INFORMATION TECHNOLOGY

PRESSURE TEST

FEBRUARY 26, 2021

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Motivation and Process - Same as for Other Disciplines

Analyze ITEC Program Academic Map
    is a pathway to graduation in four years attainable?

Identify impediments to student progress towards graduation
    examine with an eye toward momentum

Recommendations

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Information Technology at GGC

- We have a great story!
  - 1300 Students, 70 Faculty
  - 5 Concentrations: *Software Development, Systems and Security, Digital Media, Enterprise Systems, Data Science and Analytics*
  - Most diverse college in the SE, open access, undergraduate only
  - Largest ITEC Program in USG
- High quality
  - Compliance to ITEC 2017 (ACM SIGITE Standard), higher than that 88% US schools
  - Culture of competition and winning
  - Culture of continuous improvement
  - Research/scholarship: student engaged, SoTL

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INFORMATION TECHNOLOGY – PRESSURE TEST – ACADEMIC MAPS

IT: Systems and Security Academic Map

Name: _____
ID: _____

This academic map is a suggested four-year schedule of courses based on degree requirements in the GGC catalog. This sample schedule serves as a general guideline to help build a full schedule each term. *Missing milestones could delay your program.*

IT: Data Science and Analytics Academic Map

Name: _____
ID: _____

This academic map is a suggested four-year schedule of courses based on degree requirements in the GGC catalog. This sample schedule serves as a general guideline to help build a full schedule each term. *Missing milestones could delay your program.*

IT: Software Development Academic Map

Name: _____
ID: _____

This academic map is a suggested four-year schedule of courses based on degree requirements in the GGC catalog. This sample schedule serves as a general guideline to help build a full schedule each term. *Missing milestones could delay your program.*

FRESHMAN FALL		FRESHMAN SPRING		FRESHMAN SUMMER	
Course	Hours	Course	Hours	Course	Hours
☐ ENGLISH COMPOSITION 1 ENGL 1101	3	☐ ENGLISH COMPOSITION 2 ENGL 1102			
☐ PRE-CALCULUS MATH 1113	4	☐ CALCULUS MATH 2200			
☐ INTRODUCTION TO COMPUTING ITEC 1001	4	☐ DIGITAL MEDIA ITEC 2110			
☐ U.S. HISTORY HIST 2111 OR 2112	3	☐ FUNDAMENTALS OF PROGRA... ITEC 2140			
☐ CHOICES FOR LIFE PHED 1101	1	☐ PHYSICAL EDUCATION Any PHED except 1101			
TOTAL	15				
RUNNING TOTAL	15	RUNNI...			

SOPHOMORE FALL		SOPHOMORE SPRING	
☐ HUMANITIES / FINE ARTS 2 RELN 1100 / GEOG 1101 / 2000-LEVEL FOREIGN LANGUAGE	3	☐ ADVANCED PROGRAMMING ITEC 3150	
☐ INTERMEDIATE PROGRAMMING ITEC 2150	4	☐ SOCIAL SCIENCE PSYC 1102/SOCI 1101/ANTH 1102/ECON...	
☐ INFORMATION SYSTEMS ITEC 2201	3	☐ PRINCIPLES OF CHEMISTRY CHEM 1211K	
☐ DISCRETE MATH MATH 2300	3	☐ NETWORKS ITEC 3100	
☐ INTRO TO STATISTICS MATH 2000	3	☐ PHYSICAL EDUCATION Any PHED except 1101	
TOTAL	16		
RUNNING TOTAL	47	RUNNI...	

JUNIOR FALL		JUNIOR SPRING	
☐ PRINCIPLES OF CHEMISTRY 2 CHEM 1212K	4	☐ ELECTIVE 2000-4000 LEVEL	
☐ DATABASES ITEC 3200	3	☐ SOFTWARE DEVELOPMENT ITEC 3860	
☐ INTRO TO MANAGEMENT MGMT 3000	3	☐ SYSTEM ANALYSIS AND DESI... ITEC 3700	
☐ PROFESSIONAL PRACTICE AND ETHICS ITEC 3900	3	☐ HUMANITIES / FINE ARTS 1 MUSC 1100/ARTS1100 ENGL 21XX/FILM 1005	
☐ WEB TECHNOLOGIES ITEC 2130	4		
TOTAL	17		
RUNNING TOTAL	77	RUNNI...	

SENIOR FALL		SENIOR SPRING	
☐ SOFTWARE TESTING AND QA ITEC 4260	3	☐ SOFTWARE DEVELOPMENT... ITEC 4260	
☐ ITEC ELECTIVE 3000-4000 LEVEL	2	☐ ITEC/SCIENCE/MATH ELECTIV... 2000-4000 LEVEL	
☐ ITEC/SCIENCE/MATH ELECTIVE	3	☐ SOFTWARE DEVELOPMENT PR... ITEC 4860	
☐ AMERICAN GOVERNMENT POLS1101	3	☐ ITEC ELECTIVE 3000-4000 LEVEL	
☐ SOFTWARE DEVELOPMENT2 ITEC 3870	3	☐ HISTORY HIST 1111, 1112, 1121, 1122, 2111, or 21... (take one of these courses not already cov...	
TOTAL	16		
RUNNING TOTAL	107	RUNNI...	

This map is not a substitute for academic advisement—contact your advisor if you h...
requirements. Also see the current undergraduate catalog for a complete list of requi...

IT: Enterprise Systems Academic Map

Name: _____
ID: _____

This academic map is a suggested four-year schedule of courses based on degree requirements in the GGC catalog. This sample schedule serves as a general guideline to help build a full schedule each term. *Missing milestones could delay your program.*

FRESHMAN FALL		FRESHMAN SPRING		FRESHMAN SUMMER	
Course	Hours	Course	Hours	Course	Hours
☐ ENGLISH COMPOSITION 1	3	☐ ENGLISH COMPOSITION 2	3	Recommend taking classes in the summer to stay on track	
			4		
			4		
			4		
			1		
TOTAL	16	TOTAL			
RUNNING TOTAL	31				

				SOPHOMORE SUMMER	
			3	Recommend taking classes in the summer to stay on track	
			4		
			3		
			1		
TOTAL	14				
RUNNING TOTAL	61				

				JUNIOR SUMMER	
			3	Recommend taking classes in the summer to stay on track	
			3		
			3		
			3		
			4		
TOTAL	16				
RUNNING TOTAL	92				

			3	**Graduation in May!**
			3	
			3/4	
			4/3	
TOTAL	17			
RUNNING TOTAL	123			

...ave any questions about scheduling or about your degree
...ments, electives, and pre-requisites. *Note: Requirements are
...ked; contact the department and/or program area for current
...on the GGC Concentration requirements.*

04.19.v1

IT: Digital Media Academic Map

Name: _____
ID: _____

This academic map is a suggested four-year schedule of courses based on degree requirements in the GGC catalog. This sample schedule serves as a general guideline to help build a full schedule each term. *Missing milestones could delay your program.*

FRESHMAN FALL		FRESHMAN SPRING		FRESHMAN SUMMER	
Course	Hours	Course	Hours	Course	Hours
☐ ENGLISH COMPOSITION 1 ENGL 1101	3	☐ ENGLISH COMPOSITION 2 ENGL 1102	3	Recommend taking classes in the summer to stay on track	
☐ PRE-CALCULUS MATH 1113	4	☐ CALCULUS MATH 2200	4		
☐ INTRODUCTION TO COMPUTING ITEC 1001	4	☐ DIGITAL MEDIA ITEC 2110	4		
☐ U.S. HISTORY HIST 2111 OR 2112	3	☐ FUNDAMENTALS OF PROGRAMMING ITEC 2140	4		
☐ CHOICES FOR LIFE PHED 1101	1	☐ PHYSICAL EDUCATION Any PHED except 1101	1		
TOTAL	15	TOTAL	16		
RUNNING TOTAL	15	RUNNING TOTAL	31		

SOPHOMORE FALL		SOPHOMORE SPRING		SOPHOMORE SUMMER	
☐ HUMANITIES / FINE ARTS 2 RELN 1100 / GEOG 1101 / 2000-LEVEL FOREIGN LANGUAGE	3	☐ WEB TECHNOLOGIES ITEC 2130	4	Recommend taking classes in the summer to stay on track	
☐ INTERMEDIATE PROGRAMMING ITEC 2150	4	☐ SOCIAL SCIENCE PSYC 1102/SOCI 1101/ANTH 1102/ECON 2100	3		
☐ INFORMATION SYSTEMS ITEC 2201	3	☐ INTRO TO MANAGEMENT MGMT 3000	3		
☐ DISCRETE MATH MATH 2300	3	☐ NETWORKS ITEC 3100	3		
☐ INTRO TO STATISTICS MATH 2000	3	☐ PHYSICAL EDUCATION Any PHED except 1101	1		
TOTAL	16	TOTAL	14		
RUNNING TOTAL	47	RUNNING TOTAL	61		

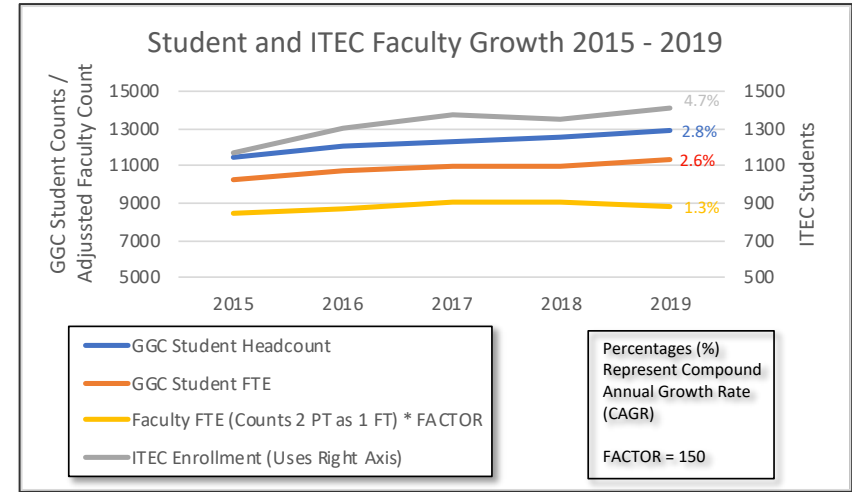| JUNIOR FALL		JUNIOR SPRING		JUNIOR SUMMER	
☐ ELECTIVE 2000-4000 LEVEL	3	☐ PRINCIPLES OF CHEMISTRY 1 CHEM 12111K	4	Recommend taking classes in the summer to stay on track	
☐ DATABASES	3	☐ COMPUTER GRAPHICS AND MULTMEDIA	3		

Are we offering enough sections at diverse days/times to meet needs?

Initial pressure test conclusion - met
- Stable: sizable enrollment and schedule
- Annual 2/3-year projection updates
- *Required* courses every semester (D/N)
- Monitor fill rates very frequently

Faculty staffing met, with concerns
- Outstanding request for 4 FT faculty
- Need robust IT and proctoring infrastructure for new programs, will stress faculty loads too
- FT faculty not following enrollment increases

Turn to impediments!

Student and ITEC Faculty Growth 2015 - 2019

- GGC Student Headcount
- GGC Student FTE
- Faculty FTE (Counts 2 PT as 1 FT) * FACTOR
- ITEC Enrollment (Uses Right Axis)

Percentages (%) Represent Compound Annual Growth Rate (CAGR)

FACTOR = 150

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Impediments – By Data/Analysis/Discussion

1) Students enter with deficiencies in fundamental English and math

2) Student is unable or chooses not to take sufficient credits each semester

3) Student is not properly advised, or fails to take the advice given, regarding sequencing.

4) Student does not achieve the required course grade to advance

5) Student suspends or takes a pause

6) Compounding of the factors listed above

Bolded items different than those of PSYC/ENGL

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1) ITEC Students Enter w/Deficiencies in English and Math

ENGL
- 8% require learning support English

MATH
- 7% require learning support math
- 87% do not take MATH 1113 as their first math course

    Only ~3% take MATH 2200 Calc I

8-9 in 10 will need to extend their ideal four-year plan to accommodate catch-up course work in math and/or English.

Repels Momentum!

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ITEC MAJORS DFWI RATE (AREA A-E)

	Area										Grand Total
	A		B	C	D			E			
Semester	ENGL	MATH	ITEC		CHEM 1211K	CHEM 1212K	ITEC	POLS	HIST	HIST	
Fall 2016	32%	47%	24%	22%	45%	35%	26%	22%	28%	26%	31%
Spring 2017	28%	47%	27%	27%	42%	42%	13%	24%	27%	24%	31%
Fall 2017	24%	48%	22%	29%	43%	41%	18%	21%	27%	15%	29%
Spring 2018	27%	41%	19%	27%	44%	38%	14%	22%	26%	25%	29%
Fall 2018	34%	43%	17%	20%	40%	38%	15%	23%	25%	21%	28%
Spring 2019	30%	47%	20%	21%	48%	31%	19%	27%	25%	23%	31%
Fall 2019	28%	47%	20%	20%	36%	38%	13%	26%	28%	26%	29%

DFWI Rate for ITEC Freshman, By Semester

The DFWI in Area A-E for ITEC majors from fall 2016 to fall 2019 timeframe has been consistently 28 to 31%, overall. **3 in 10 ITEC students will need to repeat a Gen-Ed course. Repels Momentum!**

ITEC majors most difficult: MATH 1113 and CHEM 1211K/CHEM 1212K. **4 to 5 in 10 ITEC Students will need to repeat a MATH course, 4 to 5 in 10 will need to repeat a CHEM course. Repels Momentum!**

Source: GGC Institutional Research and Analytics

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2) Insufficient Credits Each Semester

ITEC students take 11.98 credits/semester, on average. 1 in 3 ITEC majors are on a 5+ year pace.

8 in 10 ITEC majors do not enroll in enough credits for 4-year cadence. Repels Momentum!

Expected Time to Graduation, Based on Credits Taken Per Semester *

< 4 Years, 0%

> 6 Years, 19%

4 Years, 18%

5-6 Years, 13%

4-5 Years, 49%

* assumes no summer courses, no transfers, courses withdrawn or failed are included

Semester	Credits Taken														
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fall 2016	1%	1%	0%	3%	7%	3%	3%	7%	4%	16%	23%	16%	8%	4%	4%
Spring 2017	2%	1%	1%	4%	6%	3%	4%	6%	5%	15%	20%	16%	6%	4%	5%
Fall 2017	1%	2%	0%	4%	5%	3%	4%	7%	5%	16%	21%	14%	7%	6%	5%
Spring 2018	1%	1%	0%	4%	5%	3%	4%	7%	6%	15%	18%	16%	8%	6%	5%
Fall 2018	1%	1%	1%	2%	7%	3%	5%	9%	7%	18%	17%	13%	8%	5%	4%
Spring 2019	2%	2%	0%	3%	6%	3%	4%	8%	7%	14%	17%	16%	9%	5%	4%
Fall 2019	1%	2%	0%	2%	6%	2%	5%	6%	7%	16%	16%	15%	11%	6%	4%
Overall	1%	2%	0%	3%	6%	3%	4%	7%	6%	16%	19%	15%	8%	5%	5%
Aggregated	19%						13%			49%			18%		

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3) Poorly advised, or fails to take the advice given, regarding course sequencing.

- Example Course Dependency Diagram – Digital Media AY19-20
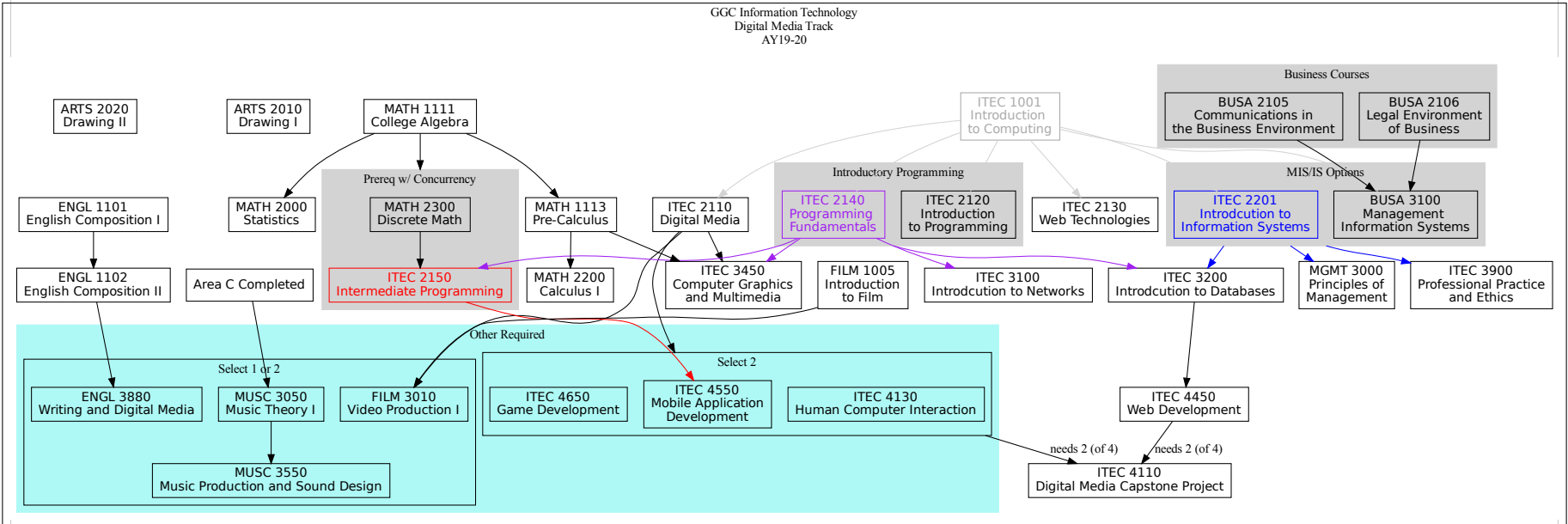
GGC Information Technology
Digital Media Track
AY19-20

Dependency Diagrams for ITEC Concentrations
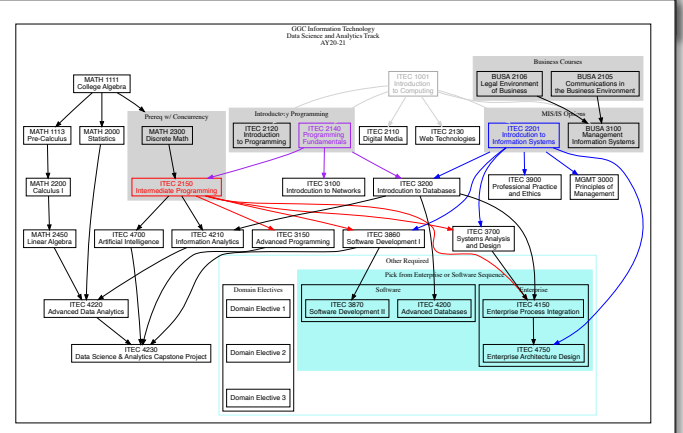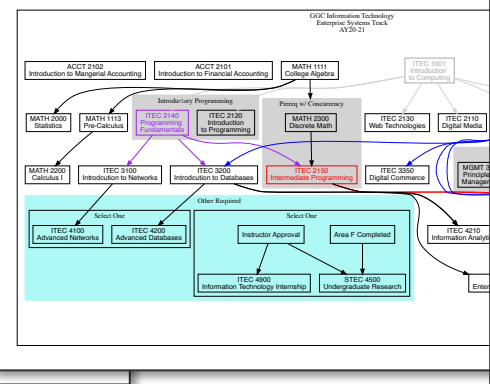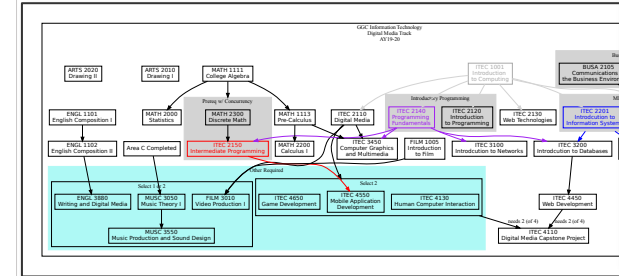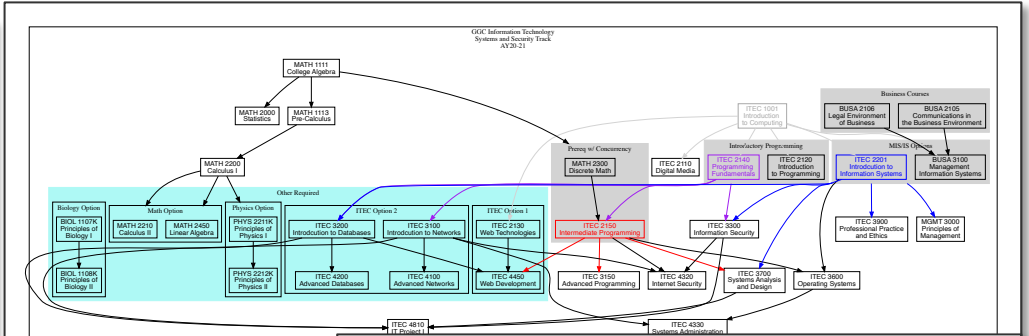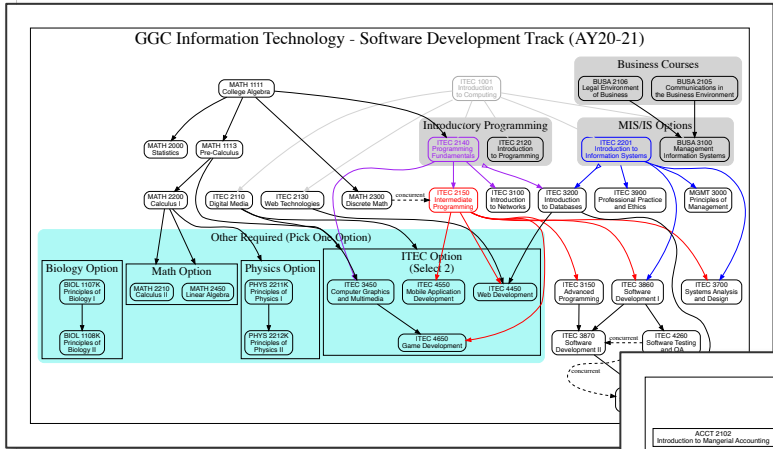
Course Sequencing

Several high stakes 'gateway' courses
- ITEC 1001, ITEC 2140, ITEC 2150, ITEC 2201

Il-Advisement
- Faculty:student ratio increasing
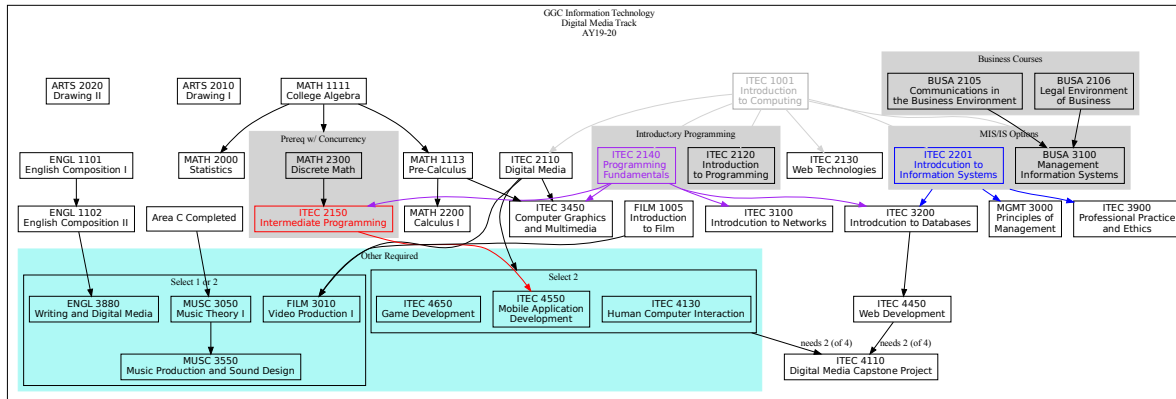 - grows from 27.9 fall '17 to 30.0 fall '19
- faculty FT shortfall, doing more with less

Any sequence interruption **Repels Momentum!**

DFWI Gateway Fall 2019	
ITEC 1001*	19.9%
ITEC 2140	51.2%
ITEC 2150	21.6%
ITEC 2201	17.6%

* Gen-ed, all majors

GGC Information Technology
Digital Media Track
AY19-20

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4) If the student does not achieve the required course grade to advance.

- C or better required
  - in all prerequisites
  - any course in major
- Any miss **Repels Momentum!**

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5) Student Suspends or Takes a Pause Semester

- "It's taking too long!"
- Anecdotally, we know this
  - Monetary reasons
  - Job demands increase, in- or out-of-field
  - Could use more data
  - Increased during pandemic
- Adds one or more semesters, **Repels Momentum!**

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6) Conditions Compound

- Frequently observed
  - through exception requests - pre-req overrides, non-standard substitutions, pile up at capstone time
  - for those that make the request. How many more are there?
- Perhaps 1-2 setbacks can be absorbed
- Long course sequences chains are unforgiving
- Consider the 5-year paced student
  - 1-2 more setbacks can easily push them to 5.5 or 6 or 6+
- Multiple setbacks will delay completion, **Repelling Momentum!**

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RECOMMENDATIONS

Work with GGC stakeholders to improve fulltime enrollment options

    - financial aid, scholarships

Mentoring

    - Focus with students on proper course sequencing

    - Advocate/reward Peer Supplemental Instruction (PSI) attendance and Academic Enhancement Center (AEC) tutoring in ENGL, MATH, and ITEC gateways

    - Keep mentor load manageable, allowing familiarity and personalized attention

Increase ITEC fulltime faculty

Explore

    - Methods to improve student performance in gateway courses

        PSI, OER, bootcamp(s), online drill/practice tools, etc.

    - Continued pressure testing

    - Gather / analyze deeper data - time to graduation, number of repeats, etc.

    - Summer bridge programs or mini-mesters to help students catch up

    - Peer-mentoring program

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