

# An Undergraduate Major for BSPM: To be or not to be?

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**What happened to the major  
we had ~15 years ago?**

Frank and Janet

# Factors contributing to failure of the Bioagricultural Sciences major

- Advantages unclear to potential students
- Lack of name recognition
- Major had issues prior to transfer from college to the department

# Factors contributing to failure of the Bioagricultural Sciences major (cont.)

- Faculty did not feel connected to major
- Required faculty effort required for success not available
- Tried to make it work with just existing classes. No new classes developed.

**What are the financial  
considerations of having a major?**

Amy

# Potential Annual Proceeds to the Department

	Year 1	Year 2	Year 3	Year 4
Students	Credits: 3	3+6	3+6+6	3+6+6+6
10	\$4,890	\$14,670	\$34,120	\$45,820
20	\$9,780	\$29,340	\$68,240	\$91,640
30	\$14,670	\$44,010	\$102,360	\$137,460

# Potential Cumulative Proceeds to the Department

	Year 1	Year 2	Year 3	Year 4
Students	Credits: 3	3+6	3+6+6	3+6+6+6
10	\$4,890	\$19,560	\$53,680	\$99,500
20	\$9,780	\$39,120	\$107,360	\$199,000
30	\$14,670	\$58,680	\$161,040	\$298,500

# Costs of major

- Specifics unknown
- New classes would be taught by faculty through
  - Meeting current appointment split between teaching, research and outreach
  - Adjusting appointment splits to accommodate additional teaching if the faculty member chooses
  - Enlisting faculty new to the department in development of new courses
  - Revising existing courses to meet student learning outcomes of the program
- Advising provided primarily through Academic Support Coordinators at the college level
  - BSPM faculty and staff to play advising roles, too
- New facilities and other resources
  - Lab teaching facilities part of Shepardson remodel?
  - Department and college funds?
  - Special course fees for supplies?

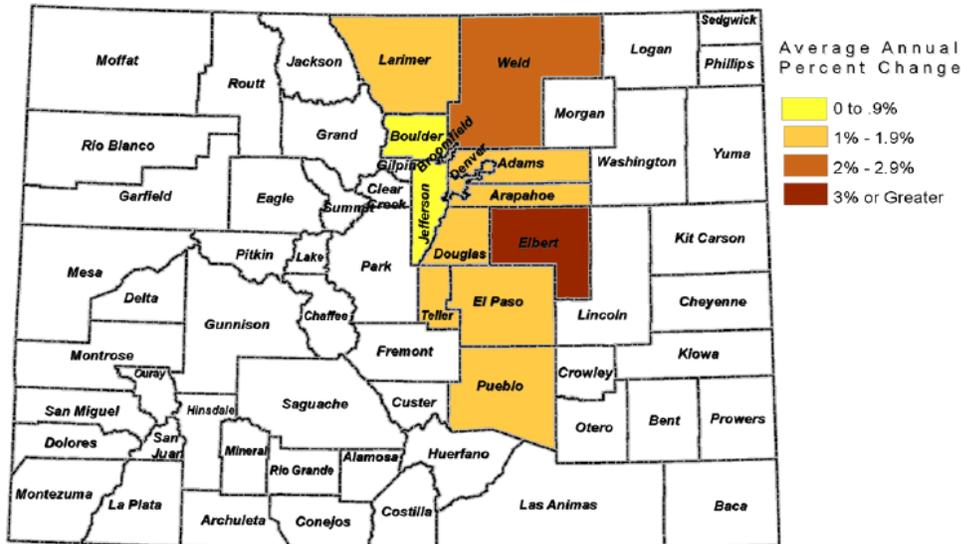
**What do the demographic  
patterns indicate?**

Andrew

# Colorado's population will grow most along the Front Range

North Front Range  
fastest growing  
region

Elbert County  
stronger growth  
due to expected  
job growth.



## Top 5 Counties for Population Growth Population Change 2000-2010

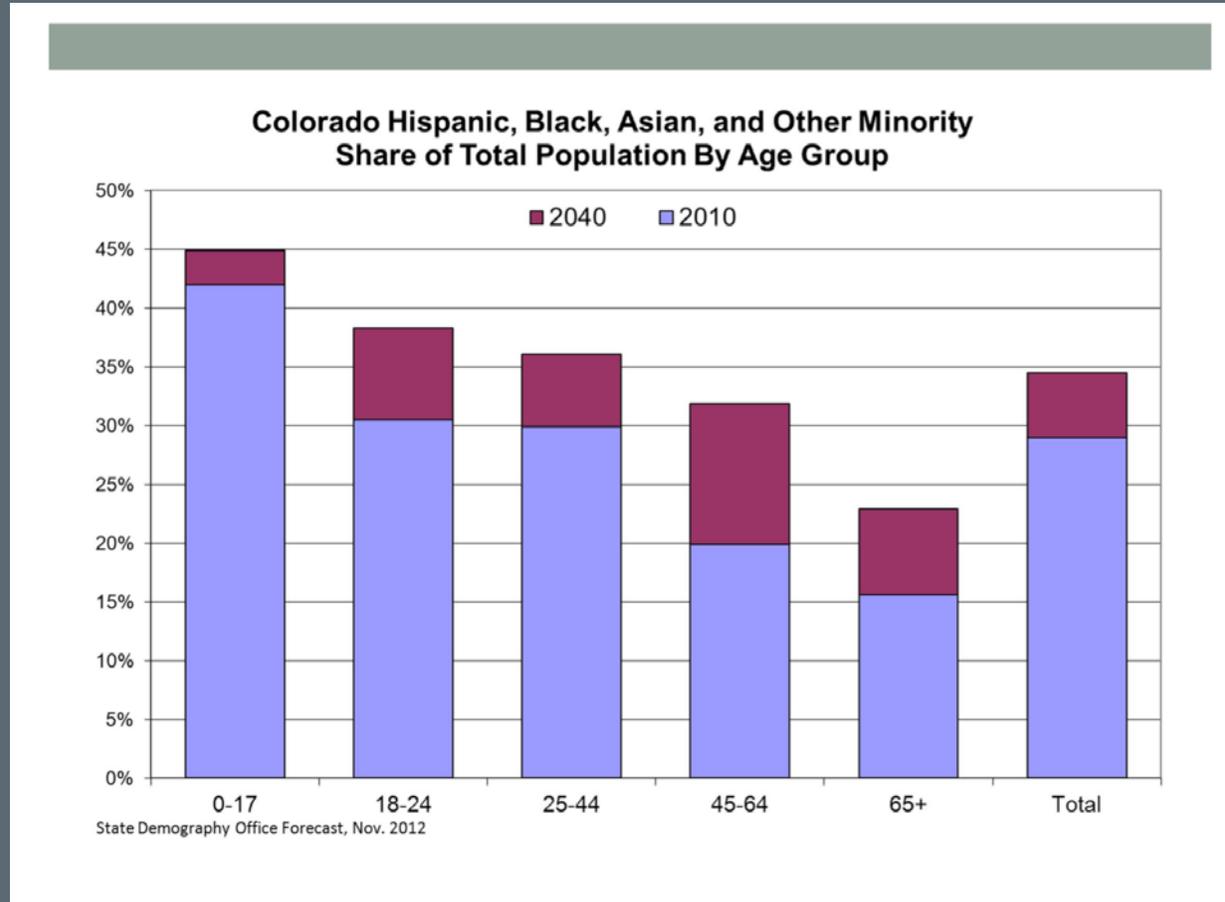
Percent		Total	
Colorado	16.92%	Colorado	727,935
Douglas	62.41%	Douglas	109,699
Weld	39.73%	El Paso	105,334
Garfield	28.77%	Arapahoe	84,036
Mesa	26.21%	Adams	77,746
Eagle	25.30%	Weld	71,889

Source: Census 2010

Expectations of growth 2010-2040 in the metropolitan Front Range.

Population growth 2000-2010 in Colorado from the State Demography Office (2012).

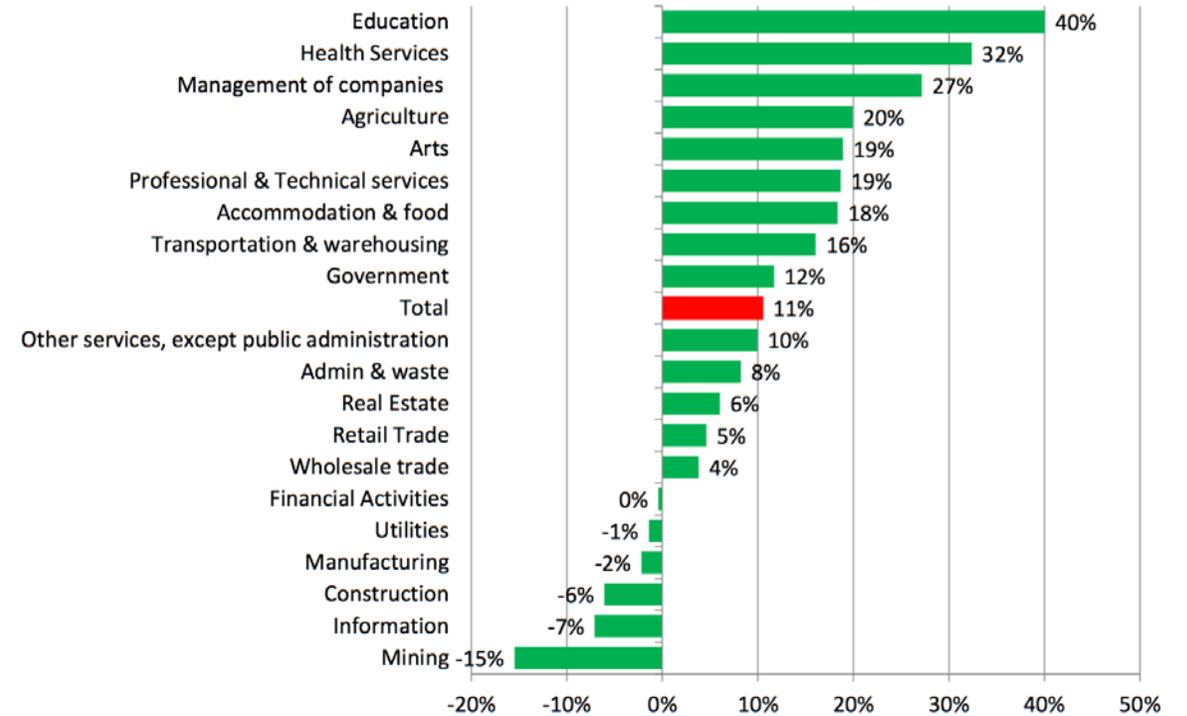
# Colorado's population will become less white



# Employment by Sector

SectorName	Jobs16	Change 08-16	Growth Pct
Government	486,959	49,578	10%
Health Services	325,193	70,548	22%
Retail Trade	308,537	14,893	5%
Prof. and business services	296,668	45,721	15%
Accommodation and food	277,400	42,760	15%
Construction	212,782	(9,868)	-5%
Admin and waste	192,735	14,582	8%
Other Services	188,543	16,889	9%
Manufacturing	149,868	(1,030)	-1%
Finance activities	129,570	3,981	3%
Wholesale trade	112,177	4,108	4%
Real estate	111,649	8,247	7%
Transport and warehousing	95,734	13,243	14%
Arts	81,795	12,555	15%
Information	78,200	(5,963)	-8%
Education	66,215	15,875	24%
Agriculture	46,111	5,564	12%
Mgmt of Companies	36,781	7,767	21%
Mining	27,185	(4,974)	-18%
Utilities	8,543	57	1%
<b>Total</b>	<b>3,232,643</b>	<b>304,532</b>	<b>9%</b>

## 2016 Employment % Change from Pre-recession Peak



# And...

- We can expect fewer traditional farms, but more farm support jobs.
- Farm labor is difficult to find. We will see a huge shift to mechanization and robots.

# A successful undergraduate major will...

- Draw from a larger population in close proximity
- Appeal to students from diverse backgrounds and experiences

**What do potential students want?**

Cini

# Interest in possible curriculum topics

Potential curriculum topic	Ag Ambassadors (6)			St. Vrain Valley FFA (6)			Fossil Ridge High (7)		
	Up	Flat	Down	Up	Flat	Down	Up	Flat	Down
Food and food production	1	4	1	1	5	0	0	4	3
Sustainable agriculture	4	2	0	6	0	0	4	3	
Invasive pests (plant diseases, insects and weeds) and how they affect natural, agricultural and urban systems	3	2	1	3	2	1	3	1	3
Improving food security	6*	0	0	4	2	0	4	1	2
How pests impact agriculture and how to manage them	3	3	0	0	6	0	0	3	4
How plants, insects, and microbes function in natural systems	3	3	0	0	1	5	6	0	1

\*Immediate response without hesitation.

# Interest in potential names for a major

Potential name of new undergraduate major	Ag Ambassadors (6)			St. Vrain Valley FFA (6)			Fossil Ridge High (7)		
	High	Med	Low	High	Med	Low	High	Med	Low
Agricultural Biology	1	3	1	1	5	0	4	3	0
Sustainable Pest Management	2	2	1	1	1	4	1	3	3
Integrated Pest Management	1	2	2	1	1	4	0	3	4
Plant and Ecosystem Health	2	1	2	3	2	1	6	1	0
Plant Protection	0	1	4	1	3	2	0	5	2
Applied Pest Biology	2	1	2	0	4	2	2	1	4
Food System Protection	5	1	0	5	1	0	2	4	1
Food Security Studies	Not included for this group. Added later bcs of their interest in food security			5	1	0	2	3	2

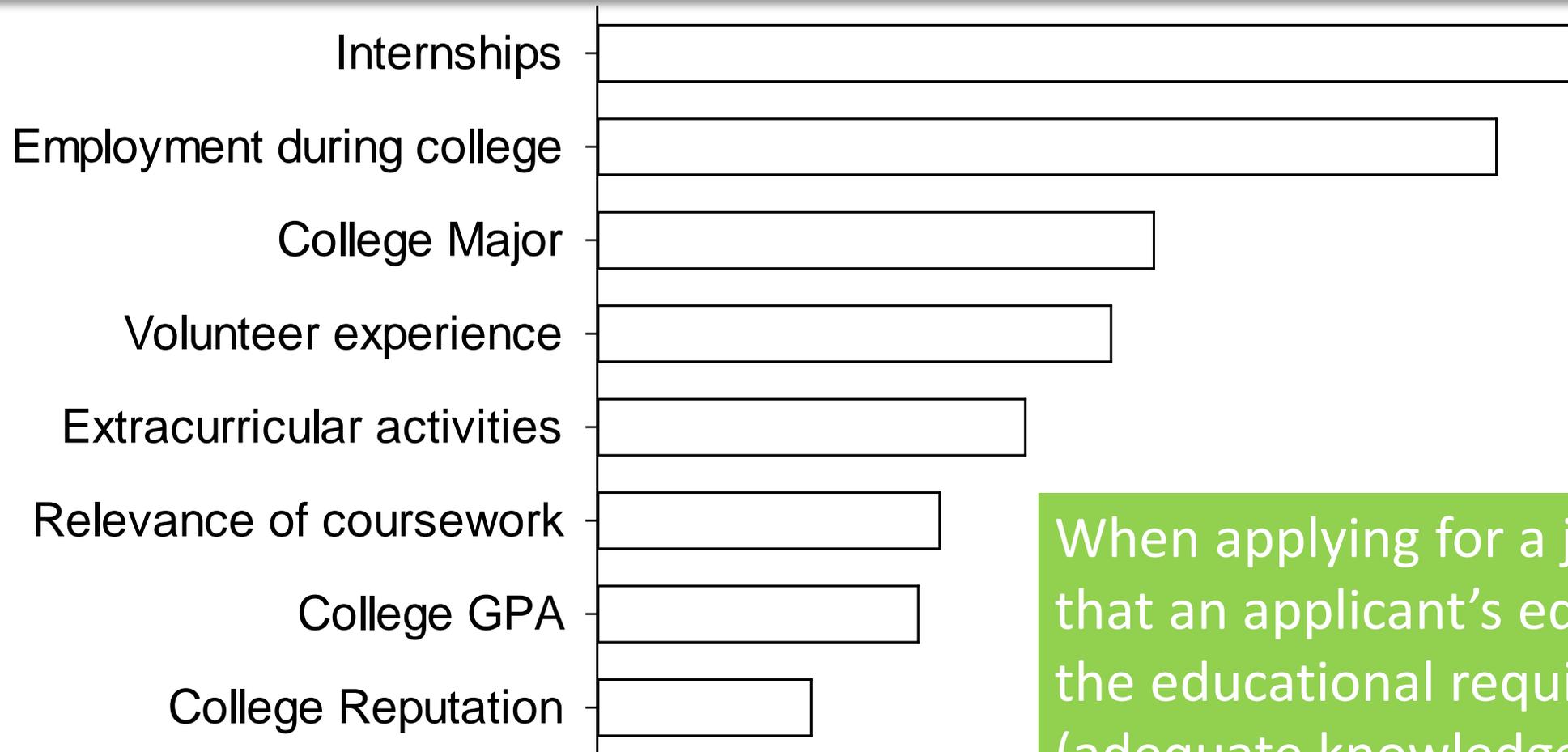
# What we learned about potential students

- We only know what we have experienced or have been exposed to.
- It is important that there is someone at CSU who is the point person for young people who may become majors.
- Young folks who are ag-aware are interested in slightly different topics and names than those who may or may not be ag-aware
- Potential students are interested in working toward solving the big problems facing their generation
  - e.g. food security resonates more with them than pest control

# What do employers want?

Cris, Frank and Kirk

# Relative importance of attributes in evaluating graduates for hire



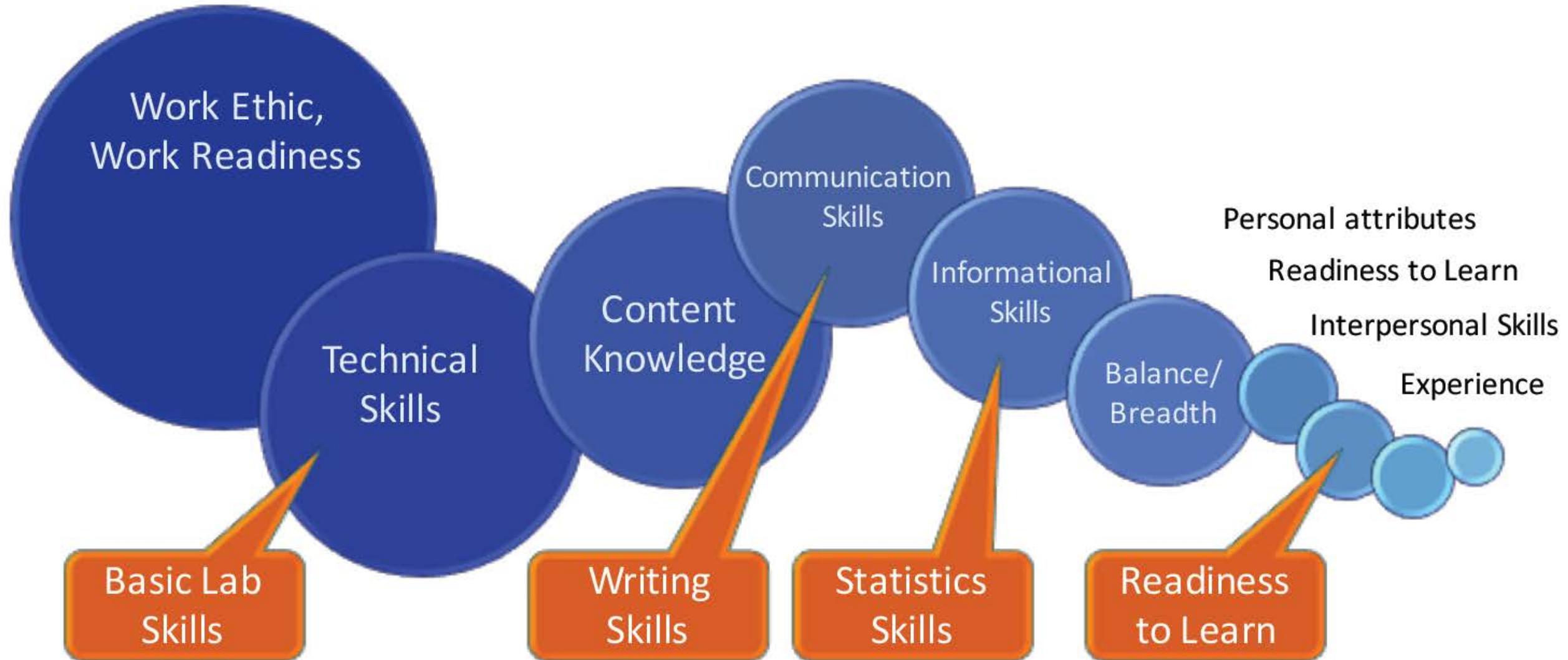
When applying for a job, it is assumed that an applicant's education fulfills the educational requirements (adequate knowledge of a particular subject) to qualify for that position

# Skills desired by employers

- 1- Problem solving skills, critical thinking, creativity, and analytical skills (data management and analysis)
- 2- Communication skills (preparing and giving presentations and reports), interpersonal skills,
- 3- Team work, organizational skills, broad training to be able to work across disciplines, leadership
- 4- Enjoy working on challenging projects

Industry has mentioned that it likes to train their employees in specific skills (hard skills) so it would prefer candidates that have received broad training at university level rather than hyper-specialized scientists

# Skills cited by employers as lacking among recent graduates with BS degrees in plant science fields



**Do other universities offer  
degrees like we can?**

Cris

# Surveyed universities

- Majors with focus on the areas of pest management, including Plant Pathology, Entomology and Weed Sciences
- Peer, regional institutions
- Land grant universities with strong emphasis in agricultural research

- University of Wyoming
- New Mexico State University
- University of Nebraska Lincoln
- Kansas State University
- Montana State University
- University of Idaho
- Utah State University
- University of Arizona
- North Dakota State University
- South Dakota State University
- Oklahoma State University
- University of Nevada

# Only one university offers specializations in all three areas

- Agricultural Biology major, New Mexico State University
- Prepares students for a variety of careers in the biological sciences and agriculture
- Five options...
  - Applied Biology
  - Applied Microbiology
  - Entomology
  - Environmental Biology
  - Invasive Pest Biology

# What courses and other components will the new major have?

Andrew, Todd, Cris and Kirk

# Program Coursework and Other Components

- Student Learning Outcomes

- Experiential Learning
- Interpersonal Skills
- Quantitative Skills, Data Literacy
- Critical thinking skills

(identified from assessment of employer needs)

Is our existing coursework sufficient to create these learning outcomes?

- Likely coursework needs

- 100-level freshman seminar
- 200-level course
- 3 credit capstone

# AUCC Requirements

## 1. Basic Competencies

- A. Intermediate Writing 3
- B. Mathematics 3

## 2. Advanced Writing

- Advanced Writing 3

## 3. Foundations and Perspectives

- A. Biological and Physical Sciences (At least one course will include an associated lab) 7
- B. Arts and Humanities 6
- C. Social and Behavioral Sciences 3
- D. Historical Perspectives 3
- E. Global and Cultural Awareness 3

## 4. Depth and Integration

- Minimum 5 credits, 2 courses 5

- A. Each major must designate courses that build upon the Core Competencies of writing, speaking, and problem solving in an integrative and complementary way.
- B. Each major must designate courses that build upon the foundations of knowledge and intellectual perspectives of Core Category 3 in an integrative and complementary way.
- C. Every major must require a capstone experience at the senior level that consists of a designated course or sequence of courses that offer the opportunity for integration and reflection on students' nearly completed baccalaureate education.

# What a hypothetical minimalist checklist would look like

• Freshman:		• Sophomore:	
• LIFE 102 Attrb. Of Living Systems	3	• CHEM 245 O. chem	4
• CHEM 107 Fund. of Chemistry	4	• CHEM 246 O. chem lab	1
• CHEM 108 Fund. Of Chem Lab	1	• BZ 220 Evolution	3
• CO 150 College Comp.	3	• AUCC Humanities	3
• MATH 117 Algebra	1	• AUCC Global and Cultural (Plants and Civ.)	3
• MATH 118 Algebra	1	• CO 250 or public speaking	3
• MATH 124 Trigonometry	1	• <b>NEW 200 – level Department coursework</b>	<b>3</b>
• PH 110 descriptive physics	3	• Electives outside department	10
• PHIL 110 Logic	3	• Total	30
• AUCC Humanities	3		
• AUCC Social and Behavioral	3		
<b>NEW 100 level discipline course</b>	<b>3</b>		
Total	29		

# What a hypothetical minimalist checklist would look like

• Junior:		• Senior:	
• BSPM 302, 303(a or b),	4(5)	• BSPM 451 IPM	3
• BSPM 308	3	• BSPM 450 Plant-Microbe Interactions	3
• BSPM 310	3	• <b>BSPM Capstone</b>	<b>3</b>
• BSPM 361	3	• BZ 440 Plant Phys.	3
• BZ 350 Genetics	3	• BZ 441 Plant Phys. Lab	2
• STAT 301/307	3	• Electives	16
• AUCC hist	3		
• Total	22		
• 7 – 8 credits electives			

Is the minimalist approach compelling enough, or suffer from the same problems that the old BSPM major did?

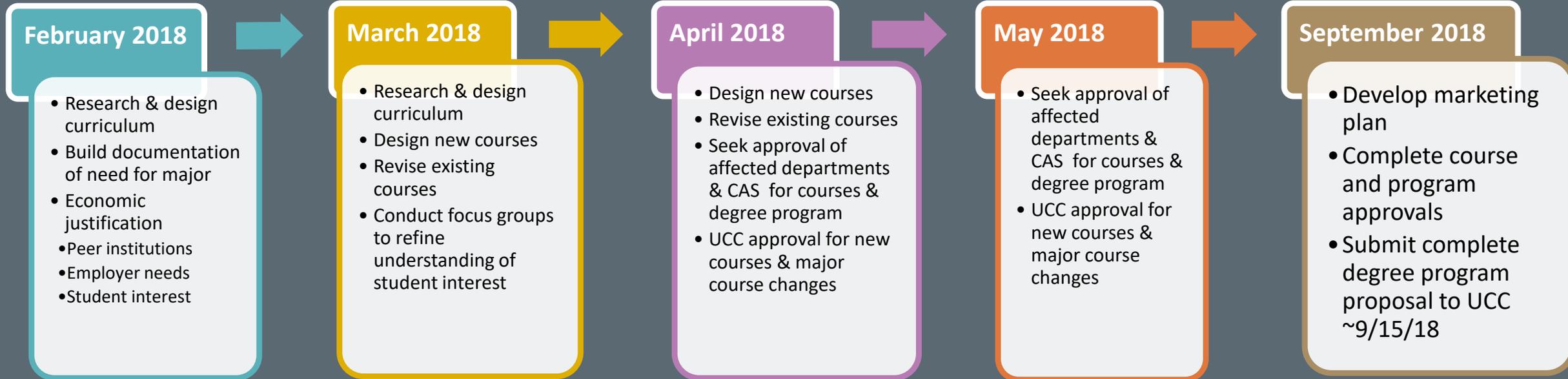
# Program Coursework & Other Components (cont'd)

- Curriculum, courses, and teaching to be thoroughly discussed and vetted with faculty
- No decisions on curriculum made yet
- Need 27 credits for a major, we have approx. 22
- Desire double major fits with S&C, Horticulture, Ag Business

**How soon can we start  
accepting students into a new  
undergraduate major?**

Cini

# Timeline for students to enroll in Fall 2019





# Questions & Discussion

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