



Curriculum Alignment Handbook

University of Central Florida

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CURRICULUM ALIGNMENT HANDBOOK

This handbook is intended to be used by facilitators of the Curriculum Alignment (CA) effort as a guide to develop the alignment team, set meetings, manage discussions, and ensure that the alignment goals are met. Within any phase of work, the facilitator can expect that additional topics and agenda items will be presented, and it is the task of those facilitating to determine which are relevant to the alignment effort and which the CA team can change or make recommendations to change. This being the case, the facilitator will ultimately set the agenda for the meetings.

The facilitator needs to have the ability to manage the conversation – not provide the solution, but help the faculty come to a collective agreement.

The facilitator's role is to guide the conversation and to help those participating in the conversation stay focused on the goal and purpose of curriculum alignment.

The Goals of Curriculum Alignment are:

- *To synchronize core content and the competencies gained by students taking courses that are transferable within the partner colleges and UCF.*
- *To ensure that the competencies gained by students taking these courses are sufficient for successful progression to a requisite/next level course at any institution, with the ultimate goal of a UCF bachelor's degree.*

As a facilitator of this process, we recommend that the individual leading discussions has experience managing group discussions, including appropriately redirecting conversations and conflict resolution. To this end, those who facilitate can benefit from facilitator or mediation training. Please refer to your institution's human resources office or to professional organizations for training opportunities.

The process of curriculum alignment is not to compromise, but to reach agreement as to what is correct for student learning outcomes.

ACKNOWLEDGEMENTS

This handbook was created as a part of the University of Central Florida's participation in the John N. Gardner Institute's Foundations of Excellence Transfer Focus Initiative, Phase II.

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Citation:

Dorman, T., Jones, A., Borglum, K., Ford, D., Hampton, M., Hepner, L., . . . Wallace, P. (2016). *Curriculum Alignment Handbook*. Orlando, FL: University of Central Florida.

OVERVIEW

A System-Wide (UCF & FCS) Model for Curriculum Alignment Implementation

Information Gathering		State Course Description Course Matrix Current Syllabi Course/Institutional Data
Meeting 1	Kickoff	Introduce Curriculum Alignment Purpose and Goals Identify Participants Identify Courses to Align Distribute Data/Information
Meeting 2	Phase I	Information and Data Review data and information Distribute Outcomes/Topics template Identify Aligned and Misaligned Items Complete Basic Assessments
Meeting 3	Phase II	Review Data and Identify Course Outcomes Understanding Meta Majors/Curriculum Mapping Develop Aligned Course Outcomes Discuss Topics Related to Outcomes
Meeting 4	Phase III	Identify Basic Assessments and Review Pedagogy Reinforce Purpose of Alignment Identify Basic Assessments Discuss Pedagogic Challenges
Meeting 5	Phase IV	Action Plan for Next Steps Identify Action Plan (What, How, When) Identify Who Will Enact Plan (Who) Establish Follow-up Date (Report Out)
Continued	Phase V	Continuous Review Continual Process Improvement Updates/Changes Conduct Alignment Assessments

CURRICULUM ALIGNMENT

What Is Curriculum Alignment?

An aligned curriculum “refers to an academic program that is (1) well organized and purposefully designed to facilitate learning, (2) free of academic gaps and needless repetitions, and (3) aligned across lessons, courses, subject areas, and grade levels.”¹

Among the DirectConnect² partner colleges and the University of Central Florida (UCF), the goals of curriculum alignment are to synchronize core content and the competencies gained by students taking courses that are transferable within the partner colleges and UCF; and to ensure that the competencies gained by students taking these courses are sufficient for successful progression to a requisite/next level course at any institution, with the ultimate goal of a UCF bachelor’s degree.

The Role of Faculty, Advisors and Facilitators

Within DirectConnect, faculty, staff and administrators strive for students to have a seamless pathway towards degree completion. In order to make that vision a reality, it is important to review the curriculum at a course and at a programmatic level to ensure that students are well prepared to advance in the curriculum.

With appropriate and adequate discussion, consultation, and decision-making by the faculty, an aligned curriculum ensures that students have access to the tools to be successful.

Faculty play a vital role in this work because they hold primary responsibility for the curriculum. Faculty engagement in conversations about course learning outcomes, pedagogy, and assessment ensures a smoother transition for students moving from the Florida College System (FCS) to UCF. Ideally, the faculty who participate should be those who have direct knowledge of the course (they teach the course in question or a requisite course that builds on it), they should have direct support of their department head, they should be able to take information and updates to the department/program faculty, and they should be willing to recommend and make changes.

Faculty members have the academic freedom to teach courses the way they believe is best. When a collective of discipline experts (the faculty members) agree on what needs to be taught and assessed, they significantly contribute to the success of the student.

Among the faculty, a particularly important participant is the program director, or the faculty who is primarily responsible for coordination of the program that offers the course. They provide a unique, administrative perspective, can communicate actions and successes of alignment, and can serve as

¹ Hidden curriculum (2014, August 26). In S. Abbott (Ed.), The glossary of education reform. Retrieved from <http://edglossary.org/hidden-curriculum>

² DirectConnect to UCF guarantees admission to UCF with an associate’s degree from one of UCF’s partner colleges: College of Central Florida, Daytona State College, Eastern Florida State College, Lake Sumter State College, Seminole State College, and Valencia College.

agents for any change that may need to take place with the course or within the program offering the course.

Academic advisors provide important perspectives to the curriculum alignment process. They are often the first who interact with students, and what advisors learn about the importance of foundational and successive course content and knowledge will aid them in student advising. Additionally, advisors are most knowledgeable of academic policies and they serve as a conduit of information to the broader advising community.

The facilitator plays a most important role. Ideally the facilitator is someone who is not connected to the discipline, so that he/she can ask both broad, big picture questions and the challenging questions with the only investment being student success. The facilitator will be the person responsible for guiding the conversation, preparing for the alignment meetings, and following up on action items. For additional information about administration of these meetings, please see Appendix G.

History³

In November 2005, UCF's president John Hitt and presidents from four-partner colleges signed a joint resolution, which eventually led to the DirectConnect to UCF program. This program guarantees entry into UCF once certain criteria are met for both the Associate in Arts and Associate in Science degrees. As a result, UCF has become the number one destination for transfer students in the nation. Soon after the resolution was signed, the curriculum alignment initiative began.

In 2006, partner colleges and UCF faculty and administrators chose to focus on the disciplines that support national, state and local initiatives to graduate more students in the area of STEM (Science, Technology, Engineering, and Mathematics). Math, Chemistry, Biology and Physics were the first four disciplines that faculty and administrators identified as priorities. In addition, Computer Programming was added in 2012 and Engineering joined in 2013.

College and UCF faculty from each of the disciplines meet with their peers to review curriculum and discuss ways to align content so transfer students are better prepared for upper division courses at the university. The curriculum alignment effort resulted in an unprecedented level of cooperation between K-12 (who joined the discussion in 2010), partner colleges and UCF, and most importantly has improved student success rates.

Communicate with Stakeholders

As you discuss more foundational changes to courses or curriculum, you need to ensure that the appropriate stakeholders are aware of and support the alignment effort. These individuals or groups need to be kept informed of the progress being made, the needs of and/or barriers to the effort, and the outcomes based on assessments of the effort.

Those who should be made aware and informed of the curriculum alignment effort include, but are not limited to:

³ Adapted from: UCF curriculum alignment website home. Retrieved 3/16/2016 from <https://curriculumalignment.ucf.edu/display/CA/Curriculum+Alignment>

- UCF/FCS Department “Chairs” (to ensure information, status, and updates/changes are shared with the general faculty)
- UCF Faculty Senate (and appropriate subcommittees and/or steering committees)
- UCF/FCS Curriculum Committees
- UCF/FCS Academic Advising Council
- UCF/FCS academic administrator
- UCF/FCS departmental meetings
- UCF’s Faculty Center for Teaching and Learning

MEETING OUTLINE

The phases of this handbook can also be considered a meeting schedule. The initial efforts of curriculum alignment can be accomplished within one academic year; however, it is important to stress that the effort should not be rushed, that topics can (and should) be revisited as needed, and that additional agenda items will present themselves.

Prior to 1st Meeting	Information Gathering	Month 1
Collecting and distributing materials to the participants at least two-weeks prior to the first meeting.		

1st Meeting	Kickoff: Introduce Curriculum Alignment	Month 2
Meeting time: approximately 5 hours (with a break)		
Agenda should include: Introductions and role of participants and facilitator, (re)statement of courses to be discussed, review of the data previously shared, review of purpose and goals, and prompts for “homework” and future discussion (course learning outcomes, prerequisites, syllabi, etc.)		

2nd Meeting	Information and Data	Month 3
Meeting time: approximately 5 hours (with a break)		
Agenda should include: Deeper discussion of course data, institutional similarities/differences, internal alignment, and course prerequisite (develop matrix)		

3rd Meeting	Review Data and Identify Course Outcomes	Month 4
Meeting time: approximately 5 hours (with a break)		
Agenda should include: Discussion of specific course learning outcomes and the list of topics that are relevant to demonstrating that outcome has been met (use template), consider depth of coverage, and engage in initial discussion of assessment		

4th Meeting	Identify Basic Assessments and Review Pedagogy	Month 5
Meeting time: approximately 5 hours (with a break)		
Agenda should include: Reinforcement of the purpose of alignment, identification of basic assessments (syllabi comparison, contribution of course sequence data), review and discussion of pedagogic challenges		

5th Meeting	Action Plan for Next Steps	Month 6
Meeting time: approximately 5 hours (with a break)		
Agenda should include: Identification of actionable items and who is responsible for acting on and reporting back on them (think SMART goals), identify who else should be involved in action, determine follow-up date for report out		

6th (ongoing) Meeting	Continuous Review	Annually
Meeting time: approximately 5 hours (with a break). This meeting may also be in the form of a collective “conference”		
Agenda should include: Report-out on actionable items identified at last meeting, discussion of challenges/barriers and opportunities/successes, share any updates or changes to curriculum that may have occurred at individual institutions, conduct alignment assessments		

PHASE I INFORMATION AND DATA

Statement of the Problem/Purpose

To begin the process, it is important to determine the goals for the alignment work. By employing a “backward design model” we can determine the problem we are trying to solve and how we will assess for the solution.

1. Identify “prerequisite” content and knowledge competencies.
What previous skills and strategies should the student have mastered in order to be prepared for the course?

2. Identify desired result.
What should a student be able to do?
What content is worthy of understanding/mastering?
What enduring understandings are desired?

3. Determine acceptable evidence.
How will we know if students achieved the desired results?
What will we accept as evidence?
What will be measured or demonstrated?

4. Plan learning experiences and instruction.
What enabling knowledge and skills will students need in order to perform effectively?
What activities will equip students with needed knowledge and skills?
What will need to be taught?
What do we need to accomplish these goals?⁴

Factors to Consider

With any review of student success and progression focusing on curriculum alignment, we must also acknowledge those variables that are within and outside of the faculty’s control.

Faculty determine how and in what style or manner to teach a course – this is the heart of academic freedom; however, they have specific content and topics to cover, assignments and exams to issue, and grades to report. These items are in the faculty’s control, sometimes as determined by an individual or a committee of faculty.

⁴ Adapted from: Wiggins, G. and McTighe, J. (2005). *Understanding by Design 2nd Edition*. Alexandria, VA. Association for Supervision and Curriculum Development.

Variables that are often outside of the faculty's control include (but are not limited to) the following:

- Institutional missions
- Institutional admissions protocol
- Classroom and institutional environmental differences
- Financial and socioeconomic status of students

Additional factors that faculty should consider in the alignment process are the following:

- Internal Curriculum Alignment (inter-departmental/intra-institutional)
- Use (or not) of Placement Tests
- Recent Course Alignment Changes
- Course Modality and Content Delivery

A Note about "Internal Alignment"

With any curriculum alignment effort, we must also acknowledge how well aligned courses are within an institution (across multiple campuses or multiple instructor types). Do all faculty within that institution know and agree on the course outcomes? Are they teaching toward those outcomes? A lack of internal alignment may produce additional challenges that need to be discussed and addressed.

Shared Information/Data

The following items are collected and shared in advance of the first working meeting for curriculum alignment. These include information from the state, from the classroom, and reference items and data that provides a comparison of the course across institutions.

This information and data will provide insight and a basic understanding of where courses are aligned or misaligned.

Statewide Course Detail

http://scns.fldoe.org/scns/public/pb_text_only.jsp

The Florida Department of Education's Statewide Course Numbering System (SCNS) provides course details that apply across all FCS and State University System (SUS) institutions. This Florida Department of Education system promotes articulation and facilitates institutions in the use of common categorization and numbering of courses. Lower division credit is accepted at any SCNS institutions when the two institutions offer the same common numbered course.

An example course is found in Appendix A. These SCNS course descriptions include an inventory of prerequisite skills, intended students, level, major topics, special requirements, and course guidelines (outcomes or operations). Any special equating provisions are also documented.

Syllabus

The course syllabus is intended to be the primary document whereby a professor communicates to the student the learning outcomes, assessment methods and directions for the course. Course syllabi from each institution involved in the alignment process should be collected and shared among the participants of the effort. At some institutions, syllabi are based on an overarching course outline, developed by a faculty committee and identifying the outcomes and topics for a course. Where these are used, these should be shared as well.

While each professor's course syllabus should contain the same learning outcomes and topics to be covered, the layout and exact content of the syllabus may have aspects required by the institution along with additional items that are the prerogative of the individual professor. Appendix B provides the sample content in a syllabus and a matrix that provides a quick assessment of alignment (this matrix can be used against the syllabi or the course matrix (see below)).

When reviewing, consider if the following are aligned: textbooks, lab/ recitation/ discussion requirements, etc.?

Course Matrix

As a quick reference tool for each of the courses to be discussed as a part of the curriculum alignment effort, provide a table of the course (title, hours) and prerequisites (include course number and credit hours - course & lab/breakout) across each institution. Use the template in Appendix C as a guide.

When reviewing, consider if the following are aligned: credit hours, prerequisites, prior grade minimums?

Course/Institutional Data

Share institutional data about student progression and success that involve the course to be aligned and/or that provides baseline data for assessment of the course in question.

UCF developed a course sequence data set to track progression from a prerequisite to a requisite (or next level) course across the FCS partners and UCF. These data provide information about student success (A, B, C grade) or lack of success (C-, D, F, W) in the prerequisite and requisite courses along with other factors, including the gap between courses and repeated attempts at the requisite.

Course data of this sort provide one piece of information with respect to successful student progression, specifically: Does success at one institution translate into success at another? Whatever institutional or course-related data you have available that speaks to the courses being aligned should be shared.

When reviewing, consider how the data support or refute existing alignment. How can pedagogy influence the outcomes?

PHASE II REVIEW DATA AND IDENTIFY COURSE OUTCOMES

After the initial information and data about the courses being aligned have been shared, the next step is to work on aligning the outcomes. The outcomes alignment work is designed to determine what a student should be able to do (or master) once he/she completes the course.

A goal of curriculum alignment is to ensure that the competencies gained by students taking these courses are sufficient for successful progression to a requisite/next level course at any institution, with the ultimate goal of a UCF bachelor's degree.

Before conversations about outcome alignment, faculty (particularly those within the FCS) may want to think about how the course fits into one of the eight Meta Majors established by the state. This is to determine who is taking the course and how the course fits into a degree program. Faculty (particularly those at UCF) may also want to think about how the course fits into the degree's Curriculum Map. This is to determine the course's contribution to the outcomes of the degree program and whether the level of instruction is introduced, emphasized, reinforced, or advanced⁵.

Meta-Majors

In 2013, the Florida Board of Education approved eight meta-majors in the FCS. "A meta-major is a collection of academic programs that have common or related content, and the intent is for Florida College System institutions to be able to advise associate degree seeking students based on the selection of a meta-major academic pathway. The rule identifies eight meta-majors, and also specifies the gateway courses in English and mathematics that are appropriate for each meta-major."⁶ The eight meta-majors from which FCS students choose are:

1. Arts, Humanities, Communication and Design
2. Business
3. Education
4. Health Sciences
5. Industry/Manufacturing and Construction
6. Public Safety
7. Science, Technology, Engineering, and Mathematics
8. Social and Behavioral Sciences and Human Services.

Within each meta-major are degrees and certificates that have related courses. The intent of selecting a meta-major is to help students choose a major and degree based on their interests, knowledge, skills and abilities. Selecting a meta-major will also help students select classes that relate to a specific, four-year degree. All FCS degree-seeking students (AA and AS) are required to identify a meta-major.

⁵ Matveev, A., Hamilton, L., Zapatero, E. (2011) Curriculum mapping: A methodology to define, document, demonstrate, and improve the coherence of program curricula. Workshop conducted at the meeting of the SACSCOC, Orlando, FL.

⁶ BOG Memorandum, 10/4/13, "Approval of Rule 6A-14.065, Meta-Major Academic Pathways". Retrieved online 8/8/16 from <http://www.fldoe.org/core/fileparse.php/3/urlt/JA-MemoMetaMajors.pdf>.

Curriculum Mapping

Faculty engaged in the curriculum alignment process should recognize how the course being discussed for alignment contributes to the overall degree (and the program's learning objectives). Accordingly, the faculty should be aware of how the courses of the program map to the curriculum and the program's learning objectives.

How is the course mapped within the curriculum?

- Is it an introductory course? One on which other content and knowledge will be based and where "instruction and learning activities focus on basic knowledge, skills, and/or complexities and entry-level complexities: an introductory course".⁷
- Is it an emphasized course? One that build upon previous, baseline knowledge where "instruction and learning activities concentrate on enhancing and strengthening knowledge, skills, and expanding complexity".⁸
- Is it a reinforcing course? One that expands on mastered knowledge and where "instructional learning activities continue to build upon previous competencies with increased complexity".⁹
- It's not likely that courses that are a part of the alignment effort will be advanced courses, but these are ones where "students are expected to possess an advanced level of knowledge, skill, or competency.... [and where] instructional and learning activities focus on the use of the content or skills in multiple contexts and at multiple levels of complexity."¹⁰

Course Learning Outcomes

Student learning outcome statements "clearly state the expected knowledge, skills, attitudes, competencies, and habits of mind that students are expected to acquire at an institution of higher education. Transparent student learning outcomes statements are:

- Specific to institutional level and/or program level
- Clearly expressed and understandable by multiple audiences
- Prominently posted at or linked to multiple places across the website
- Updated regularly to reflect current outcomes
- Receptive to feedback or comments on the quality and utility of the information provided"¹¹

The focal work of the Curriculum Alignment effort is that the faculty will identify the learning outcomes for the course and how they contribute to the program(s) that use the course.

For each course, those engaged in the curriculum alignment process will work to identify the course learning outcomes that are important for mastery of the course and any knowledge that needs to be introduced, emphasized, or reinforced in preparation for the requisite course and for completion of the program.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

¹¹ "Providing Evidence of Student Learning: A Transparency Framework." National Institute for Learning Outcomes Assessment. Retrieved 3/21/16 from <http://www.learningoutcomesassessment.org/TFComponentSLOS.htm>

The template in Appendix E can be used to outline the outcomes and topics. For each course:

- Identify three or four outcomes for the course
- Develop a list of topics that must be covered to meet the learning outcomes

As you document the course learning outcomes and topics, also consider how they are being taught and how they are being assessed.

The faculty will further examine these outcomes and topics to assess what the topic contributes to the course, thus designating it as a mandatory (M), optional (O), overview (V), or review (R) topic. Appendix F provides an example of this worksheet.

The facilitator may also introduce an additional level of review to determine how deeply the topics are covered or how much time is spent on each topic (either in course lecture or separate lab/discussion sessions). This is often referred to as “depth of coverage,” and the classification criteria (depth, time, etc.) will be established by the alignment group.

PHASE III IDENTIFYING BASIC ASSESSMENTS AND PEDAGOGY REVIEW

How Do You Know You're Aligned

The dreaded "A" word: Assessment. Now that you've gone through the effort, how will you know you are aligned?

There are a couple simple, baseline assessments to validate the alignment effort. First, revisit any existing course sequence data (see Phase I). With a two-course sequence identified at the onset of the effort, this provides a baseline of information that can be replicated on a regular basis.

What institutional data exist that can be used to establish a baseline and follow-up?

Next, a rudimentary evaluation of syllabi from across institutions will provide information about alignment. What is the case now and what is the case after the effort? Using the alignment matrix (Appendix B), compare prerequisites, course hours, lab/discussion hours, textbooks, course outcomes/topics.

As you work through reviewing the information and data and discussing appropriate course outcomes and topics, you will identify many additional areas that can impact and influence the curriculum alignment effort. It is worth further exploration of these topics where they directly contribute to the alignment effort.

A Discussion of Pedagogy

One area that can influence the curriculum alignment effort is pedagogic implications and influences. Once the faculty determine the aligned course outcomes, there should also be a shared discussion that covers the following topics:

- Who is taking the course and why?
- How are the course topics being taught/delivered?
- Where do challenges/barriers to successful alignment remain?
 - Over which do faculty have control?
 - Which relate to the student's transition between institutions?
- How are faculty assessing the learning outcomes (both formative and summative assessments)?
- What differences exist in course modality (ex: online, face-to-face, etc)
- What differences exist with respect to lecture, lab, discussion, and/or recitation requirements?

PHASE IV ACTION PLAN FOR NEXT STEPS

The action item identifies what action needs to be taken, by whom, and in what timeframe¹².

What needs to happen?

How it will happen?

By when it will happen?

And share what has been done.

Once there are agreed upon learning outcomes and topics for the course, consider the following:

ACTION: If learning outcomes need to be aligned (or adjusted), initiate changes with the faculty.

ACTION: If titles, hours, descriptions, or prerequisites should be changed, present agreed-upon curricular changes to the faculty.

ACTION: If the title, hours, description, or prerequisites need to change, adjust the course by submitting these changes to the appropriate curriculum committees.

ACTION: If the textbook, course outcomes, or topics need to change, adjust the syllabus.

ACTION: If tool or materials used in the course need to change, adjust classroom policies and activities

ACTION: Develop assessments related to alignment effort: How do you know you're aligned?

With the right faculty participating in the effort and with the recommendations communicated to the appropriate parties (chairs, deans, etc.), the faculty engaging in the Curriculum Alignment effort can take the recommended changes to the program faculty, work with them to enact the recommended changes, and report back on the progress of those changes.

Why Should Anything Change?

What incentives do faculty have for adopting the changes recommended through the curriculum alignment process? To answer this is to revisit the purpose of curriculum alignment, which is to ensure that the competencies gained by students taking these courses are sufficient for successful progression to a requisite/next level course at any institution, with the ultimate goal of a UCF bachelor's degree.

*By engaging in the curriculum alignment process, participants have the opportunity expand their pedagogic expertise, develop an enhanced understanding of curriculum, participate in a network of discipline professionals, and provide a **direct contribution to student success.***

¹² Recall S.M.A.R.T. Goals. Various sources abound, here are a couple: <https://www.projectsmart.co.uk/brief-history-of-smart-goals.php> ; <https://www.mindtools.com/pages/article/newLMD4101.html>.

PHASE V CONTINUOUS REVIEW

Once the courses are in alignment, the participating faculty should engage in an annual review to provide continued assessments and to share any updates or changes.

Items to discuss at this meeting can include:

- Results of Alignment Assessments
- Syllabus Review
- Course Sequence Success Data
- Course Outcomes and Topics

As a result of the review and discussions, be aware of and identify any steps that need to be taken to make any additional modifications to the aligned courses. Additional and ongoing changes may be needed as a result of changes to state or local mandates, changes to requisite course needs, or other changes that may have taken place that impact the learning outcomes of the aligned courses.

APPENDICES

Appendix A: Statewide Course Detail

http://scns.fldoe.org/scns/public/pb_text_only.jsp

We use Calculus I and Calculus II as an example: MAC X311 and MAC X312

MAC 311 - CALCULUS I (GE CORE)

Institutions

Statewide Course Detail

Locate Statewide Course

GO

Statewide Course Detail

Discipline	044
Discipline Title	MATHEMATICS
Discipline Definition	NONE
Prefix	MAC
Prefix Title	MATHEMATICS - CALCULUS AND PRECALCULUS
Prefix Definition	COURSES FOCUSED ON MATHEMATICS IN A CALCULUS AND PRECALCULUS TRACK.
Century	300-399
Century Title	CALCULUS WITH ANALYTIC GEOMETRY
Decade	310-319
Decade Title	CALCULUS WITH ANALYTIC GEOMETRY
Statewide Course	311
Statewide Course Title	CALCULUS I (GE CORE)
Status	ACTIVE
Transfer	GUARANTEED TRANSFER TO INSTITUTION OFFERING SAME COURSE.
Course Intent	LOWER
Prerequisites	A COURSE FROM MAC _100 - _109 AND MAC _110 - 119,
Corequisites	NONE
Profile Description	1. REVIEW OF FUNCTIONS 2. LIMITS AND CONTINUITY 3. THE DERIVATIVE 4. DIFFERENTIATION OF ALGEBRAIC FUNCTIONS 5. DIFFERENTIATION OF TRANSCENDENTAL FUNCTIONS 6. MEAN-VALUE THEOREM AND INTERMEDIATE VALUE THEOREM 7. EXTREMA AND GRAPH SKETCHING 8. AREA AND THE DEFINITE INTEGRAL 9. ANTIDIFFERENTIATION 10. FUNDAMENTAL THEOREM 11. INVERSE FUNCTIONS 12. ARC LENGTH 13. TECHNIQUES OF INTEGRATION 14. PARAMETRIC EQUATIONS AND POLAR COORDINATES 15. TAYLOR'S FORMULA, INFINITE SEQUENCES AND SERIES 16. VECTORS IN THE PLANE AND 3-SPACE 17. TOPICS FROM PLANE AND SOLID ANALYTIC GEOMETRY 18. DIRECTIONAL DERIVATIVES AND CURVATURE 19. DIFFERENTIAL CALCULUS OF FUNCTIONS OF SEVERAL VARIABLES 20. MULTIPLE INTEGRATION CREDITS: 4-5 SEMESTER HOURS THE ABOVE TOPICS APPLY TO THE ENTIRE CALCULUS WITH ANALYTIC GEOMETRY SEQUENCE. THE ORDER OF TOPICS MAY VARY IN THE TOTAL CALCULUS WITH ANALYTIC GEOMETRY SEQUENCE. THEREFORE, TRANSFERABILITY IS GUARANTEED ONLY IF THE ENTIRE SEQUENCE HAS BEEN COMPLETED

Statewide Course Detail

Discipline	044
Discipline Title	MATHEMATICS
Discipline Definition	NONE
Prefix	MAC
Prefix Title	MATHEMATICS - CALCULUS AND PRECALCULUS
Prefix Definition	COURSES FOCUSED ON MATHEMATICS IN A CALCULUS AND PRECALCULUS TRACK.
Century	300-399
Century Title	CALCULUS WITH ANALYTIC GEOMETRY
Decade	310-319
Decade Title	CALCULUS WITH ANALYTIC GEOMETRY
Statewide Course	312
Statewide Course Title	CALCULUS WITH ANALYTIC GEOMETRY II
Status	ACTIVE
Transfer	GUARANTEED TRANSFER TO INSTITUTION OFFERING SAME COURSE.
Course Intent	LOWER
Prerequisites	SUGGESTED IS MAC _311.
Corequisites	NONE
Profile Description	1. REVIEW OF FUNCTIONS 2. LIMITS AND CONTINUITY 3. THE DERIVATIVE 4. DIFFERENTIATION OF ALGEBRAIC FUNCTIONS 5. DIFFERENTIATION OF TRANSCENDENTAL FUNCTIONS 6. MEAN-VALUE THEOREM AND INTERMEDIATE VALUE THEOREM 7. EXTREMA AND GRAPH SKETCHING 8. AREA AND THE DEFINITE INTEGRAL 9. ANTIDIFFERENTIATION 10. FUNDAMENTAL THEOREM 11. INVERSE FUNCTIONS 12. ARC LENGTH 13. TECHNIQUES OF INTEGRATION 14. PARAMETRIC EQUATIONS AND POLAR COORDINATES 15. TAYLOR'S FORMULA, INFINITE SEQUENCES AND SERIES 16. VECTORS IN THE PLANE AND 3-SPACE 17. TOPICS FROM PLANE AND SOLID ANALYTIC GEOMETRY 18. DIRECTIONAL DERIVATIVES AND CURVATURE 19. DIFFERENTIAL CALCULUS OF FUNCTIONS OF SEVERAL VARIABLES 20. MULTIPLE INTEGRATION CREDITS: 4-5 SEMESTER HOURS THE ABOVE TOPICS APPLY TO THE ENTIRE CALCULUS WITH ANALYTIC GEOMETRY SEQUENCE THE ORDER OF TOPICS MAY VARY IN THE TOTAL CALCULUS WITH ANALYTIC GEOMETRY SEQUENCE THEREFORE, TRANSFERABILITY IS GUARANTEED ONLY IF THE ENTIRE SEQUENCE HAS BEEN COMPLETED. 87

Appendix B: Sample Syllabus Content with Alignment Matrix

Heading	Syllabus Item	Aligned? (Y = 1, N = 0)
COURSE:	Session and Year	
	Name and Catalog description	
	Credit	
	Prerequisite(s) and Co-requisite(s)	
	Supplemental meeting places and times	
	Statement about major learning outcomes, skills	
	Statement about TVCA core competencies (if applicable)	
	Statement about Gordon Rule requirements (if applicable)	
PROFESSOR:	Name	
	Office	
	Phone number	
	Office hours (also by appointment)	
EDUCATIONAL MATERIALS:	Primary Text - title, edition, author	
	Supplements	
	Additional supplies (if needed)	
	Resources - names and locations	
ASSESSMENT METHODS AND EVALUATION:	Examinations	
	Quizzes	
	Projects, assignments, papers	
	Type of final	
	Calculation of final grade (as specific as possible)	
CLASSROOM POLICIES:	Attendance	
	Make-up examination procedure	
	Academic honesty	
DISCLAIMER:	Changes may be made at the discretion of the instructor (usually in writing)	
SCHEDULE OF CLASSES AND/OR LABS:	Course Topics	
SPECIAL RULES:		

Appendix D: Course Matrix

Note: This is best set-up as an Excel file.

Course	Title	<u>CF</u>	<u>DSC</u>	<u>EFSC</u>	<u>LSSC</u>	<u>SSC</u>	<u>VC</u>	<u>UCF</u>
MAC 2311	Calculus I	<p>MAC 2311 5(5,0)</p> <p>PR: CLM (min 103) or MAC1114 and (MAC1140 or MAC1147)</p>	<p>MAC 2311 3(3,0)</p> <p>PR: MPT or college prep course or dev exemption or (MAC1140 w/C and MAC1114 w/C) or consent of chair CR: MAC2311L</p> <p>Separate Lab: MAC2311L 1(0,1) CR: MAC2311</p>	<p>MAC 1311 5(5,0)</p> <p>PR: MAC1147 w/C or (MAC1140 w/C and MAC1114 w/C)</p>	<p>MAC 2311 5(5,0)</p> <p>PR: MAC1114 w/C and MAC1140 w/C</p>	<p>MAC 2311 5(5,0)</p> <p>PR: MPT or (MAC1114 w/C and MAC1140 w/C) or MAC1147 w/C</p>	<p>MAC 2311 5(5,0)</p> <p>PR: (MAC1140 w/C and MAC1114 w/C) or MAC1147 w/C</p>	<p>MAC 2311C 4(3,2)</p> <p>PR: MPT or (MAC1140C w/C and MAC1114C w/C) or (MPT and (MAC1114C w/C or MAC1140C)) or AP Calc AB w/3</p>
MAC 2312	Calculus II	<p>MAC 2312 5(5,0)</p> <p>PR: MAC2311</p>	<p>MAC 2312 3(3,0)</p> <p>PR: MPT or college prep course or dev exemption or MAC2311/2311 L w/C or consent of chair CR: MAC2312L</p> <p>Separate Lab: MAC2312L 1(0,1) PR: MAC2311 CR: MAC2312</p>	<p>MAC 2312 5(5,0)</p> <p>PR: MAC1311 w/C</p>	<p>MAC 2312 4(4,0)</p> <p>PR: MAC2311 w/C</p>	<p>MAC 2312 5(5,0)</p> <p>PR: MAC2311 w/C</p>	<p>MAC 2312 5(5,0)</p> <p>PR: MAC2311 w/C</p>	<p>MAC 2312 4(4,0)</p> <p>PR: MAC2311C w/C or AP Calc AB w/5</p>

Appendix E: Outcome and Topics Template

Curriculum Alignment:

Course: prefix number Credit Hours: credit (lect, lab/disc)

Prerequisites: list all PR and CR

Also reference the [Statewide Course Detail](#) (hyperlink) for the State's Course Profile Description



State Course Profile Description:

Learning Outcome

Major Topics:

Learning Outcome

Major Topics:

Learning Outcome

Major Topics:

Action(s) to be Taken:

--

Person Responsible:

--

Transition Plan for Students (if course is changing)

--

Indicators of Alignment

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Appendix F: Course Topics

Example: MAC 2311 Calculus I

Type: M=Mandatory; O=Optional, V=Overview, R=Review

Topics	Sub Topics	Type
The limit concept	Definition/Notation of limit (including one sided limits)	M
	Finding limits graphically, numerically, and analytically.	M
	Delta, epsilon concepts.	V
Continuity property	Definition of continuity	M
	Recognizing discontinuity graphically, and analytically.	M
	Redefining the functions to make them continuous.	M
	Squeeze theorem and intermediate value theorem	M
The derivative of a function	Definition - limit of difference quotient.	M
	Interpreting a derivative as an instantaneous rate of change	M
	Interpreting a derivative as the slope of a tangent line	M
	Limitations of technology (calculators)	O
	Approximating derivatives numerically or graphically.	M
Rules for derivatives including the chain rule	Sum, difference, product, quotient, chain rule, power rule, trig functions	M
	Implicit differentiation	M
	Higher order derivatives	M
	Notation for derivatives	M
	Rules for differentiating exponentials, logs, and inverse trig functions	M
Mean Value Theorem	Rolles Theorem	M
	Mean Value Theorem	M
	Geometric and algebraic interpretation.	M
Applications of derivatives	1st and 2nd derivative test for extreme values	M
	Using the derivatives of $f(x)$ to determine the characteristics of the graphing	M
	Inflection points	M
	Related rates and optimization problems	M
	Definition of critical values	M
	Applications related to natural science, business, etc.	M
	Newton's Method	O
The definition of the definite integral	Limit of a Riemann Sum	M
	Approximating integrals numerically and graphically.	M
	Definition of area between curves.	M
	Trapezoidal and Simpson's Rule	M
	Properties of a definite integral	M
The Fundamental Theorem of Calculus	Part I	M
	Part II	M

Calculation of integrals	Indefinite integrals	M
	Substitution rule	M
	Algebraic and trig functions	M
	Transcendental functions	M
Applications of the definite integral	Volumes of solids of revolution using disc, shell, and washer.	M
	Areas between curves and their physical interpretations.	M
	Integral Mean Value Theorem	M
	Average value of a function	M

Note: This exercise does not reflect how long an instructor should spend on each topic or the depth of coverage of each topic. The topics are simply a reflection of things that should be covered during the length of the course. Once the course topics are agreed upon and identified for type of coverage, additional information about time and depth of coverage (ex: how much nuance is shared, how much time is spent on the topic, etc.) may also be added.

Appendix G: Facilitator Role

Identify what unit will facilitate the CA initiative and have administrative oversight. Responsibilities of that unit/individual may include:

1. Provide administrative assistance
2. Manage/maintain CA website
3. Provide reporting
 - a. Summary of action items and results
 - b. Successes, Challenges, Barriers
4. Set agenda
5. Facilitate discussions
6. Provide accountability (to position and initiative) to ensure:
 - a. Action items are executed
 - b. Timeline is followed
 - c. Goals are met (consider the S.M.A.R.T.¹³ approach)
7. Organize annual conference (annual meeting/cross- and multi-disciplines)
 - a. Establish an expectation of continuous review
 - b. Review actions
 - c. Share updates
 - d. Coordinate report-out
 - e. Set high level and annual goals
8. Develop and implement communication plan
 - a. What, how often, and to whom
 - b. Share results with appropriate administrative office(s)

¹³ Doran, G. T. (1981). "There's a S.M.A.R.T. way to write management's goals and objectives". *Management Review (AMA FORUM)* 70 (11): 35–36