

Department of Finance 880 West Campus Drive 1016 Pamplin Hall Blacksburg, Virginia 24061 P: (540) 231-5904 F: (540) 231-3155 fin@vt.edu

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

TO:	Governance Committees and University Registrar
FROM:	Vijay Singal, Department Head, Finance Open Suppl
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.

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.



Department of Finance, Insurance & Business Law Bachelor of Science in Business in Finance Major: FinTech and Big Data Analytics (FBDA)

For students entering under UG Catalog 2022-2023

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

FIN ELECTIVES (choose two - 6 credit hours)

*#FIN 4144: International Financial Management

*#FIN 4224: Fixed Income Securities

*#FIN 4264: Managing Risk with Derivatives

*#FIN 4274: Equity Securities

GENERAL INFORMATION

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 http://pampl.in/transfercreditsteps

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 inmajor 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 http://pampl.in/policy91

¹ 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.

² 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).

³ 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.

⁴ 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.

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

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

⁷ 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.



Department of Finance, Insurance & Business Law

Bachelor of Science in Business

APPROVED University Registrar

Major: Finance Option: FinTe For students entering under UG Catalog 2021-2022

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YEAR ONE			的时间,当时在他们的过去,但不是不同的人们也能在了自己的		
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1 message

Eric de Sturler <sturler@vt.edu> To: Vijay Singal <singal@vt.edu>, Robert Rogers <rogers@math.vt.edu> Tue, Oct 19, 2021 at 3:08 PM

Dear Vijay,

The Department of Mathematics will be able and happy to support up to 50 students per year in MATH1225, MATH1226, MATH2204, and MATH2114 in the new FinTech major without additional resources. If the number of students increases well beyond that, our departments will have to work together to find a way to accommodate the increase in the number of students in those classes.

Stay healthy and best wishes, Eric

+++++

Eric de Sturler

Professor and Chair Department of Mathematics & Professor Computational Modeling and Data Analytics, Academy of Integrated Science

460 McBryde Hall, Virginia Tech 225 Stanger Street, Blacksburg, VA 24061-1026, USA

Phone: +1 (540) 231 5279 Fax: +1 (540) 231 5960

Email: sturler@vt.edu URL: https://personal.math.vt.edu/sturler

On Sun, Oct 17, 2021 at 9:21 AM Vijay Singal <singal@vt.edu> wrote:

Hi Eric - just a quick reminder. I would like to report back to university governance by Tuesday if at all possible. Thank you.

Vijay

On Wed, Oct 13, 2021 at 9:33 PM Vijay Singal <<u>singal@vt.edu</u>> wrote: Dear Eric:

We talked about this today though I should have been in communication with you earlier as also with other select departments regarding the conversion of the FinTech option to a major, and its potential impact on enrollments. I am attaching our proposal for your ready reference.

Currently, the program has 50 students who have declared FBTA as an option. With a change to a major and for reasons discussed in the attached justification letter, we expect enrollments to increase. At the time that I wrote the letter, I was not aware of the university's plan to essentially freeze enrollments. 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 converted FinTech 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 (50 students per year) within the next 2-3 years.

I am writing in continuation of your department's earlier approval (please see attached) to accommodate up to 25 students per year in Math 1225, 1226, and 2204. While there is uncertainty about our future enrollments, I do want us to be prepared to accommodate more than 25 FinTech students per year, and up to 50 students a year. I am writing to solicit your confirmation that the Math and Finance departments can work together in the future to find a satisfactory solution, without additional resources, in case the number of students in the FinTech major exceeds 25 students a year. I will, of course, keep you informed as the number of students in the FinTech major evolves over the next several semesters.

If you prefer, I am happy to discuss our plans in more detail with you. Thank you and I look forward to your confirmation.



1 message

Stephen H Edwards <edwards@cs.vt.edu> To: Vijay Singal <singal@vt.edu> Cc: Calvin Ribbens <ribbens@vt.edu>

Fri, Oct 15, 2021 at 1:23 PM

Vijay, we've discussed the options, and we agree that the Department of Computer Science still approves of the use of the listed courses in this option. We will definitely work with your department to resolve any enrollment issues should enrollment go beyond projected estimates.

-- Steve

Virginia Tech, CS Dept. 2202 Kraft Drive Blacksburg, VA 24060 USA (540)-231-5723 Web-CAT: Web-based Center for Software Testing Automatic grading using student-written tests http://web-cat.org/ http://people.cs.vt.edu/~edwards/

On Fri, Oct 15, 2021 at 11:04 AM Vijay Singal <<u>singal@vt.edu</u>> wrote: Hi Cal, Steve:

Just making sure you received my email. I would like to report back to University governance by Monday or Tuesday. Thanks,

Vijay

On Wed, Oct 13, 2021 at 10:00 PM Vijay Singal <<u>singal@vt.edu</u>> wrote: Dear Cal and Steve:

I should have been in communication with you earlier regarding the conversion of the FinTech option to a major, and its potential impact on enrollments. But here I am now and am attaching our proposal for your ready reference.

Currently, the FinTech program has 50 students who have declared FBTA as an option. With a change to a major and for reasons discussed in the attached justification letter, we expect enrollments to increase. At the time that I wrote the justification letter, I was not aware of the university's plan to essentially freeze enrollments. 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 converted FinTech 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 (50 students per year) within the next 2-3 years.

I am writing in continuation of your earlier approval (please see attached) to accommodate up to 25 students per year in CS 1064, 1114, and 2114. While there is uncertainty about our future enrollments, I do want us to be prepared to accommodate more than 25 FinTech students per year, and up to 50 students a year. I am writing to solicit your confirmation that the CS and Finance departments can work together in the future to find a satisfactory solution, without additional resources, in case the number of students in the FinTech major exceeds 25 students a year. I will, of course, keep you informed as the number of students in the FinTech major evolves over the next several semesters.

If you prefer, I am happy to discuss our plans in more detail with you. Thank you and I look forward to your confirmation.

Vijay

Vijay Singal, Department Head and J Gray Professor of Finance Virginia Tech | Department of Finance 880 West Campus Drive, Suite 1016A Blacksburg, VA 24061-0221 vs@vt.edu, 540-231-7750 (d), 540-231-5904 (o), 540-818-4089 (c) Website: https://finance.pamplin.vt.edu/

LinkedIn: https://www.linkedin.com/school/VT-finance-department/

Facebook: https://www.facebook.com/VTFin



1 message

Dave Higdon <dhigdon@vt.edu>

Thu, Oct 14, 2021 at 10:13 AM

To: Vijay Singal <singal@vt.edu> Cc: Mark Embree <embree@vt.edu>, Michel Pleimling <pleim@vt.edu>, Ronald Fricker <fricker@vt.edu>, Leanna House <lhouse@vt.edu>

Hi Vijay,

Thanks for letting me know about plans for the FinTech FBTA option. I'm for doing as Mark suggests and keeping things going while the FinTech students are under 25 seats/year. We'll use 25 seats/year in our CMDA 3654 and 4654 courses as the "trip wire" for future discussions on how best to work things out as the FBTA program grows.

Good luck with the new major.

Best, Dave

On Thu, Oct 14, 2021 at 9:59 AM Vijay Singal <singal@vt.edu> wrote:

Thank you, Mark (and Michel). This should work for CUSP. I think there were/are 2 students in 4654. Separately, we are developing 1 or 2 capstone courses that we will try to accommodate in the major.

Vijay

On Thu, Oct 14, 2021 at 3:04 AM Mark Embree <<u>embree@vt.edu</u>> wrote: Vijay --

Thank you very much for reaching out to me about the conversion of the FBTA option to a new major. You have put together an impressive and challenging curriculum, and it is great that students are responding. I'm sure this program opens some fantastic career opportunities.

We remain committed to holding up to 25 seats/year in our CMDA 3654 and 4654 courses for FinTech students -- i.e., 100 students in the FinTech program across all four years. (This calendar year we have had about 10 FinTech students in CMDA 3654 and perhaps a few more enrolled under the CS and STAT designations; we've only had a few FinTech students in CMDA 4654 thus far.)

Should the FinTech major grow beyond 25 students a year, we will need to have discussions about how to accommodate those students in our CMDA classes. These classes are already larger than I would like, given their complexity -- CMDA 4654 is the most challenging required course in our CMDA major. Adding up to 50 FinTech students a year would likely warrant new sections of those classes. I would be happy to discuss potential options, in coordination with Dave Higdon (as Statistics staffs half of the 3654 sections, and all of the 4654 sections).

Thanks again for letting me know about these developments -- I appreciate it.

best wishes,

Mark

On Wed, Oct 13, 2021 at 12:12 PM Vijay Singal <<u>singal@vt.edu</u>> wrote: Dear Michel (and Mark):

Thank you for your comments in the CUSP meeting on 10/11/21. I should have been in communication with you earlier as also with other select departments regarding the conversion of the FinTech option to a major, and its potential impact on enrollments. I am attaching our proposal for your ready reference.

Currently, the program has 50 students who have declared FBTA as an option. With a change to a major and for reasons discussed in the attached justification letter, we expect enrollments to increase. At the time that I wrote the letter, I was not aware of the university's plan to essentially freeze enrollments. 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 converted FinTech 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 (50 students per year) within the next 2-3 years.



1 message

Mark Embree <embree@vt.edu>

Thu, Oct 14, 2021 at 3:03 AM

To: Vijay Singal <singal@vt.edu> Cc: Michel Pleimling <pleim@vt.edu>, Dave Higdon <dhigdon@vt.edu>, Ronald Fricker <fricker@vt.edu>

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best wishes,

Mark

On Wed, Oct 13, 2021 at 12:12 PM Vijay Singal <<u>singal@vt.edu</u>> wrote: Dear Michel (and Mark):

Thank you for your comments in the CUSP meeting on 10/11/21. I should have been in communication with you earlier as also with other select departments regarding the conversion of the FinTech option to a major, and its potential impact on enrollments. I am attaching our proposal for your ready reference.

Currently, the program has 50 students who have declared FBTA as an option. With a change to a major and for reasons discussed in the attached justification letter, we expect enrollments to increase. At the time that I wrote the letter, I was not aware of the university's plan to essentially freeze enrollments. 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 converted FinTech 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 (50 students per year) within the next 2-3 years.

I am writing in continuation of your earlier approval (please see attached) to accommodate up to 25 students per year in CMDA 3654, 4654. While there is uncertainty about our future enrollments, I do want us to be prepared to accommodate more than 25 FinTech students per year, and up to 50 students a year. I am writing to solicit your confirmation that CMDA and the Finance department can work together in the future to find a satisfactory solution, without additional resources, in case the number of students in the FinTech major exceeds 25 students a year. I will, of course, keep you informed as the number of students in the FinTech major evolves over the next several semesters.

If you prefer, I am happy to discuss our plans in more detail with you. Thank you and I look forward to your confirmation.

Vijay

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