.php>.

**Disability Services:** Arkansas Tech University values diversity and inclusion and is committed to a climate of mutual respect and full participation of all students. My goal is to create a learning environment that is useable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or prevent an accurate assessment of your achievement, please meet with me privately to discuss your needs and concerns. You may also contact the Office of Disability Services, located in Doc Bryan Student Center, Suite 141, in person, via phone at (479) 968-0302 or TTY (479) 964-3290, via email at [disabilities@atu.edu](mailto:disabilities@atu.edu), or visit their website at <https://www.atu.edu/disabilities/index.php> in order to initiate a request for accommodations. Third-Party Privacy and Accessibility Policies: [https://www.atu.edu/etech/privacy\\_accessibility.php](https://www.atu.edu/etech/privacy_accessibility.php)

**University Testing:** If you are a student that qualifies under the American with Disabilities Act (ADA) and requires accommodations please contact the Office of University Testing and Disability Services for information on appropriate policies and procedures. (Testing website: <http://www.atu.edu/testing/>).

**Supporting Student Needs:** There are community resources at ATU to assist students who face challenges securing their food or housing: <https://www.atu.edu/localresources/> Anyone who feels that their particular situation may affect their performance in the course can notify the instructor if they are comfortable in doing so. If further support is needed please contact the Office of the Vice President for Student Services at 479-968-0238.

**Attendance policy:** Attendance for in-person classes is required and will be tracked by the instructor. Students are allowed a maximum of four unexcused absences. Absences will be excused for qualifying ATU sponsored events with appropriate documentation. Similarly, students with health-related absences (e.g., covid-19) will be excused provided relevant documentation from health services.

**NOTE: Missing an excessive amount of class as defined above will lead to receiving a grade of FE (failure for excessive absences) for this course. Per the ATU faculty handbook, students will be warned prior to the assignment of this grade.**

**Blackboard:** Announcements, assignments, and supplemental course material will be posted on blackboard. You can access blackboard at <https://bblearn.atu.edu>.

**Email:** *Please check your email!* Given the various uncertainties about how this semester will proceed in the pandemic, please pay attention to your email. I will send important messages and supplemental class materials to your Tech email, so keep an eye out for it.

**Cell Phones & Other Electronic Devices:** Please refrain from using your cell phone while in class. But you are allowed to bring a computer and follow along with the code examples if you wish 😊

**Other Classroom Policies:** Be respectful of your classmates- please refrain from eating, sleeping, and talking in class unless instructed to do so.

**Syllabus content is subject to change at any time**

Any item on the syllabus may change at the discretion of the instructor. All changes will be communicated to the class. Additionally, I reserve the right to adjust the grade scale as I deem necessary.



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR COURSE ADDITION

Department Initiating Proposal	Date
Department of Mathematics and Statistics	6/16/2021

Title	Signature	Date
Department Head Dr. Jeanine Myers	<i>Jeanine L Myers</i>	6/22/21
Dean Dr. Jeff Robertson	<i>Jeff W. Robertson</i>	2021 June 22
Assessment Dr. Christine Austin	<i>Ch Austin</i>	9-13-21
Registrar Ms. Tammy Weaver	<i>Tammy Weaver</i>	9/14/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs Dr. Barbara Johnson		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	<i>JW 10/26/21</i>
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Course Subject: (e.g., ACCT, ENGL) <b>STAT</b>	Course Number: (e.g., 1003) <b>4383</b>	Effective Term: <input type="radio"/> Spring <input checked="" type="radio"/> Summer I
Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below) <b>Machine Learning</b>		
Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)		

RECEIVED

SEP 13 2021

Will this course be cross-listed with another existing course? If so, list course subject and number.

Yes  No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number.  Yes  No STAT 5383

Is this course repeatable for additional earned hours?  Yes  No How many total hours?

Grading:  Standard Letter  P/F  Other

Mode of Instruction (check appropriate box):

- 01 Lecture  02 Lecture/Laboratory  03 Laboratory only  
 05 Practice Teaching  06 Internship/Practicum  07 Apprenticeship/Externship  
 08 Independent Study  09 Readings  10 Special Topics  
 12 Individual Lessons  13 Applied Instruction  16 Studio Course  
 17 Dissertation Research  18 Activity Course  19 Seminar  98 Other

Does this course require a fee?  Yes  No How Much? Select Fee Type

If selected other list fee type:

Elective  Major  Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Once a Year - Fall only

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.?

None

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?

Computer lab

Answer the following Assessment questions:

- a. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

Not applicable

- b. If this course is required for the major or minor, complete the following.

1. Provide the program level learning outcome(s) it addresses.

Students will be able to (1) be able to apply appropriate statistical or computational modeling tools to analyze data, interpret the results with proper scope of conclusions; (2) implement professional software packages for statistical computing and demonstrate competence in with database management.

2. Provide tool or measure directly linked to each program learning outcome. (How will student learning in this outcome be measured?)

Homework, projects, and exams

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c. What is the rationale for adding this course? What evidence demonstrates this need?

**Classic machine learning algorithms have been proven valuable and successful in practical applications. Machine learning algorithms are used in a wide variety of applications, such as in medicine, speech recognition, and computer vision. This course provides students understanding and hands-on experience with using Python to develop machine learning algorithms for practical applications.**

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

- a. Course subject
- b. Course number
- c. Catalog course title
- d. Catalog description
  1. Arkansas Course Transfer System (ACTS) course number, if applicable
  2. Cross-listing
  3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
  4. Prerequisites
  5. Co-requisites
  6. Description
  7. Notes (e.g., information not in description such as course may be repeated for credit)
  8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
  9. Fees (e.g., \$36 art fee)
- e. Section for Name of instructor, office hours, contact information (telephone, email)
- f. Text required for course
- g. Bibliography (supplemental reading list)
- h. Justification/rationale for the course
- i. Course objectives
- j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
- k. Assessment methods (include grading policy with specific equivalents for A, B, C)
- l. Policy on absences, cheating, plagiarism, etc.
- m. Course content (outline of material to be covered in course).

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

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REGISTRAR'S OFFICE

# Syllabus

Department of Mathematics and Statistics

Course subject: STAT

Course number: 4383 /5383

Catalog course title: Machine Learning.

## Catalog description

1. Arkansas Course Transfer System (ACTS) course number, if applicable
2. Cross-listing
3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)  
Fall only.
4. Prerequisites  
MATH 4003 Linear algebras, MATH 2914 Calculus I.
5. Co-requisites
6. Description  
This course is directed towards advanced undergraduates in statistics, mathematics, or related quantitative fields. The focus of the course is an accessible overview of the field of machine learning and provide the students with valuable hands-on experience by illustrating how to implement each of the machine learning methods using Python. Topics covered include Decision Tree, Support Vector Machines, and the kernel methods, AdaBoost and GBDT method, Logistic regression, and neural network, and more.
7. Notes (e.g., information not in description such as course may be repeated for credit)
8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
9. Fees (e.g., \$36 art fee)

COURSE

Office: Corley

Phone:

INSTRUCTOR: TBD    Email:

OFFICE HOURS:

TEXTBOOK

- Machine Learning in Action, Peter Harrington. Manning Publications, ISBN:9781617290183, 2012. The book webpage is [manning.com/books/machine-learning-in-action](http://manning.com/books/machine-learning-in-action).
- Deep Learning with Python, François Chollet. Manning Publications, ISBN:9781617294433, 2017. The book webpage is [manning.com/books/deep-learning-with-python](http://manning.com/books/deep-learning-with-python).

BIBLIOGRAPHY

- Pattern Recognition and Machine Learning, Christopher Bishop, Springer-Verlag, ISBN: 9780387310732, 2006. The book webpage is [springer.com/gp/book/9780387310732](http://springer.com/gp/book/9780387310732).

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- The Elements of Statistical Learning, Data Mining, Inference, and Prediction, 2nd Edition, Trevor Hastie, Robert Tibshirani, and Jerome Friedman, Springer, ISBN:9780387848570, 2016. The book webpage is [springer.com/gp/book/9780387848570](http://springer.com/gp/book/9780387848570).

**JUSTIFICATION** Classic machine learning algorithms have been proven valuable and successful in practical applications. Machine learning algorithms are used in a wide variety of applications, such as in medicine, classification, and computer vision. This course provides students understanding and hands-on experience with using Python to develop machine learning algorithms for practical applications.

- OBJECTIVES** After completing this course, the learner will be able to:
- Identify different types of models (supervised/unsupervised, regression/classification, etc..).
  - Understand the fundamental ideas behind the machine learning algorithms covered in the course.
  - Apply algorithmic paradigms including stochastic gradient descent, neural networks, etc...
  - Design and implement certain machine learning models using Python.
  - Know the pros and cons of each method and identify which algorithms should be applied in which circumstances.

**GENERAL EDUCATION REQUIREMENTS** This course does not meet any of the General Education requirements.

**ASSESSMENT** The final grade will be computed based on the following breakdown:

<b>Homework</b>	<b>25%</b>
<b>Projects</b>	<b>30%</b>
<b>Midterm</b>	<b>20%</b>
<b>Final</b>	<b>25%</b>
<b>Total</b>	<b>100%</b>

The following percentage table will be used to assign scores:

90-100% - A    80-89% - B    70-79% - C    60-69% - D    Below 60% - F

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REGISTERED CLERK

**ATTENDANCE**

Attendance is required and necessary for success in this course. After 2 absences, a student’s name may be reported to the advising center's Early Warning staff. After 4 absences, a student may be dropped from the course with an FE\* if the grade is below 60%. Students who arrive to class late or leave class early may be counted as absent. If a student is absent for any reason, it is his/her responsibility to learn what assignment was missed and to complete on time. Being absent is NOT an excuse for missing an assignment.

**COURSE CONDUCT**

**Respect your peers.** Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

**PLAGIARISM & CHEATING**

Cheating will not be tolerated. Students are expected to do their **OWN** work. Copying or allowing someone to copy work is cheating. Consequences range from a zero on the assignment (or test) to expulsion from the course. Definitions of cheating and plagiarism are in the Student Code of Conduct from the Student Handbook.

**SCHEDULE**

Week	
1-2	Syllabus, Introduction to the course, warm-up on Python, warm-up project: kNN.
3-4	Decision Tree.
5-6	Support vector machine.
7-9	Ensemble methods (AdaBoost and GBDT).
10-11	Logistic regression.
12-15	Neural network.

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# Syllabus

Department of Mathematics and Statistics

**Course subject:** STAT

**Course number:** 5383

**Catalog course title:** Machine Learning.

## Catalog description

1. **Arkansas Course Transfer System (ACTS) course number, if applicable**
2. **Cross-listing**
3. **Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)**  
Fall only.
4. **Prerequisites**  
MATH 4003 Linear algebras, MATH 2914 Calculus I.
5. **Co-requisites**
6. **Description**  
This course is directed towards advanced undergraduates and graduates in statistics, mathematics, or related quantitative fields. The focus of the course is an accessible overview of the field of machine learning and provide the students with valuable hands-on experience by illustrating how to implement each of the machine learning methods using Python. Topics covered include Decision Tree, Support Vector Machines, and the kernel methods, AdaBoost and GBDT method, Logistic regression, and neural network, and more.
7. **Notes (e.g., information not in description such as course may be repeated for credit)**
8. **Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)**
9. **Fees (e.g., \$36 art fee)**

**COURSE**

**Office:** Corley

**Phone:**

**INSTRUCTOR:** TBD    **Email:**

**OFFICE HOURS:**

**TEXTBOOK**

- Machine Learning in Action, Peter Harrington. Manning Publications, ISBN:9781617290183, 2012. The book webpage is [manning.com/books/machine-learning-in-action](http://manning.com/books/machine-learning-in-action).
- Deep Learning with Python, François Chollet. Manning Publications, ISBN:9781617294433, 2017. The book webpage is [manning.com/books/deep-learning-with-python](http://manning.com/books/deep-learning-with-python).

**BIBLIOGRAPHY**

- Pattern Recognition and Machine Learning, Christopher Bishop, Springer-Verlag, ISBN: 9780387310732, 2006. The book webpage is [springer.com/gp/book/9780387310732](http://springer.com/gp/book/9780387310732).

- The Elements of Statistical Learning, Data Mining, Inference, and Prediction, 2nd Edition, Trevor Hastie, Robert Tibshirani, and Jerome Friedman, Springer, ISBN:9780387848570, 2016. The book webpage is [springer.com/gp/book/9780387848570](http://springer.com/gp/book/9780387848570).

**JUSTIFICATION** Classic machine learning algorithms have been proven valuable and successful in practical applications. Machine learning algorithms are used in a wide variety of applications, such as in medicine, classification, and computer vision. This course provides students understanding and hands-on experience with developing machine learning algorithms using Python.

- OBJECTIVES** After completing this course, the learner will be able to:
- Identify different types of models. (supervised/unsupervised, regression/classification, etc..).
  - Understand the fundamental ideas behind the machine learning algorithms covered in the course.
  - Apply algorithmic paradigms including stochastic gradient descent, neural networks, etc...
  - Design and implement certain machine learning models using Python.
  - Know the pros and cons of each method and identify which algorithms should be applied in which circumstances.

**Additional Objectives for Graduates** Understand the mathematics behind algorithms (e.g., backpropagation), and have projects on tuning hyperparameters.

**GENERAL EDUCATION REQUIREMENTS** This course does not meet any of the General Education requirements.

**ASSESSMENT** The final grade will be computed based on the following breakdown. The numbers outside the parentheses are for undergraduates, while the numbers inside the parentheses are for graduates. Graduates will give a final presentation at the end of semester. The topic of the presentation will be the mathematics of given algorithms (backpropagation, stochastic gradient descent, etc..). Some projects for graduates might be different for graduates and for undergraduates.

<b>Homework</b>	<b>25% (25%)</b>
<b>Projects</b>	<b>30% (25%)</b>
<b>Midterm</b>	<b>20% (20%)</b>

<b>Final</b>	<b>25% (20%)</b>
<b>Final presentation</b>	<b>0% (10%)</b>
<b>Total</b>	<b>100% (100%)</b>

The following percentage table will be used to assign scores:

90-100% - A    80-89% - B    70-79% - C    60-69% - D    Below 60% - F

**ATTENDANCE**

Attendance is required and necessary for success in this course. After 2 absences, a student's name may be reported to the advising center's Early Warning staff. After 4 absences, a student may be dropped from the course with an FE\* if the grade is below 60%. Students who arrive to class late or leave class early may be counted as absent. If a student is absent for any reason, it is his/her responsibility to learn what assignment was missed and to complete on time. Being absent is NOT an excuse for missing an assignment.

**COURSE CONDUCT**

**Respect your peers.** Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

**PLAGIARISM & CHEATING**

Cheating will not be tolerated. Students are expected to do their **OWN** work. Copying or allowing someone to copy work is cheating. Consequences range from a zero on the assignment (or test) to expulsion from the course. Definitions of cheating and plagiarism are in the Student Code of Conduct from the Student Handbook.

**SCHEDULE**

Week	
1-2	Syllabus, Introduction to the course, warm-up on Python, warm-up project: kNN.

3-4	Decision Tree.
5-6	Support vector machine.
7-9	Ensemble methods (AdaBoost and GBDT).
10-11	Logistic regression.
12-15	Neural network.





# ARKANSAS TECH UNIVERSITY

## REQUEST FOR COURSE CHANGE

Department Initiating Proposal	Date
Department of Mathematics and Statistics	6/10/2021

Title	Signature	Date
Department Head Dr. Jeanine Myers	<i>Jeanine L Myers</i>	6/21/21
Dean Dr. Jeff Robertson	<i>Jeff W. Robertson</i>	2021 June 22
Assessment Dr. Christine Austin	<i>Christine Austin</i>	9.13.21
Registrar Ms. Tammy Weaver	<i>Tammy Weaver</i>	9/14/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs Dr. Barbara Johnson		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	<i>JW</i> 10/26/21
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Course Subject: (e.g., ACCT, ENGL) <b>STAT</b>	Course Number: (e.g., 1003) <del>5113</del> <b>4113</b>
Official Catalog Title: <b>Categorical Data Analysis</b>	

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Is this course cross-listed with another existing course? If so, list course subject and number.

Yes  No

Request to change: (check appropriate box):

- Course Number                       Title                                       Course Description  
 Cross-Listing                               Prerequisite                               Co-requisite  
 Grading                                       Fee  
 Other \_\_\_\_\_

**NOTES:** These changes will become effective in the Summer I Term of the new catalog year. If this course is cross-listed, a prerequisite/co-requisite, or included in the course description of other courses, a Course Change must be submitted to address all changes in related courses.

New Course Number: (e.g., 1003)

New Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Banner Title: (limited to 30 characters, including spaces, capitalize all letters - this will display on the transcript)

New Course Description:

New Cross List:

- Adding Cross-Listing                       Changing Cross-Listing                       Deleting Cross-Listing

If adding or changing cross-listing, indicate course subject and number

STAT ~~4113~~ 5113

New Prerequisite (list all, as you want them to appear in the catalog):

STAT 3113 or permission of instructor

New Co-requisite (list all, as you want them to appear in the catalog):

- Elective                                       Major                                       Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

Answer the following Assessment questions:

- a. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.

**Not applicable.**

- b. If this course is required for the major or minor, complete the following.

- a. Provide the program level learning outcome(s) it addresses.

**The students will be able to apply appropriate statistical modeling tools to analyze data, interpret the results with proper scope of conclusions.**

- b. Provide tool or measure directly linked to each program learning outcome. (How will student learning in this outcome be measured?)

**Homework, quizzes, projects, and tests**

- c. What is the rationale for adding this course? What evidence supports this action?

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Registrar's Office

This new double-listing course will be graduate level statistical course. The goal of this course is to introduce students to statistical methods for analyzing data in which the response variables are categorical: either qualitative or quantitative and the explanatory variables can be categorical or continuous. In the real world, often times we have data that require knowledge of how to handle categorical response variables as well as the mixed inputs. By learning categorical analysis, it further deepens knowledge in statistics that will provide necessary tools and conceptual foundations in quantitative reasoning to extract information intelligently from this sea of data.

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

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# Syllabus

## Department of Mathematics and Statistics

**Course subject:** STAT

**Course number:** 5113 /4113

**Catalog course title:** Categorical Data Analysis

### d. Catalog description

1. **Arkansas Course Transfer System (ACTS) course number, if applicable**

2. **Cross-listing**

3. **Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)**

Fall only

4. **Prerequisites**

STAT 3113 Regression Analysis

5. **Co-requisites**

6. **Description**

Statistical tools to analyze univariate and multivariate categorical responses. Emphasis is given to Generalized Linear Models, including logistic regression and loglinear models. Generalized Linear Mixed Models will be covered for the graduate level categorical data analysis course.

7. **Notes (e.g., information not in description such as course may be repeated for credit)**

8. **Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)**

9. **Fees (e.g., \$36 art fee)**

This section is all to be completed by faculty of record for the course.

**Course Office:** Corley Phone: Email:

**Instructor:** TBD

**Office Hours:** To be determined by the faculty of record for this course

**Text required:** An Introduction to Categorical Analysis. 2<sup>nd</sup> edition. Author: Alan Agresti. Publisher: John Wiley & Sons, Inc. ISBN: 9780471226185.

**Bibliography:** There is NO required supplemental reading list for this course.

**Justification/rationale for the course:** The goal of this course is to introduce students to statistical methods for analyzing data in which the response variables are categorical: either qualitative or quantitative and the explanatory variables can be categorical or continuous. In the real world, often times we have data that require knowledge of how to handle categorical response variables as well as the mixed inputs. By learning categorical analysis, it further deepens knowledge in statistics that will provide necessary tools and conceptual foundations in quantitative reasoning to extract information intelligently from this sea of data.

**Course objectives** - By completing this course the student will be able to perform the following:

- Students will be able to select the appropriate statistical methodology for the analysis of categorical data.
- Justify the basic theoretical models for categorical data.
- Conduct and/or actively participate in the modeling and analyzing of categorical data.
- Interpret results from contingency tables or generalized linear models that evaluate relationships between categorical variables
- Communicate, both verbally and in writing, results with non-statisticians
- Analyze categorical data using statistical software
- Understand the random effect and the random effect models.

**Course Content:**

• 1	Overview & Intro.	1.1-1.2
• 2	Sampling models & Inference	1.3-1.5
• 3	2-way tables: structure and proportions	2.1
• 4	2-way tables: odds ratios	2.2, 2.4
• 5	Inference: Chi-square tests	3.1-3.3
• 6	Inference: ordinal data, exact tests	3.4-3.6
• 7	3-way tables: partial association	2.3, 3.7
• 8	Generalized linear models (GLM)	4.1
• 9	GLMs for binary data	4.2
• 10	Poisson regression	4.3
	Inference and model checking	4.5-4.6
• 11	Logistic regression	5.1
• 12	Logistic regression: model checking	5.2
• 13	Logit models (categorical predictors)	5.3
• 15	Multiple logistic regression	5.4-5.5

**General Education Requirements:** This course does not meet any General Education requirements.

**Assessment:** The final grade will consist of 100 percentage points, with the following breakdown:

The graduate level Categorical Data Analysis course requires the students to give a presentation on the generalized linear mixed models. Graduate students could work on a project containing random effect, present and interpret the results, or give detailed presentation on illustrating the random effect and generalized linear mixed models using multiple examples.

Homework/Quizzes	35%
Final Presentation	10%
Projects/Exams (20% each)	55%
	<hr/>
	100%

The following percentages will be used to assign scores:

90-100% - A      80-89% - B      70-79% - C      60-69% - D      Below 60% - F

**Attendance:** The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled. *In the event that you must miss, it is your responsibility to find out what material you missed and if any assignments are due.* I DO NOT take doctor's notes for absences.

No Make-Up exams will be given.

**Expectations:**

- Students must adhere to the rules set forth in the handbook.
- Students must do their own work.
- Consider your actions carefully: There will be no tolerance for conduct that even gives the appearance of cheating.
- Students are expected to respect the rights of others

- Students should not hesitate to clarify any questions regarding the policies of this course with the instructor.

**Cheating/Plagiarism** : Cheating or copying someone else's work may result in anything from a zero on the assignment (or test) to expulsion from the course with a course grade of F. Talking to others or using notes are NOT allowed during exams, either. *Please note that while I strongly encourage working together on assignments, copying someone else's work is cheating, and will not be tolerated.* Using apps, unapproved websites, etc are also considered cheating.



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR COURSE CHANGE

Department Initiating Proposal	Date
Department of Mathematics and Statistics	6/10/2021

Title	Signature	Date
Department Head Dr. Jeanine Myers	<i>Jeanine L Myers</i>	6/21/21
Dean Dr. Jeff Robertson	<i>Jeff Robertson</i>	2021 June 22
Assessment Dr. Christine Austin	<i>Christine Austin</i>	9.13.21
Registrar Ms. Tammy Weaver	<i>Tammy Weaver</i>	9/14/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs Dr. Barbara Johnson		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	<i>JW 10/26/21</i>
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Course Subject: (e.g., ACCT, ENGL) <del>MATH</del> <b>STAT</b>	Course Number: (e.g., 1003) <del>5153</del> <b>4153</b>
Official Catalog Title: <b>Experimental Design and Analysis</b>	

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Is this course cross-listed with another existing course? If so, list course subject and number.

Yes  No

STAT 4153

Request to change: (check appropriate box):

- Course Number  Title  Course Description  
 Cross-Listing  Prerequisite  Co-requisite  
 Grading  Fee  
 Other \_\_\_\_\_

**NOTES:** These changes will become effective in the Summer I Term of the new catalog year. If this course is cross-listed, a prerequisite/co-requisite, or included in the course description of other courses, a Course Change must be submitted to address all changes in related courses.

New Course Number: (e.g., 1003)

~~STAT 5153~~

New Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

~~Experimental Design and Analysis~~

Banner Title: (limited to 30 characters, including spaces, capitalize all letters - this will display on the transcript)

~~Exper. Design Anal.~~

New Course Description:

New Cross List:

- Adding Cross-Listing  Changing Cross-Listing  Deleting Cross-Listing

If adding or changing cross-listing, indicate course subject and number

STAT 4153 ~~5153~~

New Prerequisite (list all, as you want them to appear in the catalog):

New Co-requisite (list all, as you want them to appear in the catalog):

- Elective  Major  Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

Answer the following Assessment questions:

- a. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.  
**Not applicable.**
- b. If this course is required for the major or minor, complete the following.
  - a. Provide the program level learning outcome(s) it addresses.  
**The students will be able to Demonstrate knowledge of efficient design and analysis of experiments for standard situations.**
  - b. Provide tool or measure directly linked to each program learning outcome. (How will student learning in this outcome be measured?)  
**Homework, Course projects, and tests**
  - c. What is the rationale for adding this course? What evidence supports this action?

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**This new double-listing course will be graduate level statistical course. Designing experiments to effectively address research questions, performing data analysis by using appropriate software and drawing statistical conclusions are the essential skills for statisticians. Experimental design is also an important tool for engineers and scientists to use for product design and development as well as process development and improvement.**

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

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Registrar's Office

**ARKANSAS TECH UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
CLASS SYLLABUS**

Spring 2021

Course: **4153/** STAT 5153 Experimental Design

Instructor:

Office hours:

Phone:

Catalog Description: Analysis of variance, one factor experiments, experimental designs with two or more factors, linear and multiple regression analysis. Math 5153 may not be taken for credit after completion of this course.

Prerequisites: STAT 3153

Text: Design and Analysis of Experiments 9<sup>th</sup> Ed., by Douglas Montgomery , Published by John Wiley & Sons, Inc.  
ISBN: 9781119113478

Purpose: This course is a continuation of Math 3153 with an emphasis on experimental design, analysis of variance, and regression analysis.

Objectives: Students successfully completing this course will be able to:

1. Design and analyze experiments with  $k$  independent samples with respect to a quantitative variable.
2. Use multiple comparison methods to determine which means differ when the null hypothesis is rejected.
3. Set up and analyze a randomized complete block design and a Latin square design (used to eliminate two extraneous sources of variability).
4. Set up and analyze two-factor factorial designs.
5. Design and analyze general factorial experiments,  $2^k$  factorial experiments and  $2^{(k-p)}$  fractional factorial experiments.
6. Understand and explain the relationship among variables by building multiple linear regression models.
7. Check the adequacy of the fitted model and estimate and test the regression coefficients.

Assessment Methods:

**Grading:** There will be two in class **exams** given throughout the semester, each exam will be worth 100 points. The in-class exams will be announced at least one week in advance. There will be no makeup on the in-class exams. If you have to miss one of the exams, then I will substitute your final exam grade in for the missed exam.

You will have **homework** (quizzes) that will be taken up throughout the semester. The quizzes will consist of a few problems, usually taken directly from the assigned homework of the previous one or two class periods. There will be no makeup on the quizzes and your quiz grade will be the percent you get correct at the end of the semester. Your homework grade can be a maximum of 100 points.

There will be an end of semester **presentation** (end of semester presentation (100 points)) For the presentation you will choose one of the below nonparametric tests to give a presentation on at the end of the semester.

**Nonparametric tests:**

1-sample sign test, 1-sample Wilcoxon signed rank test, Friedman test, Kruskal-Wallis test.

In the presentation make sure you explain the test in detail and present an example of its application.

The **final exam** will be comprehensive and worth 100 points. The date and time will be given towards the end of the semester.

2 EXAMS @ 100 EACH	200
QUIZ Grade	100
PRESENTATION	100
<u>FINAL EXAM 100 POINTS</u>	<u>100</u>
TOTAL POINTS	500

**GRADING SCALE:**

450 - 500	A
400 - 459	B
350 - 399	C
300 - 349	D
BELOW 300	F

## Policies:

Absences: You are expected to attend all class meetings.

Cheating/plagiarism: If an occurrence of cheating is detected, then I may adjust the grade as appropriate, ranging from a grade penalty on the test or assignment involved to an **F** in the course.

**Cell phones** are strictly prohibited during the exams. If you are caught with one during the exam it will result in a zero for that exam.

## **COVID -19 Considerations In order to help keep our ATU community safe, healthy, and to prevent the spread of COVID-19, students must follow several steps:**

1. Masks must be worn by all students in public spaces, including classrooms and laboratories. Any student showing up for class without a mask will be given the opportunity to retrieve one. Entry into classrooms and laboratories without a mask will be prohibited. Please refer to the guidance from CDC as to the proper use of cloth masks (<https://www.cdc.gov/coronavirus/2019-ncov/prevent-gettingsick/how-to-wear-cloth-face-coverings.html>). Note that CDC does not recommend the use of a face shield in the place of a cloth mask (<https://www.cdc.gov/coronavirus/2019-ncov/prevent-gettingsick/cloth-face-cover-guidance.html>).

2. All students are required to participate in a daily health self-screen (<https://www.atu.edu/pandemicrecovery/student-healthscreening.php>). For students commuting to campus, please complete before coming to campus. For residential students, please complete each day before leaving your residence hall. If you do not own a thermometer, please have your temperature taken at one of the temperature testing sites listed in the student health screening document and repeated below: • Department of Public Safety available beginning July 6th (716 N El Paso Avenue); Monday-Friday; 8am-5pm • Health and Wellness Center available beginning August 3rd (outdoor tent station by north entrance of Doc Bryan Student Services Center); Monday-Friday; 8am-5pm • University Commons Clubhouse available beginning August 10th; Monday-Friday; 8am-10pm and Sunday; 5pm-10pm.

3. All students must maintain at least 6 feet of distance from every person present in all instructional spaces used in this course (classrooms, laboratories, etc.). 4. Any student who tests positive for COVID-19 is asked to self-report to the ATU Health and **Wellness Center by calling (479) 968-0329** or sending email to [hwc@atu.edu](mailto:hwc@atu.edu). Doing so will allow the university to communicate directly with others who might have been exposed to the virus and take any appropriate cleaning and sanitizing measures. Students are expected to abide by the above steps per the Student Handbook section on Classroom Behavior. For more information about ATU COVID-19 policies, please refer to the ATU Pandemic Framework

(<https://www.atu.edu/pandemicrecovery/docs/Pandemic%20Framework>)



# ARKANSAS TECH UNIVERSITY

## REQUEST FOR COURSE CHANGE

Department Initiating Proposal	Date
Department of Mathematics and Statistics	6/10/2021

Title	Signature	Date
Department Head Dr. Jeanine Myers	<i>Jeanine L Myers</i>	6/21/21
Dean Dr. Jeff Robertson	<i>Jeff W. Robertson</i>	2021 June 22
Assessment Dr. Christine Austin	<i>Christine Austin</i>	9.13.21
Registrar Ms. Tammy Weaver	<i>Tammy Weaver</i>	9/14/21
Graduate Dean (Graduate Proposals Only)		
Vice President for Academic Affairs Dr. Barbara Johnson		

Committee	Approval Date
General Education Committee (Undergraduate Proposals Only)	
Teacher Education Committee (Graduate or Undergraduate Proposals)	
Curriculum Committee (Undergraduate Proposals Only)	
Faculty Senate (Undergraduate Proposals Only)	
Graduate Council (Graduate Proposals Only)	

Course Subject: (e.g., ACCT, ENGL) <b>STAT</b>	Course Number: (e.g., 1003) <b>5393- 4393</b>
Official Catalog Title: <b>Statistical Learning</b>	

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Is this course cross-listed with another existing course? If so, list course subject and number.

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Yes  No

Request to change: (check appropriate box):

- Course Number                       Title                                       Course Description  
 Cross-Listing                               Prerequisite                               Co-requisite  
 Grading                                       Fee  
 Other \_\_\_\_\_

**NOTES:** These changes will become effective in the Summer I Term of the new catalog year. If this course is cross-listed, a prerequisite/co-requisite, or included in the course description of other courses, a Course Change must be submitted to address all changes in related courses.

New Course Number: (e.g., 1003)

New Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Banner Title: (limited to 30 characters, including spaces, capitalize all letters - this will display on the transcript)

New Course Description:

New Cross List:

- Adding Cross-Listing                       Changing Cross-Listing                       Deleting Cross-Listing

If adding or changing cross-listing, indicate course subject and number

STAT ~~4393~~ **5393**

New Prerequisite (list all, as you want them to appear in the catalog):

STAT 3113 or permission of instructor

New Co-requisite (list all, as you want them to appear in the catalog):

- Elective                                       Major                                       Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

Answer the following Assessment questions:

- a. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable.  
**Not applicable.**
- b. If this course is required for the major or minor, complete the following.  
a. Provide the program level learning outcome(s) it addresses.

**Students will be able to (1) apply appropriate statistical modeling tools to analyze data, interpret the results with proper scope of conclusions, (2) implement professional statistical software packages for statistical computing and demonstrate competence in with database management.**

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b. Provide tool or measure directly linked to each program learning outcome. (How will student learning in this outcome be measured?)

**Homework, group course project, and tests**

c. What is the rationale for adding this course? What evidence supports this action?

**This new double-listing course will be graduate level statistical course. Statistical learning has become a hot field in many scientific areas as well as marketing, finance, and other business disciplines. People with statistical learning skills are in high demand. This course provides hands-on opportunities for students to apply the advanced statistical methods to solve real-world problems.**

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at [http://www.atu.edu/registrar/curriculum\\_forms.php](http://www.atu.edu/registrar/curriculum_forms.php).

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# Syllabus

Department of Mathematics and Statistics

Course subject: STAT

Course number: 5393 /4393

Catalog course title: Statistical Learning

## Catalog description

1. Arkansas Course Transfer System (ACTS) course number, if applicable
2. Cross-listing
3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)  
Spring only
4. Prerequisites  
STAT 3113 Regression Analysis or permission of instructor
5. Co-requisites
6. Description

This course is directed towards advanced undergraduates or master's students in statistical or related quantitative fields. The focus of the course is an accessible overview of the field of statistical learning and provide the students with valuable hands-on experience by illustrating how to implement each of the statistical learning methods using R or other statistical programming language. Topics covered include: regression techniques, classification methods, linear model selection and regularization, unsupervised learning, and more. Tree-based methods will be introduced as an additional topic for graduate level statistical learning course.

7. Notes (e.g., information not in description such as course may be repeated for credit)
8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
9. Fees (e.g., \$36 art fee)

**COURSE**

**Office: Corley**

**Phone:**

**INSTRUCTOR: TBD**

**Email:**

**OFFICE HOURS:**

**TEXTBOOK**

James, G., Witten, D., Hastie, T., and Tibshirani, R. An Introduction to Statistical Learning with Applications in R. New York: Springer. The book webpage is <http://www-bcf.usc.edu/~gareth/ISL/>.

**BIBLIOGRAPHY**

Applied Data Mining and Statistical Learning: Very good online lecture notes on Statistical Learning.

**JUSTIFICATION**

Statistical learning has become a hot field in many scientific areas as well as marketing, finance, and other business disciplines. People with statistical learning skills are in high demand. This course provides hands-on



opportunities for students to apply the advanced statistical methods to solve real-world problems.

## **OBJECTIVES**

After completing this course, the learner will be able to:

- Identify supervised (regression, classification) and unsupervised (clustering) learning problems.
- Understand the fundamental idea behind statistical learning methods, know the pros and cons of each method.
- Understand the limitations of linear models and understand the nonlinear alternatives.
- Explain the challenges with high dimensional data and have a basic understanding of linear model selection and regularization.
- Formulate a mathematical solution to the real-world problems and implement the statistical learning methods by using statistical computing package.
- (Additional topic for graduate students) Understand the advantages and disadvantages of different types of decision trees.

## **GENERAL EDUCATION REQUIREMENTS**

This course does not meet any of the General Education requirements.

## **ASSESSMENT**

The final grade will consist of 100 percentage points, with the following breakdown:

**The graduate level statistical learning course requires the students using tree-based method on a project and give a final presentation.**

<b>Homework</b>	<b>15%</b>
<b>Group Course Project</b>	<b>25%</b>
<b>Final Presentation (Tree-Based Methods)</b>	<b>10%</b>
<b>3 Exams (including Final Exam, 20% each)</b>	<b>50%</b>
<b><i>Total</i></b>	<b><i>100%</i></b>

The following percentage table will be used to assign scores:

90-100% - A    80-89% - B    70-79% - C    60-69% - D    Below 60% - F

### ATTENDANCE

Attendance is required and necessary for success in this course. After 2 absences, a student's name may be reported to the advising center's Early Warning staff. After 4 absences, a student may be dropped from the course with an FE\* if the grade is below 60%. Students who arrive to class late or leave class early may be counted as absent. If a student is absent for any reason, it is his/her responsibility to learn what assignment was missed and to complete on time. Being absent is NOT an excuse for missing an assignment.

### COURSE CONDUCT

**Respect your peers.** Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

### PLAGIARISM & CHEATING

Cheating will not be tolerated. Students are expected to do their **OWN** work. Copying or allowing someone to copy work is cheating. Consequences range from a zero on the assignment (or test) to expulsion from the course. Definitions of cheating and plagiarism are in the Student Code of Conduct from the Student Handbook.

### SCHEDULE

Week		Exercises
1	Syllabus, Introduction to Statistical Learning and statistical software package R	The instructor of record will determine the assignments/exercises and point value for each weekly topic.
2	Linear Regression	
3	Logistic Regression	

4	Linear Discriminant Analysis (LDA), K-Nearest Neighbors (KNN)		
5	A Comparison of Classification Methods, Cross-Validation		
6	Cross-Validation, Bootstrap		
7	Variable Selection, Shrinkage Methods		
8	Dimension Reduction, Considerations in High Dimensions		
9	Polynomial Regression, Generalized Additive Models		
10	Decision Trees, Bagging		
11	Random Forests, Boosting		
12	Support Vector Classifiers		
13	Support Vector Machines		
14	Principal Components Analysis (PCA)		
15	PCA, Clustering		