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July 28, 2021 (*revised 10/13/21*)

TO: Governance Committees and University Registrar

FROM: Vijay Singal, Department Head, Finance

SUBJECT: Change of Option to Major: FinTech and Big Data Analytics (FBDA)

At the current time, FinTech and Big Data Analytics (FBTA) is an option within the Finance major under the BS in Business degree. The FBTA option was approved by the university effective Fall 2018 for graduating class of 2020.

An FBTA specialization is critical to the Finance department as technology disrupts current lines of business. Recent advances in technology, enhanced computational ability to handle large amounts of data, and fierce competition in the financial services industry have generated a growing demand for students with stronger mathematical, statistical, and computational skills.

The combination of specialized courses, in addition to typical Finance courses, has created an option where there are zero free electives in the checksheet. Students must begin taking courses in this specialization from the Fall semester of their Freshman year to complete the degree in a four-year timeframe.

After talking with Associate Registrar for Academic Governance, Mr. Gary Costello; Associate Vice Provost for Degree Innovation and SCHEV Compliance, Ms. Noel Byrd; Pamplin leadership; and with approval from the Department of Finance's UG Curriculum Committee, the department is proposing that we *revise the FBTA specialization from an option to the major: FinTech and Big Data Analytics (FBDA) under the Degree: BS in Business in Finance.*

Changing to a major will have **several advantages:**

a. Applicants to Virginia Tech will choose the FinTech and Big Data Analytics (FBDA) major during the admissions process and be able to start working towards their graduation immediately after joining Virginia Tech without a built-in delay in their potential graduation.

b. The Registrar can restrict courses based only on majors, not options. With a major, we will be able to control enrollments in different courses that should be taken only by FinTech and Big Data Analytics (FBDA) majors.

c. Opportunity for tracking and follow-up with students increases with a major. The Finance department has 7 options and a faculty lead for each option—although tracking is possible, it is more difficult for faculty to track students within an option than within a major. With a FinTech and Big Data Analytics (FBDA) major, the faculty lead (Professor Cara Spicer) will be better able to ensure students are on schedule to graduate on time, and distribution of information about relevant speakers, events, internships, and full-time job opportunities will be streamlined. Once FinTech and Big Data Analytics (FBDA) is a major, our department will also be able to track student progress in the workforce more accurately since job placement data is reported by major, not option.

d. Allowing students to show prospective employers their specialization as FinTech and Big Data Analytics is important. Diplomas only state the degree (BS in Business) and major (Finance), but an option is not mentioned on the diploma. With a FinTech and Big Data Analytics (FBDA) major, diplomas will display this specialization.

There are costs too, but they are relatively small. Besides this approval process, we are aware there will be additional departmental reporting for a major. In our opinion, the benefits outweigh the costs.

### **Implementation**

1. A new checksheet for a major is attached for approval that will be effective for UG students entering effective Summer 2022.
2. No courses are being changed in converting the option to a major.
3. All students in Finance will be informed of this change.
4. New students will apply directly for the FinTech and Big Data Analytics major, hopefully during the admissions process in the 2021-22 academic year, for admission beginning Summer 2022.

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In terms of the information that is normally needed for approval, please note the following:

I. Coversheet is attached.

II. The department needs no additional resources for changing the option to a major.

III.a. The option already exists with 125 hours, and the major will also require 125 hours for graduation. The program is critical to preparing students for the ever-changing field of Finance.

III.b. Currently, the option has 50 students who have declared FBTA as an option. With a change to a major and for reasons discussed above, we expect enrollments to increase. However, given that the university is currently allowing only a small increase in enrollments (1% per year for the next two years), the number of students in the proposed major may be constrained. We will be lucky if we can increase enrollments to 100 students in the option,

though we do want to plan for an increase to as much as 200 students within the next 2-3 years. I have been in contact with departments where capacity for FinTech majors may be limited and will discuss solutions with them once we go beyond 100 students in the major.

Even though we have a small number of juniors and seniors, there is high demand for them. Current students have already secured full-time jobs or internships in many companies including Capital One, BP, KPMG, Accenture, EY, Macquarie, Capital Asset Management, VT Foundation, L'Oréal, Geico, AllianceBernstein, Red Ventures, Department of Energy's FERC, USA.gov, and RegionsBank.

Students who declare a FBTA option will be eligible to change to the FinTech and Big Data Analytics (FBDA) major once effective. Since there is no change in the checksheet courses, a change from the FBTA option to the FBDA major will be smooth and simple. The final semester to declare the FBTA option is Spring 2022, since the FinTech and Big Data Analytics (FBDA) major is expected to be available for enrollment beginning Summer 2022. The final semester students can graduate with the FBTA option is Fall 2027.

III.c. No new resources are needed because the program already exists.

III.d. The new major will be effective Summer 2022. New students will apply directly for the FinTech and Big Data Analytics major, hopefully during the admissions process in the 2021-22 academic year. The new major will be communicated to students via the Admissions website and through college and department listservs. It will also be published on the department's website and on social media.

IV. The checksheet for the FinTech and Big Data Analytics (FBDA) major is attached.

V. The previously submitted/approved checksheet for the FBTA option is also attached.

VI. Since no courses are being changed or added to the existing option, other departments are not affected by this 'notional' change in revising the option to a major.



YEAR ONE					
FALL SEMESTER	✦	Credits	SPRING SEMESTER	✦	Credits
CS 1064: Intro to Programming in Python	5f/M	3	ACIS 2115: Principles of Accounting <sup>1,2</sup>	M	3
MATH 1225: Calculus of a Single Variable <sup>1,2</sup>	5f	4	*STAT 3005: Statistical Methods <sup>1,2</sup>	5a/M	3
COMM 1015: Communication Skills <sup>3</sup>	1f	3	*COMM 1016: Communication Skills <sup>3</sup>	1f	3
SOC 1004: Introductory Sociology <sup>4</sup>	7	3	*MATH 1226: Calculus of a Single Variable <sup>1,2</sup>	5f	4
ECON 2005: Principles of Economics <sup>1,2</sup>	3	3	*ECON 2006: Principles of Economics <sup>1,2</sup>	3	3
Total		16	Total		16
YEAR TWO					
FALL SEMESTER	✦	Credits	SPRING SEMESTER	✦	Credits
*ACIS 2116: Principles of Accounting <sup>1,2</sup>	C	3	*#BIT 3424: Introduction to Business Analytics Modeling	M	3
*BIT 2406: Business Statistics, Analytics, & Modeling <sup>1,2</sup>	5a	3	*#FIN 3134: Financial Analytics <sup>5</sup>	M	3
*STAT 3006: Statistical Methods <sup>1,2</sup>	M	3	#MGT 3304: Mgt Theory & Leadership Practice <sup>2</sup> or *#MGT 3404: Principles of Management <sup>2</sup>	M	3
*#FIN 3104: Introduction to Finance	C	3	*#STAT 3104: Probability & Distributions or *#STAT 4105: Theoretical Statistics	M	3
*MATH 2204: Multivariable Calculus <sup>1,2</sup>	M	3	Reasoning in the Natural Sciences	4	3
MATH 2114: Introduction to Linear Algebra	M	3			
Total		18	Total		15
YEAR THREE					
FALL SEMESTER	✦	Credits	SPRING SEMESTER	✦	Credits
#CS 1114: Introduction to Software Design	M	3	*#CS 2114: Software Design & Data Structures	6d/M	3
*#FIN 3144: Investments: Debt, Equity, & Derivatives <sup>5,6</sup>	M	3	*#ACIS 3115: Intermediate Accounting or *#ACIS 4194: Analysis of Financial Statements	M	3
*#FIN 3154: Corporate Finance <sup>5,6</sup>	M	3	*#ENGL 3764: Technical Writing	1a/M	3
#FIN 3054: Legal & Ethical Environment of Business <sup>2</sup>	C	3	Critical Thinking in the Humanities	2	3
#MKTG 3104: Marketing Management <sup>2</sup>	C	3	Reasoning in the Natural Sciences	4	3
Total		15	Total		15
YEAR FOUR					
FALL SEMESTER	✦	Credits	SPRING SEMESTER	✦	Credits
*#BIT 3414: Operations & Supply Chain Management <sup>2</sup>	C	3	*#FIN Elective <sup>7</sup> (see page 2)	M	3
*#CMDA/CS/STAT 3654: Introductory Data Analytics & Visualization	M	3	*#CMDA/CS/STAT 4654: Intermediate Data Analytics & Machine Learning	M	3
*#FIN 4214: Financial Modeling in Excel <sup>7</sup>	M	3	*#MGT 4394: Strategic Management <sup>2</sup>	C	3
*#FIN Elective <sup>7</sup> (see page 2)	M	3	MGT or HTM 2314: Introduction to International Business <sup>2</sup>	C	3
Critique & Practice in the Arts	6a	3	Critical Thinking in the Humanities	2	3
Total		15	Total		15

✦ C = Degree Core Required Course M = Major Required Course

All other designations identify Pathways General Education requirements <https://www.pathways.prov.vt.edu/>

<b>FIN ELECTIVES (choose two – 6 credit hours)</b>
*#FIN 4144: International Financial Management *#FIN 4224: Fixed Income Securities *#FIN 4264: Managing Risk with Derivatives *#FIN 4274: Equity Securities
<b>GENERAL INFORMATION</b>
A total of <u>125 credit hours</u> is required for graduation. Any exceptions to this curriculum must be approved by the student's department head and Associate Dean for Pamplin Undergraduate Programs.
Foreign Language Requirement: Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six credit hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count towards the minimum credit hours required for graduation. Please refer to the Undergraduate Catalog for details.
Pre-requisites: Students are responsible for ensuring they have met necessary pre-requisites for all courses. Courses with pre-requisites are noted with * (e.g. *BIT 2405). Please refer to the Undergraduate Catalog or academic advisor.
Transferring Courses: Requirements and procedures for transferring courses are available <a href="http://pampl.in/transfercreditsteps">http://pampl.in/transfercreditsteps</a>
Overall and In-Major GPA: Students must have an overall GPA of 2.0 and an in-major GPA of 2.0 to graduate. Courses used to calculate the in-major GPA are noted with a # (e.g. #FIN 3104).
Policy 91: University policy requires a student to make satisfactory academic progress towards a degree in order to remain enrolled at the institution (see footnote 1). Students are responsible for reading and understanding Policy 91 in accordance with Pamplin policies <a href="http://pampl.in/policy91">http://pampl.in/policy91</a>

<sup>1</sup> Policy 91: Pamplin students in a business degree program must complete ten business courses (MATH 1225 + MATH 1226 + MATH 2204, ACIS 2115-2116, STAT 3005-3006, BIT 2406, and ECON 2005-2006) with a grade of C- or higher by 72 attempted credit hours (or 90 attempted credit hours for students with more than 18 transfer credits). Students who have not met the requirements will be notified upon reaching 72 (or 90) credit hours that they must complete the missing course(s) in the next term(s) of enrollment. Failure to do so may result in the student's dismissal from the business degree program. This policy is strictly enforced.

<sup>2</sup> Graduation requirement: Students must achieve a grade of C- or higher in select business courses (MATH 1225 + MATH 1226 + MATH 2204, ACIS 2115-2116, STAT 3005-3006, BIT 2406, ECON 2005-2006, MGT or HTM 2314, MGT 3304 or MGT 3404, MKTG 3104, FIN 3104, FIN 3054 or FIN 3074, BIT 3414, and MGT 4394).

<sup>3</sup> ENGL 1105-1106: First-Year Writing can substitute for COMM 1015-1016: Communication Skills. However, students who make this substitution must also take COMM 2004: Public Speaking.

<sup>4</sup> Students may use PSYC 1004: Introductory Psychology to satisfy the requirement if they meet the Pathway 7: Critical Analysis of Identity & Equity in the U.S. requirement with a different required course.

<sup>5</sup> Graduation requirement: Students must achieve a grade of C or higher in FIN 3134, FIN 3144, and FIN 3154.

<sup>6</sup> Students who receive a grade of C- in FIN 3134 may enroll concurrently in FIN 3144 and FIN 3154 while re-taking FIN 3134.

<sup>7</sup> Students who receive a grade of C- in FIN 3144 and FIN 3154 may enroll concurrently in FIN 42XX courses while re-taking FIN 3144 and FIN 3154. A grade of C or higher in FIN 3134 is required before enrolling in FIN 42XX courses.



YEAR ONE					
FALL SEMESTER	★	Credits	SPRING SEMESTER	★	Credits
CS 1064: Intro to Programming in Python	5f/O	3	ACIS 2115: Principles of Accounting <sup>1,2</sup>	M	3
MATH 1225: Calculus of a Single Variable <sup>1,2</sup>	5f	4	*STAT 3005: Statistical Methods <sup>1,2</sup>	5a/O	3
COMM 1015: Communication Skills <sup>3</sup>	1f	3	*COMM 1016: Communication Skills <sup>3</sup>	1f	3
SOC 1004: Introductory Sociology <sup>4</sup>	7	3	*MATH 1226: Calculus of a Single Variable <sup>1,2</sup>	5f	4
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<b>Total</b>		<b>16</b>	<b>Total</b>		<b>16</b>
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*BIT 2406: Business Statistics, Analytics, & Modeling <sup>1,2</sup>	5a	3	*#FIN 3134: Financial Analytics <sup>5</sup>	M	3
*STAT 3006: Statistical Methods <sup>1,2</sup>	O	3	#MGT 3304: Mgt Theory & Leadership Practice <sup>2</sup> or *#MGT 3404: Principles of Management <sup>2</sup>	O	3
*#FIN 3104: Introduction to Finance <sup>2</sup>	C	3	*#STAT 3104: Probability & Distributions or *#STAT 4105: Theoretical Statistics	O	3
*MATH 2204: Multivariable Calculus <sup>1,2</sup>	O	3	Reasoning in the Natural Sciences	4	3
MATH 2114: Introduction to Linear Algebra	O	3			
<b>Total</b>		<b>18</b>	<b>Total</b>		<b>15</b>
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#FIN 3054: Legal & Ethical Environment of Business <sup>2</sup> or #FIN 3074: Legal, Ethical, & Financing Issues for Entrepreneurs <sup>2</sup>	C	3	Critical Thinking in the Humanities	2	3
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Critique & Practice in the Arts	6a	3	Critical Thinking in the Humanities	2	3
<b>Total</b>		<b>15</b>	<b>Total</b>		<b>15</b>

★ C = Degree Core Required Course    M = Major Required Course    O = Option Required Course

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