Nathan Jacobs

From: Joe Sventek
Sent: Monday, August 26, 2019 9:23 AM
To: Bruce Bowerman; Dan Gavin; Ben Yang; Melissa Redford
Cc: Bill Cresko; Gretchen Drew; Nathan Jacobs; Clay Small
Subject: BS in Data Science due diligence
Attachments: UGDSCurriculum1.0.pdf; 101Syllabus.docx; 102Syllabus.docx; 311Syllabus.docx; 345Syllabus.docx; 402Syllabus.docx

Dear Bruce, Dan, Ben, and Lisa,

As you know, we are in the process of creating a new undergraduate data science degree in order to capitalize on investments to the university as part of the Presidential Data Science Initiative. I believe that this program will bring synergistic gains to the entire university because it will enhance our standing as a strong research campus and help recruit increasingly qualified students. It is our expectation that the Data Science Program will recruit new students to campus, leading to a net increase in the total number and quality of students on campus, rather than being competitive with existing degrees.

At this point, we have initiated the degree approval process. The degree will at least initially sit within CAS under a new Program in Data Science, and so the degree and course approval process is moving though the CAS curriculum committee. This will ensure that the program curriculum fits within university guidelines and complements our current offerings.

The degree proposal requires several quantitative courses from Computer and Information Science and Mathematics to be taken by a student majoring in Data Science. Additionally, five new data science courses will be developed, each of which will involve application of mathematical and computational techniques. While pursuing these core courses, a student must choose a specialization domain; to specialize in a particular domain, the student must take 8-12 credit hours in the domain in the lower division, and then take at least 12 credit hours in the domain in the upper division; these latter courses are selected from a curated list provided by the domain. We have had informal discussions with you or your deputies during the Spring quarter, and the courses associated with your domain in the curriculum document are those that resulted from our discussions and some additional selections we have made as we finalized the syllabi of our new courses.

I am contacting you to ensure that the proposed Data Science Program, including degree requirements and related new course offerings, will not be seen to generate a negative impact on your department as a whole or on your existing courses. Additionally, we want to make sure that there is not significant overlap with your existing course offerings, or that if significant overlap exists, that we can put appropriate measures in place to ensure that student's do not receive duplicate credit for taking multiple courses that each teach the same content.

I'm including in this email an undergraduate curriculum summary, complete with degree plan, as well as syllabi for the set of proposed new data science courses; note that some of the syllabi have edits and comments, as we are in the process of finalizing these for submission to the CAS Curriculum Committee.

Please feel free to comment on any of the offerings as well as the general degree structure. I am also happy to answer any questions that you might have.

There is some urgency in this, as the deadline for submission of the curriculum and the new course proposals for consideration by CAS CC in the Fall Quarter is 5 September; we are trying to have the submissions complete and uploaded to CourseLeaf by this Friday, 30 August.

Thanks so much for your help with this.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

From:	Bruce Bowerman
Sent:	Sunday, September 1, 2019 6:06 AM
To:	Cristin Hulslander
Cc:	Joe Sventek; Bill Cresko; Gretchen Drew; Nathan Jacobs; Clay Small; Shelley Elliott
Subject:	Re: BS in Data Science due diligence

Thanks, Cristin. I let Joe know I agree with your comments.

Bruce

On Aug 29, 2019, at 1:47 PM, Cristin Hulslander <cristinh@uoregon.edu> wrote:

> Hi Joe,
> I sent the message below to Bruce on Monday. I've not received a reply, other than the auto reply that he's away until next week and checking email intermittently. I suspect he will support my thoughts on this.
>
> Let me know if you need anything else for the proposal to move forward,
> Cristin
>
> *Hi Bruce,*
> *I've read through the Data Science materials and don't have major concerns that the new program would negatively impact Biology as a whole or our existing courses. I think that a new data science program could actually benefit Biology, both with providing new courses for our majors to take (some of which will presumably be considered MAPS classes and these classes should better prepare our students for upper division BI classes with this content) and with data science majors taking our classes (having students experienced with programming and other data science skills could up the quality of our upper division classes). While there may be some overlap with a few of our programming-oriented classes (i.e. 4/510 Intro to Programming for Biologists, 4/510 Matlab for Biologists), I'm confident we can work with data science to put a mechanism in place so that students aren't receiving credit for both classes with significant content overlap.*
>
> *I don't think this matters too much yet (and I've had conversations with some of the folks in data science who are developing the undergrad curriculum), but we will need to remind them that students who want to take cell/mol/dev/neuro related upper division classes will likely need to take BI 214 (which is not on their list of lower-division classes and which requires the full sequence of Gen Chem). I will continue to work with data science to be sure they are clear how students will need to work through the lower division sequences in order to take the upper division coursework they want to include in the program.*
>
> *On a similar note, depending on how many majors the new program attracts (and how the major impacts the number of BI majors), we should be prepared to accommodate higher enrollment in at least BI 211, and maybe all the gen bio classes.*
>
> *Let me know if you need anything else on this.*
>
> *Cristin*

On Aug 29, 2019, at 12:58 PM, Joe Sventek <jsventek@uoregon.edu> wrote:

Dear Cristin,

I originally sent this message to Bruce Bowerman on Monday, but have yet heard back from him. I understand that you discussed the biology domain with Clay Small, so I am hoping that you will be able to respond to this message in the affirmative so that I can complete our due diligence.

As you know, we are in the process of creating a new undergraduate data science degree in order to capitalize on investments to the university as part of the Presidential Data Science Initiative. I believe that this program will bring synergistic gains to the entire university because it will enhance our standing as a strong research campus and help recruit increasingly qualified students. It is our expectation that the Data Science Program will recruit new students to campus, leading to a net increase in the total number and quality of students on campus, rather than being competitive with existing degrees.

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Please feel free to comment on any of the offerings as well as the general degree structure. I am also happy to answer any questions that you might have.

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Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

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Cristin Hulslander, Ph.D.
Senior Instructor I Curriculum Coordinator
541-346-7022
Department of Biology
University of Oregon, Eugene, OR 97403

From:	Joe Sventek
Sent:	Wednesday, September 25, 2019 2:13 PM
To:	Nathan Jacobs
Cc:	Gretchen Drew
Subject:	FW: BS Data Science Curriculum

Diane's request for a change to the lower division required courses.

From: Diane Del Guercio
Sent: Monday, September 9, 2019 4:48 PM
To: Joe Sventek <jsventek@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>
Cc: Bill Cresko <wcresko@uoregon.edu>; Angela Davis <davisan@uoregon.edu>; Collette Niland
<collette@uoregon.edu>; Heather Bottorff <bottorff@uoregon.edu>; Michael Pangburn <pangburn@uoregon.edu>;
Ben Yang <zyang@uoregon.edu>
Subject: RE: BS Data Science Curriculum

Hello Joe,
Our group met today to confirm which lower division courses we feel are best suited for the Business Analytics domain
and we have one change to make from the 8/29/19 document.
The three should be:
BA 101, ECON 201, and BA 215.
We assume that you will check with ECON as to whether they have any objection to including one of their courses. This
particular course is taken by pre-Business majors, so I am guessing that they will be fine with including it.

Thank you for the information on the timeline for choosing the upper division courses. This will require more discussion,
so we will work on that on our end. I am sure that we will make changes from the document you sent, but as you said,
we can supply those to you at a later date.

One thing that came up in our discussion is a significant concern regarding the Capstone Senior Project requirement. As
currently stated, domain partners have substantial responsibilities to co-supervise a student's data intensive project. It
also reads as if the domain partners have the responsibility of identifying data sources for individual students. We are
concerned that this will impose a significant workload on our faculty and does not appear to be affordable. We currently
don't require a thesis of our own honors majors for the same reason. Please keep us informed about developments
regarding this requirement, as we do not have the resources to offer this to all comers.
Please let me know if you need anything else from us to support the proposed degree.
Diane

From: Joe Sventek <jsventek@uoregon.edu>
Sent: Monday, September 09, 2019 7:42 AM
To: Sarah Nutter <snutter@uoregon.edu>
Cc: Bill Cresko <wcresko@uoregon.edu>; Diane Del Guercio <dianedg@uoregon.edu>
Subject: RE: BS Data Science Curriculum

Sarah,

Thanks for your message.

What is important at this juncture is that the required courses in the lower division be correct. These courses are supposed to sufficiently introduce students to your domain such that they are able to apply knowledge from the data science core courses to their work in the upper division domain courses. Therefore, if the LD required courses are incorrect, then I would like to address this ASAP.

The upper division domain courses are selected from a curated list. The domain (in this case, business analytics) owns the list. It is expected that the courses on the list will change from year to year as the domain changes its offerings, especially as 410 experimental courses are added. I expect that we will institute an annual refresh policy such that we solicit changes from each allied domain at an appropriate time each academic year for the next academic year.

The purpose of listing both LD and UD courses for each domain in the curriculum is to give the various curriculum committees an idea of how the core + domain structure would work. As such, while important when the degree is operational, I do not think that changes to the UD course list for business analytics needs to be introduced at this time. We certainly need an agreed curated list for business analytics before we go live with the degree; depending upon the chosen approach enabling existing students to change to the major, the curated list may not be needed until academic 2021-2022.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

From: Sarah Nutter
Sent: Sunday, September 8, 2019 4:57 PM
To: Joe Sventek <jsventek@uoregon.edu>
Cc: Bill Cresko <wcresko@uoregon.edu>; Diane Del Guercio <dianedg@uoregon.edu>
Subject: Re: BS Data Science Curriculum

Hi Joe – Thanks for sharing the documents. I had not seen them. Did have a chance to talk with Diane Del Guercio and Collette Niland this past week – they had not seen them either. Diane did reach out to Ben and he shared his communications with you. Do know we have some concerns about the courses that were selected for the business analytics track. The department heads had discussed this several times this spring. I do believe changes will need to be made.

Would like to follow up. Given my travel schedule, I've cc'd Diane Del Guercio as she will be taking point on this for the College.

Sarah

Sarah E. Nutter
Edward Maletis Dean and Professor of Accounting
Lundquist College of Business
University of Oregon

From: Joe Sventek <jsventek@uoregon.edu>
Date: Friday, August 30, 2019 at 12:42 PM

To: Sarah Nutter <snutter@uoregon.edu>
Subject: BS Data Science Curriculum

Sarah,

The Curriculum document is attached. I have also attached the syllabi of the 5 new courses.

Joe Sventek

From:	Ben Yang
Sent:	Thursday, August 29, 2019 10:44 AM
To:	Joe Sventek
Subject:	Re: LCB and Data Science

Thanks Joe!

This looks good for now. I am happy to be engaged in the conversation on this matter in the future.

Cheers,

Zhibin (Ben) Yang

==
Associate Professor, Operations & Business Analytics
James F. and Shirley J. Rippey Research Scholar
Charles H. Lundquist College of Business, University of Oregon
1208 University of Oregon, Eugene, OR 97403-1208

Office: 481 Lillis
Voice: (541) 346-3308
email: zyang@uoregon.edu
http://business.uoregon.edu/faculty/zhibin-ben-yang
==

On Aug 29, 2019, at 9:17 AM, Joe Sventek <jsventek@uoregon.edu> wrote:

Ben,

Thanks so much for the significant time you have spent looking into this for us.

We are trying to show in the CourseLeaf curriculum submission that we have lined up 4 domains as exemplars of the core + domain specialization structure. It is anticipated that we will add many more domains in the coming year, and may modify/enhance the listed domains going forward, as well.

I would like to stick with simply indicating the Business Analytics Domain for now in our submission and stick to the narrow, well-defined "first path". I have modified the lower division and upper division lists as per your discussion below to the following:

Business Analytics Domain:
Lower-Division – take all three
- BA 101 Introduction to Business 4 cr
- ACTG 211 Introduction to Accounting I 4 cr
- EC 201 Introduction to Economic Analysis: Microeconomics 4 cr

Upper-Division – select at least three
- OBA 335 Operations Management 4cr
- OBA 410 Predictive Analytics 4cr
- OBA 410 Big Data 4cr
- OBA 444 Business Database Management Systems 4cr (*not if CIS 451 has been taken*)
- OBA 466 Project and Operations Management Models 4cr

Later in the academic year I would like to get together with you to further discuss your "second path" proposal below.

I would be most grateful if you could respond ASAP indicating that you agree with these proposed lists for the first path definition such that I can document your agreement in the submission.

Thanks again for your help.

Joe Sventek

Hi Joe

I did some digging into LCB's major, concentrations and minors courses. In this process, I left out the Account major and kept the Business Admission major and the five associated concentrations for consideration. There are four minors offer by LCB: business administration, entrepreneurship, sports business, and sustainable business.   I also examine the pre-business requirement. All information is available fromhttps://business.uoregon.edu/ug. I will divide my response into "lower division" and "upper division".

LOWER DIVISION COURSES

Here is my discovery from the minors and pre-business program:
- All four minors and pre-business list BA 101 as required.
- Pre-business requires BA240 as "supporting" course and BA101 and EC201 as "core".
So, I definitely recommend BA101 and EC201 as a lower division courses. I am unsure about BA 240, because it is essentially MS Excel skills and be substituted from outside of LCB. If any other course(s) is to be considered for lower division, I will recommend ACTG211 and/or ACTG213, because they are pre-reqs for many business cores, if the students ever wants to adventure there (also see the "second path" that I will discuss this later).

UPPER DIVISION COURSES

The OBA courses in your list includes many 400 level courses, which are either outdated or substitutable.
- OBA 330 and 340 have recently been rebranded to be OBA 312 and OBA311 (Business Analytics II&I). OBA 330 (now OBA312) is basic statistics and linear regression. OBA 340 (now OBA 311) is general introduction to business information technology. OBA444 is relational database with business applications. Can Data

Science students gain these skills/knowledge from outside of LCB (such as Data Sci. core or CIS)?

- I am not sure OBA433 will be offered into the future, as it overlaps with the two new OBA410 courses: Predictive Analytics and Big Data.
- OBA 477 is a capstone project course for the OBA concentration in LCB. I wouldn't recommend it for non-business major for now. But possible in the future.

So, OBA335 is the lone survivor on your list of OBA courses. If I may, I will also recommend OBA 466 "Project and Operations Management Models". This course covers some project management and some linear programming (optimization) and can be useful to Data Sc students, if these subjects are not already covered by the Data Sci core.

I am OK with the list of FIN courses, but I have a general concern. The upper division list draws from two fields of LCB: finance and OBA. There are other fields in LCB not included, such as marketing and management. This would limit Data Sc students' choice and exposure to business. To resolve this issue, I suggest two optional (but not mutually exclusive) paths. The **first path** is narrow but well-defined. Students can use the requirement of a LCB minor as template for course taking (and receive a minor). You may simply copy the required courses and organize them by the minors. Please see https://business.uoregon.edu/ug/minors for more information.

The **second path** is more flexible/customizable but needs careful planning by the student.
- You may list most/all upper division business cores (such as BA308, MKTG311, FIN311, FIN316, MGMT311, OBA335 … seehttps://business.uoregon.edu/ug/majors/business-administration for full list) to allow full spectrum of choice. They are also used to meet pre-req for 400 courses, if the students wants to take them. (see my next point)
- You may also list senior 400 (and some advanced 300) courses, if you decide to open them to the Decision Sc students. A caveat is that the student have to careful plan their 300 courses to satisfy pre-reqs of these 400 courses. Following is an incomplete list of senior course of each subject field. I am sure I miss some courses that can be potentially interesting to Data Sc students, but it is only a starting point.
  - Finance: no change to your list
  - Management: MGMT455 Implementing Entrepreneurial Strategies
  - Marketing: MKTG390 Marketing Research; MKTG435 Consumer Behavior
  - OBA: OBA 466 Project and Operations Management Models; OBA 410 Predictive Analytics & OBA 410 Analyzing Big Data (if there is no such coverage in Data Sc core and CIS list).

Hope this helps. If you need more information, please let me know.

Cheers,

Zhibin (Ben) Yang

==
Associate Professor, Operations & Business Analytics
James F. and Shirley J. Rippey Research Scholar
Charles H. Lundquist College of Business, University of Oregon
1208 University of Oregon, Eugene, OR 97403-1208

Office: 481 Lillis
Voice: (541) 346-3308

email: zyang@uoregon.edu
http://business.uoregon.edu/faculty/zhibin-ben-yang
===

On Aug 21, 2019, at 2:53 PM, Joe Sventek <jsventek@uoregon.edu> wrote:

Ben,

We are scrambling to get the program spec and the new course specs in to the CAS curriculum committee by 5 September for consideration this fall.

Attached is a document that describes the overall degree program. Each student must take a set of core courses, select an additional 3 courses from a curated list of CIS courses for Computational and Inferential Depth, and then take a minimum of 5-6 courses in a specialization domain.

We have looked over the courses/tracks in LCB, and think the following are appropriate business courses to function as a specialization domain for the Data Science degree:

Lower Division
Most upper-division LCB courses require at least the following 3 courses as prerequisites:
- BA 101 Introduction to Business
- BA 240 Managing Business Information
- EC 201 Introduction to Economic Analysis: Microeconomics

We, therefore, recommend that these be the required lower division courses for a business specialization.

Upper Division
In our review of upper division courses, two tracks shown through in terms of a potential business specialization

Finance
- FIN 316 Financial Management
- FIN 380 Financial Markets and Investments
- FIN 462 Derivative Markets and Financial Institutions

Operations and Business Analytics
- OBA 330 Business Statistics
- OBA 335 Operations Management
- OBA 340 Business Information Systems
- OBA 433 Information Analysis for Managerial Decisions
- OBA 444 Business Database Management Systems
- OBA 477 Supply-Chain Operations and Information

Since the upper division requirement is a minimum of 3 courses from a curated list of UD courses, the Finance track just makes it, whereas the OBA track enables the student to choose 3 from 6.

I would like to be able to list the 3 Lower Division courses and the OBA curated set in our degree proposal document. Are you agreeable to me doing so? Have we got the set of courses wrong? Any other advice you might have for me?

Thanks in advance.

Joe Sventek
<UGDSCurriculum.pdf>

From:	Melissa Baese-Berk
Sent:	Monday, August 26, 2019 12:21 PM
To:	Melissa Redford; Joe Sventek
Subject:	Re: BS in Data Science due diligence

Dear Joe,

Thank you for the opportunity to comment on this. There is not significant overlap with Linguistics curriculum (of course some of the same topics are covered, but from a different perspective). The data science program will supplement the Linguistics program, as students will likely be able to double major in the two if they choose, which would prepare them well for a graduate program in Computational Linguistics, something many of our students are interested in.

Best,
Melissa

Melissa Baese-Berk, PhD
Department of Linguistics
University of Oregon

Pronouns: she/her

On Aug 26, 2019, at 11:29 AM, Melissa Redford <redford@uoregon.edu> wrote:

Hello Melissa,

Can I ask you to scan the attached and respond?

Thanks,

Lisa

From: Joe Sventek <jsventek@uoregon.edu>
Date: Monday, August 26, 2019 at 9:22 AM
To: Bruce Bowerman <bowerman@uoregon.edu>, Dan Gavin <dgavin@uoregon.edu>, Ben Yang <zyang@uoregon.edu>, Melissa Redford <redford@uoregon.edu>
Cc: Bill Cresko <wcresko@uoregon.edu>, Gretchen Drew <gdrew@uoregon.edu>, Nathan Jacobs <njacobs2@uoregon.edu>, Clay Small <csmall@uoregon.edu>
Subject: BS in Data Science due diligence

Dear Bruce, Dan, Ben, and Lisa,

As you know, we are in the process of creating a new undergraduate data science degree in order to capitalize on investments to the university as part of the Presidential Data Science Initiative. I believe

that this program will bring synergistic gains to the entire university because it will enhance our standing as a strong research campus and help recruit increasingly qualified students. It is our expectation that the Data Science Program will recruit new students to campus, leading to a net increase in the total number and quality of students on campus, rather than being competitive with existing degrees.

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Thanks so much for your help with this.

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From:	Mark Fonstad
Sent:	Thursday, August 29, 2019 10:54 AM
To:	Joe Sventek
Cc:	Dan Gavin
Subject:	Re: Data Science major proposal

Hi Joe,

Dan and I have had a look through your email. We don't have major comments… we agree with your annotations, and reasons for leaving out 494 and 495. BTW, while the mapping with drones course is something we plan to support now and in the future, we have no means of supporting the Machine Learning topic other than this year, unless a new faculty wants it. We apologize about not having a full 181 syllabus…neither Dan nor I have a complete syllabus at the moment either.

Cheers, Mark

From: Joe Sventek
Sent: Thursday, August 29, 2019 8:43 AM
To: Mark Fonstad
Subject: RE: Data Science major proposal

Mark,

Thanks for your message. I have several comments/questions inline below. I'd be grateful if you could get back to me sometime today indicating agreement with what I have said (or how it should be amended) so I can document our discussion in the CourseLeaf curriculum submission.

To summarize:
Lower Division
- GEOG 181 Our Digital Earth
- GEOG 281 The World and Big Data
- GEOG 481 GIScience I

Upper Division
- GEOG 482 GIScience II
- GEOG 485 Remote Sensing I
- GEOG 486 Remote Sensing II
- GEOG 490 Special Topics (must have approval from the DSCI director of undergraduate studies)
- GEOG 491 Advanced GIS: Python
- GEOG 493 Advanced Cartography
- GEOG 496 Location-Aware Systems
- GEOG 498 Geospatial Project Design

Joe Sventek

From: Mark Fonstad <fonstad@uoregon.edu>
Sent: Wednesday, August 28, 2019 11:31 AM
To: jsventek@cs.uoregon.edu
Cc: Dan Gavin <dgavin@uoregon.edu>
Subject: Data Science major proposal

Dear Joe,

My name is Mark Fonstad, and earlier this summer I was asked to be the point of contact between Geography and the Data Science major. Thank you for working with everyone on the Data Science major proposal. I appreciate all the good thoughts and work that have gone into it. Those of us in the Geography Department who work on these topics are glad to be involved. I didn't realize that the major proposal was going to be submitted this week; I only learned this from my department chair last night. As I don't think there have been any meetings to discuss details of the proposal this summer, I thought I should write with a small number of suggestions given to me by faculty involved in our spatial data science major.

I see in the proposal documents this morning that GEOG 481 is now listed as a "lower division" class – that I think is good; it solves some of the lower division/upper division imbalance that some faculty were concerned about (we have far more "upper division" courses in the spatial data Science major than we do lower-division ones, and GEOG 481 is a prerequisite for many of them). We are hoping that the following courses in Geography might be counted as upper division courses in the Data Science major. Basically these are the upper-level courses in our spatial data science major

GEOG 485: Remote Sensing I (already listed in the proposal)
GEOG 486: Remote Sensing II (already listed in the proposal)
GEOG 490: Topics: Webmapping
GEOG 498: Geospatial Project Design – JS: this would appear to be a good precursor to the Capstone Project
GEOG 491: Advanced GIS: Python
GEOG 482: GIScience II (already listed in the proposal)
GEOG 493: Advanced Cartography (already listed in the proposal)
GEOG 494: Spatial Analysis JS: not listed as per the discussion below
GEOG 490: Special Topics*(Some examples of the special topics from this coming year: GEOG 490: Topics: Public Health & GIS, GEOG 490: Topics: Mapping & Drones, GEOG 490: Topics: Machine Learning)
JS: since DSCI students are required to take a course in Machine Learning, I will list GEOG 490 but indicate that permission is required so we can vette the overlap.
GEOG 495: Geographic Data Analysis JS: not listed as per the discussion below
GEOG 496: Location-Aware Systems
GEOG 498: Geospatial Project Design JS: this was listed above

There are a couple of overlap issues you might consider. Our introductory spatial data science course is GEOG 181: Our Digital Earth. It looks like there is a significant amount of overlap between this course and the proposed Data Science 101 course.
JS: DSCI 101 provides a broad, but shallow, introduction to data science topics; it is a core education course (formerly gen ed). It introduces just enough Python and Jupyter notebooks so that students can begin to understand and perform data analysis. While I have not been able to obtain a copy of the GEOG 181 course syllabus, it appears to spend most of the time discussing "the emergence of geospatial data and technologies that are pervasive in our everyday lives and how they are shaping society". As such, I do not expect that there is sufficient overlap to prevent students from taking both for credit, and more importantly from the perspective of domain emphasis, GEOG 181 looks to firmly establish why Geography is an important domain of specialization.

Our existing GEOG 495 course, Geographic Data Analysis, is a statistics and data analysis-heavy course that is a core class for both undergrad and grads in our department; it does have a strong spatial data flavor but is not limited to just spatial data.

JS: I will not list GEOG 495 as a class in the curated upper division course list, since it appears that there is significant overlap.

There may also be a considerable amount of overlap between GEOG 494, Spatial Analysis, and some of the proposed course material in the major proposal.

JS: from the syllabus at https://cpb-us-e1.wpmucdn.com/blogs.uoregon.edu/dist/3/5358/files/2014/01/GEOG-494-11u4cip.pdf, it appears that it also has significant overlap to material covered in the DSCI core courses. As a result, it, too, will not appear in the curated list.

Please let me know if there is anything we might help clarify or help with as the proposal process for the new major goes forward. I've also copied our chair Dan Gavin on this email in case he'd like to add any thoughts or take questions. Thanks again for all of your hard work.

Cheers,
Mark Fonstad

From:	Dan Gavin
Sent:	Tuesday, August 27, 2019 10:56 PM
To:	Joe Sventek
Subject:	Re: BS in Data Science due diligence

Hi Joe,

This is all in line with how I remember from the spring, and while I am informing Geog faculty I don't anticipate major concerns coming at this point. I think we might have suggestions for other courses in the Geography domain area. We do regularly teach a Python class and given the consistent use of Python in these new courses, this might be largest (but limited) negative impact on our programs. I'll have more for you before Friday (I hope!)

Dan
Daniel G. Gavin
Professor and Department Head
Department of Geography, University of Oregon, Eugene OR 97403-1251
office: 541-346-5787 lab: 541-346-2698

On Aug 26, 2019, at 9:22 AM, Joe Sventek <jsventek@uoregon.edu> wrote:

Dear Bruce, Dan, Ben, and Lisa,

As you know, we are in the process of creating a new undergraduate data science degree in order to capitalize on investments to the university as part of the Presidential Data Science Initiative. I believe that this program will bring synergistic gains to the entire university because it will enhance our standing as a strong research campus and help recruit increasingly qualified students. It is our expectation that the Data Science Program will recruit new students to campus, leading to a net increase in the total number and quality of students on campus, rather than being competitive with existing degrees.

At this point, we have initiated the degree approval process. The degree will at least initially sit within CAS under a new Program in Data Science, and so the degree and course approval process is moving though the CAS curriculum committee. This will ensure that the program curriculum fits within university guidelines and complements our current offerings.

The degree proposal requires several quantitative courses from Computer and Information Science and Mathematics to be taken by a student majoring in Data Science. Additionally, five new data science courses will be developed, each of which will involve application of mathematical and computational techniques. While pursuing these core courses, a student must choose a specialization domain; to specialize in a particular domain, the student must take 8-12 credit hours in the domain in the lower division, and then take at least 12 credit hours in the domain in the upper division; these latter courses are selected from a curated list provided by the domain. We have had informal discussions with you or your deputies during the Spring quarter, and the courses associated with your domain in the curriculum document are those that resulted from our discussions and some additional selections we have made as we finalized the syllabi of our new courses.

I am contacting you to ensure that the proposed Data Science Program, including degree requirements and related new course offerings, will not be seen to generate a negative impact on your department as a whole or on your existing courses. Additionally, we want to make sure that there is not significant overlap with your existing course offerings, or that if significant overlap exists, that we can put appropriate measures in place to ensure that student's do not receive duplicate credit for taking multiple courses that each teach the same content.

I'm including in this email an undergraduate curriculum summary, complete with degree plan, as well as syllabi for the set of proposed new data science courses; note that some of the syllabi have edits and comments, as we are in the process of finalizing these for submission to the CAS Curriculum Committee.

Please feel free to comment on any of the offerings as well as the general degree structure. I am also happy to answer any questions that you might have.

There is some urgency in this, as the deadline for submission of the curriculum and the new course proposals for consideration by CAS CC in the Fall Quarter is 5 September; we are trying to have the submissions complete and uploaded to CourseLeaf by this Friday, 30 August.

Thanks so much for your help with this.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

<UGDSCurriculum1.0.pdf><101Syllabus.docx><102Syllabus.docx><311Syllabus.docx><345Syllabus.docx><402Syllabus.docx>

From:	Bruce Bowerman
Sent:	Friday, November 1, 2019 1:20 PM
To:	Joe Sventek
Subject:	Re: URGENT - require a response from you at your earliest convenience

Biology agreed to all of the statements, Joe. Thanks for making this happen.

Bruce

On Nov 1, 2019, at 12:44 PM, Joe Sventek <jsventek@uoregon.edu> wrote:

At the behest of the undergraduate council and the UOCC, I have been asked to solicit your unit's agreement in writing to the following principles governing inclusion of your unit's domain in the bachelor's degree in Data Science curriculum. These principles were implicit in our discussions over the summer, so none of them should be a surprise. If you have any questions, please do not hesitate to contact me by email (jsventek@uoregon.edu) or by telephone (6-3473 or 541-918-1506). Thanks in advance.

Apologies for requiring a rapid response.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

A domain-owning unit that is a part of the Data Science program agrees to the following:
- the unit works with the DS program to define the list of domain core courses
- the unit works with the DS program to define the list of (at least 4) domain elective courses, documenting constraints on course choice in this list
- DSCI students will have the same registration priority and access to courses in these lists as the unit's own majors
- the unit will expand offering of DSCI listed courses if these courses cannot accommodate new and existing students
- the unit participates in an annual update to the core and elective lists, usually in Winter quarter, for students to consider when enrolling for their courses in the subsequent academic year
- the unit will work with the DS program to optimize prerequisites for the domain elective courses
- the unit will declare if it supports joint supervision of students taking the Capstone course
- if the unit ***does*** support joint supervision of students taking the Capstone course:
  - the unit will identify faculty who will provide supervision for the Capstone course
  - the unit and the identified faculty will provide raw domain data for use by Capstone students

Therefore, please indicate your agreement to the following statements:
1. My unit agrees to work with the DS program to define the list of domain core courses

2. My unit agrees to work with the DS program to define the list of at least 4 domain elective courses, documenting constraints on course choice in this list
3. DSCI students will have the same registration priority and access to the courses in these lists as my unit's majors
4. My unit will expand offering of DSCI listed courses if these courses cannot accommodate new and existing students
5. My unit will participate in an annual update to the core and elective lists
6. My unit will work with the DS program to optimize prerequisites for the domain elective courses
7. Does your unit support joint supervision of students taking DSCI 411 (the Capstone course)? YES/NO
8. If the answer to point 7 is YES:
    a. My unit will identify faculty who will provide joint supervision for the Capstone course
    b. My unit and the identified faculty will provide raw domain data for use by Capstone students

From:	Dan Gavin
Sent:	Monday, November 4, 2019 3:18 PM
To:	Joe Sventek
Subject:	Re: URGENT - require a response from you at your earliest convenience

Hi Joe,

Sorry I started to respond to this but didn't finish because I wanted to confer. See responses below.
Dan

Daniel G. Gavin
Professor and Department Head
Department of Geography, University of Oregon, Eugene OR 97403-1251
office: 541-346-5787 lab: 541-346-2698

On Nov 1, 2019, at 9:44 AM, Joe Sventek <jsventek@uoregon.edu> wrote:

At the behest of the undergraduate council and the UOCC, I have been asked to solicit your unit's agreement in writing to the following principles governing inclusion of your unit's domain in the bachelor's degree in Data Science curriculum. These principles were implicit in our discussions over the summer, so none of them should be a surprise. If you have any questions, please do not hesitate to contact me by email (jsventek@uoregon.edu) or by telephone (6-3473 or 541-918-1506). Thanks in advance.

Apologies for requiring a rapid response.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

A domain-owning unit that is a part of the Data Science program agrees to the following:
- the unit works with the DS program to define the list of domain core courses
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- the unit will work with the DS program to optimize prerequisites for the domain elective courses
- the unit will declare if it supports joint supervision of students taking the Capstone course

- if the unit ***does*** support joint supervision of students taking the Capstone course:
  - the unit will identify faculty who will provide supervision for the Capstone course
  - the unit and the identified faculty will provide raw domain data for use by Capstone students

Therefore, please indicate your agreement to the following statements:

1. My unit agrees to work with the DS program to define the list of domain core courses

YES

2. My unit agrees to work with the DS program to define the list of at least 4 domain elective courses, documenting constraints on course choice in this list

YES

3. DSCI students will have the same registration priority and access to the courses in these lists as my unit's majors

YES

4. My unit will expand offering of DSCI listed courses if these courses cannot accommodate new and existing students

YES but there may be constraints on room size

5. My unit will participate in an annual update to the core and elective lists

YES

6. My unit will work with the DS program to optimize prerequisites for the domain elective courses

YES

7. Does your unit support joint supervision of students taking DSCI 411 (the Capstone course)? YES/NO

YES

8. If the answer to point 7 is YES:
   a. My unit will identify faculty who will provide joint supervision for the Capstone course

YES

   b. My unit and the identified faculty will provide raw domain data for use by Capstone students

If Possible…for some projects it is not a problem, for others it could be a large task for the advisor.

From:	Diane Del Guercio
Sent:	Saturday, November 2, 2019 4:00 PM
To:	Joe Sventek
Cc:	Gretchen Drew; Bill Cresko; Nathan Jacobs; Sarah Nutter; Angela Davis
Subject:	RE: URGENT - require a response from you at your earliest convenience

Hello Joe,
The Lundquist College agrees to statements 1 to 6 below. The answer to the question in 7 is NO. Let us know if you need anything else.
Diane

From: Joe Sventek
Sent: Friday, November 01, 2019 9:44 AM
To: Diane Del Guercio <dianedg@uoregon.edu>; Bruce Bowerman <bowerman@uoregon.edu>; Melissa Redford <redford@uoregon.edu>; Dan Gavin <dgavin@uoregon.edu>
Cc: Gretchen Drew <gdrew@uoregon.edu>; Bill Cresko <wcresko@uoregon.edu>; Nathan Jacobs <njacobs2@uoregon.edu>
Subject: URGENT - require a response from you at your earliest convenience

At the behest of the undergraduate council and the UOCC, I have been asked to solicit your unit's agreement in writing to the following principles governing inclusion of your unit's domain in the bachelor's degree in Data Science curriculum. These principles were implicit in our discussions over the summer, so none of them should be a surprise. If you have any questions, please do not hesitate to contact me by email (jsventek@uoregon.edu) or by telephone (6-3473 or 541-918-1506). Thanks in advance.

Apologies for requiring a rapid response.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

A domain-owning unit that is a part of the Data Science program agrees to the following:
- the unit works with the DS program to define the list of domain core courses
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- the unit participates in an annual update to the core and elective lists, usually in Winter quarter, for students to consider when enrolling for their courses in the subsequent academic year
- the unit will work with the DS program to optimize prerequisites for the domain elective courses
- the unit will declare if it supports joint supervision of students taking the Capstone course
- if the unit **does** support joint supervision of students taking the Capstone course:

- o   the unit will identify faculty who will provide supervision for the Capstone course
- o   the unit and the identified faculty will provide raw domain data for use by Capstone students

Therefore, please indicate your agreement to the following statements:

1. My unit agrees to work with the DS program to define the list of domain core courses
2. My unit agrees to work with the DS program to define the list of at least 4 domain elective courses, documenting constraints on course choice in this list
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7. Does your unit support joint supervision of students taking DSCI 411 (the Capstone course)? YES/NO
8. If the answer to point 7 is YES:
    a. My unit will identify faculty who will provide joint supervision for the Capstone course
    b. My unit and the identified faculty will provide raw domain data for use by Capstone students

From:	Melissa Redford
Sent:	Tuesday, November 5, 2019 5:58 PM
To:	Joe Sventek
Subject:	Re: URGENT - require a response from you at your earliest convenience

Dear Joe,

So sorry for the slow reply. I confirmed with relevant faculty their willingness to do #7. They said, yes, but I then forgot to actually respond to you to let you know that we absolutely agree to all 8 statements listed below, including 8a and 8b:

1. My unit agrees to work with the DS program to define the list of domain core courses
2. My unit agrees to work with the DS program to define the list of at least 4 domain elective courses, documenting constraints on course choice in this list
3. DSCI students will have the same registration priority and access to the courses in these lists as my unit's majors
4. My unit will expand offering of DSCI listed courses if these courses cannot accommodate new and existing students
5. My unit will participate in an annual update to the core and elective lists
6. My unit will work with the DS program to optimize prerequisites for the domain elective courses
7. Does your unit support joint supervision of students taking DSCI 411 (the Capstone course)? YES/NO
8. If the answer to point 7 is YES:
    a. My unit will identify faculty who will provide joint supervision for the Capstone course
    b. My unit and the identified faculty will provide raw domain data for use by Capstone students

Please let me know if you require anything further from me at this juncture.

Best,

Lisa

--

Melissa (Lisa) Redford
Professor and Department Head
Department of Linguistics
University of Oregon
Eugene, OR 97403-1290

From: Joe Sventek <jsventek@uoregon.edu>
Date: Friday, November 1, 2019 at 9:44 AM
To: Diane Del Guercio <dianedg@uoregon.edu>, Bruce Bowerman <bowerman@uoregon.edu>, Melissa Redford <redford@uoregon.edu>, Dan Gavin <dgavin@uoregon.edu>
Cc: Gretchen Drew <gdrew@uoregon.edu>, Bill Cresko <wcresko@uoregon.edu>, Nathan Jacobs

<njacobs2@uoregon.edu>
Subject: URGENT - require a response from you at your earliest convenience

At the behest of the undergraduate council and the UOCC, I have been asked to solicit your unit's agreement in writing to the following principles governing inclusion of your unit's domain in the bachelor's degree in Data Science curriculum. These principles were implicit in our discussions over the summer, so none of them should be a surprise. If you have any questions, please do not hesitate to contact me by email (jsventek@uoregon.edu) or by telephone (6-3473 or 541-918-1506). Thanks in advance.

Apologies for requiring a rapid response.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

A domain-owning unit that is a part of the Data Science program agrees to the following:
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6. My unit will work with the DS program to optimize prerequisites for the domain elective courses
7. Does your unit support joint supervision of students taking DSCI 411 (the Capstone course)? YES/NO
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From:	Jeremy Piger <jpiger@uoregon.edu>
Sent:	Sunday, October 6, 2019 1:37 PM
To:	Joe Sventek
Subject:	Re: Permission to list one of your courses as a required part of one of our degrees

Joe,

I am in agreement with the LCB listing EC 201 as one of their domain core courses for the Data Science degree.

Best,
Jeremy

Jeremy Piger
Department Head and Professor of Economics
University of Oregon
web: pages.uoregon.edu/jpiger/
twitter: @JPiger

Designated Reporter: I am required to report any incidents of prohibited discrimination and harassment including sexual violence or sexual harassment that I hear about to the university administration. I will also direct students to resources to help them.

> On Oct 2, 2019, at 12:34 PM, Joe Sventek <jsventek@gmail.com> wrote:
>
> Jeremy,
>
> I not sure if we have met – I am the Head of Computer and Information Science, and deputy director of the Data Science initiative. It is in this latter capacity that I am contacting you.
>
> I have attached a document that describes the BS in Data Science program that we have submitted to CASCC for approval. The courses consist of a set of required courses from MATH, CIS, DSCI, and PHIL.
>
> In addition to these required courses, a student is required to take a set of domain core courses and domain elective courses. We eventually expect that there will be many domains in which the students can apply their Data Science skills, but for the purposes of the program submission, we worked with 4 exemplar domains: Biology, Geography, Linguistics, and Business Analytics.
>
> Each domain owns the curated lists for their domain core courses and their domain elective courses. Business Analytics has chosen ECON 201 as one of the courses in their domain core list.
>
> I understand that ECON 201 is a required course for pre-Business majors; the purpose of this email is to obtain your concurrence that LCB can list ECON 201 as one of their domain core courses.

I should note that we have no idea regarding the number of students that would be pursuing a Data Science degree in any particular domain; we anticipate 100+ students doing the degree across all domains when in steady state.

I would be most appreciative if you could socialize this with your departmental curriculum committee and to obtain an email from you indicating that ECON agrees to this situation. If you have any questions, I can be reached by email at jsventek@uoregon.edu; alternatively, for real-time communication, my cell is 541-918-1506.

Thanks in advance.

Joe Sventek
Professor and Head
Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

<UGDSCurriculum1.0.pdf>

From:	Joe Sventek
Sent:	Friday, November 1, 2019 10:18 AM
To:	Nathan Jacobs
Cc:	Gretchen Drew; Bill Cresko
Subject:	FW: Data Science Business Domain course changes
Attachments:	Proposed courses for domains for Data Science Lundquist College 10-31-19.docx; Waiving the BA240 Requirement.docx

Nathan,

Received this from LCB yesterday afternoon. Please modify the curriculum to reflect these changes; I will modify the UGC response document. I think this now addresses the relevant issues raised by UGC.

Joe

From: Diane Del Guercio
Sent: Thursday, October 31, 2019 4:04 PM
To: Joe Sventek <jsventek@uoregon.edu>
Cc: Angela Davis <davisan@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>; Michele Civiello <civiello@uoregon.edu>; Gretchen Drew <gdrew@uoregon.edu>; Bill Cresko <wcresko@uoregon.edu>; Hal Sadofsky <sadofsky@uoregon.edu>
Subject: RE: Data Science Business Domain course changes

Hi Joe,
Our group met today and have revised the page sent to you on 10/15/19 to address the questions regarding BA 240. We hope the attached details on the two options for tracks in Business (Accounting and Marketing) are clear enough. I'm including information on how students currently test out of BA 240 in case it is helpful to the committee. I also added contact information so the committee could send us any remaining questions. This version incorporates the fourth course in the specialization option you mentioned in lieu of an individual thesis/capstone. The Accounting track in particular features a major capstone project within a course (ACTG 410). Please let me know if you need anything else. Angie Davis and I are still hoping to meet with you at some point to discuss some questions we have.
Diane

From: Joe Sventek
Sent: Thursday, October 31, 2019 11:01 AM
To: Diane Del Guercio <dianedg@uoregon.edu>
Cc: Angela Davis <davisan@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>; Michele Civiello <civiello@uoregon.edu>; Gretchen Drew <gdrew@uoregon.edu>; Bill Cresko <wcresko@uoregon.edu>
Subject: RE: Data Science Business Domain course changes

Diane,

The statistics and probability course, DSCI 345, has students doing all of their exercises and projects using Python frameworks. There is nothing in the curriculum that covers Excel or Tableau. I think offering the short course so they can test out would work best here.

Joe

From: Diane Del Guercio
Sent: Wednesday, October 30, 2019 4:48 PM
To: Joe Sventek <jsventek@uoregon.edu>
Cc: Angela Davis <davisan@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>; Michele Civiello <civiello@uoregon.edu>; Gretchen Drew <gdrew@uoregon.edu>; Bill Cresko <wcresko@uoregon.edu>
Subject: RE: Data Science Business Domain course changes

Thanks Joe. I do have one question that will help us assess the best options. BA 240 is essentially an Excel class, with 2 class sessions on Tableau. I attach the specific topics as an excerpt from a current syllabus to be clear. The question is whether this material (Excel) is covered somewhere in the DS curriculum. If so, we could definitely waive this. Alternatively, we can design a test for students to potentially test out of it, or have a short course (e.g., 2-day) prep that they could subsequently test out, etc. We have offered the latter as part of some of our programs. I am trying to get the group together tomorrow to discuss, so if you could answer this question soon that will help us.
Diane

From: Joe Sventek
Sent: Monday, October 28, 2019 12:02 PM
To: Diane Del Guercio <dianedg@uoregon.edu>
Cc: Angela Davis <davisan@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>; Michele Civiello <civiello@uoregon.edu>; Gretchen Drew <gdrew@uoregon.edu>; Bill Cresko <wcresko@uoregon.edu>
Subject: RE: Data Science Business Domain course changes

Diane,

A couple of points to consider given recent comments from the undergraduate council:

1. BA 240 is a requirement for many of the upper division courses that you have listed. The three courses that you have listed as domain core are BA 101, BA 215, and EC 201; I have obtained permission from Economics to list EC 201 as one of your core courses. The question is what to do about BA 240?

   Are you willing to waive BA 240 as a prerequisite for the domain elective courses? If not, would you consider using BA 240 as a domain core course instead of BA 215? Or are you mandating that students wishing to have their domain emphasis in business analytics must do 4 core courses? We are concerned about creeping requirements in the Data Science degree with this last option.

2. Since LCB has decided that it does not wish to support the Capstone project, then students with a business analytics domain emphasis must take 4 domain elective courses. This affects the language in the text you provided.

A potential solution to both of the points raised would be to include BA 240 in the required domain specialization sections of both analytics areas. There is nothing that limits the domain electives to 3xx and 4xx courses.

Let me know your impressions at your earliest convenience. We have received tentative approval from CASCC, but addressing point 1 above appears to be an issue with the undergraduate council. If we can resolve this this week, then we can likely get CASCC to approve the change and satisfy the undergraduate council in time for their next meeting on 6 November.

Thanks in advance. Please let me know if you have any questions.

Joe Sventek
Professor and Head

Department of Computer and Information Science
University of Oregon
jsventek@uoregon.edu

From: Diane Del Guercio
Sent: Tuesday, October 15, 2019 7:05 AM
To: Joe Sventek <jsventek@uoregon.edu>
Cc: Angela Davis <davisan@uoregon.edu>; Sarah Nutter <snutter@uoregon.edu>; Michele Civiello <civiello@uoregon.edu>
Subject: Data Science Business Domain course changes
Importance: High

Good morning Joe,
Attached are changes to the upper division courses for the Lundquist College that I mentioned in my previous email. The document is designed to replace the section referencing the business domain courses in the current proposal ("UGDSCurriculum"). The lower-division domain courses remain the same. As you will see, the approach we have taken is to change the more generic business analytics to two tracks: Accounting Analytics and Marketing Analytics. After much discussion, including with a couple employers, we decided that it makes more sense to offer students a well-integrated set of courses that build on each other and offer deeper knowledge of a subject, as opposed to getting a collection of less related courses across several business disciplines. This also gives students two choices for specialized applications instead of one. Please let me know if there are any questions or concerns about what we are sending over.

Angie Davis and I are leading efforts on our end on this initiative and we would like to take you up on your previous offer to meet, as some questions about the major arose in the discussions with our group. We think a 30 minute meeting should be sufficient.
Thank you,
Diane Del Guercio
Gerry and Marilyn Cameron Professor of Finance and Senior Associate Dean for Faculty Affairs
Lundquist College of Business
1208 University of Oregon
Eugene, OR 97403
(541) 346-5179

View my research on my SSRN Author page:
http://ssrn.com/author=16881

Waiving the BA240 Requirement.

BA240: Managing Business Information

This description details the specific content mastery we are looking for to waive the requirement for BA240. If you believe you qualify to waive the course, contact your instructor and schedule a skills test.

The goal of BA240 is for students to develop the capacity to use software applications to analyze data in service of organizational decision making. Students should be able to demonstrate the capacity to learn new information technology tools and to build reusable decision support tools using Microsoft Excel.

To waive the requirement for BA240, a student should have a course (or courses) and/or professional experience that created an **intermediate** level of expertise in Excel.

In Excel, an introductory level of expertise includes basic workbook management, the use of formulas and functions, formatting tools, and charting tools. For an intermediate level of expertise, we are looking for some combination of

- Summarizing large data sets: subtotals, Pivot tables, Pivot charts
- Analysis of large data sets using Excel tables and Pivot tables
- Advanced functions: logical, lookup, conditional summarization functions
- Specialized functions: nested logical functions
- What-if Analysis: Data tables, goal seek, scenario manager, solver
- Multiple worksheet / workbook management: 3-D formulas, linking worksheets and workbooks, auditing and data validation
- Harmonizing data from multiple sources
- importing data, cleansing data and the use of text parsing functions
- Application of the above tools in analysis of large data sets in a business context